

Mobile elites at Frattesina: flows of people in a Late Bronze Age ‘port of trade’ in northern Italy

Claudio Cavazzuti^{1,*}, Andrea Cardarelli², Francesco Quondam², Luciano Salzani³, Marco Ferrante⁴, Stefano Nisi^{4,5}, Andrew R. Millard¹ & Robin Skeates¹



Following a mid twelfth-century BC demographic crisis, Frattesina, in northern Italy, arose as a prominent hub linking continental Europe and the Mediterranean, as evidenced by the remarkable variety of exotic materials and commodities discovered at the site. Debate persists, however, about the extent to which migrants influenced the foundation and development of Frattesina. The authors present the results of strontium isotope analyses, which suggest significant migration to the site, particularly of elites, mostly from within a 50km radius. Among these non-indigenous people, the authors identify a ‘warrior-chief’, whom they interpret as representing a new, more hierarchical society.

Keywords: Italy, Frattesina, Bronze Age, migration, strontium isotopes

Introduction

While it is valuable to compare the movements of people and the trajectories of trade in pre-history, it is even more intriguing to investigate their reorganisation after periods of geopolitical instability. The Final Bronze Age (second half of the twelfth century BC) in northern

¹ Department of Archaeology, Durham University, South Road, Durham DH1 3LE, UK

² Dipartimento di Scienze dell'Antichità, Università di Roma 'La Sapienza', via dei Volsci 122, 00185 Roma, Italy

³ Independent Researcher, ex-SABAP Verona, Rovigo, Vicenza, Piazza San Fermo 37121, Verona, Italy

⁴ Trace Research Centre, via Silone 6, 64015 Nereto, Italy

⁵ CHNet, rete per i beni culturali dell'INFN, LNGS, via Acitelli 67100, Assergi, Italy

* Author for correspondence (Email: claudio.cavazzuti@dur.ac.uk)

© Antiquity Publications Ltd, 2019. This is an Open Access article, distributed under the terms of the Creative Commons Attribution licence (<http://creativecommons.org/licenses/by/4.0/>), which permits unrestricted re-use, distribution, and reproduction in any medium, provided the original work is properly cited.

ANTIQUITY 93 369 (2019): 624–644

<https://doi.org/10.15184/aqy.2019.59>

Italy saw the collapse of the Terramare settlement system and the rise of Frattesina as a nodal centre between the Mediterranean and continental Europe. Here, we use strontium isotope analysis to investigate the origins of elite and non-elite individuals in this community, and to investigate the role that outsiders may have had in the rise of Frattesina.

Collapse of the Terramare system and regeneration

The middle centuries of the second millennium BC (1650–1150 BC) saw the rise and flourishing of the Terramare settlement system in the Po River plain of northern Italy. The Terramare can be defined as mainly quadrangular settlements surrounded by an artificial embankment and ditch into which the waters of a nearby river or natural canal were re-routed. Approximately 200 of these sites are currently known in the central Po Plain: they could reach 20ha in size and occupied the territory very densely. The level of social and economic organisation of these communities was unprecedented in Italian prehistory, and thus the Terramare have long attracted the attention of European prehistorians.

The collapse of the Terramare system *c.* 1150 BC was followed by a sudden and substantial depopulation of the central part of the Po Plain (Cardarelli 2009). At the beginning of the Final Bronze Age, the southern part of the Po Valley was almost abandoned. In contrast, in the northern part of the Po Valley, some villages survived: the large terramara at Fondo Paviani (16–20ha), for example, continued through the transition between the Recent and Final Bronze Age, and experienced a crisis in the early stages of the latter (Final Bronze Age 1–2), leading to the abandonment of the site. Concurrently, a new territorial system arose, pivoting around the socio-economic pole of Frattesina (Calzavara Capuis *et al.* 1984; Bietti Sestieri *et al.* 2015; Cupitò *et al.* 2015). Therefore, within the area of the wider Terramare ‘culture’, local responses to the crisis led to different outcomes, some of which were relatively successful and others catastrophic. Economic factors—both in terms of internal carrying capacity and degree of openness to external relations—probably played a key role in determining different responses to the tensions.

It has been repeatedly stated that the collapse of the Terramare system may have been triggered by a series of concurrent factors, including environmental crises (e.g. prolonged drought), over-exploitation of the land, and famine or epidemic (Cardarelli 2009; Cremaschi 2009; Leonardi 2010). Nevertheless, while such environmental factors were probably involved, a key explanation arguably lies in the socio-political and economic organisation of the Terramare system (Cardarelli 2009: 471–72). The communities of the Terramare, especially in the southern area, were probably not flexible enough to adapt their political structure and modes of production to the needs of a rapidly changing world. Moreover, the domino effect from the overall geo-political instability of the twelfth century BC, in a highly interconnected system such as the Mediterranean, was undoubtedly another factor (Cardarelli 2009). The lack of evidence in the southern Terramare area for connections with the Aegean and the Levant suggests a more ‘closed’ system located on the edge of the ‘globalised’ world of the Late Bronze Age. In contrast, there is well-documented evidence from the largest terramare on the northern side of the Po River for possible incipient institutionalised, well-connected elites—particularly at Fondo Paviani, which has yielded locally produced pottery in Levantine and Late Helladic IIIC Aegean-Mycenaean styles (Bettelli

© Antiquity Publications Ltd, 2019

et al. 2015). During the last phase of the Terramare (1300–1150 BC), however, individual burials do not exhibit the wealth or reflect the social power of society that is suggested by the monumental and material evidence of these settlements (Cardarelli *et al.* 2015).

The display of austere equality that dominated the Middle and Late Bronze Age ‘urn-fields’ (Salzani 2005; Cardarelli 2014) strongly limited funerary expressions of social differentiation. Internal inequalities nonetheless existed between different co-resident extended families and lineages comprising tens of individuals at most (e.g. at Casinalbo; Cardarelli *et al.* 2014: 722–28), and, above all, between large centres, such as the terramara at Fondo Paviani and dependent satellite settlements (Balista *et al.* 2005; Cupitò *et al.* 2015). It seems reasonable therefore to hypothesise that groups based at nodal sites in the system attracted more prestige goods from exotic places, along with individuals from distant areas, while small villages attracted people mainly from within a local radius (Cavazzuti *et al.* 2019a). Within this dynamic cultural context, the Final Bronze Age funerary evidence from Frattesina documents a more elaborate display of power and wealth concentrated in the hands of elites. At Le Narde (Frattesina’s cemetery), this privileged segment of society, probably with its own entourage, is clearly represented by a small number of burials with several indicators of prestige.

Archaeological debate over the last decade has concentrated on the origin of these elite individuals and, more intriguingly, the founders of Frattesina. Was Frattesina a primarily indigenous community, which developed out of local dynamics and regeneration from the ashes of the Terramare system? Or did non-local groups from the Eastern Mediterranean contribute to its rise, and if so, to what extent?

Frattesina: between the Mediterranean and Central Europe

Frattesina di Fratta Polesine is unique among Late Bronze sites in northern Italy for its outstanding evidence of specialised workshops, exotic imports and rich cemeteries (Bietti Sestieri 2008; Bietti Sestieri *et al.* 2015). The settlement is located on the southern bank of the Po di Adria palaeochannel (Figure 1), 30–40km from the Bronze Age Adriatic coastline and the River Po delta. Extending over 20ha, the site is divided equally between a 10ha core and peripheral areas for cattle penning and agricultural production. Frattesina’s economic prosperity must, in part, have been due to its strategic position at the crossroads between mainland, fluvial and maritime routes from the Alps to the Mediterranean. Definitions of Frattesina as a ‘central place’, ‘primary node’, ‘port of trade’ or ‘emporium’ recur frequently in the scholarly literature (e.g. Pearce 2000; Bietti Sestieri 2008; Harding 2013; Kristiansen & Suchowska-Ducke 2015).

Since the late 1960s, a series of archaeological investigations has been conducted on the settlement and its two associated urnfields, Fondo Zanotto and Le Narde. Le Narde has been more extensively excavated and analysed, both archaeologically and osteologically (e.g. Salzani 1989, 1990; Salzani & Colonna 2010; Cavazzuti 2011; Cardarelli *et al.* 2015).

Excavations at Le Narde have targeted two distinct sectors, Narde 1 and 2 (Figure 1), which have yielded, respectively, more than 600 and 200 urn cremations, plus 3 and 22 inhumations. These features extend from the Final Bronze Age 1 (*c.* 1150 BC), soon after the collapse of the Terramare culture, to the earliest phases of the Early Iron Age (*c.* 950/925 BC). In

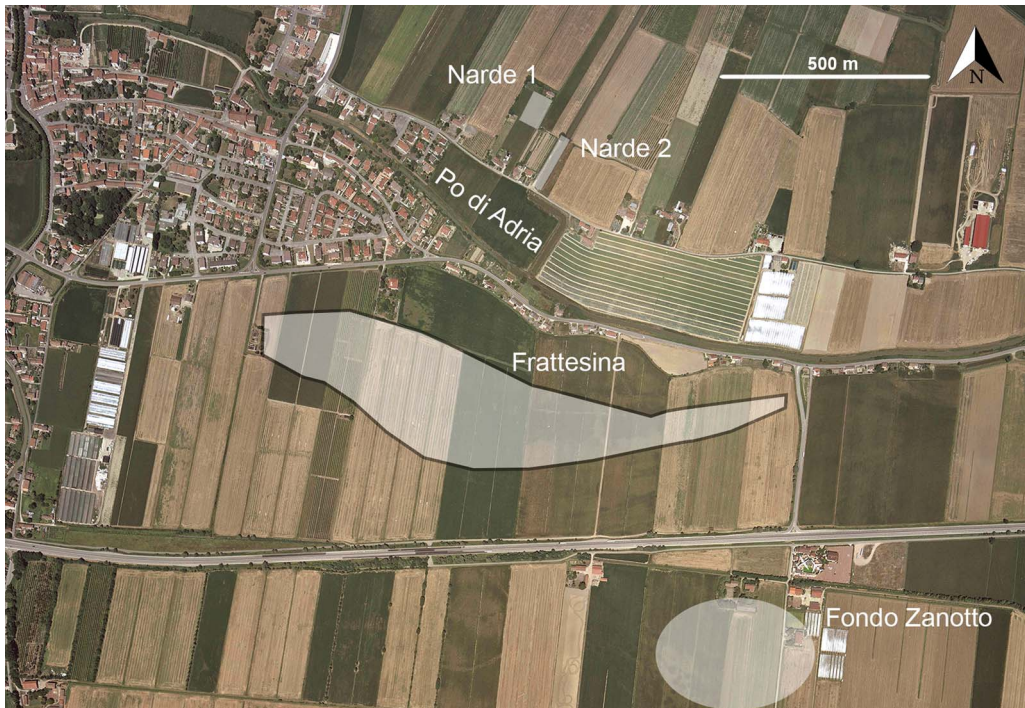


Figure 1. Aerial photograph of the Frattesina site (courtesy of the Regione Veneto website: http://mapserver.iuav.it/webstefoto_aereel/). The white areas show the extent of the settlement and the two burial areas: Narde (comprising Narde 1 and 2 sectors) and Fondo Zanotto.

both sectors, the ratio between Final Bronze Age 1–2 (phase 1) and Final Bronze Age 3 to Early Iron Age 1 (phase 2) burials is balanced, with a slight increase in the number of burials in the latter phase (40 and 60 per cent, respectively). At Narde 1, the large and dense burial groups expand both horizontally and vertically. The outcome of this progressive vertical growth is a mound of up to five levels of depositions (Figure 2). This indicates a strong desire to emphasise membership of a specific corporate group (Leonardi & Cupitò 2004; Cardarelli *et al.* 2015).

Despite the damage caused by the recent insertion of a drainage channel across the cemetery, the spatial organisation of Narde 2 is quite clear and rather different to that of Narde 1. Burials are organised spatially in larger and smaller groups, which range from 15–60 graves each. These groups tend not to be superimposed, but rather to expand horizontally (Figure 3). A recent analysis of grave goods and the sex/age categories of individuals from Narde 1 and 2 identifies five different ranks of adult males, females and sub-adults, ranked on a scale of 1–5 depending on the increasing quantity and quality of grave goods (Cardarelli *et al.* 2015). The richest burials among the adult males—characterised by the presence of swords and toiletry objects—are represented by two ‘warrior-chief’ graves (Narde1-168 and Narde1-227). Both are located in Narde 1 at the centre of two distinct burial groups comprising more than 100 graves (Salzani 1989; Bietti Sestieri 2008) (Figure 2). Another four graves contain only the rivets from a sword in place of a whole sword—probably a *pars pro toto* symbolising the

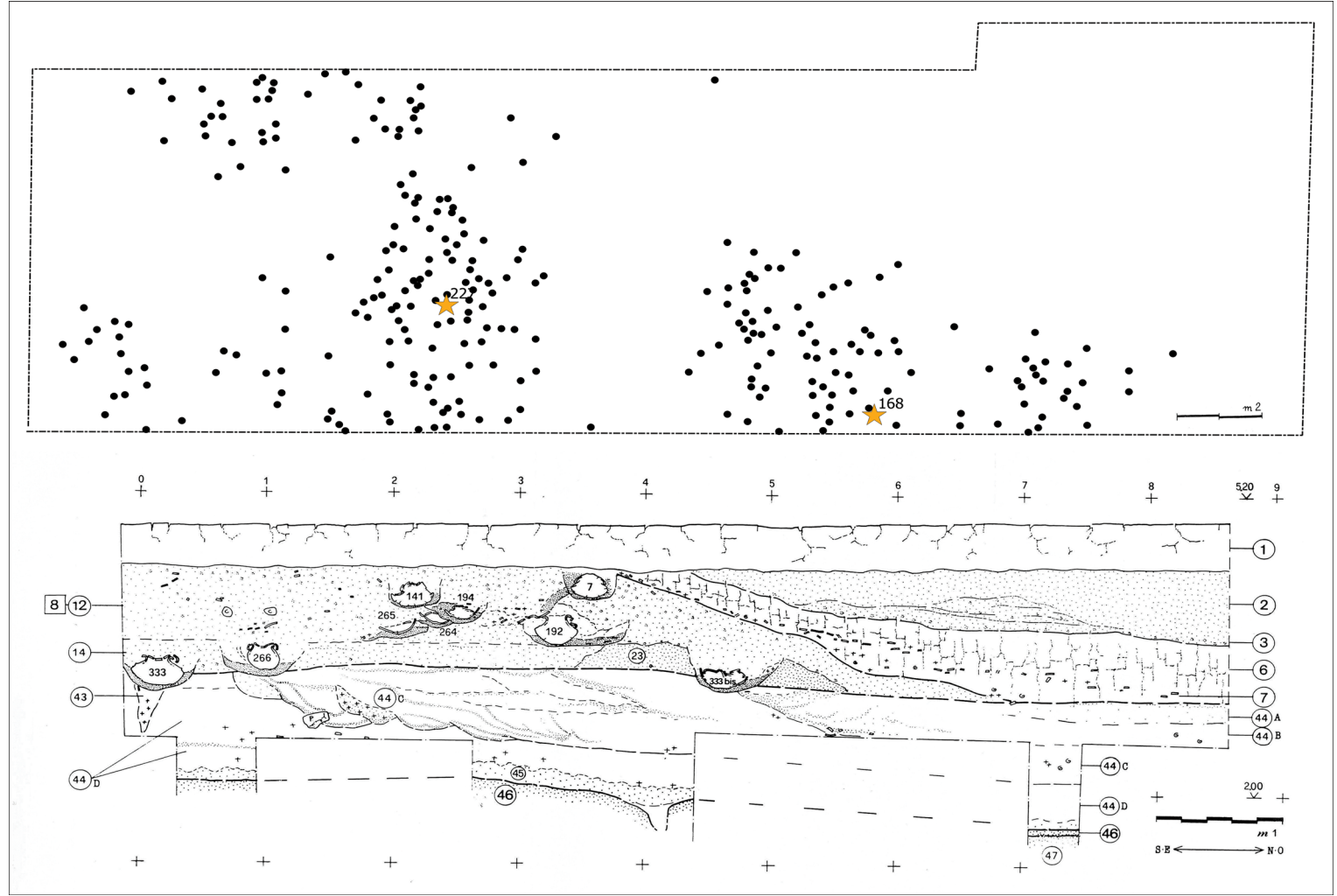


Figure 2. Top) map of the Narde 1 burial sector, with the location of burials Narde1-168 and 227; bottom) section of the mound formed by the superimposition of urns (after Salzani 1989, 1990).

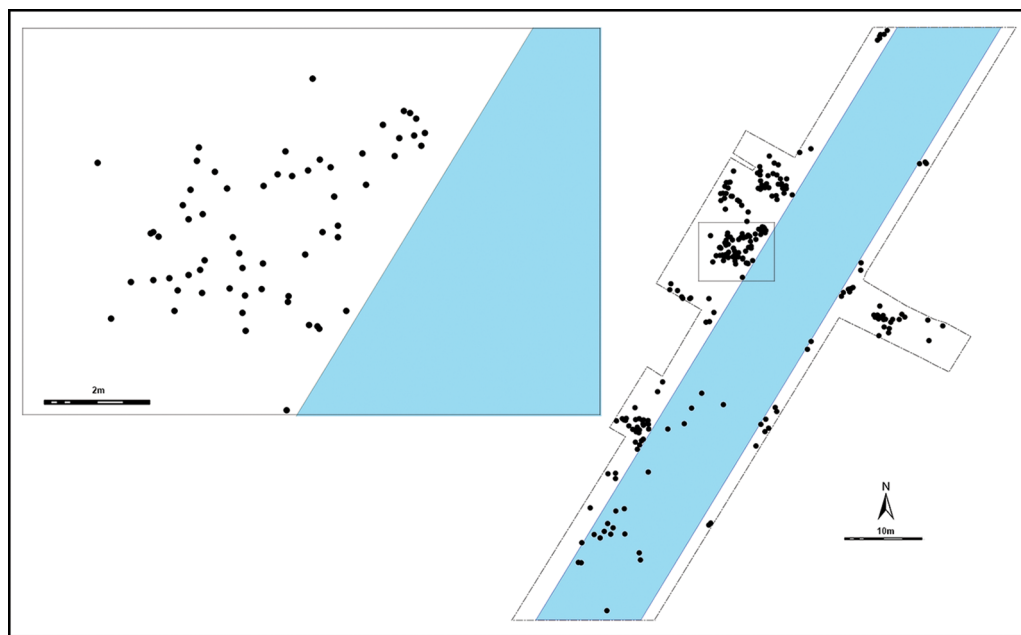


Figure 3. Map of the Narde 2 burial sector, crossed by a modern irrigation channel (in blue); inset shows the detail of one burial group (after Salzani & Colonna 2010).

warrior status of the deceased (Narde1-32, 154, 177, 273) (Leonardi 2010). Similarly, the nine richest female graves, containing prestige goods such as amber and glass beads, are located almost exclusively in Narde 1, with only one in Narde 2. Thus, Narde 1 appears to be an area designated for elite groups and their entourage, while Narde 2 could have been reserved for less prestigious yet still dominant social groups.

Demographic data and first indicators of mobility

Osteological analyses have been undertaken on 472 burials: 266 from Narde 1, and 206 from Narde 2 (Table 1). Sex and age were determined through a combination of methods analysing morphological and metric traits (Ferembach *et al.* 1980; Gonçalves *et al.* 2013; Cunningham *et al.* 2016; Cavazzuti *et al.* 2019b).

For both Narde 1 and 2, the sex ratio is close to 1:1, with slightly more adult males at Narde 1, and more adult females at Narde 2. The most marked difference between the two sectors is the frequency of sub-adults, who comprise 21 per cent of the burials at Narde 1 and 31 per cent at Narde 2. While this discrepancy is observed in all the sub-adult age classes, it is most clear among older infants (*Infans 2* class; 7–12 years); these individuals are twice as common at Narde 2.

These divergent mortality rates among children may mirror different life expectancies and conditions (Cardarelli *et al.* 2015), albeit with different degrees of inclusion of adult strangers and newcomers, as migrants are more likely to be adult. In this scenario, Narde 1's elite groups might have incorporated significant immigration, while those buried at Narde 2

Table 1. Frequency of categories of individuals at Narde 1 and 2.

	N	% Adult/ juvenile males	% Adult/ juvenile females	% Undet. sex adults	% Sub-adults	% <i>Infans</i> 1 (0–2)	% <i>Infans</i> 1 (3–6)	% <i>Infans</i> 2 (7–12)	% <i>Juvenis</i> (13–20)	% <i>Adultus</i> (21–40)	% <i>Maturus/ senilis</i> (40+)
Narde 1	266	34	30	15	21	7	9	3	5	59	17
Narde 2	206	27	34	8	31	8	12	7	8	53	12

remained closer to the traditional demographic structure of kinship-based societies. In this article, isotopic analysis is used to test these demographic and social ‘inequalities’ that emerge from the two sectors of Le Narde.

Materials

Our sampling strategy aimed to analyse the strontium isotope ratios of individuals—and therefore their mobility—in relation to osteological and archaeological data (Table 2). Samples were selected on the basis of burial sector (Narde 1 and 2), funerary rite (cremation *vs* inhumation), sex, age at death, chronology and class of grave goods. In order to facilitate data correlation, the five previously published grave goods classes (Cardarelli *et al.* 2015) were merged into three broader groups:

- Class 1) comprising exceptional combinations of fibulae and ornaments in female burials, and weapons, utensils and other prestige indicators in male burials.
- Class 2) comprising pins or fibulae (the latter sometimes combined with smaller ornaments and/or a spindle whorl) in male and female graves, respectively.
- Class 3) characterised by the absence of grave goods or very few and/or poor-quality artefacts.

Of the 46 sampled individuals, 40 were cremated and 6 inhumed. Given the almost total absence of tooth enamel in cremations, we targeted the *pars petrosa* (petrous portion) of the temporal bone, which is frequently preserved in urn cremations. The petrous portion begins forming *in utero* at approximately 16–18 gestational weeks, and is fully ossified by the time of birth. The otic capsule in the inner part of the petrous portion undergoes no further remodelling after the age of two years (Sørensen *et al.* 1992; Sørensen 1994; Jeffery & Spoor 2004). Considering that the petrous portion forms primarily before the end of weaning, its strontium isotope ratio is assumed to reflect the origin of the food consumed by the woman who breastfed the infant (Sørensen 1994). It also seems reasonable to assume that, in the vast majority of cases, the infant’s mother/wet nurse did not change over the duration of breastfeeding, did not move long distances and did not consume foods of a different origin. The petrous portion is suitable for strontium isotope analysis, as calcination of the bone increases its resistance to diagenesis while not significantly changing its strontium isotope composition (Harbeck *et al.* 2011; Harvig *et al.* 2014; Snoeck *et al.* 2015). In order to test the reliability and consistency of the *pars petrosa* results, we also sampled and analysed the surviving first permanent molar (M1) crowns of two sub-adults (burials Narde2-197 and Narde2-208); these two elements form at approximately the same age.

In the case of the prestigious ‘warrior-chief’ burial (Narde1-168), the cortical tissue of the femur was also sampled. As bone tissue remodels in life, its biogenic strontium isotope ratio reflects the place(s) where he spent the last decades of life (Hedges *et al.* 2007). Grave Narde1-154, which contained only rivets to symbolise warrior status, was also sampled. For inhumations, we sampled enamel from permanent second molars (M2), the crowns of

Table 2. Sampling strategy. Number of individuals sampled for each archaeological and osteological parameter.

Number of sampled individuals	Burial sector		Funerary rite		Grave-good class				Phase			Sex/age category		
	Narde 1	Narde 2	Cremations	Inhumations	1	2	3	NA	1	2	NA	Adult male	Adult female	Sub-adults
	17	29	40	6	10	13	22	1	18	16	12	20	16	10

which develop between three and eight years of age (AlQahtani *et al.* 2010). Thus, the effects of breastfeeding on the isotope ratios of the M1 enamel are negated for planned future oxygen isotope analysis. In two cases (Narde1-25 and Narde1-59), we also analysed the enamel of permanent third molars (M3), which form between 8 and 15 years of age—to identify possible migration between childhood and adolescence. In order to represent all the geolithological units of the region, biologically available strontium baselines were collected from a database of 199 $^{87}\text{Sr}/^{86}\text{Sr}$ values gathered from the existing literature, and 35 values produced in the Ex-SPACE project framework (Table S1 in the online supplementary material (OSM); Cavazzuti *et al.* 2019a).

Results

Full details of the methods used, including general principles and their specific application in northern Italy, are provided in the supplementary material (OSM). The results of the strontium isotope analysis in relation to archaeological and osteological data are shown in Table 3. The ‘isoscape’ of the Frattesina area—and more generally for north-eastern Italy—is shown in Figure 4.

Two tests were performed on sub-adult burials Narde2-197 and Narde2-208 to verify the correspondence between the $^{87}\text{Sr}/^{86}\text{Sr}$ values measured on petrous portions and first molar crowns. Encouragingly, in both cases, the values are very similar (0.708803 and 0.708851; 0.708830 and 0.708862), thus confirming that the petrous portion represents a good indicator of childhood origin (Harvig *et al.* 2014). The inhumations with both M2 and M3 (burials Narde1-25 and Narde2-59) show no significant shift in the strontium isotope composition in the two phases of life represented by these molars.

Of the 46 analysed individuals, 29 (63 per cent) are compatible with the 0–20km range $^{87}\text{Sr}/^{86}\text{Sr}$ baselines (0.70853–0.70934) surrounding Frattesina, while the other 17 (37 per cent) are incompatible (Figure 5). The strontium isotope ratios of these ‘outsiders’, however, fall within the 20–50km range baseline (0.70772–0.71022), with only two exceptions (Narde2-44 and Narde2-45), which fall just below this range. While the community of Frattesina therefore appears to have been largely ‘local’, it included a significant number of people from the broader hinterland—potentially from both north and south of the Po River. The patterns of mobility among males and females do not differ significantly. Notably, some sub-adults—despite their young age—also moved to Frattesina, where they died within a few years of arrival (unless their cremated remains were brought from elsewhere). This probably indicates that mobility involved entire family groups, not only individuals.

Diachronic variations in the percentage of non-local individuals may reflect the transition from an early stage, in which immigrants contributed to the growth of the settlement, to a phase of stabilisation and internal growth, with only a few newcomers to maintain the relationship with the hinterland; for example, through intermarriage, fosterage practices or other forms of social relationship (Figure 6: top). The rare inhumations are all compatible with the 0–20km baselines, while cremated individuals represent more widespread origins, both local and from a broader radius (Figure 6: bottom).

The grouping of $^{87}\text{Sr}/^{86}\text{Sr}$ values by burial ground (Narde 1 and 2) and grave-good class identifies further important distinctions. While Narde 2 individuals mainly concentrate

Table 3. Results of the $^{87}\text{Sr}/^{86}\text{Sr}$ analyses (Rite: C = cremation, I = inhumation; Sex/age: Inf1 = 0–6 years; Inf2 = 7–12 years; Juv = 13–20 years; Ad = 21–40 years; Mat = +40 years; Ad = adult; F = female; M = male; I = indeterminate).

Burial group number	Sampled material	Rite	Sex/ Age	Grave-good class	Phase	$^{87}\text{Sr}/^{86}\text{Sr}$	2SE
Narde1-21	Petrous	C	F/Ad	1	1	0.708607	0.000019
Narde1-28	Petrous	C	M/Ad	3	NA	0.709239	0.000019
Narde1-57	Petrous	C	F/Ad	3	2	0.708874	0.000025
Narde1-70	Petrous	C	M/Mat	3	NA	0.709426	0.00002
Narde1-76	Petrous	C	F/Ad	2	1	0.708868	0.000017
Narde1-112	Petrous	C	I/Inf1	3	1	0.708254	0.00002
Narde1-135	Petrous	C	F/Ad	2	1	0.708180	0.00002
Narde1-154	Petrous	C	M/Mat	1	1	0.708907	0.000019
Narde1-156	Petrous	C	F/Ad	3	2	0.709035	0.000019
Narde1-168	Femur	C	M/Ad	1	1	0.709243	0.000017
Narde1-168	Petrous	C	M/Ad	1	1	0.709831	0.000015
Narde1-190	Petrous	C	M /Mat	2	1	0.708265	0.000022
Narde1-233	Petrous	C	M/Ad	1	2	0.709982	0.000022
Narde1-239	Petrous	C	F/Ad	2	NA	0.708356	0.000015
Narde1-330	Petrous	C	I/Inf1	NA	NA	0.708490	0.000023
Narde1-347	Petrous	C	F/Ad	1	1	0.708302	0.00002
Narde1-511	Petrous	C	M/Ad	2	NA	0.708981	0.000022
Narde1-545	Petrous	C	M/Ad	3	NA	0.708444	0.000022
Narde2-13	M2	I	I/Inf2	3	NA	0.709105	0.000018
Narde2-22	Petrous	C	M/Ad	2	2	0.708852	0.000019
Narde2-23	M2	I	M	3	NA	0.708864	0.000023
Narde2-25	M2	I	I/Juv	3	NA	0.708796	0.000020
Narde2-25	M3	I	I/Juv	3	NA	0.708905	0.000021
Narde2-33	Petrous	C	F/Ad	2	2	0.710071	0.000021
Narde2-40	Petrous	C	M/Ad	3	2	0.708560	0.000022
Narde2-44	Petrous	C	I/Inf2	1	1	0.707675	0.000021
Narde2-45	Petrous	C	F/Juv	2	2	0.707585	0.000022
Narde2-49	Petrous	C	M/Ad	3	1	0.709098	0.000017
Narde2-53	Petrous	C	M/Ad	2	1	0.708819	0.000028
Narde2-56	Petrous	C	F/Ad	1	2	0.709200	0.000015
Narde2-58	M2	I	M/Mat	3	NA	0.708837	0.000017
Narde2-59	M2	I	M/Ad	3	NA	0.708778	0.000021
Narde2-59	M3	I	M/Ad	3	NA	0.708915	0.000025
Narde2-70	Petrous	C	I/Inf1	3	NA	0.709435	0.000024
Narde2-85	Petrous	C	F/Juv	3	2	0.709299	0.000019
Narde2-90	Petrous	C	F/Ad	2	2	0.708972	0.000014
Narde2-99	Petrous	C	M/Ad	3	2	0.709157	0.000017
Narde2-109	Petrous	C	F/Ad	3	2	0.709039	0.000017
Narde2-112	Petrous	C	F/Ad	3	2	0.708254	0.000020
Narde2-116	Petrous	C	M/Mat	3	1	0.708502	0.000028

(Continued)

Table 3. (Continued)

Results of the $^{87}\text{Sr}/^{86}\text{Sr}$ analyses (Rite: C = cremation, I = inhumation; Sex/age: Inf1 = 0–6 years; Inf2 = 7–12 years; Juv = 13–20 years; Ad = 21–40 years; Mat = +40 years; Ad = adult; F = female; M = male; I = indeterminate).

Burial group number	Sampled material	Rite	Sex/Age	Grave-good class	Phase	$^{87}\text{Sr}/^{86}\text{Sr}$	2SE
Narde2-128	Petrous	C	M/Ad	3	1	0.709051	0.000016
Narde2-131	Petrous	C	I/Juv	1	2	0.708836	0.000028
Narde2-168	Petrous	C	F/Ad	2	2	0.709000	0.000016
Narde2-180	Petrous	C	M/Mat	1	1	0.708325	0.000020
Narde2-181	M2	I	M/Mat	3	1	0.709294	0.000011
Narde2-197	Petrous	C	I/Inf1	1	1	0.708803	0.000019
Narde2-197	M1	C	I/Inf1	1	1	0.708851	0.000016
Narde2-208	Petrous	C	I/Inf1	2	1	0.708830	0.000022
Narde2-208	M1	C	I/Inf1	2	1	0.708862	0.000021
Narde2-216	Petrous	C	F/Ad	3	1	0.708872	0.000015
Narde2-240	Petrous	C	I/Juv	2	2	0.709160	0.000016
Frattesina	Pig tooth enamel					0.708923	0.000011
Frattesina	Snail					0.708534	0.000015
Frattesina	Snail					0.708639	0.000026
Frattesina	Soil					0.709339	0.000016
Badia P.	Snail					0.708989	0.000011

within the interval of the local strontium isotope ratio—except for a few outliers (15 per cent), the Narde 1 group includes a higher proportion of people of different origins (33 per cent), although this latter group are all compatible with origins in the broader hinterland (Figure 7: top)—including Narde1-154, marked as a warrior by the presence of sword rivets (Figure 7: top). Considering the grave-good classes (Figure 7: bottom), mobility is more evident among the ‘richer’ burials (classes 1 and 2), while class 3 burials are mostly of individuals of local origin.

The concentration of non-local individuals amongst Narde 1 burials could also provide an explanation for the anomalously high proportion of adult individuals—mostly males—buried in this sector. The Narde 2 sector may be characterised as representing a local, kinship-based population, while the more privileged social groups of Narde 1 show a greater degree of mobility—and therefore tend to incorporate more non-local adults. From this perspective, growing social inequality may have triggered mobility, both among the members of the elite themselves and in the subaltern classes, the latter now probably more strongly tied to the elite by constraints of power and economic bonds than in the past. Thus, our analyses document the extent to which social inequality and mobility were interconnected in the Late Bronze Age, and the geographic scale of the social network, at least in relation to the flow of people. On the one hand, for a well-placed community to participate in the ‘global’ arena of trade, maintenance of the socio-political order in the polity’s territory was decisive; on the other hand, wealth and prestige derived from trade probably reinforced this position of power.

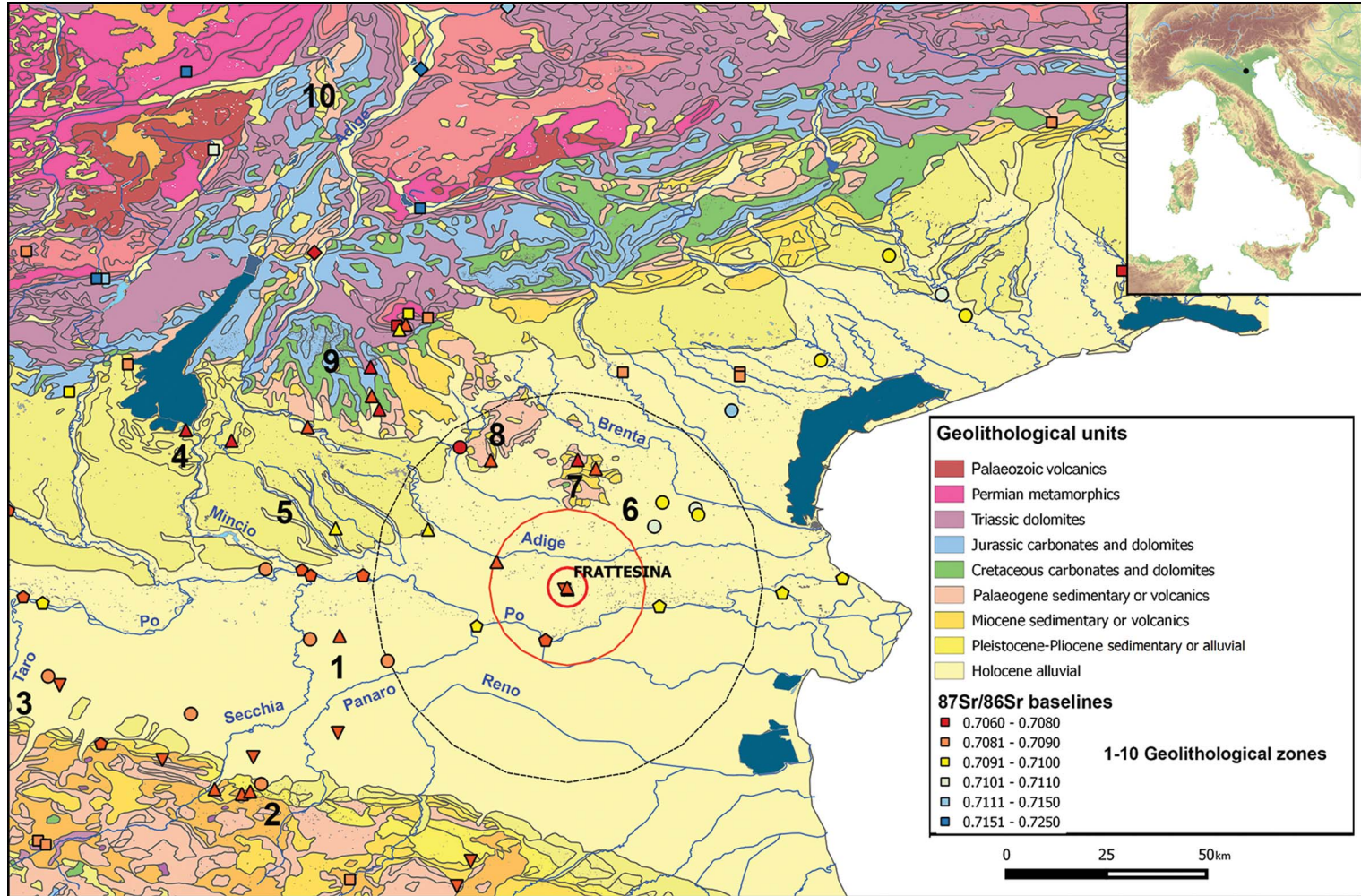


Figure 4. Geolithological map of Frattesina and its surroundings. Circles around the site represent the two buffer zones (immediate hinterland and broader hinterland); markers indicate the $^{87}\text{Sr}/^{86}\text{Sr}$ baseline samples (dots = modern plants; squares = spring waters; pentagons = river waters; triangles = snails; inverted triangles = archaeological fauna; rhombi = soil leachates). Numbers indicate the zones detailed in Table S1 in the OSM (map under a CC BY licence, with permission from http://wms.pcn.minambiente.it/ogc:map=ms_ogc/WMS_v1.3/Vettoriali/Carta_geolitologica).

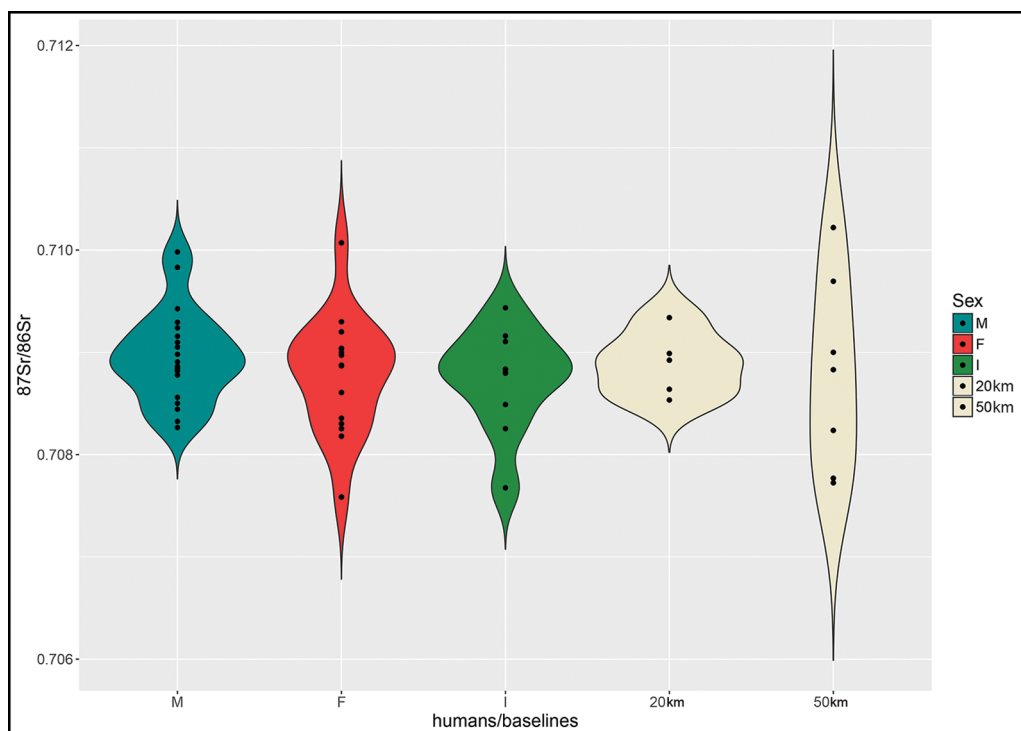


Figure 5. Violin plot of strontium isotope ratios for baseline samples (for references, see Table S1) and humans grouped by sex/age category (*M* = adult male; *F* = adult female; *I* = indeterminate sex, sub-adult). Each dot represents a single individual/baseline sample, and the width of the outer curve represents the kernel density of the distribution.

Mobile elites and the ‘warrior-chief’ at Frattesina

As noted above, the individual in burial Narde1-168 may have achieved the status of a ‘warrior-chief’, as symbolised by the presence of an Allerona-type sword (Bianco Peroni 1970). This was ritually broken and deposited in pieces inside the grave, along with a bronze pin, a pair of tweezers and other ornaments (Figure 8). For this individual, identified osteologically as an adult male, we analysed both the petrous portion as an indicator of childhood origin, and the femoral cortical bone as a possible proxy for the place where he spent his last years of life. The former yielded a strontium isotope ratio (0.70983) that is incompatible with the local 0–20km baseline (Table 3), but fits within the 20–50km range. By contrast, the value obtained from the femoral cortical bone (0.70924) is consistent with the local range of Frattesina. This means that this individual moved to the site after early childhood—possibly during youth or early adulthood—and he probably spent the last years of his life there, at the apex of the community.

Assessing the provenance of an individual through strontium isotope analysis alone is not straightforward, as different locations can be characterised by similar ratios. Our interpretation considers only the closest possible places of origin. The nearest geolithological zone in northern Italy with the closest $^{87}\text{Sr}/^{86}\text{Sr}$ baseline to Frattesina is, however, the easternmost part of the Verona plain, approximately 50km to the west. In particular, the baselines from the Middle–Late Bronze Age terramara at Fondo Paviani/Scalvinetto (0.7097–0.7101;

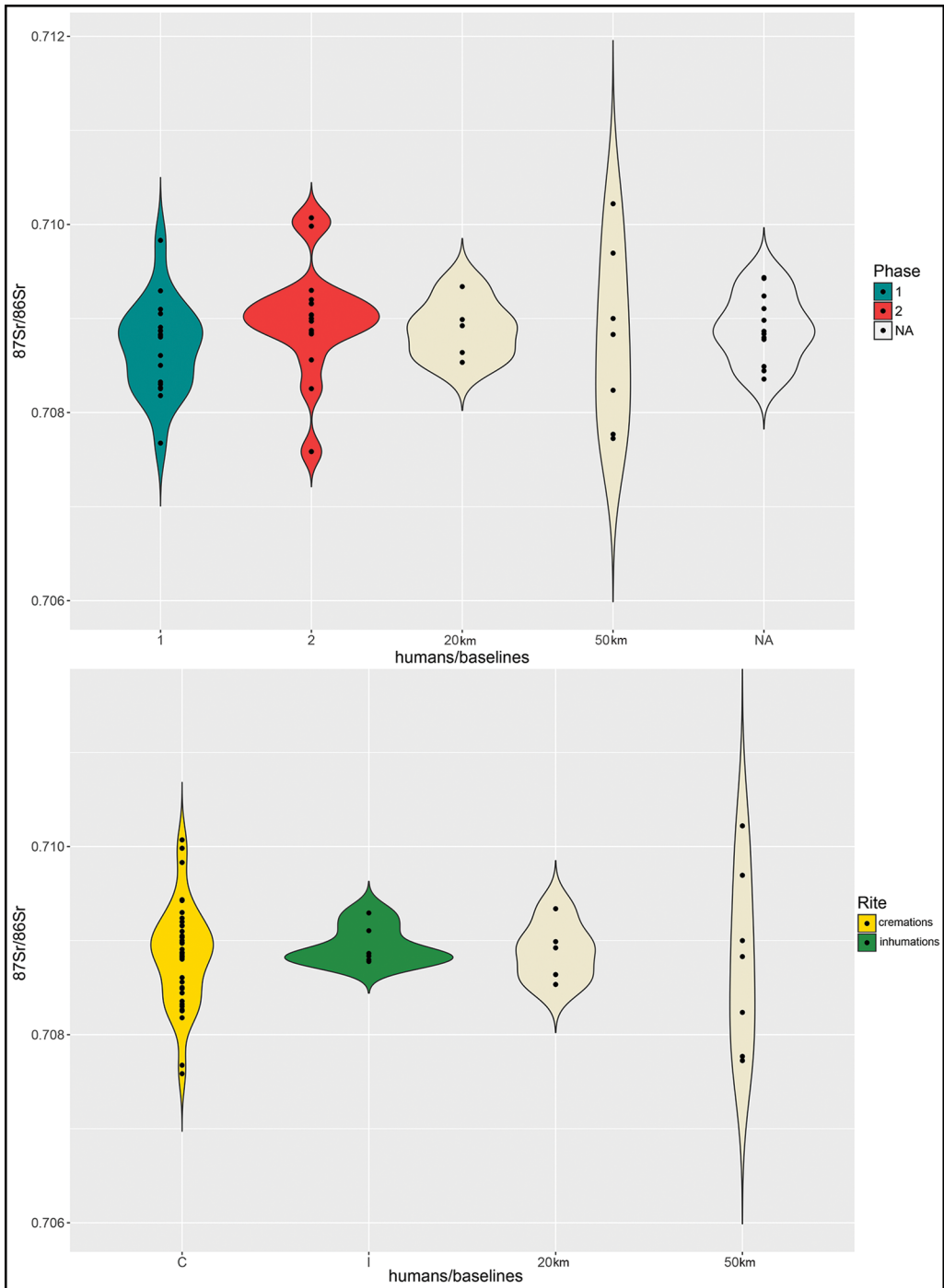


Figure 6. Violin plots of strontium isotope ratios of baseline samples (for references, see Table S1) and humans grouped by chronological phase (top) and type of funerary ritual (bottom). NA refers to burials that could not be assigned to a specific chronological phase.

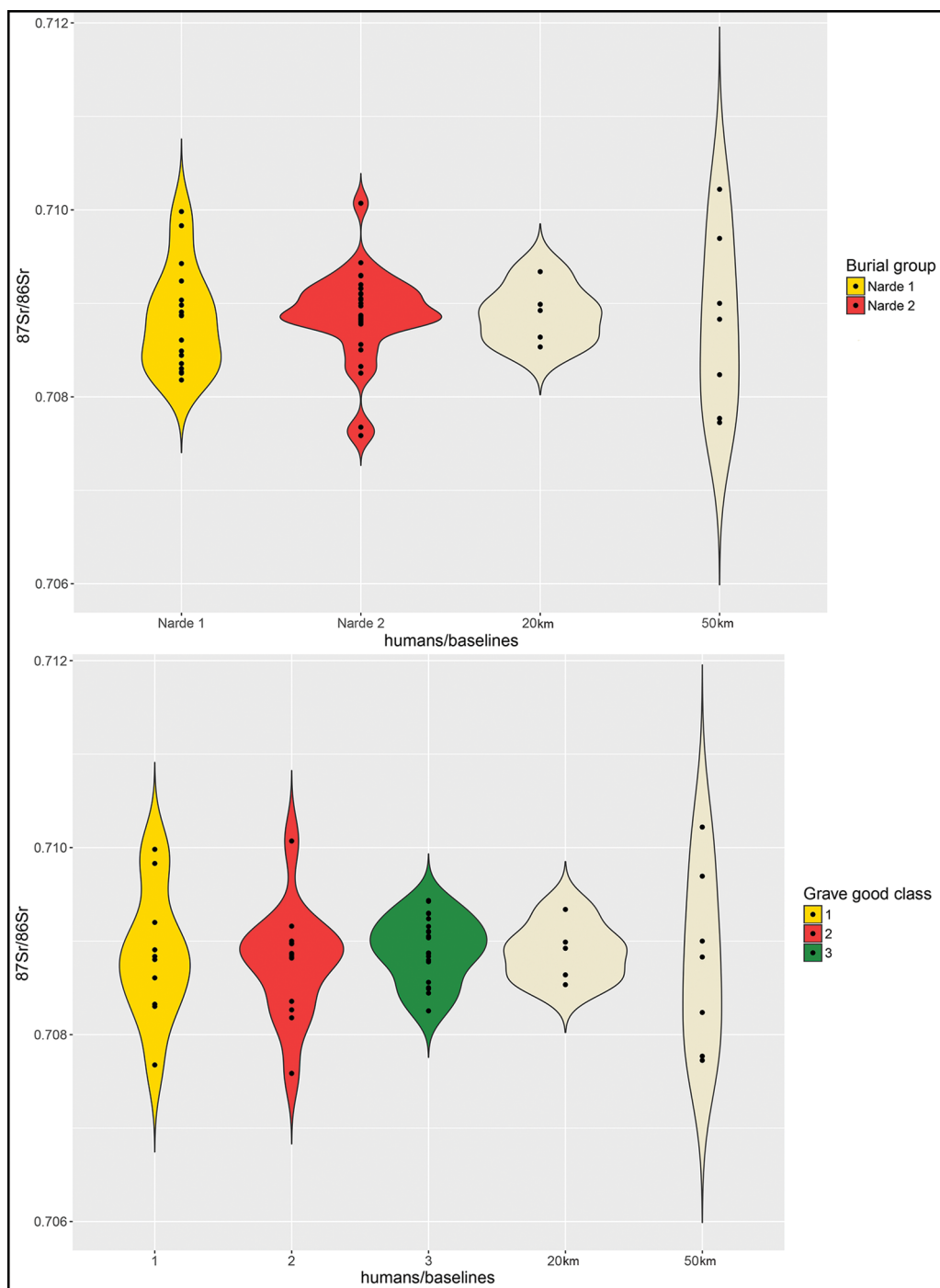


Figure 7. Violin plots of strontium isotope ratios of baselines (for references, see Table S1) and humans grouped by burial area (top) and grave good classes (bottom).

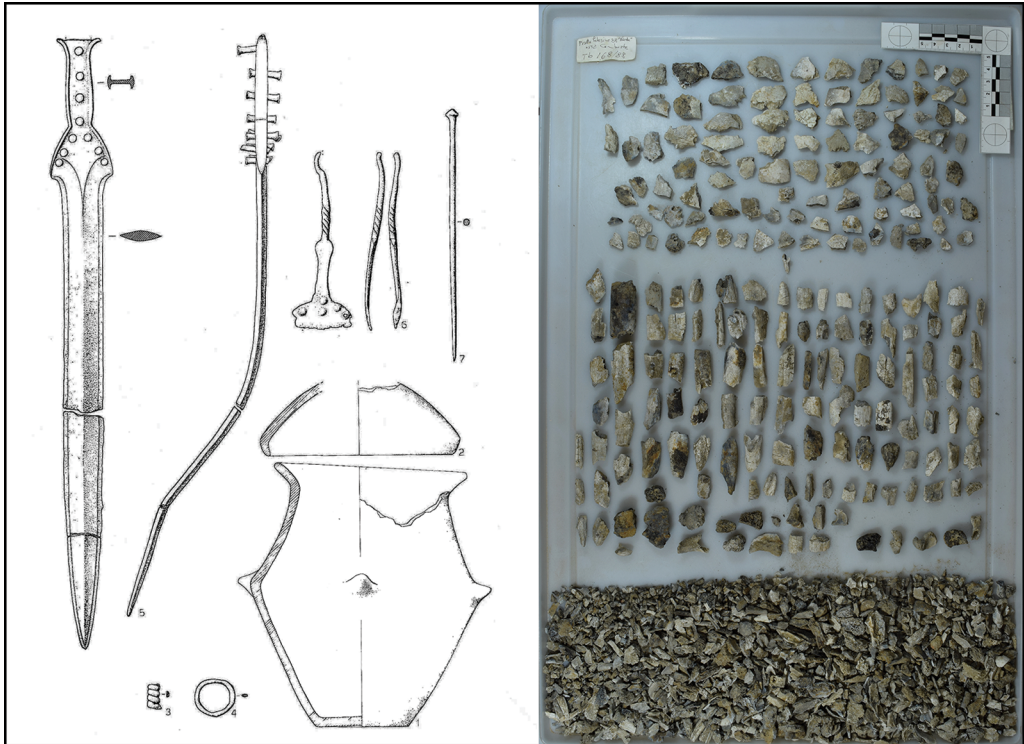


Figure 8. The grave goods and cremated bones of burial Narde1-168 (after Salzani 1989). Urn height is 0.26m, sword length is 0.46m.

Cavazzuti *et al.* 2019a) seem to correlate with the ratio obtained from the petrous portion of burial Narde1-168.

Marshall Sahlins (1981), in his famous article ‘The stranger-king: or Dumézil among the Fijians’, compares the dynamics of power in the Fiji Islands to the Indo-European tradition, arguing that human societies tend to locate power as originating from the outside (Sahlins 1981, 2008; see also Ling & Rowlands 2015). Sahlins focuses on origin myths across ancient polities in the Indo-European language area, which systematically feature a dichotomy between what the Romans called *gravitas* and *celeritas*. The former refers to the conservative, peaceful and productive character of an established native community, while *celeritas* represents the disruptive, transformative violence personified in the *stranger king*, who “erupts upon a pastoral scene of peaceful husbandry and political equality (or at least limited authority)” (Sahlins 1981: 112).

The individual buried in grave Narde1-168 at Frattesina was probably neither a true ‘king’, nor a true ‘stranger’. Despite its uniqueness, his grave resembles those of the rest of the community and is included within a large collective—or at least not evidently exclusive—burial mound. ‘Warrior-chief’ perhaps would be a more appropriate definition for this individual. Moreover, his place of origin was not so distant as to define him as a ‘stranger’. Nonetheless, Sahlins’s archetype of the ‘stranger-king’ evokes the power of alterity; burial

Narde1-168 perfectly embodies *celeritas*, which breaks with the *gravitas* of the former Terramare tradition and guided whatever survived the collapse towards a new social model.

Since the discovery of Frattesina and its cemeteries, Italian scholars have debated the mechanisms underlying the origin and economic success of the settlement, and the degree of foreign (i.e. Cypriot and Levantine) involvement in this process as suggested by archaeological finds (Cupitò *et al.* 2015). The new isotopic data presented here demonstrate that even though some individuals may have come from the Levant—where the available $^{87}\text{Sr}/^{86}\text{Sr}$ baseline ranges from 0.7079–0.7086 (Sheridan & Gregoricka 2015; Gregoricka & Guise Sheridan 2016)—or were from other exotic places, they nonetheless represent a minority of the population and, in any case, not the upper elite. The latter appear quite mobile, although probably from within the broader hinterland radius.

Conclusions

Recent advances in mobility studies, isotopes and ancient DNA have revived the interpretative tensions between the paradigms of migration and local development. The current results from Frattesina display a complex pattern, in which regional mobility, territorial organisation, socio-economic growth and political power are deeply intertwined. We may infer that mobility patterns during Frattesina's formative phase are compatible with the local and regional dynamics of an area, concurrent with a phase of political re-organisation. Through a system of alliances, the nascent elite of Narde 1, which was less reliant on traditional kinship ties than the population represented by Narde 2, extended its influence over wider territories. Thus, Frattesina developed as a recognised partner in long-distance trade networks, inheriting the role previously held by centres such as Fondo Paviani—a legacy that might also have included a degree of elite transfer from the latter, as tentatively suggested by the isotopic evidence.

With regard to the concept of elite mobility, the rich ensemble of myths concerning the origins of Rome demonstrates that, at the formative stages of a new centre, even an outsider could rise to the apex of political power. The legend of Titus Tatius, the king of the Sabines, tells how, as a result of the chain of events generated by the rape of the Sabine women, he reigned over Rome with Romulus for five years (Carandini 2010). Beyond the historicity of the character, the story of Titus Tatius offers an example of Sahlins's concept of new powers (or allies) coming from outside, and accounts for the varied origins of Rome's first lineages, even at the highest social levels. The evidence presented here suggests that a similar scenario may have played out at Frattesina.

Acknowledgements

The strontium isotope analyses presented in this paper were conducted in the context of the Marie Skłodowska-Curie Action 'Ex-SPACE' ('Exploring Social Permeability of Ancient Communities of Europe', number 702930), funded by the European Commission.

Supplementary material

To view supplementary material for this article, please visit <https://doi.org/10.15184/aqy.2019.59>

References

- ALQAHTANI, S.J., M.P. HECTOR & H.M. LIVERSIDGE. 2010. Brief communication: the London atlas of human tooth development and eruption. *American Journal of Physical Anthropology* 142: 481–90. <https://doi.org/10.1002/ajpa.21258>
- BALISTA, C., A. DE GUIO, A. VANZETTI, A. BETTO, G. DE ANGELI & F. SARTOR. 2005. Paleoidrografie, impianti terramaricoli e strade su argine: evoluzione paleoambientale, dinamiche insediative e organizzazione territoriale nelle Valli Grandi Veronesi alla fine dell'Età del Bronzo. *Padusa* 41: 97–152.
- BETTELLI, M., M. CUPITÒ, S.T. LEVI, R. JONES & G. LEONARDI. 2015. Tempi e modi della connessione tra mondo egeo e area padano-veneta. Una riconsiderazione della problematica alla luce delle nuove ceramiche di tipo miceneo di Fondo Paviani (Legnago, Verona), in G. Leonardi & V. Tinè (ed.) *Studi di preistoria e protostoria 2*: 377–88. Firenze: Istituto Italiano di Preistoria e Protostoria.
- BIANCO PERONI, V. 1970. *Die Schwerter in Italien. Le spade nell'Italia continentale* (Prähistorische Bronzefunde: Abteilung IV, Band I). Munich: Beck.
- BIETTI SESTIERI, A.M. 2008. L'età del bronzo finale nella penisola italiana. *Padusa* 44: 7–54.
- BIETTI SESTIERI, A.M., P. BELLINTANI, L. SALZANI, I. ANGELINI, B. CHIAFFONI, J. DE GROSSI MAZZORIN, C. GIARDINO, M. SARACINO & F. SORIANO. 2015. Frattesina: un centro internazionale di produzione e di scambio nell'Età del bronzo del Veneto, in G. Leonardi & V. Tinè (ed.) *Studi di preistoria e protostoria 2*: 341–48. Firenze: Istituto Italiano di Preistoria e Protostoria.
- CALZAVARA CAPUIS, L., A. DE GUIO & G. LEONARDI. 1984. Il popolamento in epoca protostorica, in *Misurare la terra: centuriazione e coloni nel mondo romano. Il caso veneto*, in *Misurare la terra: centuriazione e coloni nel mondo romano. Il caso veneto*: 38–52. Modena: Franco Cosimo Panini.
- CARANDINI, A. 2010. *La leggenda di Roma—volume II: dal ratto delle donne al regno di Romolo e Tito Tazio*. Roma: Mondadori.
- CARDARELLI, A. 2009. The collapse of the Terramare culture and growth of new economic and social systems during the Late Bronze Age in Italy. *Scienze dell'Antichità* 15: 449–519.
- 2014. *La Necropoli della terramara di Casinalbo*. Firenze: All'Insegna del Giglio.
- CARDARELLI, A., C. CAVAZZUTI, G. PELLACANI & V. POLI. 2014. Confronto tra analisi antropologiche e analisi distributive, in A. Cardarelli (ed.) *La Necropoli della terramara di Casinalbo*: 709–62. Firenze: All'Insegna del Giglio.
- CARDARELLI, A., C. CAVAZZUTI, F. QUONDAM, L. SALVADEI & L. SALZANI. 2015. Le necropoli delle Narde di Frattesina: proposta per una lettura delle evidenze demografiche, rituali e sociali a partire dai dati archeologici e antropologici, in G. Leonardi & V. Tinè (ed.) *Studi di preistoria e protostoria 2*: 437–45. Firenze: Istituto Italiano di Preistoria e Protostoria.
- CAVAZZUTI, C. 2011. Aspetti rituali, sociali e paleodemografici di alcune necropoli protostoriche a cremazione dell'Italia Settentrionale. Unpublished PhD dissertation, Università degli Studi di Ferrara.
- CAVAZZUTI, C., R. SKEATES, A.R. MILLARD, G. NOWELL, J. PETERKIN, M. BERNABÒ BREA, A. CARDARELLI & L. SALZANI. 2019a. Flows of people in villages and large centres in Bronze Age Italy through strontium and oxygen isotopes. *PLoS ONE* 14: e0209693. <https://doi.org/10.1371/journal.pone.0209693>
- CAVAZZUTI, C., B. BRESADOLA, C. D'INNOCENZO, S. INTERLANDO & A. SPERDUTI. 2019b. Towards a new osteometric method for sexing ancient cremated human remains. Analysis of Late Bronze Age and Iron Age samples from Italy with gendered grave goods. *PLoS ONE* 14: e0209423. <https://doi.org/10.1371/journal.pone.0209423>
- CREMASCHI, M. 2009. Ambiente, clima ed uso del suolo nella crisi della cultura delle Terramare. *Scienze dell'Antichità* 15: 521–34.
- CUNNINGHAM, C., L. SCHEUER, S. BLACK & H. LIVERSIDGE. 2016. *Developmental juvenile osteology*. New York: Elsevier. <https://doi.org/10.1016/B978-0-12-382106-5.00003-7>
- CUPITÒ, M., G. LEONARDI, E. DALLA LONGA, C. NICOSIA, C. BALISTA, M. DAL CORSO & W. KIRLEIS. 2015. Fondo Paviani (Legnago, Verona): il central place della polity delle Valli Grandi Veronesi nella tarda Età del bronzo. Cronologia, aspetti culturali, evoluzione delle

- strutture e trasformazioni paleoambientali, in G. Leonardi & V. Tinè (ed.) *Studi di preistoria e protostoria* 2: 357–75.
- FEREMBACH, D., I. SCHWIDETZKY & M. STLOUKAL. 1980. Recommendations for age and sex diagnosis of skeletons. *Journal of Human Evolution* 9: 517–49.
[https://doi.org/10.1016/0047-2484\(80\)90061-5](https://doi.org/10.1016/0047-2484(80)90061-5)
- GONÇALVES, D., T.J.U. THOMPSON & E. CUNHA. 2013. Osteometric sex determination of burned human skeletal remains. *Journal of Forensic and Legal Medicine* 20: 906–11.
<https://doi.org/10.1016/j.jflm.2013.07.003>
- GREGORICKA, L.A. & S. GUISE SHERIDAN. 2016. Continuity or conquest? A multi-isotope approach to investigating identity in the Early Iron Age of the southern Levant. *American Journal of Physical Anthropology* 162: 1–17.
<https://doi.org/10.1002/ajpa.23086>
- HARBECK, M., R. SCHLEUDER, J. SCHNEIDER, I. WIECHMANN, W.W. SCHMAHL & G. GRUPE. 2011. Research potential and limitations of trace analyses of cremated remains. *Forensic Science International* 204(1–3): 191–200.
<https://doi.org/10.1016/j.forsciint.2010.06.004>
- HARDING, A. 2013. World systems, cores, and peripheries in prehistoric Europe. *European Journal of Archaeology* 16: 378–400.
<https://doi.org/10.1179/1461957113Y.0000000032>
- HARVIG, L., K.M. FREI, T.D. PRICE & N. LYNNERUP. 2014. Strontium isotope signals in cremated petrous portions as indicator for childhood origin. *PLoS ONE* 9: e101603.
<https://doi.org/10.1371/journal.pone.0101603>
- HEDGES, R.E.M., J.G. CLEMENT, D.L. THOMAS & T.C. O'CONNELL. 2007. Collagen turnover in the adult femoral mid-shaft: modeled from anthropogenic radiocarbon tracer measurements. *American Journal of Physical Anthropology* 133: 808–16.
<https://doi.org/10.1002/ajpa.20598>
- JEFFERY, N. & F. SPOOR. 2004. Prenatal growth and development of the modern human labyrinth. *Journal of Anatomy* 204: 71–92.
<https://doi.org/10.1111/j.1469-7580.2004.00250.x>
- KRISTIANSEN, K. & P. SUCHOWSKA-DUCKE. 2015. Connected histories: the dynamics of Bronze Age interaction and trade 1500–1100 BC. *Proceedings of the Prehistoric Society* 81: 361–92.
<https://doi.org/10.1017/ppr.2015.17>
- LEONARDI, G. 2010. Le premesse alla formazione dei centri protourbani nel Veneto. *Scienze dell'Antichità* 15: 547–61.
- LEONARDI, G. & M. CUPITÒ. 2004. Necropoli 'a tumuli' e 'ad accumuli stratificati' nel Veneto dell'età del ferro. *Padusa* 40: 191–218.
- LING, J. & M. ROWLANDS. 2015. The 'stranger-king' (bull) and rock art, in J. Ling, P. Skoglund & U. Bertilsson (ed.) *Picturing the Bronze Age*: 89–104. Oxford: Oxbow.
- PEARCE, M. 2000. Metals make the world go round: the copper supply for Frattesina, in C. Pare (ed.) *Metals make the world go round: the supply and circulation of metals in Bronze Age Europe*: 108–15. Oxford: Oxbow.
- SAHLINS, M. 1981. The stranger-king: or Dumézil among the Fijians. *Journal of Pacific History* 16: 107–32.
<https://doi.org/10.1080/00223348108572419>
- 2008. The stranger-king or elementary forms of the politics of life. *Indonesia and the Malay World* 36: 177–99.
<https://doi.org/10.1080/13639810802267918>
- SALZANI, L. 1989. Necropoli dell'Età del bronzo finale alle Narde di Fratta Polesine—Prima Nota. *Padusa* 35: 5–42.
- 1990. Necropoli dell'età del bronzo finale alle Narde di Fratta Polesine—Seconda nota. *Padusa* 26: 125–206.
- 2005. *La necropoli dell'età del bronzo all'Olmo di Nogara*. Verona: Museo Civico di Storia Naturale.
- SALZANI, L. & C. COLONNA. 2010. *La fragilità dell'urna. I recenti scavi a Narde, necropoli di Frattesina (XII–IX sec. a.C.)*. Sommacampagna: Cierre.
- SHERIDAN, S.G. & L.A. GREGORICKA. 2015. Monks on the move: evaluating pilgrimage to Byzantine St. Stephen's monastery using strontium isotopes. *American Journal of Physical Anthropology* 158: 581–91.
<https://doi.org/10.1002/ajpa.22827>
- SNOECK, C., J. LEE-THORP, R. SCHULTING, J. DE JONG, W. DEBOUGE & N. MATTIELLI. 2015. Calcined bone provides a reliable substrate for strontium isotope ratios as shown by an enrichment experiment. *Rapid Communications in Mass Spectrometry* 29: 107–14.
<https://doi.org/10.1002/rcm.7078>

SØRENSEN, M.S. 1994. Temporal bone dynamics, the hard way: formation, growth, modeling, repair and quantum-type bone remodeling in the otic capsule. *Acta Oto-Laryngologica* 114: 5–22.
<https://doi.org/10.3109/00016489409127318>

SØRENSEN, M.S., P. BRETLAU & M.B. JØRGENSEN. 1992. Quantum-type bone remodeling in the human otic capsule: morphometric findings. *Acta Oto-Laryngologica* 112: 4–10.
<https://doi.org/10.3109/00016489209136839>

Received: 4 July 2018; Revised: 22 November 2018; Accepted: 6 December 2018