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The Greek Colonies of Sicily During the First Millennium BCE: Status of Health as an Indicator of Social Inequality

Abstract: *Investigating the past represents a fascinating challenge, but one full of pitfalls. Often our vision of the past is altered by our attempt to read cultural, biological and social events that occurred a long time ago. Inequality has probably accompanied humanity since it came into existence. In order to be able to partially understand this phenomenon, I used an anthropological approach and applied it to two populations of eastern Sicily that are chronologically attributable to the first millennium BCE: Ortigia and Contrada Fusco in Syracuse. The results highlight a probable equality between the two sexes in the older sample in terms of workload and access to food sources, and a homogeneity of occupational stigmata for each sex. The more recent sample shows similar results, although it is easier to hypothesize the presence of a greater social stratigraphy because of the growth of the phenomenon of urbanization.*

1 Introduction

History is always a challenge. It presents many questions, among which the most important is – who tells it! The use of an interdisciplinary approach has certainly breathed life into the decoding and interpretation of past times. An analysis of situations like dependency and inequality during the first millennium BCE can be carried out and written by decoding the work of the various disciplines that interpreted it differently, and all with the same goal: the reconstruction of a truth as reliably as possible. The first millennium BCE represented the emergence of a great phenomenon in the Mediterranean basin, which involved not only the birth of developed cultures, but also the first affirmation of new cultural, social, commercial and genetic patterns, including, unfortunately, pathologies. All of these were related, mostly for simple reasons, to three methods of investigation: the historical, the archaeological and the anthropological. The conquest of the Mediterranean Sea during the first millennium BCE represents the greatest commercial expansion known from the past. Greeks and Phoenicians, before the advent of the Roman fleets, knew the commercial routes well and had consequently spread their coastal commercial centres throughout the Mediterranean basin. What did this mean? Not only did they make an impact through the transportation of goods, culture and social norms, but they also left behind genes and pathologies. During that period, important cultures emerged in peninsular Italy, the most important of which was perhaps the Etruscan one, as well as in the two regions

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of insular Italy – Sicily and Sardinia. This confirmed the seafarers as the masters of the Mediterranean Sea: more specifically, the Greeks and the Phoenicians. The goal of this study was to focus on Sicily, in particular the eastern part, a destination for traders, adventurers and seafarers.

Some of the questions that arose were related to how the individuals in that society lived, and whether they had equal roles or hierarchies. Several investigative methods were available, but the approach chosen for this study is one that focuses on health status. This choice stemmed from the fact that illness affected both the rich and poor members of a community and could therefore reveal whether inequality was solely a social phenomenon or also cultural. As a scholar specializing in paleopathology and genetics, I chose to examine those factors to be able to interpret past events. This study analysed second-generation individuals of Greek origin who had inhabited Ortigia (an eighth-century BCE Greek trade centre) as well as the Hellenistic-period citizens of Syracuse (fourth–third century BCE). Additionally, I extrapolated the findings to better understand hierarchical power dynamics throughout the Mediterranean region.

2 The Basis of Inequality

Inequality has presented itself in many ways in the human world – in physical, cultural and social events in the past (but perhaps even today), and between losers and winners. Inequality has always been a reason for the careful analysis of populations of the past.[1] Those born with severe physical defects (for example, trisomy 21, quadriplegia, mental retardation) had great difficulty in weaving themselves into the social fabric, as did those suffering from diseases that could cause deformity and disability, such as leprosy; they were all considered to be marked by the gods, or by God.[2] An unborn child with severe disabilities was not capable of warfare, was not capable of cultivating fields, and was probably not capable of the nascent political life in what would become important cities of the Italian Peninsula and islands in the first millennium BCE. Despite this, and in some cases, the community took care of them and ensured their survival. In eastern Sicily during the second and especially the first millennium BCE, it was not only the Greek social pattern that was transmitted, but

1 Walter Scheidel, *The Great Leveler: Violence and the History of Inequality from the Stone Age to the Twenty-First Century* (Princeton: Princeton University Press: 2018); Pim De Zwart, "The Global History of Inequality," *International Review of Social History* 64, no. 2 (2019): 309–23.

2 Mauro Rubini and Paola Zaio, "Lepromatous Leprosy in an Early Mediaeval Cemetery in Central Italy (Morrione, Campochiaro, Molise, 6th–8th century AD)," *Journal of Archaeological Science* 36, no. 12 (2009): 2771–79; Mauro Rubini and Paola Zaio, "Miseria e nobiltà nell'area extraurbana a sud-est di Roma in età imperiale," in *Lazio e Sabina*, vol. 9, *Atti del Convegno, Roma, 27–28 marzo 2012*, ed. Giuseppina Ghini (Rome: Soprintendenza per i Beni Archeologici del Lazio, 2013): 261–65.

also a much more important factor that would later determine differentiations among the Italian peninsular populations – the cult of physical health. There were various causes behind this. The Greek colonists who arrived in Sicily (but also on the southern Tyrrhenian coast, for example, in the colony of Cumae or Naples during the first millennium BCE) had already seen examples of social inequality in their homeland, such as in the situation of the Spartans. But these were not social inequalities based on economic disparities; they were solely based on being useful or not to the community.[3] One of the main peninsular cultures that first assimilated these concepts was probably the Etruscan one. This was surely because of its intense contact with the Greek world. Moreover, one of the main and neglected problems can certainly be linked to slavery (the vanquished), which automatically establishes a hierarchy, and thus inequality. In colonized Sicily, such a practice had left no traces until the fifth century BCE, although the Greeks had already known this in their homeland, for example, through the Spartan 'helots'. Why?

3 What is inequality for?

From a biological point of view, inequality can be interpreted as variability, a fundamental requirement in the genesis of a species. In terms of the social aspect, it is what determines the hierarchies within a human community. In some cases, socio-cultural inequality has even come to represent a value that is to be protected, especially in relation to the social status that has been achieved. In the first millennium BCE, maintaining an acquired status became a sort of guarantee for not losing what one had acquired. At that point, a very dangerous parameter came into play: *endogamy*. In the colonial Hellenic world of seventh-century Sicily, this appeared to be of little importance. On the other hand, on the Italian Peninsula, especially within the Apennine Cultures, it represented an instrument for maintaining acquired 'power'. This practice would condition the population of peninsular Italy until the advent of Roman times, on both the Tyrrhenian and Adriatic sides.

In this way, the social inequality that had structured peninsular sites during the first millennium BCE became hereditary. But the real problem was the inequality generated by an endogamy that had been implemented for the maintenance of some prestigious social statuses.

In the Greek colonies of eastern Sicily in the seventh century BCE, there were scarce traces of endogamy.[4] Indirectly, these provided us with an important datum:

3 Walter D. Penrose Jr., "The Discourse of Disability in Ancient Greece," *The Classical World* 108, no. 4 (2015): 499–523.

4 Mauro Rubini and Silvia Mogliazza, *Storia delle popolazioni italiane dal neolitico ad oggi: i nuovi orientamenti dell'antropologia* (Rome: Soprintendenza per i beni archeologici del Lazio, 2005); Mauro

that the Greek populations probably already knew the risks of inbreeding. In Syracuse during the third century BCE, the differences in the manifestation of social inequality were significant and evident, and they revealed the presence of endogamy. In addition, it is noteworthy that protohistory cannot be understood as a linear and continuous evolutionary process leading to the appearance of the state; it is fraught with conflict, crises and reactionary movements against social stratification. Thus, this analysis draws attention to those studies that highlight the existence of non-hierarchical forms of social relationship or, as they have been defined recently, 'non-triangular societies'. These societies were probably the result of a productive system that was contrary to surplus production, combined with exclusive communal identities and strategies for intercommunity relations. These strategies would have been conditioned by the search for isolation and an egalitarian ethos, which could be accountable for its success. Some researchers studying inequality in past populations have based their research on burial rituals, which they used to assess the range of mortuary offerings and related practices, and to which they applied the Gini coefficient.[5] This is a method that the statistician Gini devised in the last century to evaluate social inequalities based on economic income. In reality, the formula represents a useful and versatile algorithm that can also be utilised for evaluating past scenarios. Perhaps only limit is its applicability in the analysis of the purely economic or dominance aspect within a community.

4 Material and Methods

One of the skeletal samples under study comes from the second-generation Greek necropolis of Viale Ermocrate in Ortigia (Syracuse), which can be dated back to the eighth century BCE, and the other is from the Hellenistic necropolis of Contrada Fusco (Syracuse), which dates from the fourth century BCE. The burial typology in Ortigia consists of rectangular pit tombs approximately 2 m long, 80 cm wide and 60 cm deep. The inhumed person was buried supine, with the ceramic grave goods at head height consisting mostly of Orientalising pottery. There were also metal pins, clasps and spear points positioned on the body and along its sides. The necropolis from Syracuse (Contrada Fusco, Tor di Conte) presents a more varied sepulchral typology. There were both cremations and inhumations, which were of many types, including pit tombs with an urn, pit tombs, lead sarcophagi placed in the pit, 'cappuccino' tombs, box-tile tombs and hypogea with pit access. The grave goods were imported

Rubini, "The Mediterranean Population from the Past Up Today," Conference Talk, Tampa University USF, 10 November 2019.

5 Mattia Fochesatoa et al., "Changing Social Inequality from First Farmers to Early States in Southeast Asia," *Proceedings of the National Academy of Sciences* 118, no. 47 (2021): 1–6.

Greek pottery, bronzes, gold, ivories and glass balsam jars.[6] It is probable that the population of the Greek necropolis in Viale Ermocrate was mixed, in which the females had probably mostly been autochthonous.[7] This is because the settlement was established as an *emporion*, founded solely by men from Greece; only later did it become a colony and a city (*polis*). The site included 72 adult individuals; non-adults were not recovered. A total of 42 individuals were male and 30 female. The necropolis of Contrada Fusco yielded 364 individuals, of which 61 were infants, 162 were males and 141 were females. The morphological examination of the skeletal material was carried out using standard methods. Three indicators were used to establish the age at death for sub-adults: the stage of dental mineralization and eruption,[8] the length of the long bones[9] and the extent of the epiphyseal fusion of the long bones and the hip bone.[10] All three methods were used simultaneously whenever the state of preservation allowed for it as this enabled more precise estimates to be obtained. The determination of age at death in adults was initially based on the degree of fusion of the sphenooccipital suture (*sutura sphenooccipitalis*), which indicates the stage of adulthood. As a further step, age was assessed according to the standards of Buikstra and Ubelaker,[11] with special reference to the morphological changes in the pubic symphyseal face and the auricular surface of the *os coxae*. These two features are the most commonly used, both in the anthropological analysis of ancient populations and in forensic analysis, and they allow for accurate age determination. When possible, the fourth rib was also considered.[12] Sex diagnosis was based on the morphological traits of the skull and pelvis, when preserved, and the suggested standards in Buikstra and

6 Maria Musumeci, *Le necropoli di Siracusa* (Syracuse: Museo Archeologico Regionale "Paolo Orsi" Siracusa, 2006).

7 Mauro Rubini et al., "The Population of East Sicily during the Second and First millennium BC: The Problem of the Greek Colonies," *International Journal of Osteoarchaeology* 9, no. 1 (1999): 8–17.

8 Douglas H. Ubelaker, *Human Skeletal Remains: Excavation, Analysis, Interpretation*, Manuals on Archeology 2 (Washington, D.C.: Taraxacum, 1989).

9 Pascal Adalian et al., "Nouvelle formule de détermination de l'âge d'un foetus," *Comptes Rendus Biologies* 325, no. 3 (2002): 261–69.

10 Hugo F.V. Cardoso, "Age Estimation of Adolescent and Young Adult Male and Female Skeletons II, Epiphyseal Union at the Upper Limb and Scapular Girdle in a Modern Portuguese Skeletal Sample," *American Journal of Physical Anthropology* 137, no. 1 (2008): 97–105; Hélène Coqueugniot et al., "Brief Communication: A Probabilistic Approach to Age Estimation from Infracranial Sequences of Maturation," *American Journal of Physical Anthropology* 142, no. 4 (2010): 655–64; Hugo F.V. Cardoso et al., "Age Estimation of Immature Human Skeletal Remains from the Diaphyseal Length of the Long Bones in the Postnatal Period," *International Journal of Legal Medicine* 128, no. 5 (2014): 809–24.

11 Jane E. Buikstra and Douglas H. Ubelacker, *Standards of Data Collection from Human Skeletal Remains*, Arkansas Archaeological Survey Research Series 44 (Fayetteville: Arkansas Archaeological Survey, 1994).

12 Jessica I. Cerezo-Román and Patricia O. Espinoza, "Estimating Age at Death Using the Sternal End of the Fourth Ribs from Mexican Males," *Forensic Science International* 236 (2014): 196.

Ubelaker were used.[13] Otherwise, sex diagnosis was based on the observation of other dimorphic anatomical traits.[14] The measurements were obtained using the Martin and Saller method.[15] Stature was calculated according to the methods of Trotter and Gleser for whites.[16] The health status and quality of life of the individuals were determined through their skeletal and dental attributes. The scoring of occupational stress (MOS, see Tab. 1) was performed according to the recommendations of Capasso et al. and Mariotti et al.,[17] who proposed to consider five levels of development for each enthesis. Dental features, for the reconstruction of oral health, were also recorded. Caries was scored according to Powell's suggestions.[18] Abscesses were assessed only through the presence of perforations in the bone in the apical region of the tooth.[19] Antemortem tooth loss (AMTL) was observed according to Lukacs,[20] and linear enamel hypoplasia (LEH) was scored according to the criteria of the Federation Dentaire Internationale.[21] The age of individuals at the time of LEH was assessed with reference to the chronology of enamel development,[22] and a chart was used to convert the distance from the cementoenamel junction to developmental age.[23] Furthermore, a palaeopathological survey was conducted to explore the general health of the populations.[24]

13 Buikstra and Ubelacker, *Human Skeletal Remains*.

14 Mehmet Y. İşcan, "Forensic Anthropology of Sex and Body Size," *Forensic Science International* 147, no. 2–3 (2005): 107–12.

15 Rudolf Martin and Karl Saller, *Lehrbuch der Anthropologie* (Stuttgart: Fischer, 1956–1966).

16 Mildred Trotter and Goldine C. Gleser, "A Re-Evaluation of Estimation of Stature Based on Measurements of Stature Taken During Life and of Long Bones After Death," *American Journal of Physical Anthropology* 16, no. 1 (1958): 79–123.

17 Luigi Capasso et al., *Atlas of Occupational Markers on Human Remains*, Journal of Paleopathology: Monographic Publication 3 (Teramo: Edigrafial, 1999); Valentina Mariotti et al., "The Study of Entheses: Proposal of a Standardised Scoring Method for Twenty-three Entheses of the Postcranial Skeleton," *Collegium Antropologicum* 31, no. 1 (2007): 291–313.

18 Mary L. Powell, "The Analysis of Dental Wear and Caries for Dietary Reconstruction," in *The Analysis of Prehistoric Diets*, ed. Robert I. Gilbert and James H. Mielke (Orlando: Academic Press, 1985): 307–38.

19 Don R. Brothwell, *Digging Up Bones* (Oxford: Oxford University Press, 1981).

20 John R. Lukacs, "Dental Paleopathology: Methods for Reconstructing Dietary Patterns," in *Reconstruction of Life from the Skeleton*, ed. Mehmet Y. Iscan and Kenneth A.R. Kennedy (New York: A. Liss, 1989): 261–86.

21 Federation Dentaire Internationale, "A Review of the Developmental Defects of Enamel Index (DDE Index): Commission on Oral Health, Research and Epidemiology: Report of an FDI Working Group," *International Dental Journal* 42, no. 6 (1992): 411–26.

22 Maury Massler et al., "Developmental Patterns of the Child as Reflected in the Calcification Pattern of the Teeth," *American Journal of Diseases of Children* 62 (1941): 33–67.

23 Torsten Swardstedt, *Odontological Aspects of a Medieval Population in the Province of Jämtland, Mid-Sweden* (Stockholm: Tiden-Barnangen AB, 1966); Alan H. Goodman et al., "Enamel Hypoplasias as Indicators of Stress in Three Prehistoric Populations from Illinois," *Human Biology* 52, no. 3 (1980): 515–28.

24 Mauro Rubini and Paola Zaio, *Elementi di Paleopatologia: Atlante* (Rome: Cisu Editore, 2008); Jane E. Buikstra, ed., *Ortner's Identification of Pathological Conditions in Human Skeletal Remains* (Saint Louis: Academic Press, 2019).

5 Results and Discussion

The results obtained are certainly interesting. Height does not represent a direct inequality discriminant, but it can provide us with a series of indications in the time trend (see Tab. 2). The population of the second-generation Greek 'colonizers' of Ortigia (eighth century BCE), made up of allochthonous males and autochthonous females, highlights a stature dimorphism that is favourable to females. This result could be coincidental, but there is another possible answer: a difference in genetic background between Greek males and Sicilian females. The time between two generations is too short to produce genetic adjustment phenomena, which could explain the height inequality between the two sexes. The question often asked is whether this skeletal inequality also had repercussions in social hierarchies. A comparison with other populations of peninsular Italy shows that dimorphism is the prerogative of males, probably because they lived within strictly autochthonous dynamics. During the eighth century BCE, this development was still premature, as indicated by the MOS, since the skeletal markers in males and females show a roughly similar range of stresses. In particular, the presence of osteophytosis of the spinal column and humeral hypertrophy in almost similar proportions (47.3% males, 46.2% females in Ortigia; 38.6% males, 36.1% females in Syracuse) in young subjects highlights work stress that was of equal intensity in terms of musculoskeletal impact, although this would have been differentiated by the type of work. This represents an equal index for their access to jobs and thus, indirectly, to food sources. This latter aspect was highlighted by a recent study on the nutrition of these two populations, the results of which showed the same levels of protein and carbohydrate intake in both sexes.[25] There was probably an internal hierarchy, but one that was a result of prestige within the community, not social inequality. This is evidenced by the LEH values close to 100% in both Sicilian populations (99.6% males, 99.8% females in Ortigia; 98.3% males, 99.1% females in Syracuse), which testify to a weaning period and the exposition to pathological and environmental stresses that were equal for all males and females. In comparison with almost-contemporary Italian peninsular populations, a discrepancy between males and females is highlighted only in the MOS. In the Etruscan populations of Latium or Tuscany, or the southern ones of Pontecagnano or Sala Consilina, the values for musculoskeletal stress are greater in the male individuals. On the other hand, the females show statural and nutritional deficiencies. As it is well known that stature is strictly linked to nutrition,[26] and based on an analysis of intersex inequality, this indicates that males and females did not have the same access to food sources in adolescence and in adulthood. Here, too, a weaning index such as the LEH appears to be similar between the two sexes, probably because newborns during this period did

25 Mauro Rubini et al., "Patterns of Human Diet in Eastern Sicily (Italy) during the First Millennium BCE," *Austin Anthropology* 4, no. 2 (2020): 1018.

26 Vittorio Maglietta, *Valori normali, richiami diagnostici e dati clinici utili in pediatria* (Rome: Carlo Erba, 2022); Vinay Kumar et al., *Robbins Basic Pathology* (Philadelphia: Elsevier, 2018).

not yet have the privilege of being adequately nourished as they were partially edentulous. It is during adolescence that males in parental structures were better nourished as they were probably seen to be more useful for various causes: above all, work and war. Four centuries later, in Hellenistic Syracuse, many changes took place. The most important was the transition to an organized, cosmopolitan and modern society. Inbreeding increased with the centripetal function of the city. In a comparable situation on the peninsula, this would become the fundamental reason for populating 'modern' Italy with the major force that Rome had during the period of its territorial hegemony. This involved some fundamental changes: demographic increase, a need for roles, politics, economy and little consideration for the availability of resources. These are often underestimated, but nature has taught us that a species can only survive if it has the necessary resources for the entire population. If these are insufficient, then a hierarchy of inequality will be established. Food is necessary, and if this is scarce, then products will come about that are not necessary for survival but assume a purchase value. Today, money is the means by which wealth is measured (Gini coefficient), but back then, owning assets to defend oneself and one's property did not only serve to 'get rich' materially, but also to have access to more useful products for living, such as food. Social inequality, yesterday as much as today, was not only limited to the accumulation of useless goods, but it also depended on the possibility of obtaining easy access to what was needed to live: food. All this may seem simplistic for a period like the first millennium BCE, but let us never forget that inequalities arise not from power, but from necessity.

Tab. 1: List of markers of occupational stress (MOS) used in this study (R= right; L= left).

Poirier's facet femur (L)	Syndesmosis femur (L)
Schmorl's disc herniation – vertebrae	Syndesmosis femur (R) 3.70
Schmorl's disc herniation – lumbar vertebrae	Syndesmosis of cruciate ligaments tibia (L)
Schmorl's disc herniation – sacral vertebrae	Syndesmosis of cruciate ligaments tibia (R)
Vertebral column osteophytosis	Facets of the femoral condyles (L) 3.70
Clavicular fracture (R)	Messeri's patella (L)
Clavicular syndesmosis (R)	Messeri's patella (R)
Humeral hyperthrophy (L)	Squatting facets tibia (L)
Humeral hyperthrophy (R)	Squatting facets tibia (R)
Humeral asymmetry (L)	Squatting facets talus (L)
Humeral asymmetry (R)	Squatting facets talus (R)
Ulna: Woodcatter's lesion/gout (R)	Platycnemia tibia (L)
Platymeria femur (L)	Platycnemia tibia (R)
Platymeria femur (R)	Fibular bowing (L)
Enthesopathies femur (L)	Phalanx flexor hypertrophy (L)
Exostosis of the trochanteric fossa (R)	Phalanx flexor hypertrophy (R)
Enthesopathies tibia (L)	Muscle-skeletal stress of hand palm side (L)
Enthesopathies tibia (R)	Articular extension of first metatarsal (L)
Pilasterism (L)	

Tab. 2: Comparison of mean statures among various populations from the Italian Peninsula (in meters).

Sites	Males	Females
Iron Age		
Viale Ermocrate	**1.62**	**1.64**
Caracupa	1.64	1.70
Ardea	1.70	1.61
Camerano	1.67	1.54
Ceretolo	1.67	1.56
Etruscans Latium	1.67	1.53
Etruscans Tuscany	1.67	1.55
Osteria dell'Osa	1.66	1.54
Pontecagnano	1.66	1.54
Pozzilli	1.68	1.55
Riofreddo	1.67	1.58
Hellenistic Period (and Roman Period)		
Contrada Fusco	**1.69**	**1.61**
Palestrina	1.66	1.51
Minturnae	1.60	1.49
Cures	1.61	1.51
Gargano	1.63	1.48
Romans (third century BCE)	1.59	1.50
Gallicano	1.68	1.52
Basiliano	1.65	1.51
Lucrezia Romana	1.65	1.53
Lucus Feroniae	1.64	1.52
Quadrella	1.64	1.49
Suasa	1.65	1.53

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