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A decorated Late Postclassic Mixtec human skull from Teotitlán del Camino, Oaxaca, Mexico, possibly dating to c.1400–1520 CE. The type of adhesive used to affix the mosaic to the skull raised some doubts about the authenticity of the object. Photo P. Erdil. (Collection Nationaal Museum van Wereldculturen. Coll.No. RV-4007-1.)

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Tracing the Final Bronze Age–Early Iron Age transition

Groningen Institute of Archaeology settlement excavations in the Sibaritide, 2018-2019

P.M. van Leusen & F. Ippolito

Groningen Institute of Archaeology

Abstract: *We report here on the first two seasons of excavations by the Groningen Institute of Archaeology (the Netherlands) at two settlement sites in the foothill zone of the Sibaritide coastal plain (northern Calabria, Italy). The work is throwing new light on finds assemblages unique to the transitional period of the Final Bronze Age–Early Iron Age, a poorly understood period in southern Italy, and is helping to resolve methodological questions about the interpretation of non-invasive archaeological and geophysical survey data. The finds so far excavated, supported by radiocarbon dates, form one of the first ‘pure’ FBA–EIA transitional assemblages, and thus contribute to fill a significant typo-chronological hiatus with wider implications for protohistoric archaeology in the region. It is also becoming clear what long-term effects mechanized ploughing has on slope processes and soil profiles typical for the region, knowledge that will help us understand the results of the wider field surveys and geophysical investigations conducted since 2000 in the Raganello River basin.*

Keywords: *Bronze Age–Iron Age transition, southern Italy, settlement excavation, pottery typology, new radiocarbon dates.*

1. Introduction

In this article, we introduce and describe the first two excavation campaigns conducted by the Groningen Institute of Archaeology (GIA) at the sites of Monte San Nicola (MSN) and RB228, in the northern foothill zone of the Sibaritide coastal plain (northern Calabria, Italy; Fig. 1), as part of a broader research programme into poorly understood aspects of the Final Bronze Age–Early Iron Age transitional period in southern Italy (Colelli & Ippolito 2017). This research programme has identified key single-period sites whose finds assemblages can testify to the sociocultural development of indigenous societies prior to the Greek colonization of southern Italy.

As an outgrowth of GIA’s 1991–2010 excavations at the Bronze Age to Greek colonial hilltop sanctuary-cum-settlement and necropolis of Timpone della Motta di Francavilla Marittima (Kleibrink 2006; Colelli & Jacobsen 2013; Jacobsen *et al.* 2020), systematic and large-scale investigations of its hinterland through intensive fieldwalking survey were commenced in 2000

(Attema *et al.* 2001; Van Leusen & Attema 2003; Attema & Van Leusen 2007; Attema *et al.* 2010). Initially limited to the ‘foothill’ zone within 5 km of the site, these surveys in later years expanded into the uplands and mountains of the Raganello River basin (Van Leusen 2005; Feiken 2014). They eventually covered some 8.5 km² out of a total land surface area of 225 km² and documented some 240 finds scatters ranging from the Late Neolithic to the Byzantine period but mostly dating to the Bronze Age and the Hellenistic–Roman period. From about 2005, increasing effort was put into geophysical and geoarchaeological investigations to understand processes affecting the formation, post-depositional history and visibility of the surface archaeological record (Van Leusen *et al.* 2014; De Neef 2016) and the cultural affinities of the protohistoric sites that form the majority of this record (Ippolito 2016). Fieldwork was halted after 2013 to allow for in-depth analysis and assessment of the reliability of the results obtained in the preceding 13 years through controlled experiments. A new research programme, which began in 2018, was formulated to throw more light on the poorly understood

Fig. 1. Location of the study area and the sites mentioned in the text.

transition period between the Bronze Age and the Iron Age in southern Italy.¹ This article presents the results of the first two excavation seasons within that new programme.

The influential settlement model proposed by Peroni in the 1980s, and since taken forward by other researchers at the Sapienza University of Rome, already described the development, from the second phase of the Middle Bronze Age (MBA) to the Recent Bronze Age (RBA), of sites in the foothill zone (Peroni & Trucco 1994 (II); Bettelli *et al.* 2004; Vanzetti 2013; see also De Neef 2016: 221-31). The model then proposes a retrenchment from the end of the RBA to the FBA, with a reduction in the number of foothill settlements in favour of more internal locations in the nearby mountains, presumably due to the diversification of the subsistence economy from agrarian to more pastoral-oriented. For the FBA and EIA, the Roman School projected a significant increase in size of a few settlements of MBA origin that were located on the slopes facing the coastal plain, initiating the development of 'proto-urban' central places that, contrary to what we might expect, never went on to achieve the size and status that we are familiar with

in Etruria (Peroni & Trucco 1994 (II): 869-77). Something must have happened at the end of the Bronze Age in the Sibaritide to halt this incipient centralization and proto-urbanization, as can also be seen in the three main large, excavated sites of this period, Torre Mordillo, Broglio di Trebisacce and Timpone della Motta itself (Arancio *et al.* 1995: 230; Attema *et al.* 2010: 112-17; Ippolito 2016; Attema & Ippolito 2017). Ippolito's recent (2016) study of the ceramics collected by the Raganello Archaeological Project (RAP) and its local partner the Gruppo Speleologico 'Sparviere', by contrast, found that the inland portions of the Raganello watershed were all but abandoned at the end of the Middle Bronze Age, and that from then on and until the start of the Iron Age, settlement concentrated in the foothill zone surrounding the plain of Sibari.

The end of the Bronze Age in the Sibaritide is also the phase in which an increasing amount of material of Aegean derivation is found in the area.² Foothill sites recorded by the RAP on both sides of the Raganello were shown to contain substantial numbers of fragments of so-called *doli cordonati*, large storage vessels with a capacity of about 500 l produced according to Aegean

1 Publications of the Raganello Basin finds and sites catalogue by the authors, and of the geophysical studies and survey experiments conducted, respectively, by Dr K.L. Armstrong and the first author, are in preparation as volumes in the series Raganello Basin Studies, published by GIA/Barkhuis.

2 Bettelli 2011: 111 and, for Timpone della Motta, van Wijngaarden 2002: 248; Jacobsen 2007: 9-10; Jones *et al.* 2014: 34; Ippolito 2016: Section 4.10.

models and techniques. Vessels from Timpone delle Fave were studied in detail by Ippolito and were shown to date to the FBA by means of parallels from Broglio di Trebisacce Sector B West (levels S3 and H; Ippolito 2016; Ippolito & Attema in press). The RAP found FBA dolium fragments not only at the hilltop site of Timpone delle Fave, but also in numerous locations in the Contrade Damale-Capraro and Portieri area, between Cerchiara and Francavilla (Attema *et al.* 2010: 93–5), as well as in the excavations at Torre Mordillo, Amendolara (Belardelli & Capoferri 2004) and Timpone della Motta. This evidence indicates that, starting in the LBA, direct or indirect Aegean influences began to cause or at least affect changes in the socio-political organization of indigenous societies in the Sibaritide. It is worth noting that these cultural contacts with the Aegean therefore existed long before the traditional beginning of Greek colonization in southern Italy in the 8th century BC. Interestingly, the RAP surveys show that FBA objects of Aegean origin occur *only* in the foothill zone; despite intensive and systematic searches, no such material of Aegean or Italo-Aegean origin has ever been found in the mountainous hinterland (Ippolito 2016: Section 5.9). This reinforces our impression that these areas seem to be excluded from further significant developments after the MBA.

Our 2018–2022 research programme, therefore, set out to investigate those few sites that are dated precisely in the period of interest, that is, from the FBA to the EIA; are located in the zone between the coastal plain and the mountainous hinterland; and are culturally characterized by an assemblage with both Aegean and local traits. Three such sites have so far been identified, two of which have been partially excavated in 2018 and 2019; the third, Timpone delle Fave, has so far seen only preliminary, non-invasive investigations.

A further significant aspect of the research described below is that of geo-archaeology. Geology, morphogenesis and soils of the study area were extensively studied and described in Sevink *et al.* (2016), showing that slope processes have a great impact on the preservation and detectability of archaeological sites in the foothill zone. As we will see below, plough erosion and accumulation affect both of the sites described here, and one of the goals of our work has been to document and study these processes in greater detail in order to better understand the results of the preceding non-invasive geophysical and fieldwalking surveys.

2. Monte San Nicola

The Monte San Nicola, located for the most part in the municipality of Civita, is the eroded remains of one of the oldest, and at 525 m asl the highest, Plio-Pleistocene marine terraces in the Sibaritide. It is flanked, to the west, by the valley of the Eiano, and to the east by that

of the Raganello, and thus forms part of the watershed between these streams. The site is characterized by a central hilltop, occupied since the 1960s by a radio/TV transmitter station, and surrounded on three sides at about 500 m asl by relatively flat ‘lobes’ forming part of a slightly younger, and slightly less dissected, marine terrace. The central hill, composed partly of layers of conglomerate rocks, seems to have functioned to some extent as a ‘cap rock’ protecting the underlying silty-clayey layers from erosion. Although ploughing was abandoned in recent years on the north lobe, previous land use was arable (grain, corn) with extensive fallow grazing in between. From the central hill and its three lobes there are extensive views in all directions. A short distance to the north lies the limestone massif of the southern Apennine chain, rising up to 2100 m asl; to the west lies the Eiano valley with the towns of Cassano-Lauropoli and the San Marco cave complex; and to the east and south there is an unimpeded view of the Sibaritide coastal plain, all the way to Trebisacce in the east, Rossano and the Sila massif in the south, and Torre Mordillo and the Crati river in the south-west. The site is located on the north lobe, so the view to the south is blocked by the central hill (Fig. 2).

Fig. 2. Monte San Nicola site overview map, showing datum points and location of trenches. The radio/TV transmitter station, at 526m asl, is visible at bottom right.

Current vegetation on the north lobe is sparse, with some isolated and stunted trees, as well as shrubs and brambles encroaching on the field margins. A small, collapsed building (probably a cabin) built of limestone boulders is located on the break of slope on the

Fig. 3. Status quo ante: non-invasive survey data from Monte San Nicola north lobe. Magnetic gradiometry data by Eastern Atlas GmbH 2010 is stretched between -3 and $+3$ nT; symbols indicate locations of individual finds of the GIA 2013 survey.

north-eastern flank. Soils on the north lobe, described by Sevink *et al.* (2016: 39–42), consist of an Ap horizon (plough layer) of c. 30 cm thick, over a Bt horizon of 40–90 cm thick, in clayey silt. The presence of calcium carbonate nodules at the surface, which normally form in the lower part of the B horizon, demonstrates that the original soil has been significantly truncated, probably by plough erosion in recent decades.

2.1 Research history 1980s–2013

Although the first documented report of FBA–EIA surface material at Monte San Nicola, discovered by a team from Rome La Sapienza University during a targeted survey of hilltops in the Sibaritide foothill zone, dates to 1987 (Peroni & Trucco 1994: 669–70), reports of illegal excavations in the 1970s (C. Colelli, pers. comm., 28 June 2018) indicate that archaeological materials must have surfaced soon after the start of mechanized ploughing. The precise origin of the material reported in 1987 is, unfortunately, not recorded. No further activities are documented until the arrival of the RAP survey teams in the autumn of 2000, when scatters of undiagnostic protohistoric and later pottery were reported to the south and east of the central hill. A survey of the central hilltop in 2008 resulted in the discovery of a diffuse scatter of FBA–EIA pottery, including a spindle whorl, on the slope just south of the transmitter station (RB207). In July 2010, the survey for the first time covered the north lobe, under poor visibility conditions,

and recorded a dense protohistoric scatter of about 6 m diameter (RB216), consisting of large, freshly broken fragments of a type initially believed to be associated with graves.

In the course of the Rural Life Project (RLP), Eastern Atlas GmbH conducted a magnetometer survey of all three lobes in 2011 (De Neef 2016), revealing, among other less identifiable anomalies, a total of about 35 positive circular anomalies of about 1.5 m diameter, distributed in clusters on the north and south-west lobes. Soil profiles and anomalies in the northern cluster were studied in more detail in 2013 by a coring transect and, locally, by stripping of the plough layer over anomaly 245a (De Neef 2016: 370–6; Sevink *et al.* 2016: 39–42); the latter demonstrated that pit-like features generated the geophysical anomalies (Fig. 3). Meanwhile, other GIA teams resurveyed the north lobe in systematic detail under better circumstances in 2012–2014, confirming and extending our records of FBA–EIA materials on the surface. RB216 was mapped in detail, and a second, more diffuse, scatter of protohistoric pottery (RB233) containing dolium and kiln fragments was identified about 50 m to the east.

2.2 Surveys and excavations 2018–2019

Excavations at Monte San Nicola were begun in 2018.³ The initial trench (10 × 10 m) was targeted at a group of four circular geophysical anomalies, 245a–d (Fig. 4), which were believed to represent cremation graves

3 A preliminary report on the 2018 excavation season was published in FASTI Online, Van Leusen & Ippolito 2018.

Fig. 4. Monte San Nicola, results of the 2018 surface survey and planned excavation trenches plotted on magnetic gradiometry data. Yellow: surveyed area; blue: trench I; red: trench II.

and therefore to contain single-context ceramic assemblages of the period of interest (De Neef *et al.* 2017: 288–91). Before excavation, an area of 30 × 60 m surrounding the trench was resurveyed in detail, using the Total Station to map individual finds, in order to record any changes with respect to the 2013 survey of the same area that may have been caused by continued working and erosion of the field. The second trench (2019; 10 × 20 m) was placed just to the south and slightly upslope of the first to cover two further anomalies – one circular, the other diffuse – in the presumed settlement area.

Methodological considerations

Since the excavation was targeted at geophysical anomalies rather than any physical evidence, the measurement system used by Eastern Atlas had to be re-established from fixed points left behind in 2011. These were carried over with some difficulty to the north lobe. While all XYZ positions established by Total Station within this measurement system are correct to within 1 cm, the precise locations of the fixed points themselves within the ED1950-UTM33N system await confirmation by high-precision DGPS.

Because one of the goals of the excavation was the more detailed geophysical investigation of the positive circular anomalies, the excavation procedures were adapted for anomalies 245a and 245d to allow the collection of magnetic susceptibility (MS) samples from plans and sections, and the collection of gridded

magnetometer survey (FM256) data at several depths within a 2.5 by 2.5 m area (Fig. 4). These data will form the input for computer-generated 3D models of the archaeological features and their geophysical properties. MS samples were collected in minigrip bags for every stratigraphic unit ('US' in Italian) distinguished in anomalies 245a and d, as well as most of those distinguished in anomalies 245b and c, and for the natural soil layers adjacent to and below the features. Directional samples for remanent magnetism measurement were only collected from the lining and bank of the fired structure that caused anomaly 245c, as shown in Figure 5.

Features and finds

The systematic Total Station field survey of an area of 30 by 60 m surrounding trench I (indicated in yellow in Fig. 4), intended to record changes in the surface archaeology since the 2013 survey (Fig. 3), confirmed that the general character of the assemblage and the spatial distribution of materials had changed very little despite the removal of all the surface finds recorded in 2013. Continued ploughing in the intervening years had apparently re-established the earlier finds pattern, changing the shapes and shifting the positions of scatters RB216 and RB233 slightly northward but leaving their composition unchanged. Fragments of a massive, perforated kiln floor were again present in RB233, although no geophysical signature of a kiln has been found. The position of scatter RB233 somewhat to the

Fig. 5. Monte San Nicola, trench I of 2018 with labelled features and sectors. Repeated magnetic gradiometer surveys have taken place at several depths in two 2.5 by 2.5m squares around anomalies 245a and 245d. The section lines indicated in red refer to the drawings in Fig. 7.

Fig. 6. Monte San Nicola, oblique photo showing situation at end of 2018 excavation, with labelled anomalies. View to North.

north of a group of circular geophysical anomalies suggests that the latter may well be the main 'reservoir' for the surface finds.

Excavation trench I, 10 by 10 m in size and located over the four round positive anomalies 245a-d, was divided into four 5 by 5 m sectors (named S, W, N, E; see Fig. 5a). The plough layer was then manually removed to a maximum depth of 40 cm, until the excavation reached the undisturbed geology represented by the light yellow clayey silt visible in Fig. 6. Even before reaching this level, ploughed-up lumps of yellow-brown to reddish brown soil were encountered, indicating the presence of features corresponding to the four geophysical anomalies. Upon cleaning of the level, four approximately round pit features distinguished by a dark fill were in evidence, along with several sets of plough marks. Sector E was not excavated further due to the lack of features.

Figure 5 shows the archaeological features as they emerged after the removal of the plough layer, along with their sections (Fig. 7). Pit 245a, which had already been partially investigated in 2013, measures 1.10 m (S-SW) by 1.25 m (N-NE) and has a maximum preserved depth of 68 cm; the very similar pit 245d has a diameter of 1.60 m and a preserved depth of 45 cm. The fill of

245a

245b

245c

245d

Legend

Fig. 7. Section drawings and photos of 245a–d, Monte San Nicola 2018. Photos not to scale.

Fig. 8. Trench II, Monte San Nicola 2019. A: Magnetometer anomalies 245e and g. B: Trench plan at the close of excavation. C: Detail of contexts in sector D, including the pebble pavement.

245a contains a large amount of material, from ceramics (impasto, *figulina*, large containers) and charcoal and bone fragments to lumps of baked clay, an ash lens and two bladelets out of light grey flint.⁴ That of 245d also contained two spindle whorls and fragments of *figulina* painted in protogeometric style. The ceramic assemblage can be assigned to the transitional period between the end of the Bronze Age and the beginning of the Iron Age.

In the centre of the trench, a third subcircular pit (245b) measures 1.60 m (N-S) by 1.50 m (E-W). Its fill contained fewer materials – a few ceramic fragments and some charcoal – but one of the fragments has decoration datable to the end of the Final Bronze Age (FBA3). The function of this pit is still unclear.

A fourth feature, 245c, is of a more elliptical shape and clearly distinguishes itself from the others by the presence of a reddish lining out of fired clay with a width of 25 cm in the best-preserved part, and with internal dimensions of 1.20 m by 0.80 m. A smoothed internal step of fired clay, still visible on the west side, runs along the perimeter of the structure, and fragments of storage vessel have been re-used as temper in the floor (poorly preserved). These characteristics clearly identify this feature as a food oven, similar to ones documented at Sorgenti della Nova and Torre Mordillo (Colburn 1977; Cattani *et al.* 2015, and references therein; Ippolito 2019). This, too, was filled with impasto and *figulina* pottery of the BA-IA transition, in addition to charcoal, bone and burnt clay fragments, rachis fragments of *Triticum monococcum/dicoccum*, and a fragment of a *Dentalium* shell. The oven was cleaned, conserved in place, and covered by cloth in 2019, prior to backfilling.

Trench II, excavated in 2019, focused on an area slightly upslope from trench I, and more centrally located on the north lobe (see Fig. 4), where we expected to find the habitation associated with the pits and oven recorded in 2018. The 10 by 20 m trench covers two magnetometer anomalies (Fig. 8a): 245e, which is similar in shape and intensity to the anomalies excavated in 2018, and 245g, which is less intense, is less homogeneous, and has a vaguely rectangular shape. The trench has been subdivided into eight 5 × 5 m sectors, named A to H, only some of which were excavated in 2019 (excavations will continue in 2021).

Following removal by mechanical digger of the top part (about 25 cm thick) of the plough layer, the excavation was continued manually. This was hampered by

the presence of a clayey colluvial layer, increasing in thickness in the upslope (southerly) direction, that formed the lower part of the plough layer. It quickly hardened upon exposure to the sun, and could then only be removed in lumps by pick-axe. Once the excavation had reached below this level, excavation in sector D and the neighbouring part of sector C brought to light a section of a pebble pavement (US10, Fig. 8b). To its east and south, several other contexts were exposed that have yet to be excavated, among which a subcircular pit US25 and a very compact concentration of stones and pottery US26. The latter continues farther south in sector F and appears to coincide with one of the more strongly positive parts of magnetic anomaly 245g. These features are consistent with the presence of habitation structures: similar pavements have been found in association with buildings or living quarters at the nearby Bronze Age site of Broglio di Trebisacce⁵ and at other Bronze Age sites, such as Coppa Nevigata, in northern Apulia.⁶

During excavation, multiple samples for macro-botanical analysis were collected from all contexts below the plough layer; since their analysis has not yet been completed, we will report on this subject later. Trench II was then covered with cloth and partially backfilled in anticipation of further excavations.

Pottery

The pottery assemblage from Monte San Nicola is made up of large vessels (*doli* or *pithoi*), protogeometric *figulina* pottery, and both coarse impasto jars and fine impasto cups/bowls (see Appendix). Most of the typological parallels were established with the aid of materials from the nearby sites of Broglio di Trebisacce, Torre Mordillo and Timpone della Motta-Rovitti, but some were also found at sites in Apulia, such as Punta Meliso (Santa Maria di Leuca). In general, the 2018–2019 assemblages from Monte San Nicola resemble the FBA-EIA assemblages at other inland sites, such as Monte Pedalacci and Serre d'Altilia, in the hinterland of Crotone (Capriglione *et al.* 2012; Nicoletti 2014). However, the presence of types with incised decoration moves the chronology of Monte San Nicola towards the FBA.

Fragments of impasto and *figulina* vessels datable to FBA3–EIA1a have been found in the fill US8 of pit 245d (Appendix, Plate 1). These are often fragments that can be refitted, belonging to the same vessels: bowls with

4 Lithic blades continue to be used into the Iron Age; they also occur, for instance, at the Late Bronze Age site of Torre Santa Sabina, in Apulia (Martinelli 1998: 260).

5 Level H, dated to the advanced FBA; Peroni & Trucco 1994: Fig. 4.

6 Sectors H3C and H3H, dated to the Subapennine period; Cazzella *et al.* 2014: Fig. 11.

diagonally ribbed decoration,⁷ with a collared neck,⁸ or with a horizontal handle;⁹ various types of jars;¹⁰ and decorated fragments.¹¹ Fill US14 of pit 245a contains FBA3–EIA1a ceramics as well, and here the chronology is provided by bowls with in-turning rim,¹² spindle whorls,¹³ painted fragments,¹⁴ and ovoid jars.¹⁵ Fill US6 in oven 245c included a few FBA3–EIA1 sherds, such as the bowl fragment MSN18IW6.29.1,¹⁶ and fill US7 of pit 245b included one impasto sherd with FBA3 incised decoration (MSN18I7.59.2).¹⁷

The pottery from Trench II of 2019 (Appendix, Plate 2), found in the context of both the pebble pavement and the adjacent pit feature, can also be ascribed to the Final Bronze Age and the Early Iron Age (FBA3–EIA1a), and in some cases it was possible to match fragments typologically between trenches I and II.¹⁸

Bone fragments

Bones from pit 245a (US14) were too fragmented to be analysed, but 54 fragments from pit 245d (2 from US11, 52 from US8) could be described (see Table 1). The usual three common domesticated taxa were identified: *Bos taurus* (cattle), *Sus scrofa* (pig) and *Ovis aries/Capra hircus* (sheep/goat). As the material is very fragmented, brittle and lime-encrusted, no butchery marks or pathologies could be identified. Seventeen pieces, most of which are from the harder and denser teeth and metapodia, could be attributed to a species and skeletal element.

Radiocarbon dates

In addition to a charcoal fragment from the upper fill (US14) of pit 245a, dated in 2014 and reported on by De Neef (2016: 131, 375–6), bone collagen from the fills of pit 245d and the oven 245c was radiocarbon dated at the University of Groningen, with the following results:

- MSN1 (bone from US8 in pit 245d), GrM-17680-AMS, 2770 ±20 BP 1σ: 978–842 calBC

- MSN2 (bone from US11 in oven 245c), GrM-17681-AMS, 2825 ±25 BP 1σ: 1047–913 calBC
- MSN3 (charcoal from US14 in pit 245a), GrA-62526-AMS, 2735 ±35 BP 1σ: 905–835 calBC

The significance of these radiocarbon dates is discussed in Section 2.3.

Geophysics

Besides showing the relationship between anomalies and buried features, the results of the geophysical investigations will help us create models that relate types of geophysical ‘signature’ (shape and intensity of the anomaly) to different types of structures and their state of preservation.

In 2018, two square areas of 2.5 × 2.5 m, located over anomalies 245a and 245d, were subjected to repeated magnetic gradiometer survey at 0.25 m resolution at different depths by the first author, using a Geoscan FM256 instrument operated at 1nT sensitivity. The first grids at 245a were not zeroed, due to operator inexperience. Readings were taken along N–S lines at the ground surface (top of US o), the tops of US1 and US2, and after every increase in depth of 15–20 cm. Typically, the lower sensor would be at 20 cm above the surface; where standing sections may have affected the readings, this has been indicated. Figure 9 shows the raw data, the dates, and the levels at which the measurements took place. A preliminary examination shows that, as expected, the definition of the anomalies improves somewhat as readings are taken below the level of the plough layers (the background becomes less noisy), and their size is somewhat reduced as the diameter and volume of the remaining fills becomes smaller. A more detailed analysis will take place in the near future.

The same anomalies, as well as their plough layer and geological context, have been subjected to detailed sampling (77 samples of 10cc each) for MS analysis. Given

7 See, for instance, the fragments MSN18IN.30.2 and MSN18IN.55.1 in the Appendix.

8 See, for instance, fragment MSN18IN.8.46.2 in the Appendix.

9 See, for instance, fragment MSN18IN.8.71.4 in the Appendix.

10 Fragments similar to shapes 30A, 57A and 58A in Peroni & Trucco 1994 also occur in Sect. B West, lev. H; see Ippolito 2016, cat. no. 526.

11 See fragment MSN18IN.8.63.7 in the Appendix.

12 See, for instance, fragment MSN18IS.14.90.1 in the Appendix.

13 See, for instance, fragment MSN18IS.14.87.1 in the Appendix.

14 See fragment MSN18IS.14.88.1, with proto-geometric decoration comparable to Yntema 1990: Fig. 6, no. 1.

15 Similar to Peroni & Trucco 1994, shape 57A, dated to FBA3 (also in Sect. B West, lev. H, BF3–Fe1A).

16 Similar to Peroni & Trucco 1994: Plate 100.26, Sect. B West, lev. S.

17 cf. Barbaro 2010: Fig. 76A no. 8.

18 Fragment MSN2D6.35 in the Appendix matches MSN18IN.8.71.4, and MSN2B1.7 matches MSN18IN.8.55.1.

Table 1. Identified bone and tooth fragments from Monte San Nicola, pit 245d (identifications by E. Scheele).

Bag	Taxon	Element	Portion	Side	Comments	US
43	Medium to large mammal	Unidentified bone	Fragments			8
47	Medium to large mammal	Unidentified bone	Fragments			11
58	Medium to large mammal	Unidentified bone	Fragments			8
40	Medium to large mammal	Unidentified bone	Fragments			6
45	Medium to large mammal	Unidentified bone	Fragments			6
46	<i>Bos taurus</i>	Mandible	Mandibular condyle	Left		8
41	<i>Bos taurus</i>	Upper molar 1 or 2	Almost complete	Unknown		8
43	<i>Sus scrofa</i>	1st phalanx	Complete	Unknown		8
43	Medium to large mammal	Unidentified bone	Fragments			8
50	Medium to large mammal	Unidentified long bone	Shaft fragment			11
46 2/5	<i>Bos taurus</i>	Lower molar 3	Almost complete	Right		8
46 2/5	<i>Sus scrofa</i>	Canine	Complete	Unknown		8
46 2/5	<i>Ovis aries</i> / <i>Capra hircus</i>	Upper molar	Complete	Left		8
46 2/5	<i>Bos taurus</i>	Incisor	Complete		Probably a young(er) animal	8
46 2/5	Medium to large mammal	Unidentified bone	Fragments			8
68	<i>Ovis aries</i> / <i>Capra hircus</i>	Upper molar	Complete	Left		8
68	<i>Ovis aries</i> / <i>Capra hircus</i>	Lower molar 3	Fragment	Right		8
68	<i>Ovis aries</i> / <i>Capra hircus</i>	Unidentified molar	Fragment			8
68	<i>Ovis aries</i> / <i>Capra hircus</i>	Unidentified molar	Fragment			8
68	<i>Bos taurus</i>	Metatarsus	Shaft distal	Unknown		8
68	Large mammal	Unidentified long bone	Shaft fragment			8
55	<i>Bos taurus</i>	Metatarsus	Shaft fragment	Unknown		8
55	<i>Bos taurus</i>	Unidentified meta-podial	Shaft fragment		Three pieces, not fitting together	8
55	<i>Ovis aries</i> / <i>Capra hircus</i>	Lower molar 3	Fragment			8
55	Medium to large mammal	Unidentified bone	Fragments			8

the obviously different formation of the oven 245c, three directional block samples were taken from its lining and floor in order to determine both its firing temperature and its magnetic remanence. The former will be used to confirm whether or not the oven was used at low temperatures, consistent with food preparation; the latter information is needed to model the geophysical difference between this oven and the two rubbish pits. With the help of external experts, both types of data will be used for a methodological study of the geophysical

‘signature’ of pits. In 2019, the MS sampling programme was continued (28 samples), and gridded MS readings using a Bartington MS2F probe and MS3 sensor were taken at 10 cm resolution in sectors BCD and GH.¹⁹

2.3 Discussion

The ongoing excavations at Monte San Nicola are contributing to our understanding of both the site itself and the pottery typochronology of the Bronze Age–Iron Age transition in the Sibaritide. To begin with the latter,

¹⁹ At the time of writing, the analysis of these samples is not yet complete; they will therefore be discussed in a companion article in a later volume of *Palaeohistoria*.

Fig. 9. Raw 25-cm resolution gradiometer plots at various depths, Monte San Nicola. A: pit 245a, B: pit 245d. North is to the right; the eastern and western measurement rows of the final 245d plot are affected by the presence of standing sections.

we want to reiterate here that few archaeometric date ranges are yet available in the Sibaritide to anchor the ongoing debate on the absolute chronology of Italian protohistory (Guidi 2018). We are now establishing the first firm link between relative chronology based on pottery classification and absolute dates for the FBA3 in the Sibaritide, using a detailed analysis of secure stratigraphic contexts containing typological parallels dating to the broad phase FBA-EIA at other sites in the region (Ippolito & Van Leusen 2020).

A case in point is the Timpone della Motta, at Francavilla Marittima. A recent review of radiocarbon dates from this site (Jacobsen *et al.* 2020: Table 2) shows that dates falling into the Final Bronze Age come from Plateau I, Casa Aperta and Casa al Muro Grande. Two further dates from Casa al Muro Grande and one from the Acropolis are from the FBA-EIA transition, and four more – two from Casa Aperta and two from the Acropolis – date to the beginning of the EIA (between 900 and 800 BC). The impasto pottery typochronology for most of these contexts is consistent with the radiocarbon results (Ippolito 2016). What is missing at Timpone della Motta, however, is clear ceramic evidence relating to the end of the Bronze Age, in particular the protogeometric (Ferranti 2008; Colelli 2015; Colelli & Ippolito 2017). Conversely, no radiocarbon dates are available for the two other contexts with protogeometric pottery in the Sibaritide, at Broglio di Trebisacce and Torre Mordillo; in these cases, therefore, the typochronology is not supported by absolute dates. The protogeometric fragments from Monte San Nicola,

and especially the possibility of identifying their exclusive stratigraphic association with impasto types, are therefore of great interest. Of the three radiocarbon dates currently available for MSN, one (MSN3) must be considered less reliable because it is based on a charcoal fragment from wood of unknown age; another (MSN2) is from a context lacking diagnostic pottery. This leaves MSN1 as our single date falling in the FBA3 from a reliable context that can be dated by pottery analysis to the same period.²⁰ Considering the contexts of the more specific typological parallels and the typological characteristics of the reconstructed pottery forms, most of the pottery assemblage at MSN must date exclusively to the advanced FBA. The radiocarbon date from pit 245d places the assemblage in the 10th or the early 9th centuries BC (FBA3-EIA1a), a period that is otherwise rarely attested in the Sibaritide or in southern Italy generally. Even where the forms considered are typologically longer lasting, from the Final Bronze to the Early Iron Age, the specific contexts of origin of the parallels belong almost exclusively to advanced Final Bronze Age levels. This provides us with the first secure, single-phase FBA3 assemblage in the region, which will be helpful in dating similar assemblages elsewhere on purely typological criteria (Ippolito 2016: Section 4.9).

Regarding the interpretation of the contexts excavated so far, and that of the site as a whole, some progress has been made as well. The idea that the cluster of round positive magnetic anomalies on the north lobe of MSN represents a cremation cemetery can now be discounted, as each of the four anomalies excavated in 2018

²⁰ This is irrespective of whether we follow the absolute chronologies proposed by Pacciarelli (1996, 2001) or Nijboer (2005, 2016) and Nijboer & van der Plicht (2006); following Pacciarelli, the date for pit 245d falls in the middle of FBA3, while following Nijboer it falls at the start of that phase.

has been shown to be not a grave, but another type of pit or even an oven base. However, we cannot exclude the possibility that graves are present elsewhere at MSN (scatter RB216 being a prominent candidate) and that some pit-like geophysical anomalies will prove to be graves. It now seems likely that the majority of the round positive anomalies represent ‘service’ features located in (or, more precisely, on the periphery of) a minor settlement of the FBA3–EIAa1. Pits found in the nearby site of Broglio di Trebisacce have been distinguished, by the composition of their fills and evidence for repeated use, into pits with a storage function, pits linked to the maintenance or rearrangement of nearby houses, and pits used as household rubbish dumps (Moffa 1998: 111). It is even possible, though we have seen no indication of this, that some pits were dug and filled with fragmented objects for symbolic reasons (Chapman 2000a, b; Denti 2020). While we can exclude a storage function for the pits that have so far been excavated at MSN – neither structure nor fills provide any indications for storage – they all seem to have been filled rapidly: none of the fills shows the fine layering that would indicate that they had been open for long enough to allow filling by natural processes, and except for the presence of an ash lens in 245d, no indication was found for phasing of the fills. Indeed, in 245b, fragments of the same bowl were found in the top and the bottom of the fill, indicating that the filling of the pit happened in a single action.

Pits a and d were evidently used to dispose of settlement waste from nearby habitation areas, although that was probably not their original purpose. The high fragmentation and poor quality of the bone and ceramics in the fills indicate that they had been lying around in the settlement for quite some time, and were trampled and eroded before finally being swept up into the pits. Unfortunately, none of this provides us with any indications for the primary purpose of the pits. It seems *a priori* unlikely that pits were specifically dug for rubbish disposal when convenient disposal areas were available on nearby slopes, and it is known that pits dug for other purposes were re-used for rubbish disposal.²¹ While we are hopeful that further evidence can be found during continued excavation, we must acknowledge that the interpretation of pits remains one of the larger unresolved issues in European pre- and protohistoric archaeology.

The discovery of the pebble pavement in 2019 provides the first indication (but no definite proof yet) of the presence of a settlement on the flat, upper section of the north lobe, as had already been supposed after the 2018 season. The associated vaguely rectangular positive magnetic anomaly 245g now seems likely to

represent one or more structures; continued excavation should produce direct evidence in the form of cut features, such as foundation slots and postholes, but in view of the strongly eroded surface, it is unlikely that we will find well-preserved floor levels. Furthermore, the presence of a similar, but less clearly defined, cluster of round magnetometer anomalies with protohistoric impasto on the south-east lobe of MSN suggests that a similar settlement (or more probably another part of the same settlement) will be located there. The sum total of the evidence so far therefore supports the interpretation of MSN as a ‘minor’ hilltop settlement, as originally suggested by Peroni and Trucco (1994: 835–45).

3. Contrada Damale-Capraro: Site RB228

Site RB228 is located at about 182 m asl, on the north-eastern flank of the Pleistocene alluvial fan of the Sciarapottolo seasonal stream, in the Damale-Capraro area of the municipality of Cerchiara di Calabria (Fig. 10). While forming part of the ‘Undulating Sloping Land’ unit defined by Feiken (2014: Chapter 4), the site is located on a geomorphological unit with a single straight slope, interrupted only by the artificial banks separating the current agricultural fields, which are between 1 and 2 m in height. The area is nowadays sparsely populated and is used to grow low-value crops of grain and olives. A minor road runs immediately to the south-west of the site.

The Sciarapottolo alluvial fan is locally composed of coarse, angular erosion products (mainly limestone) brought out of the immediate hinterland, that have since been cemented together by carbonate-charged groundwater and then eroded, resulting in dry gullies. One such gully is located immediately to the south-west of the site, across the road. A few hundred metres upslope lies the limestone mass of Serra del Gufo, with its debris apron consisting of limestone boulders.

Soils in this area were studied by Sevink and colleagues (Sevink *et al.* 2016: 42–5), who begin by noting that impermeable rocks, such as marl or shale, are common outside of the alluvial fan, leading to relatively poorly drained soils where carbonate-charged groundwater is locally close to the surface. One such location was observed only 100 m to the north-east of the site. Alluvial fan deposits typically consist of more or less indurated gravels, with prominent secondary carbonates in the form of concretions and nodules. While natural soils formed on this substrate would have been about 1 m deep, actual soils of this thickness are rarely found; soils have therefore been truncated by natural

21 Cavulli (2008: 87) and Degasperì (2000), for example, showed that quarries and storage pits at Neolithic sites were re-used in this manner.

Fig. 10. Archaeological sites recorded by the Raganello Archaeological Project in the Damale-Capraro and Portieri areas, with undulating sloping lands to the South and East of the limestone massif of Serra del Gufo. Some 70 protohistoric pottery scatters (blue) were identified in this 150 hectare area, along with a few Hellenistic-Roman scatters (red). The yellow box indicates the area of Fig. 11.

Fig. 11. Position of the RB228 excavation trench, straddling an agricultural terrace bank in the Contrada Damale-Capraro, with the results of the RAP field surveys in blue and local datum points in red. The terrain slopes down from top left to bottom right. Background: extract of the cadastral map on hillshaded DEM.

or – more probably – anthropogenic erosion, resulting in loose materials having been transported downslope. Ploughing and terrace formation have locally resulted in bedrock at or close to the surface, and elsewhere in deeply weathered soils covered in slope materials.

3.1 Research history 2002–2013

Archaeological research in the Damale-Capraro-Portieri area began with a brief episode in the mid-1960s, in which a large-scale extensive survey recorded three Hellenistic or Roman sites (De Rossi *et al.* 1969). This was followed, after a gap of nearly 40 years, by the RAP surveys in 2002. These covered the fields in which RB228 is located but failed to identify it at the time, even though several other protohistoric scatters were

recorded nearby (Fig. 11). RB228 itself was only discovered in 2010, during large-scale geophysical prospection by Eastern Atlas for the Rural Life Project (RLP). It then presented as a dense scatter of (possibly recently ploughed up) dolium fragments, located just below a bank marking the boundary between two adjoining fields (De Neef 2016: 115–17, 307–19). A detailed re-survey was conducted in 2011, resulting in the mapping of a substantial and rich scatter of *figulina*, impasto and dolium fragments dated to the FBA–EIA.

The site was subsequently selected for further intensive study by the RLP in 2011 because the position of the scatter immediately below the bank separating two fields strongly suggested that the site must have been partially preserved beneath the upper field. We

Fig. 12. RB228, situation before the excavation. A: View to the west, with locations of 2011 test trench, 2011–2013 plough-layer investigations, and field clearance cairns. B: Results of the 2011–2013 investigations on top of the 2011 gradiometer data (–13 to +14 nT). Impasto, dolium and depurated fragments are indicated in red, yellow and green; the 2019 trench is indicated in blue (after De Neef 2016, figure A18).

surmised that a platform had probably been cut in the natural slope to create a horizontal surface for habitation and/or other activities, and that the part now located in the lower field had been wholly or mostly destroyed by mechanized ploughing in the past 50 years. Additional geophysics were used in an attempt to map any remaining subsurface features around the site, and corings were used in an attempt to verify the character of magnetometer anomalies thought to represent buried dolia, but both were unsuccessful. The degree of preservation of the site stratigraphy inside the bank was investigated with a small exploratory trench in 2011 (of which more in Section 3.2), which confirmed the presence of in situ horizontally stratified FBA to EIA contexts. A single radiocarbon date on charcoal from US6 in the test trench provides a calibrated date of 1195–1045 BC (1 sigma).²² In both 2011 and 2013, a narrow, T-shaped section of the very thin plough layer in the most plough-damaged part of the site was manually removed to see if any archaeological features at all remained here (Fig. 12b). While none were found, among the notable additional finds from the plough layer and the lip of the bank were bone fragments, parts of a plano-convex bronze bun, and a perforated *Murex* shell.

Throughout these investigations, RB228 has yielded a varied but consistent habitation assemblage, composed of the cream- or pink-coloured grooved *doli cordonati* a scanalature, various impasto and *figulina* wares and shapes, as well as diverse objects, among which a toy horse figurine with protogeometric decoration stands out (De Neef 2013).²³

3.2 Results of the 2019 excavation season

Features and finds

A system of six fixed points was set up around the site (three of which had already been established and provided with GPS coordinates and elevations by De Neef in 2011) to serve as the basis for a local measurement system. This allowed us to deal with the substantial elevation difference of more than 2 m across the site. A trench of 10 × 10 m, divided into four sectors of 5 × 5 m (A–D), was then set out around the location of the test trench of 2011, such that its western edge would coincide with the boundary between sectors C and D (Fig. 12b). Following clearance of vegetation and loose stones, the surface was documented through drawings and photographs (Fig. 13a), and a levelling instrument was used to record a 1 × 1 m grid of elevations across the trench. The location of the 2011 test trench was confirmed by the presence of a peg left at its eastern corner.

US1, the plough layer, was then removed manually, in spits, from sectors B and D; as expected, its thickness varied substantially, from about 30 cm at the upper edge of the trench to about 70 cm at the top of the bank, to less than 10 cm in the lower field. To save time, after the photographic recording of the section standing along the sector boundaries, the plough layer over sectors A and C was removed mostly by mechanical digger; the final part was again excavated manually. Finally, the fill US8 of the 2011 trench US7[^] was removed.²⁴

Following cleaning of this surface, the presence of a subrectangular cut US9[^], made to create a horizontal habitation platform in the natural slope, became apparent in sectors A and B. It was filled with a dark brown, humic fill that contained numerous limestone boulders and dolium fragments not in resting position and was easily distinguished from the stony natural geological stratum US6 all around it. In the downslope sectors C and D, cut US9[^] became less apparent on the bank between the two fields, and it was completely absent in the lower field; here, cleaning off the thin plough layer had revealed a set of plough scars running at approximately 40 cm intervals parallel to the bank, as well as a smaller set of traces running at approximately right angles to it. A thin, grey-brown layer US2, containing pottery fragments, was all that appeared left above the natural, cemented limestone cobbles. All visible objects and features at this level were drawn and photographically documented (Fig. 13b).

Much of the remainder of the excavation period was devoted to the laborious and time-consuming excavation of the platform fill in sectors B and D, which proved to be full of chaotically placed limestone boulders which had to be recorded three-dimensionally. Two main fill strata were present (see drawing of section A–a' in Fig. 14): US4, with a maximum thickness of 50 cm, and US10 with a more greyish brown silty matrix but equally full of limestone boulders. A large number of impasto fragments and some bone fragments were mixed in chaotically in US4, whereas smaller amounts of impasto and dolium fragments were encountered in flat positions in and on top of US10. The top of US10 was documented photographically and by means of a levelling instrument. At the rear of the platform, in sector B, two courses of boulders were clearly still aligned, and these have been left in situ (Fig. 13d; Fig. 15 shows the top course during excavation); these probably formed part of a drystone revetment wall for the rear of the platform.

In view of the limited time available, it was then decided to focus the excavation on sector D only. Here,

22 2915±35 BP (GrA-060844-AMS; De Neef 2016: 314).

23 Publication of the site assemblage will take place when we have completed the excavation and analysis.

24 We use the convention of adding a circonflex (^) to indicate cuts as opposed to fills and layers.

Fig. 13. RB228, excavation plans clockwise from top left: surface after removal of vegetation, with projected plan of 2011 trial trench; surface after removal of plough layer; features and sections at the close of excavation; idem, with boulders in 20cm depth slices. Pottery in orange/red, 2011 boulders in light green, plough marks in double dotted lines, natural cracks in light grey. For sections A-a' and B-b', see Figures 14 and 17.

US10 was excavated to a maximum depth of 30 cm, until we reached a set of darker-coloured horizontal layers US11–12, consisting of gravel and small, angular stones in a sandy matrix, together less than 15 cm thick. Two

almost complete tronco-pyramidal loom weights were found on top of these layers (Fig. 16), in approximately the same stratigraphical position as the horse figurine

Fig. 14. RB228, main section A-a'.

found in 2011; this seems to indicate that US11 formed the floor level at the time of the abandonment of the hut.

Underneath US12 we found a very thin, light grey layer US13 with the consistency of cement that forms the top of the off-white, concrete-like layer US17. Since we believed this to be the original floor level as established during the construction of the hut, we did not excavate beneath this. Removal of US11-13 from the remainder of sector D revealed a series of features apparently cut into US17.²⁵ While some of these turned out to be shallow irregularities in the surface of US17, others are clearly structural features of the building occupying the platform. In particular, US16⁺ and US24⁺ (unexcavated) are probably postholes, US20⁺ (partially excavated) is probably a shallow foundation trench, and US23⁺ is a step to a higher floor level inside the building. Though now almost completely removed by plough damage in the lower part of sector D, it is likely that US17 originally continued for at least a few metres to the south-east, as witnessed by the location of posthole US16⁺.

Continued excavation of US2 in the lower field (south-eastern parts of sectors C and D) showed that it contains FBA-EIA pottery fragments and should be identified with the layer investigated during topsoil stripping in 2013. Removing this led to further definition of the plough marks documented earlier, and showed that the less regular features running more or less at right angles to them (i.e. parallel to the modern road) are probably settling cracks, a geological phenomenon caused by the cementation and subsequent subsidence of layers inside the Sciarapottolo alluvial fan. Unfortunately, due to plough damage at the bottom of the bank, it proved impossible to establish any stratigraphic relationship between US2, in the bottom field, and US10, inside the bank.

At this stage, the excavation was halted, and the standing section A-a', running through the centre of the trench, was cleaned and documented photographically and drawn before samples of US 4, 10 and 11/12 were collected for botanical macro-remains, along with smaller samples for MS measurement. The entire trench surface was again cleaned and photographed, and all features and major objects drawn as well as measured by Total Station (Fig. 13c). A further macro-botanical sample was taken, for purposes of comparison, from US1 in the outer trench walls. The trench was then covered in cloth and backfilled in anticipation of further excavations.

Limestone boulders

Figure 13b shows the positions of boulders after removal of the plough layer US1 from the trench, and it

²⁵ We do not yet know by which process US17 was constructed, or whether it was shaped out of existing sediments; this will be studied in future campaigns.

Fig. 15. RB228, during excavation of sector D. Contrast enhanced photo showing plough marks on the platform in the foreground and aligned boulders at the rear of the platform.

immediately makes clear that a large number had been dumped as part of the upper fill US4 of the habitation platform. Modern farmers, using mechanized equipment, would have regularly ploughed these up, explaining both the presence of the clearance cairns on the side of the road and the re-use of some boulders to fortify the terrace bank – see the row of boulders on top of US6 in sector D. The idea that the stone mass encountered in the test trench of 2011 may be part of a terrace revetment wall can now be discounted.

Figure 13d shows the positions and heights of some 275 boulders individually recorded up to the close of excavation, nearly all of which are limestone (only a few sandstone boulders have been noted so far). At the start of the excavation, the outline and top and bottom elevations of each boulder were individually recorded by Total Station, but this caused a bottleneck in the workflow when the equipment was in use elsewhere, so we then began recording boulder positions photographically (using local fiducial points) and their elevations by means of a levelling instrument. The plan shows the

stones colour-coded in four 20 cm depth slices, but no pattern is apparent in their distribution except for the two courses of aligned boulders at the rear of the platform, and two ‘gaps’ where no boulders were present along the boundary of sector B.

Pottery

The 2019 excavation resulted in a total of 1128 archaeological finds (pottery, bone, and fired clay), the bulk of which consists of handmade impasto pottery. Most of the finds (85%) derive from the two fills US4 and US10, rather than from the horizontal layers US11–13. A preliminary typological analysis has so far identified parallels dating between FBA and EIA1, with the majority consistent with FBA3 because of the impasto types, grooved *doli cordonati*, and protogeometric pottery present (Fig. 16). The study of the finds assemblage resulting from all of the research activities in the period 2010–2019 is still in progress, for which reason we do not report on it in detail here.

Fig. 16. RB228, selected finds of the 2019 excavation. Scale 1:3.

Table 2. Correlation of context descriptions, RB228 2011-2019.

2011		2019	
1	Loose, granular, sandy clay, 7.5YR3/2 dark brown. 25% small sharp stones 0.5-5 cm	1	Brownish black sandy clay, 7.5YR4/2.5, full of small, medium and large limestones
2	Hard, compact, sandy clay, 10YR3/2 very dark greyish brown. Well distributed small stones 2-4 cm	4	Dark brown silty clay, 7.5YR3/2, with numerous large and medium-sized stones
3	Clay, 10YR3/2 very dark greyish brown, between limestone boulders	10	Greyish brown silt, 10YR4.25/1, containing small, angular stones 0.5-2 cm, in between larger stones 4-10 cm
4	Loose, humic, silty clay between limestone boulders	4	Dark brown silty clay, 7.5YR3/2, with numerous large and medium-sized stones
5	Compact and sticky, silty clay, 7.5YR3/2 dark brown. Includes small charcoal fragments	10	Greyish brown silt, 10YR4.25/1, containing small, angular stones 0.5-2 cm, in between larger stones 4-10 cm
6	Loose, silty clay, 7.5YR3/3 dark brown (but more reddish than context 5). Small, sharp, angular stones <4 cm	12	Horizontal layer of brown silt, 10YR4/4, with many small stones 0.5-5 cm
7	Small limestone fragments and lime concretions, 7.5YR6/6 reddish yellow	11	
8	Natural gravel, 7.5YR6/6 reddish yellow	17	Light grey natural conglomerate, 5YR7.5/1

Correlation of the 2011 and 2019 stratigraphies

The correlation of De Neef's plan and section drawings for the 2011 test trench to the 2019 excavation plans and section, shown in Fig. 17 and Table 2, was made by combining information about the position of the peg marking a corner of the 2011 trench, the position of a stone with a distinct triangular outline that is recognizable in both, and the fact that elevations in both sections were

tied to the same set of fixed points. This demonstrates that her US6-8 correspond to our US11-12 and her US1, 2 and 3 correspond to our US1, 4 and 10. The contexts in the lower half of the bank (her US4-5 and our US2) and the finds made during topsoil investigation at the base of the bank in 2013 (De Neef 2016: Table A18) thus cannot currently be linked, but this may become possible when the excavation is resumed in sector C.

Fig. 17. RB228, correlation of the strata in section B-b' of the 2019 excavation with those in the test trench of 2011.

3.3 Discussion

The 2019 excavation at RB228 has provided evidence that a subrectangular platform was excavated into the naturally sloping Pleistocene alluvial fan sediments of the Sciarapottolo stream in the Final Bronze Age. In view of the depth of the floor level US17, the rear cut of this platform must have stood about 1.20 m high, which was probably the reason it was subsequently reinforced by the construction of a drystone wall. How far this platform originally extended downslope cannot be said with certainty, because of its almost complete destruction by ploughing in the lower field, but the excavated material could surely have been used for a platform extension of several metres. Deeply cut features, such as posthole US16²⁶, may be partially preserved and serve as indications for the extent of the building constructed on this platform.

The fully excavated area is too small to draw any far-reaching conclusions yet, but on current evidence, that building is very likely a hut; the use of platforms cut into the natural slope is familiar from coeval buildings in central and northern Italy.²⁶ The excavated part of the floor level (US17) has the characteristics of a *battuto*, or pounded floor, and the cut features so far identified (postholes, gutter-and-step) provide the first indications for the ground plan. Since the platform appears to have been preserved beneath the upper field over an area of about 7 × 6 m, further excavation is likely to give us a large part of that ground plan. Flat-lying materials on top of, or in shallow cuts in, US17 suggest that this was the original floor level. We tentatively interpret the horizontal layers US11–13, which include damaged or incomplete materials, as a new, heightened floor level indicating the moment of site abandonment.

In view of the finds assemblage collected so far, both from the surface and during excavation, we classify

the hut as a normal habitation for a farming family. We have the full breadth of a household pottery assemblage – impasto and *figulina* table ware (cups, bowls and jars, both plain and decorated) as well as large- and medium-sized storage vessels – plus a wide range of functional or decorative objects, from loom weights and *fornello* fragments to shell pendants and a toy horse. All of these can be dated to the Final Bronze Age and are consistent with a more precise dating in the FBA3.

The post-abandonment history of the site poses problems. At least three phases of deposition can be distinguished: 1) deposition of horizontal layers US11–12; 2) deposition of US10; and 3) deposition of US4. US11–12 may belong with a final phase of occupation, and may be limited to an outer section of the structure if they can be shown to stop at the gutter-and-step, indicating the position of an internal wall. US10, with its chaotically distributed boulders and damaged objects, is clearly a post-abandonment context, although we do not yet understand the origin of the grey and clayey matrix. It is likely that this context has somehow resulted from the collapse of the hut, but the lack of pattern in the boulders speaks against this. Finally, the equally chaotic fill US4, with its mixture of boulders and large and small pottery fragments, is currently the most enigmatic of all: it appears to be the result of an intentional action, presumably the removal of obstructions to the later agricultural use of the area by dumping remains into the hole left by the platform. So far, we have no indication when this might have happened, but it seems most likely that it occurred in the modern period because there is no substantial evidence for Iron Age to medieval activity nearby.

Even more recently, probably mainly after the advent of mechanized ploughing in the late 1960s or early 1970s, the current terrace bank was formed by differential ploughing on both sides of the property boundary, and boulders ploughed up from the platform fill were dumped to the side of the road, forming clearance cairns. We can now use the presence of such cairns as an indicator of further nearby buried ancient structures in areas where such boulders do not occur naturally.

Conclusions and further work

In view of the fact that neither excavation is yet completed, and that conclusions regarding the individual sites have already been drawn in sections 2.3 and 3.3 above, we limit the discussion here to matters relevant to our overarching research programme. At the current stage of excavation, it is too early to draw definitive conclusions about the purpose of many of the individual features encountered, but both MSN and

26 See, for example, Leonardi *et al.* (2011), and the building in Sector Vc of Sorgenti della Nova (Negroni Catacchio 1995: Fig. 94a).

RB228 have now been confirmed as settlement sites of the FBA-EIA transitional period, although the scale of the MSN settlement is not yet clear: given the distribution of geophysical anomalies and surface pottery, it may extend to other parts of the north and south-west lobes of Monte San Nicola. The pottery assemblages at both sites, being exclusively datable, by combined typology and radiocarbon dating, to the transition period FBA-EIA, provide us with the opportunity to review the region's typochronology in a phase so far obscured by three factors:

- the main types of pottery characterizing this phase are relatively undiagnostic: many of the impasto shapes have a long duration, and the potentially more diagnostic protogeometric *figulina* easily loses its decoration in the soil;
- the FBA-EIA stratigraphic levels of the BA sites so far excavated in the Sibaritide, being at or close to the surface, have been very poorly preserved; and
- the historical focus on the 8th century BC Greek colonization has kept scholarly interest away from indigenous settlement assemblages, founding the regional typochronology on exotic painted pottery and Greek sources instead.

The post-depositional history of both sites has been heavily affected by (mainly anthropogenic) slope processes, the bulk of which probably occurred after, and because of, the introduction of mechanized ploughing in the late 1960s or early 1970s. At MSN, the lithology and topography have conspired to asport the topsoil by as much as 75 cm in thickness, as shown by the presence of lime concretions at the surface. At RB228, the position of the site on a property boundary in a slightly sloping area has resulted in the near-complete destruction of the lower (downslope) half of the settlement platform, whereas the upper half has been well preserved. One of the goals of this research has been to study the details of this destruction process, in order to understand how it affects the results of the geophysical and fieldwalking surveys, and here we have made significant progress: pottery scatters at MSN appear and fade in decadal-scale cycles driven by occasional deeper ploughing of the tops of the archaeological features and, in the case of RB228, by occasional deeper damage to the lip of the terrace bank as the plough is turned around in the corner of the lower field. Furthermore, the origin of the limestone boulders dumped on the roadside at RB228 is now confirmed to be the result of very local field clearance (i.e. within 10 m of the cairn), representing boulders lifted from the top c. 35 cm of the platform fill. This observation will surely have consequences for the future recording and study of similar clearance cairns in the study area and elsewhere.

The excavations will be continued in 2021-2022 as part of the GIA Mediterranean Field School. At MSN,

excavation will be continued in the hopes of identifying the structures and features associated with anomaly 245g and the pebble pavement in trench II; the pits associated with anomalies 245b and e will be reopened to study details of their formation; and the excavation will be extended with further trenches to cover more of the circular anomalies. At RB228, excavation of the settlement platform will be completed, with a slight shift of the trench to the south-west in order to cover the full potential extent of cut features associated with the platform.

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Appendix: Monte San Nicola diagnostic finds catalogue

Dimensions are given in cm; colours follow the Munsell soil chart

MSN18IN8.30.2

Bowl fragment. Wide and shallow bowl with ribbed decoration, slightly inturning rim, rounded and slightly tapered lip.

Burnished surface, coarse impasto, few small inclusions, <0.25 mm

Exterior Gley1-3N3 (very dark gray), interior 10YR3/2 (very dark grayish brown)

H 2.2, W 3, Th 0.6, D (rim) 10

Date: FBA3

Parallel: Peroni & Trucco 1994, type 31b from Broglio di Trebisacce, Sector B West, lev. H

MSN18IN8.46.2

Bowl fragment. Short-necked rim, thickened to the outside and cut to the inside lip. A ring base fragment belonging to this bowl was not included in the drawing.

Smooth surface, coarse impasto, few small inclusions, <0.25 mm

Exterior 5YR5/6, 3/2 (yellowish red), interior 5YR3/2 (dark reddish brown)

H 3.2, W 5.2, Th 0.6, D (rim) 10.4

Date: EIA1a

Parallel: Trucco & Vagnetti 2001, type 216 from Torre Mordillo

MSN18IN8.55.1

Bowl fragment. Wide and shallow bowl, slightly inturning rim with ribbed decoration, rounded and tapered lip.

Burnished surface, coarse impasto, frequent small inclusions, <0.25 mm

Exterior and interior 7.5YR2.5/1 (black)

H 3.8, W 9, Th 1, D (rim) 22

Date: FBA3

Parallel: Peroni & Trucco 1994, type 31b from Broglio di Trebisacce; Peroni & Trucco 1994, Plate 141, nos. 12-14 from Bellolucco; see also MSN2B1.7

MSN18IN8.71.4

Bowl fragment. Wide and shallow bowl, inturning rim, rounded lip; horizontal handle attachment, rounded in section.

Burnished surface, coarse impasto, few small and medium inclusions, <0.50 mm

Exterior 2.5YR4/8, interior 2.5YR4/6 (red)

H 4.2, W 8.6, Th 0.6, D (rim) 21.6, D (handle section) 1.8.

Date: FBA-EIA1a

Parallel: Peroni & Trucco 1994: Plate 95.1, Broglio di Trebisacce, Sect. B West, lev. S3; Trucco & Vagnetti 2001: Fig. 69 no. 18, Torre Mordillo, Sect. EF8-10, US2, type 38; see also MSN2D6.35

MSN18IN8.63.7

Wall fragment. Incised decoration forming linear motifs. Burnished surface, coarse impasto, frequent small inclusions, <0.25 mm

Exterior and interior 10YR3/1 (very dark gray)

H 3.6, W 3.6, Th 1

Date: FBA3

Parallel: Peroni & Trucco 1994: Table 81.9, Broglio di Trebisacce, Sect. B West, layer 4, lev. 2, type 59, Motif E; Sect. B West, layer 4, Level S, sqq. V-W

MSN18IS14.90.1

Bowl fragment. Shallow bowl, inturning rim, flattened and cut to inside lip.

Burnished surface, coarse impasto, few small inclusions, <0.25 mm

Exterior and interior 5YR6/6 (reddish yellow)

H 4, W 6, Th 1

Date: FBA3-EIA1a

Parallel: Peroni & Trucco 1994: Plate 100.26, Broglio di Trebisacce, Sect. B West, lev. S; see also MSN18IW6.29.1

MSN18IW6.29.1

Bowl fragment. Shallow bowl, inturning rim, flattened lip.

Burnished surface, coarse impasto, few small inclusions, <0.25 mm

Exterior Gley 1/3N (very dark gray), interior 10R3/1 (dark reddish gray)

H 3.2, W 4.8, Th 0.8

Date: FBA3-EIA1a

Parallel: Peroni & Trucco 1994: Table 100.26, Broglio di Trebisacce, Sect. B West, lev. S; see also MSN18IS14.90.1

MSN18I7.59.2

Bowl fragment. Shallow bowl, inturning rim, cut to inside lip, incised decoration forming triangular motifs.

Burnished surface, coarse impasto, few small inclusions, <0.25 mm

Exterior and interior 10YR3/2 (very dark grayish brown)

H 3.4, W 5.6, Th 0.8, D 13

(MSN18I7.59.2 continued)*Date:* FBA3*Parallel:* Barbaro 2010: Fig. 76A no. 8**MSN18IS14.88.1**

High-necked vessel (rim and neck fragments). Convex neck, slightly outcurving outwards rim, tapered to the outside lip. Matt-painted decoration with three horizontal lines on the rim and a band of triangular motifs on the neck, formed by two horizontal lines enclosing sets of oblique parallel lines.

Plain surface, depurated clay

Exterior and interior 5YR7/6 (reddish yellow), decoration 5YR6/4 (light reddish brown)

Th 0.4, D 15.6; rim fragment: H 6.2, W 3.8, neck fragment: H 3, W 3.8

Date: FBA3–EIA1a*Parallel:* Yntema 1990: Fig. 6 no. 1.**MSN18IS14.87.1**

Biconical and ribbed spindle whorl.

Smoothed surface, common small and medium inclusions, <0.50 mm

2.5YR4/4 to 3/4 (reddish brown to dark reddish brown)

H 2, D max 2.6, D central hole D 0.6

Date: FBA3

Parallel: Peroni & Trucco 1994, type 92B3, Broglio di Trebisacce, Sect. West, lev. H

MSN2S.30

Spindle whorl, globular shape.

Smoothed surface, common small and medium inclusions, < 0.50 mm

7.5YR5/6 to 4/1 (strong brown to dark gray)

H 2.4, D max 2.8, D (central hole) 0.6

Date: FBA3–EIA1a

Parallel: Although a long duration type, fabric and context suggest a date in the range FBA–EIA. Similar objects come from FBA3–EIA1 levels at Broglio di Trebisacce (Peroni & Trucco 1994, Sector B West, lev. S3+H, sq. C, Plate 94.18; lev. S, sqq. U–V–W, Plate 100.10); see also Negroni Catacchio 1995: Fig. 146 nos. 76 and 77, Sorgenti della Nova

MSN2B1.7

Bowl fragment. Shallow and wide bowl, slightly inturning rim with ribbed decoration, tapered and cut to the inside lip.

Smoothed surface, coarse impasto, frequent small and medium inclusions, <0.50 mm

Exterior 7.5YR4/2 to 3/2 (brown to dark brown), interior Gley 1–4N (dark gray)

H 2.6, W 4.8, Th 0.7, D (rim) 14.5

Date: FBA3

Parallel: Peroni & Trucco 1994, type 31b; see MSN18IN8.55.1

MSN2D6.38

Bowl fragment. Shallow and ribbed bowl, inturning rim, tapered lip.

Smoothed surface, coarse impasto, a few small and medium inclusions, <0.50 mm

Exterior 2.5YR5/6 (red), interior Gley 1–2.5N (black)

H 1.6, W 2.4, Th 1

Date: FBA2/3–EIA1a*Parallel:* Trucco & Vagnetti 2001, type 45, Torre Mordillo**MSN2C2.15**

Rim fragment of a lid. Lip thickened to outside and flattened.

Smoothed surface, coarse impasto, frequent small and medium inclusions, <0.50 mm

Exterior 7.5YR5/6 to 5/4 (strong brown to brown), interior 10YR5/1 (black)

H 1.8, W 3.1, Th 0.5, D 10.5

Date: FBA3–EIA1a**MSN2D6.35**

Bowl fragment. Shallow and wide bowl, inturning rim, rounded and tapered lip; attachment of horizontal handle, concave in section with small concave dell on top.

Burnished surface, coarse impasto, frequent small and medium inclusions, <0.50 mm

Exterior 10YR4/1 (dark gray), 7.5YR6/4 (light brown), interior Gley 1/2.5N (black)

H 5.6, W 6.8, Th 1.4, D (rim) 24.4, handle 5.4 × 6, handle section 2.6 × 1.8

Date: FBA3–EIA1a

Parallel: Peroni & Trucco 1994: Plate 95.1, Sector B West, lev. S3; Trucco & Vagnetti 2001: Fig. 69 no. 18, Sect. EF8–10, US2, type 38; see also MSN18IN8.71.4

MSN2G1-2.22

Bowl fragment. Quite deep bowl, inturning rim, circular boss on the rim, horizontal handle attachment.

Smoothed surface, coarse impasto, frequent small and medium inclusions, <0.50 mm

Exterior 10YR4/2 (dark grayish brown), interior Gley 1/3N (very dark gray)

H 3, W 4.4, Th (wall+boss) 1.2, Th wall 0.8, D (rim) 10.8, handle section 2 × 1.1

Date: FBA3

Parallel: Trucco & Vagnetti 2001: Fig. 54 no. 3, US 51, Torre Mordillo

Plate 1. Pottery fragments from MSN2018 mentioned in the text, scale 1:2 unless otherwise stated (drawings A. Sotgia, M. Los-Weijns, GIA).

Plate 2. Pottery fragments from MSN2019 mentioned in the text, scale 1:1 unless otherwise stated (drawings A. Sotgia, M. Los-Weijns, GIA).