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12-1-2012

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### Repository Citation

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## **Arcane Whispers Echoed from Monumental Tomb “M” at Orthi Petra in Eleutherna: Contributions of Anthropological Research**

Kneeling respectfully within monumental funerary building “M”, touching the blessed earth that had been entrusted to preserve the immortal memories of our ancestors, face to face we came in the ultimate judgment of the Fates to a nexus with roots of old unearthed, untouched by the passage of time, unseen by the rays of the Sun for millennia. In mother Gaia’s protective embrace the bodies of four women had been laid to rest for the ultimate journey to the underworld, summoned as they may have been at a breathless point in time by divine hushed sounds that had conferred the meaning and purpose of their transference to the meadows of asphodels...

Their bodies, caringly linked in the physical dimensionality of spatial allocation, were tenderly touching each other in deeply meaningful associations, esoteric as they may have been yet indicative of the intended companionship of theirs to be everlasting in the intangible domains of Chronos. After the crossing of Hade’s gates, the passing of time, tantalizingly as it aimed in diffusing corporeal elements of their bodies, dispersing them in favor of the bountiful fertility web offered by nurturing earth, could not have bruised the aura of their presence and the gravity of their evocative legacy. Subtle and arcane as they were initially, echoes of their saga faintly began to resonate as syllables extracted from a divulging vocabulary by means of careful excavation procedures and thought out adaptations of recovery processes in stratigraphic and contextual associations of significant complexity coupled by a plethora of cultural materials, anthropological remains, and traces of behavioral and ideational concepts sensitively imprinted in the ambience and special associations within the funerary milieu; gently unveiled by the decoding of tangible idiomatic expressions articulated, and of perceptible symbolic communications recounted.

In due time sequential and overlaying layers of deposits had accumulated within funerary building “M”, generated by an amalgam encompassing the affectionate and compassionate burial preparations for afterlife conducted by those who interred the four ladies, the subsequent observance of funerary rights and traditions, and the taphonomic impacts afforded over the centuries and millennia that followed. Furthermore, diachronic processes of digenetic changes affecting both organic and inorganic constituent elements of the four interments had modified the anthropological record to comprise incompletely preserved dry skeletal remains; the structural composition of a considerable number of preserved bone surfaces showed relatively fragmented and deteriorated conditions. Nevertheless, important clues life had permanently recorded on their bones and teeth were recovered. Essential traces of the multifaceted spectrum of their human condition were able to be recomposed and revealed, under careful study, reflective as they were of traits of genetic and/or epigenetic variation, aspects of biological growth processes, and where pertinent of degenerative processes. Acquired *intra vitam* conditions were decoded, considering the spectrum of a range of parameters conditional to the physical environment, and as direct and/or indirect expressions of the habits of civilization ranging from dietary intake to kinetic issues as choices and/or mandates imposed by the socio-cultural settings and norms; these were most valuable tesserae of the unique mosaic work of reconstructing and meaningfully deciphering in conjunction with the rest of the archaeological record the pathways of the ancients.

Upon completion of the archaeo-anthropological field recovery and documentation, and aided by subsequent laboratory physical-forensic anthropologic analyses which are ongoing, it was determined through a deductive interdisciplinary process that three of the ladies had been placed tightly adjoined to each other, in a head-to-toe arrangement, at supine and mostly extended body positions, oriented on a cardinal north-south direction, resting on the basal domain of the funerary building. The fourth lady, the oldest of them in biological age, had been placed contiguously to

them, fitted however in a preeminent seated positioning, enthroned, as if shepherding the three younger ladies in the perceived particulars and minutiae of the funerary context, as well as officiating on the elusive affairs of the occult agencies. Her feet had been resting on the basal domain of the funerary building, on the elemental earth, abutting amid the upper bodies of the second and third ladies which laid closest to her, whereas her legs and thighs were moderately overhanging the thoracico-abdominal region of the third one who was situated most proximally to her enthroned position.

The four ladies, as revealed by the anthropological analysis, had been placed adjoining each other not in a random order but in a select sequence in reference to their biological ages, from the youngest to the oldest, enthroned, lady. Hence, the youngest lady--designated for the purposes of anthropologic analysis with letter "H", aged at approximately 13.5 years at the occurrence of death, had been laid furthest from the oldest. Sequent to Lady "H" was the second lady--designated with letter "N", aged at approximately 16 years, followed by the third lady--designated with letter "Y", age assessed at approximately 28 years, who laid nearest to the fourth and oldest lady--designated as letter "I", aged at approximately 72 years (see an artist's rendering<sup>1</sup>, Fig. 1).

Based on *in situ* archaeo-anthropological forensic assessments, considering the features of cultural stratigraphy in relations to the substrate variability (both the natural geo-pedologic and the introduced, cultural, stratigraphic components) on which the anthropological remains had been laid, along with the specific relations of their anatomic composition and articulations, and considering the multifarious peri-, and post-interment considerations that were and/or could have in effect been involved in the settling and truncation of corporeal tissues during and after diagenetic processes, affected by the geodynamic and taphonomic processes (observable effects of which were recorded in the nature of accumulation and sequencing of taphonomically accrued stratigraphic layers and pockets) infiltrated exogenously into funerary building "M", it was possible to establish that the placement of the four interments had been conducted as a coextensive in time and conterminous in space funerary event.

Accordingly, ladies "H" and "Y" clearly appear to have comprised the initial lateral stratigraphic layers of interment deposits during a twofold phase, whereby lady "H" under most probabilities was laid to rest first followed by the positioning of lady "Y", defining with their supine and nearly extended body placements the relative rectangular space into which their bodies would have been nestled for the timeless state at the end of mortal life. Juxtaposing slight left-rotatory, versus right-rotatory arrangements of the thighs (pivoting in the hip joints) of ladies "H", and "Y", respectively, combined with analogous, moderate degree, flexion patterns of their knee joints, guided the plantar surfaces of their right feet toward an adjacent convergence in plantar flexion, providing thus for a nearly isosceles in shape spatial terminus, between their legs, hence confining in it among other nonperishable cultural materials a bronze vessel (laid at the basal level as the two ladies "H" and "Y") the most distal perimetrical surface of which was touched by dorsal surfaces of their legs and feet, whilst their left feet symmetrically arranged, paralleled the anatomic arrangements of their right counterparts. Lady "N" was subsequently laid to rest in a supine and fully extended positioning, fitted between ladies "H" and "Y", airily adjoining with her right upper arm the left upper arm of lady "Y", while gently superimposing with her left upper extremity the right counterpart of lady "H"; an arrangement that provided in essence contiguous upper bodies' interconnections among the three younger ladies, with head-to-head isometric spatial relations whereas lady's "N" lower extremities fully extended and mildly flexed at the knee joints had been fittingly affixed to overlay the legs of lady "H", considering that the right lateral components of the right lower extremity of lady "N" had been placed adjoining the left peripheral domain of the same bronze vessel mentioned above.

Lady “T” had been placed last in the sequence of interments, secured at her throned positioning, her thighs, flexed knee joints and upper thirds of her legs overhang the upper body components of lady “Y”, namely over the thoracic and upper abdominal regions (from the claviculo-sterno-acromial level to the epigastric region). The posterior surfaces of the two lower thirds of lady’s “T” legs (from the level of *cruris posterior* to the most dorso-proximal<sup>2</sup> calcaneal region) had been placed in the following positions: the right adjoined to the left lateral side of lady’s “Y” left elbow region and the right lateral side of lady’s “N” right elbow, while the left counterpart of lady’s “T” legs, was affixed adjacent to lady’s “N” right suprascapular region and shoulder. The plantar surfaces (*planta pedis* region) of lady’s “T” feet rested on the basal level of the elemental earth, the right subjoined below the right lateral domain of lady’s “N” abdominal region, while the left counterpart’s tarso-calcaneal region had been placed adjoined to the spatial domain demarcated above the right suprascapular border of lady “N”, whereas the distal<sup>3</sup> metatarsal and phalangeal region of the same foot was secured under lady’s “N” neck region.

The interment arrangements evaluated from an anthropological perspective, without considering the wealth and unique nature of the non-perishable burial artifacts and additional archaeological features, focusing on the particular placement of the four ladies in the chamber of monumental tomb “M”, as a fundamental component of the burial process and overall funerary custom indicative as it may be of a complex decorum, is assessed may discernibly reflect but on a few expressions out of a multitude of intricate facets of an arcane and deeply sophisticated process; involving a transition and transference of attributes and functions of the ladies’ assembly from mortal to eternal life. The bodies of the tetrad, placed in sequential orderliness yet distinctive in its hierarchical utility of the three-dimensionality between the triad and the fourth member, the highest in authority, offered an interconnected array of figures as if in a formation of continuity, drawn from youngest to oldest and vice versa, reflective of progression, of succession, and probably of issues of rank within the triad of younger ladies, placed on the elemental earth, subject to being overseen and/or mentored by the highest in rank and responsibility persona, the oldest lady. As in a prosodic caesura of winged words and phrases, proverbial axioms of unconventional wisdom, they lay congregated in unison communicating mutely, their heads having been placed with dignified propriety and with a nearly exacting precision on the same linear outline; their profound devotion, duty and companionship had remained unbroken, unable to be effaced by the passing of ages. The minutiae as integral components of such a spectacle, although rooted in the physical space of funerary building “M”, were nevertheless suspended in the realm of Chronos, deferred as a fervid act, aspired as it may have been to be animated in perpetuity. Elusive as the esoteric functions and purpose of such animism may be to the un-inducted observer, the utterances asserted by the vivid impressions and discernible symbolic associations of the tetrad effectively challenged the fated conditions of their refrained speech on the intended purposes of their striking context and placement arrangements.

And yet the expressed symbolism and apparent relations of the tetrad revealed in their unique funerary congregation, were to be enhanced by additional facets divulged through the record of their skeletal remains conceding as phonemes of a verbose eye witnesses’ report, yet without a hurried implication of destructive forensic/archaeometric techniques on irreplaceable materials, the illumination of important conditions and circumstances of their *ante mortem* life and even of an aggregate of genetic and congenital physiological characters, elements requisite of their skeletal constitution. The prevalence of a number of distinct dental epigenetic morphological features expressed among clinical and anatomic surfaces of their teeth reached a unique climax with the positive scoring of the heritable trait of Carabelli<sup>4</sup>, a phenotypic manifestation marking the mesio-palatal crown surfaces of maxillary molars, with the most significantly observed frequency

recorded among European populations. Four basic grades of the manifestation may appear bilaterally, most commonly in maxillary arcade symmetry between left and right side counterparts, ranging from a pit, to a fissure/groove, to a ridge, or a tubercle/cusp; continuous forms of expression variability (i.e. in the case of a tubercle/cusp from a slight tubercle through to a very pronounced cusp) indicate a gene typology of a polygenic causality<sup>5</sup> acting on the odontogenetic cusp formation processes within the broader domain of orofacial growth and development. As illustrated through a considerable number of interdisciplinary studies focusing on bio-cultural and bio-distance studies, a select number of well documented heavily inbred population isolates show first maxillary molar Carabelli trait expressions with frequencies up to 86% (prone to reflect on grandparental endogamy from within the same small village area)<sup>6</sup>, whereas the records on the Carabelli trait expressed on the second and third maxillary molars appear to indicate when recorded significantly diminishing frequencies. It is in light of the above that in the case of the four ladies, the triad of the so called “H”, “N”, and “Y” younger ladies revealed positive trait first maxillary molars, expressed bilaterally and symmetrically within their maxillary hemispheres as emphasized cusps. Such a score provided for a phenomenal 100% observation ratio, presenting a unique case within the context of this qualitative population sample, indicative as it may be of their associated descent and kindred relatedness. Oldest lady “T” had not preserved the majority of her maxillary molars, lost to *ante mortem* conditions, except of the left third maxillary molar which could not be evaluated in this matter given its severely, obliquely, worn occlusal platform and mesio-palatal crown surfaces as a result of aging conducive to functional modification of masticatory processes. Further on the triad of younger ladies, their second and third maxillary molars revealed positive trait Carabelli expressions, mostly in bilateral and symmetrical sequences in the forms of less emphasized tubercles and pits, hence providing additional scores of 100% observation ratios respectively on the expressed distribution of this polymorphic inheritable dental trait and lending further support to the *unicum* of their contextual association; taking into consideration that positive Carabelli trait expressions in the second permanent molar are quite infrequent, and rarely expressed in the third molars<sup>7</sup>. Furthermore, the bilaterally-symmetric emphasized Carabelli cusp expressions, particularly on the first maxillary molars, indicate that they had been modulated during ontogeny by the strength of inheritable odontogenetic rather than of environmental parameters or determinants. It appeared clear therefore that at least the triad of young ladies, given the unavoidable sample exclusion of old lady “T”, due to preservation/aging issues limitations, shared considerably as genotypic recipients in the outcome of a process, of the passing down of genes from forebears to descendants, the genotypes of whom had been contributed from a population gene pool the demographic dynamics of which on the function-variable of “gene flow”<sup>8</sup> had been very limited, indicative of a population with significant endogamy and/or of a population subgroup committed to a rigidly selective endogamous behavior, over multigenerational periods, within inbred, hence, in relative time of consanguineous lineages of descent.

The data established through dental inheritable traits, manifested to an ultimate degree of expression potential<sup>9</sup>, offer a testament on conditions of unique genetic relatedness at least among the triad out of the tetrad of ladies, providing tangible evidentiary data which lend support to the symbolism of the complex burial contextual associations and funerary behavioral conduct that prevailed within monumental tomb “M”. Besides the affirmation of their common ancestry and genetic relatedness, additional lines of evidence from the domain of physical-forensic anthropology and paleopathology retrieved from the skeletal record of the interred ladies elucidated a number of shrouded facets of their *ante mortem* life conditions, offering essential clues on their early life years of development, relative to their upbringing in a socio-cultural milieu

which seemed to have been characteristic of at least a few persisting commonalities. Owing once more to data borrowed from the dental record and particularly of enamel hypoplastic<sup>10</sup> manifestations on crown surfaces, it was possible to primarily document that the triad of the younger ladies had undergone conditions of early life constitutional stress. These had been characterized by instances of interrupted and subsequently improved biological growth, circumstances permanently recorded on the enamel surfaces of their teeth as linear enamel hypoplastic defects. In being able to calculate the biological age of the occurrences of the linear enamel hypoplasias<sup>11</sup>, a notable pattern emerged for the three younger ladies. They had undergone on average between the third year to the first quarter past their fifth year (~3.0 to 5.25 years) of life, through three distinct cumulative corporeal stress events, sequential instances at a mean interval of about nine months. These episodes had been serious enough to temporarily restrain aspects of the biological growth of the triad of younger ladies, arresting the activities of ameloblast cells, which develop the dental enamel tissue, having thus interrupted the relatively smooth formation of crown enamel. Once each of the three ladies recovered from each of the stressors, ameloblastic cell activity rebounded, however, permanently marking with a delineable boundary the dental crown loci where growth cessation had occurred and subsequently rekindled.

The causative agents of linear enamel hypoplasias are multifactorial and may be caused in a prenatal environment involving maternal implications, and/or postnatally, secondary to a range of idiopathic conditions such as autoimmune-hypersensitive responses, trauma effects, epidemiological reasons such as infectious diseases of the childhood including exanthemas, sociocultural conditions such as maladaptation effects to weanling conditions, as well as environmental parameters such as those causing under-nutrition and/or seasonal starvation. The case of the triad of ladies presented at the focal level of their qualitative composition as a population sample a unique window of opportunity to illuminate facets of their own circumstances of life in as much as can be reconstructed from the hypoplastic defects with the possibility to reflect on the larger context of the Eleuthernian socio-cultural milieu. Supported by differential palaeopathological diagnosis evaluations as permitted by the condition of bone preservation but also tapping into relative components of the skeletal biological and overall palaeopathological / epidemiological profile of a coeval Eleuthernian population component, the probabilities of trauma effect and of dietary intake inadequacies, it is suggested could be disqualified from possible explanatory causative agents from the roster of the early life stressors that could have caused the hypoplastic effects. Although the competing explanatory hypothesis of weaning complications for one of the stress events, possibly expressed by the earliest hypoplastic defect, could not be deductively nullified, the possibilities were also slated of contagious childhood diseases accompanied by fevers, conditions within the domain of epidemiology of the population specific age subgroup, as very probable causative agent candidates to be considered for the early life stress conditions. These taken into account as recordings of early life stress phases, bearings of projected infectious pathogenicity, afforded with relative constancy during the later half of the Infancy I<sup>12</sup> age subgroup at an Eleuthernian living context, seemed to have persisted; lingering as endemic-epidemiologic checking point events with the potential of morbidity, and to have inescapably afflicted the three young ladies once each of them reached the aforementioned chronological intervals.

The age specific consistency and clustering of the manifestations, cumulative events of arrested and improved biological growth, yielded by the dental record of the triad comprising a range of age cohorts, offered valuable clues on the commonalities of certain physical and social environmental exposures and predispositions during their early upbringing. These commonalities clearly seemed to have endured pertinaciously in time between the age cohorts of the triad of

ladies and to have unfailingly introduced a series of three events during their early childhood years, affecting first in sequential manner of occurrence, lady “Y”, subsequently after twelve years triggered to affect lady “N”, and finally fourteen and a half years later since the first impact afforded on lady “Y”, initiated once more to affect lady “H”. From a palaeopathologic and palaeoepidemiologic scope, these early life stress events raised additional issues to be considered and examined closely, given that the apparent threefold constancy and relative bio-chronological specificity of their incidence was attested, albeit with a lower prevalence, by a coeval Eleuthernian female-specific palaeopathological dental record<sup>13</sup>. Consequently, the plausibility of a number of explanatory hypotheses<sup>14</sup> is evaluated, as part of an ongoing research endeavor including but not limited to the following: a) the possibility that idiopathic conditions related to proximity of genotype<sup>15</sup> characters could have made the ladies of the triad more susceptible to the impact of contagious childhood diseases, compared to the rest of the coeval female population sample; b) the triad although sharing in the lines of descent, as revealed by the unique prevalence of the dental inheritable traits, could have lived the early years of their life elsewhere<sup>16</sup> where the buffering of communicable childhood diseases could not have been as easily implemented; c) during their early upbringing in the inhabitable domain within the territorial boundary of Eleutherna, there could have been an absence of an aggregate environment either by conditions of spatial non-proximity among the various vicinities of Eleutherna’s sectors, and/or by culturally imposed measures aiming to avoid the spread of recognizable contagious childhood disease; and as an adjoining condition to the previous d) that within the entopic social context of Eleutherna, even among individuals sharing in common lines of descent, there would have been conditions of social position, distinctions that had already set in motion norms if not obligations for the hierarchical staggering of individuals and particular contexts for the specific upbringing of select offspring which among all other socio-cultural goals and objectives also sheltered from and hindered an unobstructed spread of contagious childhood disease.

Although additional lines of evidentiary data from the combined archaeo-anthropological records would fine-tune aspects of the inquiry on the circumstances of early life strain, ultimately based on the fact that each individual lady comprising the triad successfully recuperated from all three cumulative stressors<sup>17</sup>, it is possible to glean the availability of adequate buffer mechanisms, components of the organizational abilities and capacities of the socio-cultural context which were presumably able to alleviate biological stress conditions at this critical childhood period.

On the matter of the oldest lady “I”, the preservation of her dental crowns (given the effects of dental wear and pathogenesis conducive to aging and degenerative processes) did not allow the conduct of relative observations with the exception of a few enamel rings of crown surface components retained closer to the cemento-enamel junctions of recovered dental surfaces which provided enamel tissue biological age templates, subsequent to the advent of the first quarter of the fifth year of life. Be that as it may, such available surfaces showed an absence of linear enamel hypoplastic defects, displaying a consistency with the dental record of the triad of younger ladies, and in concert with the rest of the coeval female-specific dental record that showed an absence of linear enamel hypoplastic defects past the first quadrant of the fifth year (5.25 y). This illuminated a biological growth and development record unobstructed by major stress events, till the eleventh and a half approximately year of life, which would have otherwise marked the formation of dental enamel surfaces.

Additional clues on matters of dietary intake retrieved from the dental record of the four ladies interred in monumental building “M” indicated (with a particular emphasis on the triad of the three younger ladies based on the better preservation of their dental surfaces) that the foods consumed had been very well prepared. Smoothly homogenous wear patterns on anterior and

posterior teeth had retained well preserved incisal edges of labial teeth and occlusal platforms of buccal teeth, indicative of the preparatory modes of foods consumed which lacked a collateral inclusion of dietary grit and/or a high prevalence of accidentally or inadvertently included foreign particles with a hardness index equivalent or higher to that of enamel tissue<sup>18</sup>. Wear patterns<sup>19</sup> ranged from initial cusp tip polishing to mild incisal edge and cusp flattening among the younger ladies “H” and “N”<sup>20</sup>, with the exception of isolated loci prevailing at the labial teeth where based on habitual conditions they had served in “third” hand functions<sup>21</sup>, and then to only bite on softer materials. A moderate degree of wear was established for lady “Y”, while a severe degree of wear was documented at the remaining dental surfaces of old lady “I”. Her dental conditions were commensurate to aging, corresponding in degree of severity to a lifelong masticatory functional modification reflective of very well prepared intake. Changes of jaws and teeth had been sequential to the altered dynamics caused by a synergy of periodontal disease with slight infragingival calculus deposits, dental root surface hypercementosis, alveolar resorption processes, the *ante mortem* loss of a number of her teeth and a periapical abscess<sup>22</sup> in the process of healing, dental migration coupled by altered trajectory stress relations afforded between intra-, and inter-maxillary and mandibular counterparts<sup>23</sup>, as well as the consequences of osteoarthropathy and eburnation loci at her articular temporo-mandibular junction areas.

In so far as it can be revealed, especially from the dental record provided by the triad of ladies, based on acquired changes manifested on both clinical and anatomic dental surfaces as well as periodontal conditions of alveolar bone components, it appeared that the foods ingested contained an adequate proportionality of carbohydrate rich components yielded from agricultural products. Cervical (root) cariogenic<sup>24</sup> lytic activities were documented to exceed considerably the prevalence scores documented among populations whereby the bulk of dietary intake is based on carbohydrate<sup>25</sup>, starch-glucose rich, staple foods derived for example from cereals and the consumption of cultivar products such as that of the grape vine and even if enriched by galactose components obtained from dairy product consumption. Both mandibular and maxillary dentitions had been affected by cariogenic lesions involving with a greater prevalence posterior teeth but not excluding labial and in a considerable number of cases including multiple cervical surfaces on single teeth. Given the significant prevalence of cariogenic lesions documented, cervical in their vast majority<sup>26</sup> although coupled by a few on occlusal surfaces<sup>27</sup>, an ingestion of considerable fructose rich materials seems to have been an essential if not most probable a component, acquired from the consumption of honey predominantly it is proposed with probabilities for a prolonged retention in the mouth cavity of honeycomb matter, masticated as a gum-like substance, combined with the possible consumption of cooked-baked carbohydrates with and/or without added portions of honey or alternative glucose rich floral sweeteners. Glucose and fructose components would have provided the necessary elements for oral bacteria to metabolize them for their functions, fueling their infectious activities<sup>28</sup>, enhanced in their biofilm proliferation by the substrate provided through plaque flora and subsequent appositional effects of mineralized plaque deposits<sup>29</sup> discernible on the dental surfaces of the triad, despite their overall good dental hygiene, with lytic consequences particularly affecting the dental root surfaces in the regions of their cemento-enamel junctions. The high prevalence of cervical cariogenic lesions observed among the triad of younger ladies was to not just resemble comparable manifestations documented among the dental surfaces of the rest of a coeval female-specific population in Eleutherna, but to significantly exceed them in consistency and prevalence comprising a distinct apex cluster above the level of their scores. It was clearly apparent that the triad of ladies had a very advanced access to rich or richer in sugars intake compared to the rest of the female-specific coeval Eleuthernian population. Should lady “H”, age assessed at 13.5 years of age, serve as a representative example for the rest of the triad of



ladies, then an additional parameter may be considered on the matter of intake, stipulating an earlier in life and more frequent consumption of such foods, rich in sugars, compared to the rest of the female-specific coeval Eleuthernian population sample. Regarding the old lady “T” on the matter of cariogenic lesions, along with several teeth lost ante mortem<sup>30</sup>, her preserved dental components showed severely worn incisal and occlusal surfaces; conditions that would have obliterated the traces of cervical caries from her dental record. Both incisal and occlusal surfaces showed in their majority obliquely sloping platforms, revealing tertiary reparative dentin in concave centra, the most inferior termini of which reached below the regions of the cemento-enamel junctions where cervical caries would have originally festered. Cervical caries could have contributed, with great probability, along with dental wear processes, to such dental crown surface changes by undermining the structural support of the crowns through the continued advancement of lytic effects inwards, anatomically speaking, towards the domain of the dental pulp. This would have minimally resulted to the deconstruction and destabilization of the affected segment of the dental crown with a consequent outcome the flaking off of the anatomically compromised crown surface, even under the prevailing conditions of masticatory trajectory stress.

An additional dental manifestation documented showed a unique partiality on the skeletal record of the tetrad of ladies interred in monumental building “M”, when compared with the rest of a female-specific coeval Eleuthernian population sample. It pertained to the staining of their dental surfaces with a distinct discoloration which ranged from reddish yellow (7.5YR 6/6 Munsell reading), brownish yellow (10YR 6/6 Munsell reading), strong brown (7.5YR 5/8 Munsell reading), to dark brown (7.5YR 3/4 Munsell reading) hues, showing a relative increase in density of chroma value conducive to aging; hence, macroscopically and inspectingly not lending support to an exclusive taphonomically induced causative agent such as for example infiltration-discoloration by ferrous oxides. Although macroscopically and under low magnification there were no dental crown or enamel tissue diagnostic symptoms linked to enamelogenesis imperfecta, nevertheless autosomal dominant or recessive, and/or X-linked recessive inheritance modes of the disorder are under consideration<sup>31</sup>. Be that as it may it is suspected, comprising an important parameter of investigation in the ongoing dental research, that *in vivo* exposure of the oral cavities to a substance of an organic composite derived of floral elements with compound<sup>32</sup> functions, including adjunctive chromatic abilities, penetrated and discolored the dental crown surfaces<sup>33</sup>. Its staining intensity depended on the duration, prevalence and cumulative effects of its usage by means of infiltration and/or chemical bonding into the thinner areas of the acellular substance of crown enamel and further into the less mineralized intercellular histology of underlying mantle<sup>34</sup> dentin tissue. This took place with a greater emphasis on incisal and occlusal surfaces, unconcealed by wear-induced enamel thinning and where relative by dentin islet precursor stages (for lady “N”), at already exposed islets of dentin (for lady “Y”), and much intensified in obliterated incisal edge/occlusal platform components (as with old lady “T”). The discoloration manifestations expressed on the dental record of the tetrad of ladies offered testimonials on the accessibility of a shared context of exposure to the conditions of staining potential and efficacy, revealing a lack of intra-group fundamental diversities on this acquired matter. Such supplementary indications traced from dental surfaces were concomitant with integral components of all lines of evidence derived from heritable conditions expressed, and of acquired manifestations documented in the dental record so far, reflective as they were of the particular and interdependent relations of the ladies interred in monumental tomb “M”.

Admittedly, although the dental record of the tetrad of ladies was better preserved, when overall compared to the rest of their skeletal remains, important clues were retrieved from the cranial and infracranial bones, juxtaposing to dental record information and gathering new data

including but not limited to skeletal biology and bone plasticity issues, skeletomuscular markers reflective of kinetics and habitual or occupational stress, and palaeopathology. Greater emphasis had been placed in the study of infracranial axial<sup>35</sup> skeletal components, however aided by the study of appendicular components, in retrieving information relative to developmental growth past the early infancy years and where applicable (for ladies “Y” and “T”) up to the earlier years of Young Adulthood<sup>36</sup>. Accordingly, it appeared that there had not been any discernible traces of obstacles or debilitating conditions which had hindered their corporeal processes of developmental growth; such could and would have otherwise affected the skeletal remains with discernible traces of recorded stress markers. Acquiescing to the limiting factors imposed by skeletal preservation it was nevertheless possible to forensically discern that all four ladies although of a rather gracile morphoanatomic build had been actively involved, up to the interruption provided by the occurrence of death, in physical undertakings that required the coordinated involvement of the entirety of their skeletomuscular systems, yet lacking any skeletal changes which would have been caused by the effects of excessively strenuous activities including but not limited to axial load bearing stress and trauma impact. These assessments were able to illumine aspects of their lives indicative of a non-circumstantial buffering from overall physically imposing responsibilities in the domain of gender relative labor diversity<sup>37</sup>; circumstances which juxtaposed were in relative concert with the prevailing conditions observed among a female-specific coeval Eleuthernian population sample representing apparently membership of a social superstructure<sup>38</sup>.

However, it clearly appeared that the two older ladies, lady “Y” and particularly lady “T”, had not remained sheltered from relatively laborious efforts, specific as they were in demanding upper body kinetic tasks with perseverance and precision of movement functions. These had involved industrious processes, engaging the sterno-clavicular articulations and of the upper extremities the shoulder, elbow and distal forearm/carpal joints, leveraging muscular systems in synergistic-antagonistic functions and inciting muscle enlistment of anti-fatigue abilities in support of specific humero-scapular angles of about 45° with abducted and moderately extended upper extremities, such as in facultative working capacities exemplified by weaving on the loom. Evidence of the consequences of excessively repetitive actions carried out with constancy over considerable periods of their lives, with an early initiation and in co-relevancy to an aging curve, were revealed by the premature onset of osteoarthropathic changes focal to the distal forearm joint combined with a sclerotic, eburnation, locus of the elbow joint for lady “Y”, whereas significant osteoarthropathic changes accompanied by severely eburnated focal areas predominated in the relative upper extremity articular surfaces of old lady “T”. As permitted by the conditions of preservation, oldest lady “T” was to offer a considerable nexus through her osseous record to facets and mode of her life conditions in sustained good health and considerable longevity. Laden nevertheless with the unavoidable effects of aging, lady “T”, osteoporotic, spondylo-, and osteoarthropathic with countless spells of painful inflammation and swellings at her suffering joints in her later years, she offered a remarkable record of stamina and determination having also revealed through the muscular imprints of origin and insertion of her lower extremities with ailing, osteoarthropathic and eburnated joints a testament of long term and unremitting locomotory behavior minimally traversing the pristine Eleuthernian environs.

Their symplectic relations, initially whispered by winged words of the complex burial symbolism, were to surpass the ambience of funerary behavior, crossing over to reflect into the domains of *intra vitam* social milieu, illuminating on facets of life developmental experiences, and even advancing into the realm of earlier times on issues of ancestral relatedness and genealogical lines of descent which having preceded their life, formulated nevertheless the framework of important components of their existence. Such was the unique narrative recounted as to underline

their particular *ante mortem* relations apparently meant to be continued in a *post mortem* existence. The relatedness deciphered and commonalities of significant life experiences revealed among the tetrad of ladies interred in monumental funerary building “M” were to also be placed on a common denominator in relevance to the lack of evidentiary data which through the skeletal record would or could have disclosed constraint, violence or the implication of injurious physical impact for the cause of death. Although the intragroup composition of age cohorts involving a range of age subgroups could provide as an explanatory hypothesis for the observed mortality an epidemiological causative agent, there was a lack of coeval, intra-site, archaeo-anthropological evidentiary data to lend support to such a scenario. Among a few competitive explanatory hypotheses under investigation, a conditional proposition is also explored under the supposition that at a juncture in time embedded in the parchments of Cleo, possibly triggered by a momentous event, and in the ultimate expression of selfless sacrifice, in respectful and obedient conduct bound by moral obligation and the permanent dictates of virtue and conscience, in dedication and loyalty to the lawful and dutiful fulfillment of actions required of particular socio-cultural positions held, and/or in piety, devotion and fealty in a conferred allegiance to the occult existence of the divine, a substance of deleterious influence possibly with a somniferous precursor that had invoked Atropos to act, allowed them in unique fellowship to transcend and to carry on eternally their duties and functions in the asphodel meadows of Hades.

Admittedly we may never know their names, their individual thoughts, their individual responsibilities, their expectations, their hopes and dreams... Yet gleaning on aspects of the esoteric complexities and the emerging apparition of their meaningful relations, at the initial unfolding of this ancient riddle discovered and the narrative deciphered so far, confide not only a nexus to ancestral times and most significant events but also bestow the responsibility to search deeper beyond the extent of the perceived fundamentals, enthused with great anticipation that further interdisciplinary inquiry and long term research based on methodical procedures and careful analysis would shed additional light to the matters at hand on the spirited sequence of events and splendid accomplishments attained by our ancients at Eleutherna.

#### Acknowledgments:

I wish to express my gratitude to colleague Dr. Nikolaos Chr. Stampolidis, Professor and Director of the Museum of Cycladic Art in Athens-Greece, excavator of Orthi Petra, for his long-standing, unpretentious, trust and support during the past 20 years of scholarly collaboration at Eleutherna, and to Ms. Argyro Moutafis-Agelarakis, MFA, for all her care, efforts and contributions over the years regarding the domain of anthropological research at Orthi Petra-Eleutherna.

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<sup>1</sup> The artist's rendering purposely provides a most basic schematic depiction, seen from a north-western point of view, aiming to only simulate the interment arrangements and the interrelations of the anatomical positioning of body components of the tetrad, hence the sheer garments and the lack of a more elaborate context portrayal.

<sup>2</sup> "Proximal" in such a context descriptive of skeletal anatomy is to indicate an anatomic locus or position designated to be situated closer to the cranium in reference to a juxtaposed or insinuated counterpart.

<sup>3</sup> "Distal" in such a context descriptive of skeletal anatomy is to indicate an anatomic locus or position designated to be further away from the cranium in reference to a juxtaposed or insinuated counterpart.

<sup>4</sup> First described by Carabelli, G. (1844) *Systemisches Handbuch der Zahnheilkunde. Anatomie des Mundes*, Braunmüller und Seidel, Wien, Österreich; cf. Hofman-Axthelm, W. (1981) *History of Dentistry*, Chicago, Quintessence Publishing. Standardization of classification of the Carabelli trait variants, along with other dental crown variants, was conducted most confidently by Dahlberg, A. A. (1963) *Analysis of the American Indian Dentition*, in Brothwell, D. (Ed.) *Dental Anthropology*, London, Pergamon Press, pp: 149-178.

<sup>5</sup> Cf. Goose, D.H., and Lee G.T.R. (1971) The mode of inheritance of Carabelli's trait, *Human Biology* 43, pp: 64-60.

<sup>6</sup> See a few representative bibliographical references: Rudan, I., and Rudan, P. (2000) Comparison between coefficients of inbreeding computed from deficit of heterozygotes for codominant autosomal genetic polymorphisms and from isonymy data: A study of Hvar island isolates, Croatia, in Susanne, C., and Bodszar, E.B. (Eds.) *Human population genetics in Europe*, Biennial Book of European Anthropological Association, Budapest, 1, pp: 117-128; Lauc, T. (2003) Influence of Inbreeding on the Carabelli Trait in a Human Isolate, *Dental Anthropology*, 16(3), pp: 65-72.

<sup>7</sup> Hillson, S. (1996) *Dental Anthropology* Cambridge University Press, New York, pp: 91.

<sup>8</sup> "Gene Flow" is a population relative evolutionary dynamics concept describing the conditions that may influence, allow or hinder, allelic genetic material distribution, hence of interest to gene pool variation, at inter-group/population levels of the same species.

<sup>9</sup> Which by the way not only mimicked but exceeded the prevalence scores of the inheritable dental trait of Carabelli documented among a coeval sample of female individuals from the Eleuthernian population.

<sup>10</sup> The manifestation was first termed as "hypoplastic defects" by Zsigmondy, O. (1893) On congenital defects of the enamel, *Dental Cosmos*, 35, pp: 709-717. Out of a subsequent plethora of references relative to the nature of linear enamel hypoplasias see the following representative sample: Sarnat, B., and Schour, L., (1941) Enamel Hypoplasia (chronological enamel aplasia) in relation to systemic disease: A chronologic, morphological and etiologic classification, *Journal of American Dental Association*, 28, pp:1989-2000; Goodman, A.H., Armelagos, G.J., and Rose, J.C. (1980) Enamel hypoplasias as indicators of stress in three prehistoric populations from Illinois, *Human Biology*, 52, pp:515-528; Goodman, A.H., and Rose, J.C. (1990) Assessment of systemic physiological perturbations from dental enamel hypoplasias and associated histological structures, *Yearbook of Physical Anthropology*, 33, pp: 59-110; Hillson, S.W. (1992) Dental enamel growth, perikymata and hypoplasia in ancient tooth crowns, *Journal of the Royal Society of Medicine*, 85, pp: 460-466; Witzel, C., et al., (2008), Insights From the Inside: Histological Analysis of Abnormal Enamel Microstructure Associated With Hypoplastic Enamel Defects in Human Teeth, *American Journal of Physical Anthropology*, 136, pp:400-414.

<sup>11</sup> For aspects of methodological issues cf. Swärdstedt, T. (1966) *Odontological aspects of a medieval population in the province of Jämtland/Mid Sweden*, Tiden-Barnängen AB, Stockholm, Sweden; Reid, J.D., and Dean, C.M., (2000) Brief Communication: The Timing of Linear Hypoplasias on Human Anterior Teeth, *American Journal of Physical Anthropology*, 133, pp: 135-139; Reid, J.D., and Dean, C.M., (2006) Variation in modern human enamel formation times, *Journal of Human Evolution*, 50, 329-346; Hubbard, A. et al., (2009) Under Restrictive Conditions, Can the Widths of Linear Enamel Hypoplasias Be Used as Relative Indicators of Stress Episode Duration?, *American Journal of Physical Anthropology*, 138, pp: 177-189.

<sup>12</sup> Ranges from Birth to six years of age

<sup>13</sup> Although the overall coeval female-specific population sample from Eleutherna may contain a cadre of qualitative attributes, lacking therefore the ability of broad statistical implications, it is nevertheless reflective of the only possibility so far to add an intrasite perspective to a number of period-specific bio-cultural circumstances minimally involving Eleuthernian women.

<sup>14</sup> Singularly, and/or in combination thereof

<sup>15</sup> This would indicate diminished genetic variability, due to decreased bio-distance; issues that are continued to be investigated further by means of a carefully scheduled sequence of archaeometric research

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<sup>16</sup> Although there are no apparent indications that such could have been the case the particular scenario must nevertheless be considered and evaluated appropriately juxtaposed to systems of available and emerging data

<sup>17</sup> As also effectively substantiated from the anthropological record documented of a coeval Eleuthernian female-specific population sample

<sup>18</sup> Rated to No. 5 on the Mohs scale of mineral hardness, out of a maximum of No. 10 for the diamond

<sup>19</sup> Cf. Fine, D., and Craig, C.T., (1981) Buccal surface wear of human premolar and molar teeth; a potential indicator of dietary and social differentiation, *Journal of Human Evolution*, 10, pp:335-344; Johansson, A., et al., (1993) A system for assessing the severity and progression of occlusal tooth wear, *Journal of Oral Rehabilitation*, 20, pp:125-131.

<sup>20</sup> Lady “N” also showed initial stage tendencies for islets of dentin at isolated occlusal cusp loci.

<sup>21</sup> Cf. with characteristic samples by Molnar, S., (1971) Human tooth wear, tooth function and cultural variability, *American Journal of Anthropology*, 34, pp:175-190; Molnar, P., (2008) Dental Wear and Oral Pathology: Possible Evidence and Consequences of Habitual Use of Teeth in a Swedish Neolithic Sample, *American Journal of Physical Anthropology*, 136, pp:423-431.

<sup>22</sup> Cf. Alexandersen, V., (1967) The pathology of the jaws and temporomandibular joint, in (Eds.) Brothwell, D.R., and Sandison, A.T., *Diseases in Antiquity*, Springfield, Thomas, pp: 551-595; Brook, I., et al., (1991) Aerobic and anaerobic microbiology of periapical abscess, *Oral Microbiology and Immunology*, 6, pp: 123-125; Alt, K.W., et al., (1998) Periapical lesions-clinical and anthropological aspects, in (Eds.) Alt, K.W., and Teschler-Nicola, M., *Dental anthropology: fundamentals, limits and prospects*, Vienna, Springer, pp: 387-415.

<sup>23</sup> Khera, S.C., et al., (1990) Anatomy of cusps of posterior teeth and their fracture potential, *Journal of Prosthetic Dentistry*, 64, pp: 139-147.

<sup>24</sup> Out of a considerable record of relative references cf. Magitot, E., (1875), *Treatise on Dental Caries*, Osgood Publishing Co., Boston: Houghton; Mandel, D.I., (1983) Caries Through the Ages: A Worm’s Eye View, *Journal of Dental Review*, 62(8), pp: 926-929; Kim, S., (1990), Neurovascular interactions in the dental pulp in health and inflammation, *Journal of Endodontics*, 16, pp: 48-53; Hahn, C., (1991) Microbiological Studies of carious dentin from human teeth with irreversible pulpitis, *Archives of Oral Biology*, 36, pp:147-153; Ismail, A.I., (1997) Clinical Diagnosis of precavitated carious lesions, *Community Dentistry and Oral Epidemiology*, 25, pp:13-23; Hillson, S., (2001) Recording dental caries in archaeological human remains, *International Journal of Osteoarchaeology*, 11, pp: 249-289.

<sup>25</sup> An issue evaluated through clinical studies since the epidemiological study by Gustafson, B.G., et al., (1954), The Vipeholm dental caries study. The effect of different levels of carbohydrate intake on caries activity in 436 individuals, observed for five years, *Acta Odontologica Scandinavica*, 11, pp: 232-364; Sreebny, L.M., (1983) Cereal availability in dental caries, *Community Dentistry and Oral Epidemiology*, 11, pp: 148-155; Kashket, S., et al., (1994) Delayed effect of wheat starch in foods on the intraoral demineralization of enamel, *Caries Research*, 28, pp: 291-296.

<sup>26</sup> Lady “Y” showed 13 (40.625%) out of her 32 teeth affected by cariogenic lesions, or 18 (11.25%) out of 160 (each tooth has five dental surfaces: 32 teeth x 5 surfaces = 160 surfaces) dental surfaces affected, whereas 16 (12.5%) out of the 128 cemento-enamel juncture (CEJ) relative surfaces (excluding incisal or occlusal surfaces from each of the 32 teeth: 32 teeth x 4 surfaces = 128 surfaces) had been affected by cervical cariogenic lesions; the latter calculation excluded two occlusal surfaces affected by cariogenic lesions. Lady “N” showed six (40.0%) out of 15 teeth available for study affected by cervical cariogenic lesions, or nine (12.0%) out of 75 dental surfaces affected, whereas nine (15.0%) out of 60 CEJ relative surfaces had been affected by cervical cariogenic lesions. Lady “H” showed five (17.0%) out of her 29 teeth available for study affected by cervical cariogenic lesions, or seven (4.82%) out of 145 dental surfaces affected, whereas seven (6.03%) out of 116 CEJ relative surfaces had been affected by cervical cariogenic lesions; the prevalence of CEJ cariogenic lesions may increase following continued research in differential diagnosis between cervical/root caries to the effects of fast acid bacilli acting in *post mortem* peri-CEJ/dentin tissue diagenetic functions, mimicking on some occasions cervical/root caries.

<sup>27</sup> Exclusively affecting lady “Y”, whom was the oldest among the triad of younger ladies; her age parameter allowing enough time of exposure and circumstances for two occlusal cariogenic lesions to develop.

<sup>28</sup> Such as *Streptococcus mutans* and *Lactobacillus acidophilus*, particularly for dentin lesions

<sup>29</sup> Swärdstedt, T. (1966) *Odontological aspects of a medieval population in the province of Jämtland/Mid Sweden*, Tiden-Barnängen AB, Stockholm, Sweden; Powell, B., and Garnick, J.J., (1978) The use of extracted teeth to evaluate clinical measurements of periodontal disease, *Journal of Periodontology*, 49, 621-624; Dobney, K., and Brothwell, D., (1986) Dental calculus in relevance to ancient diet and oral ecology, in (Eds.)

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<sup>30</sup> Cf. Lukacs, J.R., (1995) The “caries correction factor”: a new method of calibrating dental caries rates to compensate for ante mortem loss of teeth, *International Journal of Osteoarchaeology*, 5, pp: 151-156

<sup>31</sup> Especially since in consanguineous conditions the prevalence of the disorder may be significantly increased.

<sup>32</sup> Having more than one function, not exclusively for dietary purposes; considering as a working hypothesis of this ongoing anthropologic research a number of candidate soluble substances deriving from a select variety of flower buds, fruit and leaves of aromatic plant species, while not excluding *Papaver somniferum*.

<sup>33</sup> Recognizing (although not lending support to this as a causative agent for the discolorations in the case of the dental record under investigation) that in cases of the amelogenesis imperfecta disorder, the non-sufficiently mineralized and/or thinner layer of enamel crown and its subsequent premature demineralization process may allow an enhanced staining of dental surfaces caused by intake or masticated substances

<sup>34</sup> The most superior-exterior histological layer of primary dentin superimposed by enamel tissue

<sup>35</sup> With considerable emphasis on vertebral body and canal growth and development evaluations

<sup>36</sup> Ranging from 18 to 20/21 years, hence of the earlier component of “Young Adulthood” (18-25 years). The latter designates an age subgroup categorization of bio-archaeological demographic studies without implication of ancient cultural norms, i.e. regarding issues of fertility, rite of passage to marriageable status. and progeny.

<sup>37</sup> As for example in obligatory or mandatory participation in heavy duty economic output activities in the field, susceptible to conditions prone to excessive load bearing stress and/or trauma impact

<sup>38</sup> Cf. Agelarakis, A., (2010). “Making of a Martiline” in (Ed.) Bonn-Muller, E., On Line Features, *Archaeology Magazine*