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Chronocide by Science? Bioarchaeology and Archaeogenomics Rewrite Ancient History to Specification

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ABSTRACT

The Cultural Warfare goes back many millennia and strives to weaken an enemy and to make a subject docile. Assimilation derails the future of a culture by diverting the population in the future to other practices. The Chronocide, a rather modern concept as a term, attacks the Past, so that the manipulation within the Future of an orphaned population is much easier and without any potential for recurrence. A new iteration seems to emerge, using multi-domain scientific methods to perform such tasks and abusing the notion of evidence-based research: biomedical technology for analyzing human remains requires the fusion of scholarship and experimentation. The combination of Isotopic Analysis/Bioarchaeology and Archaeogenomics was used to a small sample of human remains from a grave site near the ancient battle site of Himera to track the lineage of deceased individuals. The suggested high percentage of alien adult males to natives for burials of 480 BC opposed to natives-only burials of 409 BC, led researchers to revise Ancient Greek military practices of the 5th century BC. Foreign mercenaries, many from East Europe, are supposed to have played prominent, hitherto shushed, role, within the ancient Greek world. The discrepancy of this theory with the own findings, which do not prove or suggest such

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association, would suggest that a flawed interpretation was expanded first to a fact and then to a paradigm, to promote politicized agendas. Whether this constitutes Chronocide or not is debatable.

Keywords: Biomolecular Archaeology; Archaeological Science; Chronocide; Archaeogenomics; Isotopic Analysis; Evidence-Based Research; Historical Revisionism

1. Introduction

The term "Chronocide" is recent and not widely used; it describes the denial of History, and thus an alteration of the Past[1]. As such, it is not something innovative as a concept; the name simply puts it into a wider, integrated framework. The rewriting of history is a repeated theme through the centuries, mostly within Cultural and Cognitive Warfare[2–4] and constitutes a disinformation practice that functions not in the present and future but deeply in the Past. Cultural Warfare is not taken in any philosophical sense[5,6], but rather within the context of Hybrid Warfare by Western parlance[7,8], or within the 6th Generation Warfare in the Russian strategic thought[9]. It is an influence tool the use of which transcends the Psychological Warfare/Operations (PsyOps)[10,11] and has a narrow objective: To shrink, depreciate, defame or erase the Past of some culture or group, so as to facilitate, in many possible ways, either assimilation and exploitation, or extermination. The former may be pursued through changing the way said group apperceives itself and possibly by compromising its public image to other audiences, usually international ones; the latter mainly by targeting and undermining said public image—or more properly termed, the complete Identitiscape[12], the issues of heritage and historical continuity being of prime importance. And such rewriting may be accomplished by various traditional methods including but not limited to revisionist retelling of the Past[13]. Revisionism is not in itself good or bad. As with all tools, it is the use that makes the difference. It may improve the understanding by allowing further aspects of an entity, or corrupt and mar it by retro-projections.

Within the methodology of Revisionism but also beyond it, lies the innovation of historical and archaeological research aided by the use of novel scientific and methodological research. Based technically on Natural Sciences, not Humanities, and methodologically on the practice of interdisciplinary approach, it opens very interesting possibilities for more direct and objective understanding of the Past, far outreaching the potential of the original methodology. In this, there has been vast progress in the conduct of Science and Research. Still, there is a double pitfall: once more this is just a tool, a more modern and capable one but just a tool. Its use may be advantageous or malevolent: since the 80s, the—then novel—concept of Biohistory has been repeatedly criticized as such, a construct to justify a set of rather offensive and predatory attitudes[14]. And much more so if the innovative approaches are used by themselves without proper and competent informing by the traditional approaches, which formulate the nature and structure of the research query but also the proper interpretation and contextualization of the results. Questions regarding semiotic methodology[12] then arise. True, the case of inadequate/erroneous use may be clearly discriminated from intentional improper, or even malicious, such (sim)use of the more modern approaches by the exploitation of the results and conclusions by the practitioners themselves. Human ambition or vanity explains some transgressions, but heated polemic tone suggests rather an intentional misconduct, isolated or within the framework of a set strategy or policy. It is the interface of the wider reception of a flawed work from different communities and the stance of its authors that allow discrimination between unintentional and deliberate misconduct of science, occasionally, but not necessarily, irrespective of the tone and wording.

The discovery of the western necropolis in Himera, Sicily[15,16] has been the basis for two papers that processed a limited number of skeletal findings with isotopic analysis[17] and paleogenomics analysis by retrieving, extracting and sequencing ancient DNA (aDNA)[18]. Here, neither the conduct of the methods nor their choice cause concern, as they are commonly used in such scientific inroads to archaeological findings concerning remains[19]. But the interpretation and the resulting conclusions are a clear semiotic example: the authors in both cases, without establishing any conclusive connection between the tested remains and the two battles of Himera, especially with the former one, of 480 BC (as

attempted by the original publication [15], overstep the latter and engage in far-fetched hypotheses aimed at revising the understanding of Ancient Greek classical warfare methodology, including the social parameters it incorporates, and thus also disqualifying classical authors. The task of this revision, extending in an extremely large spatiotemporal continuum and implicating millions of ancient people, is not supported by evidence, it is only ill-supported by argumentation and sample size and is understood, by its follow-up in numerous non-scientific media (See **Table 1**), to be upholding multiculturalism as a social mandate and the use of mercenaries as a military prerogative, as both cases seem to be promoted by current western ideologies and governments, rather than ethnically clear-cut states and citizen-soldiers defending their country, freedom and families upon need. In all, technically, the use of novel methodological aspects, to be productive, requires proper information through consulting the traditional historical sources and the conduct of the research in an unbiased manner, preferably, though not necessarily, in an evidence-based manner.

Table 1. Indicative sites reproducing the conclusions of Reitsema et al. [18] and Reinberger et al. [17].

#	Name	Year	Title	URL
1	Sabelli C	2022	In ancient Sicily, migrant mercenaries helped Greek settlers defeat Carthaginians.	https://www.nature.com/articles/d43978-022-00139-5
2	Kuta S	2022	Mercenaries Were More Common in Greek Warfare Than Ancient Historians Let on.	https://www.smithsonianmag.com/smart-news/mercenary-soldiers-were-more-common-in-greek-battles-than-historians-let-on-180980902/
3	Curry A	2022	Mercenaries may have helped ancient Greeks turn the tide of war.	https://www.science.org/content/article/mercenaries-may-have-helped-ancient-greeks-turn-tide-war
4a	Lidz F	2022	Hidden in 54 corpses, a revelation about Ancient Greece.	https://www.nytimes.com/2022/10/04/science/greece-sicily-himera-genetics.html
4b	Lidz F	2022	This 2,500-year-old mass grave of troops from the second Battle of Himera in Sicily hides a revelation about Ancient Greece.	https://www.thearchaeologist.org/blog/this-2500-year-old-mass-grave-of-troops-from-the-second-battle-of-himera-in-sicily-hides-a-a-revelation-about-ancient-greece
5	Howitt-Marshall D	2022	Mercenaries for hire: Ancient DNA study makes startling discovery.	https://www.ekathimerini.com/culture/1195278/mercenaries-for-hire-ancient-dna-study-makes-startling-discovery/
6	Unknown	2021	Geochemical study: What it reveals on the war of Ancient Greeks against the Carthaginians in Sicily. (in Greek)	https://www.cnn.gr/style/politismos/story/265688/geoximiki-meleti-ti-apokalyptei-gia-ton-polemo-arxaion-ellinon-me-karxidonioys-sti-sikelia
7	Unknown	2021	The Greeks of Sicily fought Carthage using foreign mercenaries. (in Greek)	https://www.alfavita.gr/epistimi/349523_oi-ellines-tis-sikelias-polemisan-tin-karhidona-me-xenoys-misthoforoys
8	Unknown	2021	Greeks of Sicily against Carthage: The role of mercenaries. (in Greek)	https://www.defence-point.gr/news/ellines-tis-sikelias-kata-karchidonas-poios-o-rolos-ton-misthoforon

Note: No. 1–4 refer to international media, of general (#4) and scientific (#1–3) audiences and content. No. 5–8 are Greek pages, Anglophone (#5) or Grecophone (#6–8), also reproducing the same conclusions.
Source: Adapted from Kambouris ME, *Hybrid Warfare 2.2*, Chapter 9, Springer, Cham [8].

2. Methodology

This work is rather a case report. After setting the epistemological background by a brief discussion on studies, discourses and methods, the case of the two interlinked publications is reported and examined in its proceedings and compared to more meticulous and interrogatory treatment of the traditional sources, from classical, ancient texts for the course of events to more modern historiography and scholarship regarding ethics, beliefs and practices to geographical, military and political—and even cultural—considerations, from either scientific publications or working papers and declarations where applicable. After identifying the weak points of the argumentation, the impact and dissemination of the results and conclusions of the said cases are then scrutinized through their penetration and presence in the press outlets. The presence in such widely accessible, non-scientific outlets may be an indication of deliberateness in biased interpretation and argumentation, which would suggest progression beyond semiotic methodology to intentional distortion of a wide and impactful identitiscape and thus constitutes Chronocide.

The case report refers to the successive Bioarchaeology papers [17,18] published successively (while also considering the original archaeological publications [15,16,20]) and on the effort, of the two former ones to deeply revise the common

apprehension of a given historical event, the Battle of Himera in Sicily in 480 BC and from there to also revise the authority of ancient sources and, also, of the sociopolitical and ideological structure of the Greek city-state military practice.

In the former pair of publications,[17] sharing some of the authors, advanced bio-molecular techniques (isotopic analysis and aDNA analysis/archaeogenomics) have been applied on an existing and already published archaeological corpus and are understood to have manipulated not the results, but their interpretation in a semiotic manner, so as to reach a far-fetched groundbreaking sociocultural and military discovery, incidentally in line with many current political and ideological vogues, if the plural may be excused. The motivation may be debated, but the flaws are less so: first in interpreting the data collected by the two analyses to reach immediate, primary conclusions regarding the corpus of samples; and second in integrating the primary conclusions into a wider, historical and political-sociological context, thus drawing secondary conclusions of high impact over a vast spatiotemporal continuum; the ancient Greek word.

The intent of this work is to showcase the potential for weaponization of Culture, Identity and heritage studies *through* Bioscience. This "through" is the core analytical concept herein. The underlying intent is not to exhaustively present the inroads of the natural sciences to the realms of History and Archaeology, and considers their usefulness self-evident. They allow actual, scientific resolution of puzzling queries that cannot be factually approached in any other way. Thus, the respective references are limited, and go only up to the time of the Case of the Case Report, which is the 2021–2022 time-frame. Regarding this discussion of epistemological nature, the objective herein is to trace, but not to analyze, the practice of such potentially beneficial interaction, indicatively and not exhaustively substantiated by the used references. This allows to showcase the upgraded malevolent—or simply detrimental—potential of this novelty when compared to similar uses of the traditional approaches, if abused or misused; not in terms of execution, but of semiotic practices in interpretation[12] and lack of proper correlation with evidence and conclusions drawn by other methods, approaches and resources; including traditional ones[14]. The authors of this work consider it essential to underline the possibly far-fetched effects in the concerned identitiscapes[12]: mostly the memories formed and dis-formed and the image apperceived by both foreigners and descendants of the impacted polity/culture (which constitute its identity in the Present and its heritage, when extended to the Past) by arraying secondary and tertiary sources that reproduce the biases formulated as revision in the scrutinized case(s).

2.1. The New Paradigm: Methodology of Natural Sciences in Humanities/Archaeology

The transfusion of methods of Natural Sciences to the fields of Humanities revolutionized the ability of the latter to confirm and substantiate associations either established but not proven by the standard comparative scholarly and field methods, or to draw results simply lying beyond their reach[21]. Such practice is aligned with evidence-based research prerogative[22]. Evidence may be questionable in quality or interpretation—the latter infringing on semiotic practices. The development of Life and Health Sciences' methodologies furthered such endeavors and spawned Biohistory[14] and Archaeological Science, a much less controversial, common ground of archaeology and paleontology. In this context, bioarchaeology studies human (and occasionally, animal) remains from archaeological sites and is a synonym of osteoarchaeology[23]. Biomolecular archaeology[24] employs methods of molecular biology to elucidate archaeological problems. Such are the identification of biological remains, from corpses to wood and bone artefacts and textiles, possibly degraded and contaminated beyond recognition by standard approaches[25]; the elucidation of dietary habits of populations and communities of the Past, performed by analyzing skeletal remains, which is another aspect[26]; and the assessment of the genetic homogeneity of groups of remains and to trace their lineage. These efforts analyze Ancient DNA (aDNA) extracted from said biological samples, with all restrictions and conditionality that may apply[27–30] and fall in the fields of palaeogenomics[31] and archaeogenomics[30], both plagued by ingrained incompatibility in the interpretation of results by geneticists and anthropologists or archaeologists, respectively[32]. The prefixes *archaeo-*/*palaeo-* are alternatives in their use, depending on the existence of contemporary and relevant resources of human testimony; the *Archaeo-* prefix is used when such resources are accessible, while the *palaeo-* prefix is used when their perceived absence[33].

The framework of Archaeogenomics presupposes an

archaeological basis for the issues under scrutiny, and became greatly enhanced in content and context when WGS (whole genome sequencing) became affordable and available. Still, even earlier, non-WGS genome-wide scans (GWS) had achieved routine status for a range of biological remains [33,34].

Occasionally, in such a context, data produced by instrumentation is seen as inherently objective, contrary to associations by cultural and calendar evidence or artefact morphology and style, which are all subject to interpretation [21,32] and to a higher degree of subjectivity than technology-derived methods. Still, this objectivity may be exaggerated [35,36]; both the production of data and their interpretation are subject to factors leaning to subjectivity, as are the linear and non-linear areas of plots [15,16]. The archaeological Science evidently displaces archaeology [24] and now does so much faster, resulting in a quantum-leap transformation. A solid body of data-derived evidence to leverage and promote thought and conclusions is a prerogative of further progress in the context of evidence-based research [22] if biases in interpretation, especially of the much more sought-after politically correct or revisionist agendas, are avoided [37].

The Cultural Warfare goes back many millennia and strives to weaken an enemy and to make a subject docile. Utter extermination is reserved for the plundering of the resources and perhaps massive migration in a primitive style. If the subject population is among the intended spoils, in any possible context of serfdom, then assimilation and cultural erasure are a promising two-step approach, the latter making the former easier and smoother. Assimilation derails the future of a culture by diverting the population in the future to other practices. The Chronocide, a rather modern concept as a term [1] but of previous practice deep in the dust of centuries, as with the destruction of pagan monuments by the Christians, attacks the Past, so that the manipulation within the Future of an orphaned population is much easier and without any potential for recurrence.

A new iteration of the *Chronocide* phenomenon, or, rather, practice [1], which aims to change the nature of something Past, usually a practice or a population or a culture, usually to defame it or to appropriate it and generally to re-arrange it within a different storyline than the original, seems to utilize the abovementioned multi-domain scientific approaches. The combination of Isotopic Analysis and Archaeogenomics has been tried on a small sample of human remains from a grave site near an ancient battle site, to track the lineage of deceased individuals. The data has been interpreted and manipulated so as to promote a preconceived theory of multi-cultural and multi-ethnic martial superiority compared to the prowess of homogenous polities and armies. Moreover, the results were used aggressively so as to impose on the current conscience as commonplace, in a previous spatiotemporal continuum, a given socioeconomic and sociopolitical choice: the use of mercenaries. Not incidentally, this practice is fervently upheld by the Western World (made up entirely of liberal states at the time), but is absent from any historical or archeological record regarding the timeframe of the study. A tailor-made rewriting of the Past.

2.2. The Battle of Himera: A Suitable Case for a New Paradigm

Due to the Roman Marian tradition [38] and the feudal one of the Middle Ages [39], irrespective of the level of the feudal lords holding prominence, the West had high regard for mercenary soldiery, both native professionals, as for example the US army, and band of *Condotiere*, like the Private Military Corporations (PMCs) such as the Blackwater [40], again of the US. This concept seems to be failing after the events in Ukraine, but it was prominent at least until 2022. Similarly, there is an effort to promote migration and multiculturalism as seen in the UN migration policies (https://www.ohchr.org/en/migration) and thus demonstrating that this was a universal, or at least commonplace in the Past, seems to be a common denominator to many historical and social research publications [41,42].

Himera is an ancient Greek colony in Sicily, where two battles were fought between Sikeliot Greek forces and invading metropolitan and colonial Carthaginian forces [16], first in 480 BC (Diod 11.20–244; Hdt 7.165–7) and then again in 409 BC (Diod 13.59–62). Due to its status, scale and significance, and also due to other factors such as the duplicate nature of events at the same place over 70 years and some massive archaeological discoveries, such as mass burials in the environs [15], this duo of battles has been deemed advantageous for archaeological research with modern biomolecular techniques and ideological and social ramifications. This is attempted by a research corpus (understood as interlinked research efforts and publications), made up of two publica-

tions. They use state-of-the-art analyses, and generalize their somewhat biased conclusions regarding social, ethical, legal, cultural and political issues, such as the nature of armed forces and the conscription practices and ethics, to levels unsupported by the findings.

The scientific principles regarding the techniques are state-of-the-art. Isotopic analysis comparison of skeletons unearthed in the mass burial site near the battlefield, to determine the native or alien origin of the deceased and possibly to track their place of residence during childhood and early adulthood[17] is the first publication of the two-part corpus. The archaeogenomic comparison of some of these remains is the second[18]. Still, the results stem from the contents of a very limited number of skeletons found in the graves near the battlefield of Himera. As a result, to use them for extrapolating historic and sociological facts on a massive scale, such as the proposition that the Greek Sikeliot army of the city of Syracuse in 480 BC included a large proportion of foreign mercenaries (not native professionals) who were instrumental in the victory against Carthage is far-fetched even if the findings and the results were most reliable—which they are not.

The Himeraean army had no such elements in 409 BC, a fact unequivocally supported by the findings. But to consider this substantiated absence as the reason behind its catastrophic defeat is even more far-fetched. In effect, to explain a historical fact, the different verdicts of the two spatially coinciding battles distant by 70 years through such findings is inherently flawed: the proposition that the multinational Sikeliot/Syracusean army won in 480 BC but the uninational Himeraean army of 409 BC was utterly defeated, exactly due to this difference in synthesis, is somewhat biased: If for no other reason, because the enemy in both cases was a multinational and multicultural host raised, organized, paid, and led by the same enemy state, Carthage (Diod 11.1, 5 and 13.44, 6), as this was the standard for the Carthaginian armies, especially the expeditionary ones (Hdt 7.165; Plut Tim 28, 6; Polyb 31.21, 3; Diod 5.35, 3).

2.3. The Paradigm Change

The authors of the two abovementioned studies[17,18] examined a limited number of skeletons found in the western necropolis, near—or, possibly, on—the battlefield of Himera[15,16,20], where the two battles were fought. Regarding the first battle of 480 BC, the authors suggest that the remains belong to combatants fighting on the Greek side of the battle. They argue that a substantial proportion is alien in origin and genetic heritage and proceed, to use such conclusions drawn from this sample and study as a paradigm for the military institutions of the Greek city-states of the era, anywhere, a speculative and uncorroborated proposition.

Though both the combatant status and the assignment to the Greek side are unproven conclusions based on speculation; there is no solid scientific proof, but some arguments of interpretation of evidence and of ethology. For example, the fact that such remains were entombed in a massive format near the site of the battle (a fact) at a convenient timeframe (which is debatable) and belong to military-aged males that have suffered violent trauma (a statement that needs elaboration), does not prove they were combatants, contrary to the authors' allegations, nor their affiliation, have they been.

The authors maintain that the ratio of alien to native skeletons suggests a high percentage of alien troops in the armed forces of Greek city-states at the time. They further their conclusion to suggest that these aliens were evidently mercenaries and some of them came from as far away as today's Latvia and Ukraine, based on the genomic match of the obtained remains to respective reference samples. The genomic match is a scientific fact, but the other two propositions are projected and massively generalized, not to mention unsubstantiated: different polities had different Constitutions and there is not one ancient source, of the many we still possess and know of, to suggest such practices for the 480 BC timeframe in the Greek world, but for the use of mercenaries as police by autocrats[43]. This corpus seeks to revise not only the current understanding of how the first Battle of Himera (an oversimplification of the campaign of 480 BC but retained for convenience herein) was fought, and by whom, but, much more important, the classical Greek armed forces arrangements in a vast spatiotemporal continuum.

2.4. Science as an Enforcer: Bioarchaeology, Archaeogenomics and Genography

The isotopic comparison of 51 skeletal remains of males in a 480 BC-compatible mass burial[17] convincingly suggests that many belong to alien individuals that moved there during their lifetimes, but the "there" and "alien" are vague and actually imply the environs of Himera and not

Sicily[18]. Although the results derived from the two elements differed considerably, as in one case (Sr), two-thirds (~67%) were deemed aliens, and in the other (O), over four-fifths (~84%); as a methodology, it provides a rather solid track of the geolocation of the upbringing of the subjects[44,45]. But this stands only if the temporal parameter has been taken into account, regarding the isotopic context of geolocations. This may be achieved by proofs of stability over time elapsed (present and historical time of the subject's lifetime); alternatively, a well-substantiated time-dependent curve may provide the necessary reliability in matching current isotopic geolocation to 2,500-year-old skeletal remains. Similarly, alternative locations of origin with similar isotopic profiles, where the subjects could have been brought up, if any, should be excluded by historical context. This is also the case for locations purely of evidential context, i.e., with similar or identical profiles, even if seemingly unrelated to the subjects. They must be excluded only after close scrutiny and solid argumentation.

From the 16 sets of male remains belonging to the 480 BC-compatible burial, ~56% were considered non-Greek: these nine (9) remain sets belong to groups "Sicily_Himera_480BCE_2–5"; plus 2 outliers. This 7:9 ratio, had it been accurately reached, already differs significantly from the 1:2 and 1:4 suggested by the isotopic analyses of the two abovementioned elements. The genomic ratio of the suggested alien genetic heritage to that of natives is much lower than the one(s) derived from the isotopic analysis. The latter differ substantially between them (67% vs. 84%), more than the difference between the genomic ratio (58%) and the nearest isotopic analysis = derived one (67%). Thus, there are differing results from even more differing sample sizes (the genomic—n = 16—being less than one-third (1/3) of the one used for isotopic analysis: n = 51). The only common attribute is qualitative: the "foreigners" (sensu lato) are more than the natives (sensu stricto).

Moreover, of the 9 allegedly non-Greek individuals, five (5) present genomes partially matching Aegean ones, according to the authors' admission[18]. The two individuals of the "Sicily_Himera_480 BCE_2" group are described as between an Aegean and a central/Western European DNA pool. This applies to a lesser extent to the two individuals of the group "Sicily_Himera_480 BCE_4"; with very low but detectable Aegean DNA content mixed into a much more abundant Steppe DNA pool. One of the outliers, individual I17870/W0336, falls in between the "Sicily_Himera_480BCE_2", with the solid Aegean DNA constituent, and the "Sicily_Himera_480BCE_3" group, associated with East and NE Europe, without Aegean constituent. Once more, there is a detectable Aegean constituent, although lower than that of the "Sicily_Himera_480BCE_2"[18]. Considering them non-Greek, or even alien, has been clearly a matter of interpretation of inconclusive data.

Such genomes (as in the group "Sicily_Himera_480BCE_4" and the outlier) should not have been considered "out-of-area" immigrants. A more probable theory would be mixed marriages between Greeks of Sicily or from the mainland, serving or migrating by invitation to Sicily, and non-Aegean aliens. The latter could have been arrivals of an earlier generation, when the Balkans were not under Persian occupation, conceivably as slaves. The outlier individual and the group "Sicily_Himera_480BCE_4"). A conservative age of 30 years for the tested remains suggests birth in 510 BC, before the solid establishment of Persian authority in the central and southern Balkans. People from there, including but not limited to Thracians, Tribalians, Illyrians, and even Getae, might have been enslaved by the continuous raids within the tribal warfare and predatory statehood ingrained in these areas, and transported through the Ionian Sea to be sold to the rich Greek cities of the Magna Graecia, in Sicily and Italy. In any case, there is not one shred of evidence to consider them mercenaries.

The (Archaeo)genomics analysis is somewhat inconclusive, as per the above. The evidence is debatable due to the very low numbers: just 16 individuals of the 480 BC burial site were processed[18]. As a percentage and as an absolute figure, this reads unconvincing for large-scale conclusions and assumptions. Nor does this limited sample provide conclusive evidence; seven of these nine were compatible (although not identical or fully matching) with the Ancient Greek genomic signature. From the rest (nine), some were matched to modern-day genomes from Lithuania, and not any findings of concurrent populations, irrespective of location. The comparison must be with genomes of individuals of the era, not of today, given that the continent has witnessed successive mass migrations ever since[46]. The validity of Genography[47] rests with contemporary populations, where

social, political, ethnographic and anthropological data can refer to quasi-simultaneous genomic data. It remains a snapshot, not taking into consideration the time flow, except if repetitive sampling is implemented at known intervals of historic time. Cemeteries of various ages in a given location are such instances.

Else, in cases such as the discussed one, the movement of "genome vectors"—humans, tribes, nations, groups—must be factored in, by historic or scientific evidence, as a reported mass migration or sequential skeletal and genomic findings. The association of the exhumed skeletons to modern populations through genomic comparisons does not reveal the archaeogenography, meaning the geographical origin of the deceased people at their lifetime. Genomes are not fixed in space but they move with their carrier organisms and their communities. Actual geographic/genographic fixations of today may differ widely from the historic point of origin of a given population at some distant past. This is especially so for roaming, nomadic or migrating populations, as were the Scythians. The isotopic analysis does advise against a *local* point of birth[17], suggesting that these people arrived at Himera during their lifetimes; but not necessarily simultaneously. This is important: mercenaries tend to move in nationally, if not tribally homogenous bands, (Thuc 7.29–30) not individually or in multinational bands, for the sake of vocal communication, which is vital in battle, if for no other reason. A heterogeneous population implies either multiple arrivals, a proposition against Occam's razor, or slave status, whence different batches of different peoples arrive gradually within a temporal window.

The most important objection to the mercenary hypothesis is based on geopolitics: to reach Sicily from modern Eastern Europe, the trek is through Etruria or through the Balkans and then by ship. These lands were utterly hostile to the Greeks—the latter as part of the Persian Empire, the former on its own right (Dion Hal: Rom Antiq 7). Chattel slaves might have been allowed to cross Etruscan lands for a bribe, as business went on during war; sanctions were not a widespread practice at the time (Hdt 7.147, 2–3). But no armed bands of mercenaries would have been allowed through, to assist their enemies[48]. The establishment of mercenaries in Syracusean service as combat troops antedates the battle of 480 BC, and the death of Gelon, the victorious tyrant of Syracuse (Diod 11.67, 5).

Any itinerary through the Balkans meant crossing territories of the Persian Empire, which capped mainland Greece, having pushed their borders to the southern part of the peninsula (Hdt 7.108, 1). No mercenaries could pass through to offer their services to the Greeks[49]. This is even more so for the—very few—individuals from populations set due east[18].

A historically, culturally and geographically fitting proposition for the slot of the alleged and unidentified foreign mercenaries are the Scythians. They were contracted by Peisistratus of Athens in the mid-6th century BC[50–52], before the Persian expansion in Europe[53]. The next round of their mercenary service in Athens follows the Persian withdrawal caused by the Battle of Plataea of 479 BC (Hdt 9.89) since the mid-5th century and afterwards[52,54]. But before 480 BC, no mercenaries from Eastern and Central Europe could cross to assist the mainland or western Greeks.

2.5. The Underlying Issues: History, Archaeology and Anthropology

Based on the above issues, the revisionist conclusions[17] referring to a *historical*, event, and not an *archaeological* corpus, read unconvincing in terms of archaeology but more so of history. Regarding archaeology, the dating of the remains thought to refer to the 480 BC battle, is focal, as it forms the revisionist theory's nucleus. They have been dated to 480 BC, but the accuracy of the method must be proven to be of a yearly tolerance or less, something perhaps tricky[32,35,36]; one of the original publications admits the dating of the burials was by context and not by scientific measurements, as Carbon dating is not suitable for the era at hand due to the Hallstatt Plateau[15]. All conclusions thereupon are speculative. Violent death in combat (determined by perimortem traumas substantiated by bone damage and, occasionally, parts and pieces of offensive weapons, such as arrowpoints and spearpoints[15]) could be the result of raiding, strife and other conceivable medium-scale events at a similar/compatible timeframe. An approximate dating to *circa* 480 BC[16] would suggest a possible but not *solid* association with the battle or even with the campaign. If the association is flawed, all conclusions therein do not stand and the excavators have admitted that the findings might not directly associate with the 480 BC battle[15]. A spear trauma to the trunk suits well the Hoplite engagement profile, as

understood but also as depicted in pottery as accurately remarked[15], but is compatible with other infantry or even cavalry-derived traumas. If the perimortem signs imply a horizontal blow, it may be the result of cavalry lancing delivered from a low, underarm hold of a cavalry shafted weapon (spear/lance), an attitude regularly depicted in Ancient Greek pottery; all the above are compatible with a major battle but not exclusively so; other interpretations do exist.

If the dating issue is ignored, sampling becomes the next issue: First, the proportion of skeletons/individuals being fatalities as a direct consequence of combat-derived traumas is essential, and differs substantially from "violent trauma" as stated by the authors. The latter includes, but is not limited to, battle injuries. Alternative sources of violent traumas may be any kind of accidents such as a fall from a mount or an accident with a beast of burden or a wild animal or even of a bred animal like a rearing, infuriated horse; not to mention a bar fight, a brawl over agricultural or commercial matters, a large robbery of passers-by by gangsters or a factions' clash, possibly to the extent of a rebellion. The correct classification of battle trauma is essential for compatibility, not proof, of the cause of the "mass" burial and needs to be addressed before jumping to conclusions.

Second, many battle injuries, actually, are not likely to be evident on skeletal remains, as they are not dealt with on bone; the original publication actually admits this restriction and records only 11 cases with traces of bone-associated perimortem traumas in their much larger sample of 133 sets of skeletal remains.[15] Not 51, not 16, but 11 out of 133. The abdomen is a spot preferentially targeted for piercing and cutting weapons as it is relatively soft, sparing the blade from possible damage, requiring less power in delivering the blow and causing a higher rate of injury-related fatality or at least incapacitation. Although a much more challenging target, the inner part of the thigh shows similar susceptibility attributes. In these instances, the battle trauma cannot be deduced securely if some material evidence of the weapon proper, such as a blade or an arrow point, is not retrieved close in and in the relevant spatial context, thus implying deep penetration into soft tissue, such as muscle or entrails (**Table 1** #3)[16]. This indeed makes possible or even probable the consideration of more remains to be battle-derived casualties, than the 11 featuring traces on bone, but this is only an assumption.

Third, in the common ground of archaeology and history, lies the fact that slightly over 130 skeletons are mentioned as exhumed and attributable to the 480 BC timeframe[15,17], a number not compatible with a true battle fought *in situ*, but rather with some large skirmish or a raid. True, cremations-both primary and secondary, the latter with the remains recovered and placed in urns, as reported in the Homeric Epics- might have occurred, but this would apply chiefly to the Greeks and to rather limited cases of them[20]. Moreover, for the reasons detailed in the publication just mentioned, such evidence would have amended the foreigners-to-natives ratio more towards the Greeks.

If the authors of the pair of publications scrutinized herein, along with any others of the original groups that study and publish on the necropoleis of Himera[15,16,20,55], were set to completely revise the magnitude of the First Battle of Himera of 480 BC, this should have been reported as the major conclusion of their corpus of research. Else, the historical accounts report casualties of tens of thousands (Diod 11.22, 4) and such inconsistency should be explained somehow to attain an association between the corpus of evidence and the narrated event. One explanation might be that numerous working parties were simultaneously digging at different locations, burial pits to quickly dispose of the corpses so as to avoid stench and possible intoxication and disease; but the authors do not ponder upon this or any other possible explanation[17,18]. They simply avoid the matter of numbers altogether. Be it as it may, the number of corpses suits better the pre-battle skirmishes and devastation operations (Diod 11.20, 5 and 11.21, 2) than the battle proper.

Both material and inscriptional evidence qualifying the deceased as warriors is missing: no own panoplies, no votive offerings, no funerary representations, symbols or inscriptions are reported by the authors[15,17,18]. Even less so to categorize them as mercenaries. The passing mention of weapons may refer to points or blades fixed in bone or soft tissue of the deceased and buried with them as specifically mentioned in the initial, archaeological publications of the findings[15,16], and without elaboration it is insufficient to imply warrior status, even if the victims are exclusively adult males[16,17], which they are not, but the occasional female remains are so rare that they do not deny the characterization of the site as a *Polyandreion*[15,20,55].

Evidently, death by battle wounds does not suffice to

characterize a corps of an adult male as a combatant, and even less so by any kind of "violent trauma"[17] if the perimortem signs do not insinuate use of some weapon relevant to the age and circumstance. In the 480 BC invasion, the Carthaginians were victorious over the Himeraean forces, who took the field alone (this is exactly what happened in 409 BC) before relief from Syracuse was able to participate; as a result, they controlled the countryside and devastated the surroundings thoroughly (Diod. 11.20, 5). Devastation, as in the raiding warfare of the Middle Ages[56], included wholesale slaughter of any native individual, preferably unarmed and caught by surprise in the open—something compatible with the rare presence of females in the mass burials[15,55], and even more so with the low numbers of victims killed by weapon-derived injuries, as implied with the perimortem traumas in few and with weapons' remains[15]. Such murder was dealt with indiscriminately regardless of social status, and included citizens but also slaves. This implies that the deceased studied and considered combatants[17,18] (despite the original work being more reserved on the matter[15]) could have been slave labor in an agrarian context and were exterminated by the marauding invaders in the vicinity of the burial site, a possibility compatible with their low number, the sporadic female presence and any alien origin. Slaves, bought from slavers who dealt in diverse human stocks and of different ages, coming in at different times and set to labor on the farms or assigned to other duties, such as public works and interests of the state, such as erecting walls or working in mines and quarries (Diod. 11.25, 2–3). The population metrics support such propositions, as slaves outnumbered the citizenry and their families, possibly by quite a margin[57], as described by ancient sources also (Thuc 4, 80). Still, the number of the studied (not exhumed) individuals does not suffice for conclusions projected onto entire populations and states, contrary to the authors' practice.

The burial customs of the early 5th century BC, contrary to earlier practices of more heroic ages, did not prescribe burial with the panoply. This is irrelevant, though: own weapons, or any other indication of martial status being absent, the deceased may not be considered combatants without some convincing explanation. Nor may they be considered mercenaries *a priori*: even if they were combatants, it must be remembered that farmhands, manservants and other categories of slaves could have been enticed (or—less probably—forced) into armed service. Classical Greek states did so repeatedly when in extreme danger, as Himera had been in both invasions of Carthage. The Marathon example is vivid and valid: some slaves were armed and accepted for service, and the ones that were killed along with the citizenry of Athens were honored with burial rites; but they were interred separately from the said citizenry that fell (Paus I.32), a social, not a racial discrimination, as this convention was followed by the Plataeans. Similarly, the lightly armed Helots of the Lacedaemonian army (Hdt 9.28–29) who perished in the 479 BC campaign culminating in the Battle of Plataea (Hdt 9.85, 2), were buried separately, but considered and honored as warriors of the state. Such instances are not taken into consideration in the interpretation of the identities and context of the burials of 480 BC[17,18], although in temporal terms they are within a very narrow margin (1–9 years) from the 480 BC Battle of Himera. Somewhat later, in the last quarter of the 5th century, Helots were conscripted again by the Lacedaemonians but this time to fight as regular hoplites. Thus, if the males whose remains have been analyzed were indeed killed during the Battle of Himera and were combatants on the Greek side (both status and side are not solidly established), they might have been slaves coerced or volunteering for military service during an existential threat, and not mercenaries identity, a key factor in large-scale politics and warfare, does not necessarily coincide with genetic associations, nor with their lack[19]; even kinship may be occasionally independent of biological proximity as established by genomic comparisons[27].

Regarding the identity of these men, had they been combatants, they might not have been on the side of the Greeks. No reason or evidence to suppose so. The Carthaginians had Greek allies and associates in Sicily and Italy aplenty (Hdt 7.165; Diod. 11.21, 4), and similarly so other off-theater allies and mercenaries (Hdt 7.165). The careful burial does not suggest that the deceased were with the victors, contrary to the view of the authors[17]. It might have been a courtesy of the victorious Greeks to their enemies, combat troops or auxiliaries/foragers (Hdt 9.29) or any mix, who were taken by surprise and obliterated by the Syracusean cavalry during its harassment operations once it arrived in the theater and some days before the battle itself (Diod. 11.21, 2), something indicated by some findings[16]. This would explain the rudimentary Greek-style burial conventions combined with the

careful removal of any weapons the deceased might have had.

The Greeks reportedly buried not only their slaves who participated in the defense of the State, as (lowly) members of the city, as mentioned above for Plataea and Marathon, but also their enemies as well: after the battle of Marathon, the dead Achaemenid troops were buried—unceremoniously perhaps (Paus I.32). The reverence and ceremony extended in such cases is debatable, but not the principle: Pausanias, the Spartan Commander at Plataea, refused any notion of exacting revenge from the corpse of Mardonius, the enemy Commander, to avenge the desecration of the corpse of Leonidas (Hdt 9.78–9). The basic funeral dignity was extended to non-Greek, invader combatants, and not doing so would have been unthinkable if not for the desecration of the corpse of Leonidas (Hdt 7.238). Burial is thus no indication of sides; such crude rites might have been performed by comrades before the main battle, or by enemies on the morrow who would be unwilling to offend dead men, possibly by using the workforce of the captive enemies (Diod 11.22, 6) for the task entailing religious, aesthetic and public health aspects; a notion applicable to the Carthaginian victors of the 409 BC battle as well[15]. Thus, the argument that the burial suggests belonging to the victorious side[17] is null. On the contrary, a perfect match for the obtained results would have been indeed to consider the deceased as part of the Carthaginian force, as in the Battle of Himera of 480 BC, Greeks were actually fighting for the Carthaginians (Diod 11.21, 4) but made up a small proportion of their truly multinational host (Hdt 7.165).

3. Discussion

3.1. Primary Interpretation of Results

The authors of the Archaeogenomic analysis report that the osteoarchaeological profiles of the remains within the "Sicily_Himera_480BCE_2–5" groups agree with Sicilian origin as well, but not from Himera or other friendly/allied states[18]. They state that it is the coincidence of the alien genographic profile that informed their determination of the remains as out-of-area, of far-away origin, not any measured lack of positive association with Sicily: "The outlying isotopic data by themselves do not prove non-Sicilian origins for the individuals from Himera: similar outlying ratios for both isotopes can also be found in other parts of Sicily, albeit not in the immediate region of Himera. However, the agreement between genetic and isotopic evidence, showing that all nine individuals with outlying genetic profiles also have nonlocal isotopic profiles, provides compelling evidence that many soldiers who fought in the battle of 480 BCE came from distant regions of the known Greek world"[18]. Such interpretation of the evidence is problematic and semiotic: nine individuals are not "many soldiers"; of these nine only three do not have any Aegean traces in their genomes, and there is no coincidence of the two methods: as mentioned above, the ratios of the archaeogenographic and the two bioarchaeologic tests vary considerably in the estimated natives-to-aliens ratios. The osteoarchaeological analysis was consistent with the non-native remains being from other Greek areas in Sicily, with individuals coming to dwell, work (as seasonal hands) or fight in Sicily, a theory supported by the ancient sources, especially Diodorus Siculus[17].

When genographic data poured in, instead of suggesting spawns of mixed marriages, possibly of surf social status, in other parts of Sicily which somehow found their way during their lifetime to Himera through the island's land or seaways during the political turmoil of the years before 480 BC, as narrated by both Herodotus and Diodorus, opted for a theory of inter- or even intra-continental travels, with no consideration of the geopolitical conditions that made them impractical at the time. This was followed by the completely unsubstantiated claim that the tested remains were of combatants, fighting on the Greek (Syracusean/Himeraean) side and being of mercenary status, despite the lack of respective evidence.

3.2. Secondary Interpretation and Magnification

The two publications in question, if seen in the above-mentioned context, proceed boldly in two respects: First, they cast doubt (actually defame) ancient sources, such as Diodorus, by actually suggesting that they were biased against mercenaries and foreign help in their numerous interviews (**Table 1** #4b, 5) to scientific and non-scientific outlets regarding their discovery. It is hardly relevant that the "Greek Historians" are Herodotus and Diodorus. Diodorus wrote in Greek and, by name (no Archaeogenetics test has been used to date), he must have been Greek, but he wrote under Roman statehood in the Imperial era…In any case, the defamation is

hardly novel; since Herodotus had been slandered as Father of Lies [58], and the veracity of his narration was totally negated anew through the leverage of the concept of mnemotopes [59]. Perhaps Diodorus has escaped such criticism for too long. And one may wonder what happened to Xenophon, a proponent of mercenaries (Xen Hipp 9, 3–4; Xen Hell 7.1, 20) and a mercenary himself (Xen Anab 1.8, 15). It seems that not *all* Greek authors, even during the Classical Antiquity if taken sensu stricto, mid-6th to late 4th century BC, are biased against mercenaries, as an idea—and actually, neither is Herodotus, but this is by itself another matter.

Second, a revised understanding of classical Greek armies in the first quarter of the fifth century BC is pitched and promoted. These armies—not of Sicilian Greeks but of "Greeks"—suggest *all* Greeks of the era—are considered, by definition from now on, as of mixed composition: not just citizen hoplites, but also mercenaries—whose troop type is left unexplained. This conception of Greek armies is expanded with no effort or hint of differentiation among the eastern Greeks, dwelling in the Euxine or in Asia Minor and the Levant or North Africa, the mainlanders and the ones in Magna Graecia (Italy-Sicily) and other western colonies, in Iberia and southern France. Nor among different polities: commonwealths/leagues, kingdoms, city-states of democratic, oligarchic or autocratic governance. One army type fits all.

There is no consideration for the references, in other cases, by the same authors, especially Diodorus, to mercenaries fighting for Greece; he is defamed as biased (**Table 1** #4b, 5). Moreover, this—imaginary—multiethnicity in the armed forces is considered the reason for the different outcomes of the two battles, of 480 BC when the—alleged—mercenaries from faraway lands allowed the Greek victory, and of 409 BC, where their lack led to disaster. The fact that in the 409 BC battle the Himeraeans fought in the open only when augmented by other Sikeliot Greek forces (Diod 13.54, 5 and 13.59, 9–60, 1) is somehow missed from the Bioarchaeological analysis, as it does not match the results.

There is no problem with the scientific methods, but the number of the studied (not exhumed) individuals does not suffice for conclusions projected onto entire populations and states, contrary to the authors' practice. Moreover, the interpretation of these numbers has issues. The number of remains tested is too low: only 16 of the 480 BC stratum were genotyped, of which nine (9) individuals were characterized as non-indigenous [18] but five (5) of them have a partially Aegean genomic origin, and thus possibly some, distant or not, Greek origin (one parent, grand-parent or great-grandparent).

The casualty ratio for the winning army, estimated as per above to be 7 natives for 9 aliens (correctly or not) is magnified to reflect the composition of the—alleged—army. But casualties do not occur proportionately between civilian and mercenary units if the latter exist, as they are used exactly to curtail citizen casualties. Only for a totally annihilated army *might* such counts reflect the real composition. For a victorious army the proportional expansion of percentages from some tens of remains of Killed-In-Action (KIA) to reflect the composition of a host of tens of thousands (Diod 11.21, 1) is unwarranted.

3.3. Science Overreaching and Misstepping

Scientific archaeology and thus the implicated biologists understand concepts differently from archaeologists [32]. Regarding genomes, archaeologists translate them to fix sites and correspond to historical nations, ethnicities, and communities. The biologists refer in an abstract way to "populations", a useful tool in ecology, zoology and, when related to humans, in palaeontology, due to the utter lack of other, corroborating sources. However, in historical times there are by definition such sources, for example literary and representational ones, so, the use of the term "populations" is ill-advised: History is not about nameless populations genographed by their nucleic acids [12,14,19,27], but about achievements of individuals and groups of people which always have a strong sense of identity, irrespective of their social iteration and organization: cultures, polities, states and nations. Even if there is no genetic common ground whatsoever, as is the case with Civic Nations [60].

There has been no attempt to identify the genographed populations [18] with any historical context from literary sources such as Herodotus and later geographers such as Strabo [61] and Tacitus [62]. In historical terms, it is imperative to identify, may this be by family, clan, race, nationality or culture—or to try to. But there was no consideration to fuse material, cultural, ethological or literary evidence with genomic/genographic and bioarchaeological data so as to identify these unknown individuals (alleged mercenaries, but definite unknowns), with any of the exotic peoples

parading in *Scythica* (Hdt Book 3), especially the Scythians. This would have been a limited and reasonable objective for a study attempting to leap from archaeogenomics to history[18]. Such aspirations would be served by putting genomic and bioarchaeological findings into archeological and then historical context[63]. "East European populations" is a null proposition in historical context, contrary to "Thracian mercenaries" or "Illyrian slaves" which would have been meaningful.

Another interesting task of historical interest would have been to attempt to link the bioscientific data to troop types, which would further or dissuade (or do neither) the idea of mercenary troopers. The material evidence, so inconspicuous in both papers, is not mentioned to extrapolate any troop type of the era, i.e., Hoplites, light assault infantry or missile troops, so as to promote the idea of foreign mercenaries[64] and it may be interesting that there is no hint on the subject in the original publication that focuses on the historical context of the archaeological discovery.[15]

Contrary to the abovementioned pathways, which were left unexplored, the biased conclusions produced and aggressively promoted are speculative. Instead of a measured step to associate findings into an *archaeological* context (limited due to numbers of samples and controls), the authors opted to tackle *historical* issues of massive scale for which their data, collected from valid scientific core methods, were unfit: the number of samples and the extent and gravity of the argumentation are inadequate and disproportionate to the scope of their conclusions. For example, the effort to link the different outcomes of the two battles, of 480 BC and 409 BC, with the—perceived—difference in Greek troop diversity is also unwarranted. The main sources show reasons enough for the resounding defeat of 409 BC: The relative strengths (Diod 11.21, 1 and 11.20, 2 in 480 BC vs. Diod 13.54, 5 and 13.59, 9–60, 1 in 409 BC), the leadership quality (Diod 11.24, 6), and mere luck (Diod 11.20, 2) were the elements that favored the Greek cause in 480 BC and were absent in 409 BC (Diod 11.21, 2–11.24, 6).

3.4. The Chronocide Attempt

The Cultural Warfare goes back many millennia and strives to weaken an enemy and to make a subject docile and susceptible to targeted cognitive and influence imposition and suggestion. Utter extermination is reserved for the plundering of the resources and perhaps massive migration in a primitive style. If the subject population is among the intended spoils, in any possible context of serfdom, then assimilation and cultural erasure are a promising two-step approach, the latter making the former easier and smoother. Assimilation derails the future of a culture by diverting the population in the future to other practices and is especially sought for by multinational polities trying to forge new identities, deprived of—or unhindered by—the diverse heritages of the constituent groups, including cultural identity (material culture, customs, ethology) and historical memory. The Chronocide, a rather modern concept as a term[1] but of previous practice dwelling deep in History throughout the planet, as with the destruction of pagan monuments by the Christians, attacks the Past. The Modus Operandi is by malevolently revising its interpretation by present stakeholders, especially enforcers of influence, such as Academia so as to have the said group/community/population stripped of identity, coherence, homogeneity, civilization and popular culture and degraded to a group of people with or without genetic association in a Biohistorical context. In such a state, the manipulation of the targeted entity within the Future is facilitated and potentially definitive, without any prospect for recurrence.

The idea of the "hidden mercenary constituent" which was suppressed by the Ego and Pride if not Arrogance of the "Greek historians" has not been a novel idea: it is well liked in a context of multi-nationalism/-racialism/-culturalism and has a confirmed, actual precedent (or rather antecedent): the suppression by the popular lore and official records alike of the role and importance of local, native allies-"shadow allies" in the Spanish conquest of Mexico in 1521 AD[65]. This concept was adopted intact in form and argument, with very slight amendments to suit the case at hand. This transplantation, though, is inherently flawed, as the ideological differences between Christendom and other religions and cultures, not admitting foreign assistance, are enormous. In many cultures, the admixture of populations and cultures had been discouraged sternly, and immigration averted at all costs; a fact many cultural archaeologists, set on a stern course against genetic determination of identity and biohistory, tend to ignore[14,27]. Cases at hand are Ancient Egypt, an isolated and large nation-state (Hdt 2.179) and many city-states in Ancient Greece (Diog Laert 1, 34). At the climax of

their existential struggle against the Achaemenid Persians, the Lacedaemonians referred to the invaders simply as "Foreigners" (Hdt 9.53, 2), not by political/national name "Persians/Medes" or defining subjective quality "enemies", nor even in a cultural derogatory term so much loved by the Ancient Greeks, i.e., "Barbarians". The above, taken together, speak of an identity *not based* on cultural or linguistic factors, as with the Greeks who used the derogatory term "Barbarian". Which means that, at the 480 BC timeframe, the Greeks probably would not consider enlisting foreign help. The issue lies there, not in any—alleged—reluctance to acknowledge such assistance.

This is far from unique Greek obnoxiousness: as a matter of principle, some cultures do not recognize multicultural assistance in pursuing and implementing their achievements, not due to plain denial to do so, but because the reason for such denial obstructs causatively such occurrence: high moral standards are approachable only as appearances and excuses in current western ideological practice that centers on the motto "Business is business", but other cultures and civilizations have/had different values. The Romans rejected with disgust the offer of a physician to assassinate their arch-enemy King Pyrrhus in 278 BC. (Plut Pyrrhus 21, 1–2) The Jews refused donations to the Temple if acquired by prostitution (Deut 23, 19). Such moral standing might have resulted in success, as for the Romans, or in utter failure and destruction, as with the repeated falls of Jerusalem. But the observation stands: to uphold their high principles, ultimate sacrifice was deemed acceptable. The rejection of half-bloods and foreign cultures was often, if not usually, one such high principle (Hdt 4.76, 1). Regarding the latter, the vehement objection to Hellenization of the Jews [66] and the Scythians (Hdt 4.76, 2–5) proves the point, along with the renowned *motto* of Isocrates (Isoc Paneg 50)—if read in proper context, informed by his life and teachings.

The above apologetic paragraph does not concern the two papers, but does concern their downstream exploitation and treatment by both members of the team(s) in news outlets and the news outlets proper. The two papers might have been just an epistemological transgression, with suboptimal integration of own findings in a given, existing historical context; it should be noted that the original publications were much more conservative in their conclusions and more precise regarding the material; for example only 11 remains were found with perimortem traumas [15], and there has been no explicit reporting by the archaeogenomic publication [18] how these are related to their sample of 16 skeletons from the 480 BC-compatible burials: were the 11 such remains sets all included in the archaeogenomic analysis, or just a number of them- and how many. Furthermore, even if all 11 remains were included in the 16 tested samples, it would be interesting to know the distribution of the bearers of perimortem traumas between the two groups (alleged Greeks Sicily_Himera_480BCE_1 vs. alleged foreigners Sicily_Himera_480BCE_2–4 and outliers) and even the distribution among the different foreigners' subgroups (Sicily_Himera_480BCE_2–4), outliers included.

An epistemological issue (which is, of course, by definition debatable, as this is the Nature of Science) even if well-established, leaves many questions. It is accidental, subjective and a matter of opinion, or intentional? The latter usually, but not always, includes semiotic practices in interpretation, as the opting for considering the osteoarchaeological findings indicative of distant, continental locations inland, rather than of Sicilian upbringing to other, compatible spots on the island—which, incidentally, are not mentioned [18].

Moreover, intentionality is further divided into some naïve practices, such as the positive motivation to follow a given vogue in Science, which suggests a faster and better publication and then funding, or, contrarily, an effort to recast our views on a given subject and thus attain renown; or both. The abovementioned two possibilities are not mutually exclusive. But Chronicide is an intentional act; it requires premeditation and a degree of hostility. If these two are not securely fixed on the abovementioned intentionality in epistemological lapses, Chronocide cannot be assumed. It entails a clear mission and a given set of tasks to accomplish. It could also be detected by external indicators- though, once more, not exclusive ones. These are the downstream reception and use; the first refers to external entities and stakeholders, not involved in the research, while the latter refers to the researchers themselves and, conceivably, to their institutions, as institutional policies may affect the proceedings of research within the respective premises.

Such indicators may be identified in the discussed corpus of the two papers. In an evidence-based approach, it becomes obvious that the stakes lie not with the Battle of Himera, which is the focus of the research. The stakes lie

with the projection of the constitution of Ancient Greek armies in general and the infringement on the ideology that glorified indigenous citizen-soldiers rather than "a bunch of mercenaries" (**Table 1** #2 and #4 respectively): As directly said "...ancient authors would choose to embellish the Greeks for Greeks aspect of the battles, rather than admit they had to pay for it" (**Table 1** #5). The omission that one of the same authors (Diodorus), in other excerpts, underlines if not magnifies exactly the role of mercenaries explicitly stated as foreign (Celts and Iberians) for their role and conduct in Greek warfare in mainland Greece, and their employment by no other but the Lacedaemonians (Diod 15.70, 1 corroborated by Xen Hell 7.1, 20), is a semiotic pitfall. The extreme aggressiveness in the used language and the focus on the alleged bias of the ancient historians in interviews with the participating scientists fall in the abovementioned indicator of the use of the research by its authors, showing intentionality beyond a somewhat ill-seated conclusion reached. Had it been an attempt at Chronocide, it would have followed exactly these lines.

As mentioned above, a highly informative indicator regarding the nature of intentionality is the reception of such research by different audiences, or rather, providers/outlets. The dissemination of the abovementioned extrapolated findings is surprising in width and depth. Furthermore, its isolation of negative scientific responses and criticism, as well as its amplification, could be considered to constitute an exemplary case of the Echo-chamber effect[67], which isolates an opinion/statement from criticism and testing and repeats it to amplify it up to "general truth" status. The journal that published one of the two papers discussed above denied publication of a different view—Letter to the Editor declaring that "...our Editorial Board has determined that it does not contribute substantially to the discussion of the original article and therefore has declined to accept it for publication..." (Decision 2022 Oct 20). The revisionist corpus stood unchallenged and became the new reality, assisted by the journals' metrics, which proved a passive discouragement to criticism by other platforms. After this protection and isolation event, came the active amplification by repetition. Prestigious international journals and media, such as the *New York Times* (**Table 1** #4a**)** and even Greek media—a most unexpected follower due to the nature and ramifications of the projections—(**Table 1** #5) undertook the—allegedly—ground-breaking historical discovery, which was corroborated by interviewed non-participating, consenting scholars and scientists (**Table 1** #2). No dismissive or critical responses were recorded but whether such scientists and scholars have been bypassed or shushed remains.

4. Conclusions

It is a very questionable approach to suggest a reappraisal of the Ancient Greek military forces in general, based on the isotopic analysis of 51 corpses[17] and the archaeogenographic analysis of 16[18]. The acceptable sample sizes in this field are not common knowledge, but 51 seems few and the 16 genotyped ones[18] even fewer, in view of the projected conclusions and their extent. Capability or attainability are irrelevant; if such expansion of the dataset is not feasible, abstaining from the research altogether, or at least from ambitious amplification of the conclusions, is warranted.

Bioarchaeology demonstrated a debatable origin of the tested remains[17]. This *is* a result of a moderate profile, but valid. Coupled to Biomolecular archaeology and (Archaeo)genography[18], it implied *possible* links with populations *presently* associated with residence in Eastern Europe, and that is all. The scarcity of respective evidence in the set timeline and the alternative interpretation of the bioarchaeological/ osteoarchaeological data make detailed geolocation and genography highly speculative.

Instead, this very limited evidence was amplified to reappraise the military practices of the Greek World. Not of the city of Syracuse, which provided the bulk of troops for the Battle of Himera and that at a very specific timeframe and under duress, but the *whole* Greek world. This is ambitious if nothing else: The Hoplite era starts no later than 600 BC[68] and extends temporally to *circa* 270 BC; some Greek Hoplites faced the Gauls in 278 BC (Paus 10.22, 4), more than three centuries, or ten generations, if the span of one generation is taken as 30 years. Spatially the Hoplite has been identified from the Greek colonies in Spain, such as Zacanthus (Polyb 3.14, 9), to dwellers in Egypt (Hdt 2.78–79), Cyprus (Hdt 7.90), the Asia Minor coast, (Hdt 7.74 and 7.91) to Cuma in Italy (Dion Hal. Rom Antiq 7). Other nations/states followed suit[69], the Etruscans[68] and the Carthaginians (Plut Tim 27, 2–3) being just two exam-

ples. The footprint almost covers the Mediterranean, for different time spans, but still the participants to the model may have been some tens of millions. To revise this massive scale based on the testing of 16 or 51 skeletons, in one spot, Himera, at one—alleged—timepoint, 480 BC might be considered overambitious. Should this corpus and its downstream exploitation be considered a Chronoside case (there is always a big "Should"–"If" despite the positive sign in the respective indicators) its motivation is beyond the scope of this Case Report as it remains inherently conjectural.

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Conceptualization, M.E.K. and A.V.; methodology, A.V. and S.B.; investigation, M.E.K. and S.B.; writing—original draft preparation, M.E.K., S.B. and A.V.; writing—review and editing, M.E.K., S.B., A.V. and G.P.P.; supervision, G.P.P.; project administration, G.P.P. All authors have read and agreed to the published version of the manuscript.

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AI Use Statement

The authors declare that no artificial intelligence (AI) tools were used in the preparation of this manuscript.

Abbreviations

Deut	The Bible/Deuteronomy
Diod	Diodorus Siculus, Library
Diog Laert	Diogenes Laertius, Lives of Eminent Philosophers
Dion Hal	Dion Halicarnasseus, Roman Antiquities
Hdt	Herodotus, The Histories
Isoc	Isocrates, Panegyricus
Xen	Xenophon Hipparchicus/Anabasis/Hellenica
Paus	Pausanias, Description of Greece
Plut	Plutarch, Lives
Polyb	Polybius, Histories
Thuc	Thucydides, History of the Peloponnesian War

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