

REGIONAL ARCHAEOLOGICAL PATTERNS IN THE SIBARITIDE
PRELIMINARY RESULTS OF THE RPC FIELD SURVEY CAMPAIGN 2000¹

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ABSTRACT: In the late summer of 2000 members of the Groningen Institute of Archaeology carried out a three-week archaeological field survey in the Sibaritide (Calabria, South Italy) within the framework of the Regional Pathways to Complexity project, a joint undertaking by the archaeological institutes of Groningen University and the Free University of Amsterdam. The survey area is located opposite the protohistorical site of Francavilla Marittima that is currently being excavated by the Groningen Institute of Archaeology and transects a series of marine and fluvial terraces along the river Raganello. The survey covered 125 hectares intensively and 315 hectares extensively. The aims of the survey were twofold; to compare the results obtained by modern survey methods such as adopted by the RPC project with those from earlier region-wide topographical surveys in order to identify possible biases in the older regional data sets; and to add to the earlier piecemeal site catchment surveys carried out by the Groningen Institute of Archaeology as part of the Francavilla Marittima excavations in the period 1991–2000. Following a description of the survey and finds processing methods employed, the results of the survey are presented and discussed in two main chronological phases (protohistory and Hellenistic/Roman). Finally, implications for future research in the catchment of Francavilla Marittima are laid out.

KEY WORDS: Archaeological survey, South Italy, Francavilla Marittima, protohistory, Bronze Age, Iron Age, Hellenistic period, Roman period, settlement patterns, bias modelling.

1. INTRODUCTION

This article presents a preliminary report on the October, 2000 field walking survey campaign of the Regional Pathways to Complexity (RPC) project in the Sibaritide (northern Calabria, Italy), focusing on the study of spatial and chronological patterns in the archaeological record and their interpretation in terms of regional settlement history.

From 1991 onwards, the Groningen Institute of Archaeology has conducted annual excavations at the hilltop sanctuary and settlement areas of Timpone Motta at Francavilla Marittima, with occasional limited field surveys in the immediate neighbourhood of that site (Attema et al., 1998, 2000; Maaskant-Kleibrink, 2000 (with references to earlier publications)). In 1997, the Sibaritide became one of three regions being studied in the context of the RPC project run jointly by the archaeology departments of the University of Groningen and the Free University of Amsterdam (both in the Netherlands).² The central aim of the RPC project is to study regional processes of centralisation, urbanisation, and colonisation which have occurred from the Iron Age onwards, and especially to evaluate the relative importance of internal and external contributing factors to these processes. Among several approaches toward that aim is the detailed study of the relations between the regional landscape and its settlement history at various spatial and temporal scales. It requires the modelling of landscape characteristics within a GIS environment, and the

application of careful ‘source criticism’ of the available archaeological data. Fieldwork, especially survey, has been used in an attempt to fill gaps and assess biases in these data.

2. THE SIBARITIDE

The Sibaritide is an alluvial plain on the Gulf of Taranto (part of the Ionian Sea), bounded on the landward side by the Pollino massif (to the north) and the Sila mountain range (to the south). It is named after the ancient Greek colony of Sybaris, which lies in the approximate centre of its coastline. Since, on the one hand, its history of settlement and land use has been largely determined by the possibilities afforded by the physical and natural environment and, on the other, its archaeological record has been conditioned (through the medium of recent land use and land cover) by that same environment, a brief review of the geology, climate, and land use of the study area will be given here.

2.1. Geology

The Sibaritide is a roughly triangular coastal lowland, formed mainly in the Quaternary by the accumulation of erosion products from the Pollino mountain range to the north and the Sila mountains to the south. A series of stepped fossil coastlines, up to an altitude of several hundred meters above the present sea

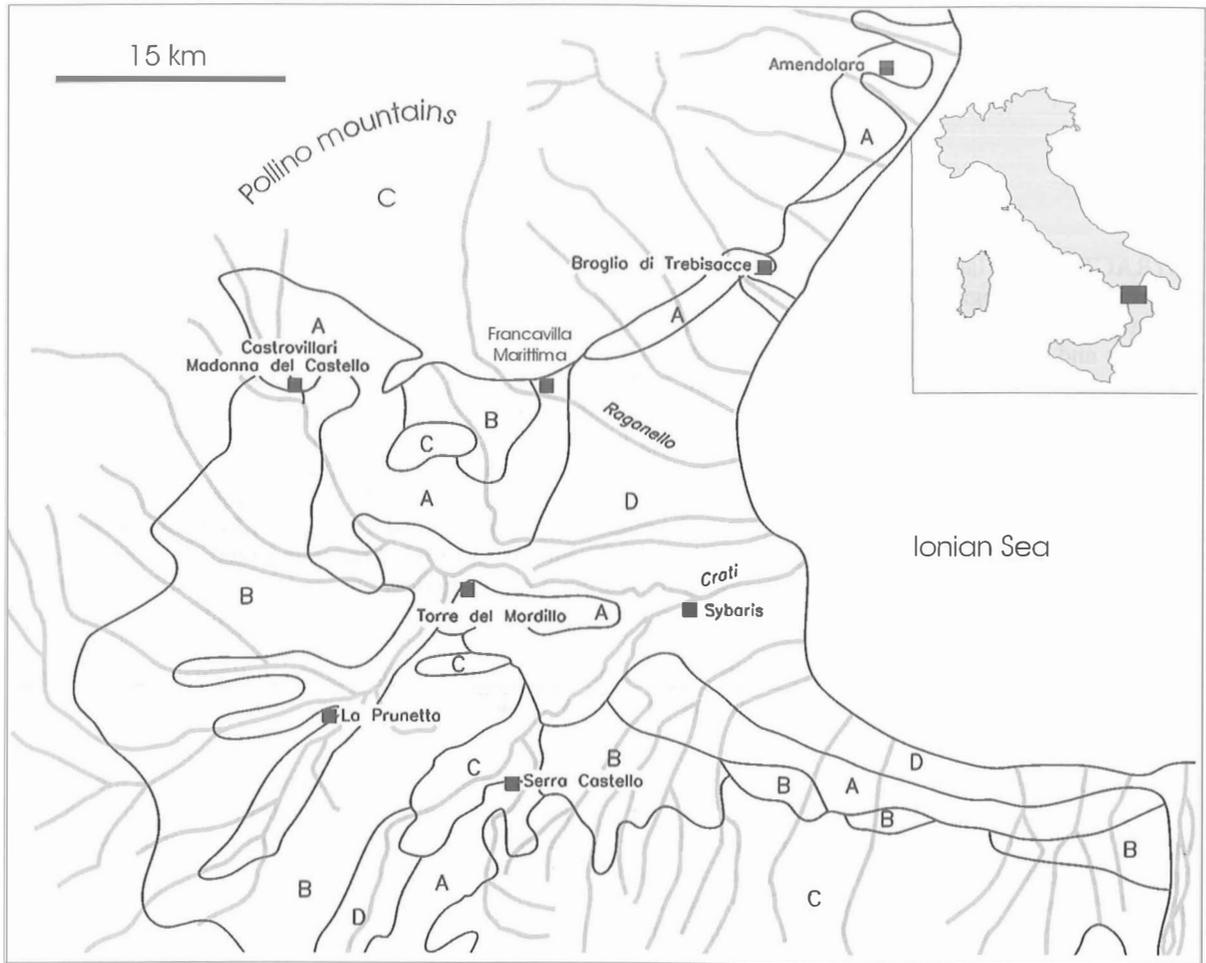


Fig. 1. Major landscape units of the Sibaritide. The coastal and alluvial plains (D) are surrounded by terraced (A) and non-terraced (B) marine and fluvial sands and conglomerates which merge into the lower slopes of the Pollino and Sila ranges (C).

level, can be recognised in these loose sediments and conglomerates. Each is represented by a relatively steeply sloping 'cliff' and a weakly sloping (5%) fan-like 'terrace'. These stepped coastlines possibly were the result of the interplay of tectonic uplift of the area and changing sea levels due to climate changes in the Quaternary. Fluvial erosion and deposition must have accompanied these changes in climate through changes in vegetation cover, river regime and sea level. As vegetation cover increased at the onset of the Holocene, the rate at which sediment was transported must have slowed down. However, the sedimentation rate in the coastal plain could still have been considerable in human terms, and the alluvial deposition of several meters of sediments could easily have changed local hydrogeography. Erosion in the hinterland and sedimentation in the coastal lowlands are ongoing processes, though now mostly as a consequence of violent winter storms. Their effects, how-

ever, have in historic times been minimised by regulatory works such as river bank reinforcements.

Given the very dynamic geology of the Sibaritide, in which for example the Greek colony at Sybaris lies below six to eight meters of alluvial deposits, the archaeological record of the plain can only be interpreted with reference to palaeogeographical reconstructions. However, the late Holocene deposits are generally too thick for a manual auguring programme to succeed, although the mechanical augerings taken in the course of the 1960s search for Sybaris demonstrate that a dedicated coring program is not impossible (Rainey & Lerici, 1967).³ Turning to the mountainous inland parts of the Sibaritide, geomorphology and land use are such that surveys of large contiguous areas are impossible. These two zones are therefore generally unsuitable for survey, and the opportunistic study of available sections is the only low-budget option open to researchers. The location

of our survey transect across the transitional zone, consisting mainly of the aforementioned marine and fluvial terraces of the Raganello river, was therefore largely determined by the geomorphological structure of the region. However, as will be made clear below, there were other archaeological reasons to concentrate research in this zone as well.

The legend of the most recent detailed geological map of the area (CGC 1969) allows us to establish that there are four main formations in the study transect. From lowest to highest these are:

1) Alluvial deposits held in place by vegetation or artificial works; morphologically, these consist of a single alluvial fan emanating from the Raganello valley;

2) Yellow-red sands and pebbly sands associated with conglomerates consisting of well-cemented rounded pebbles; this formation includes clayey intercalations and, locally, banks of yellow-green clays and silts; morphologically the formation consists of three terrace levels. The formation is highly permeable but can resist erosion well locally, depending on the degree of cementation of the deposits;

3) Grey-blue clays, often intercalated with sand lenses, and conglomerate sands. This formation occurs only in one area near Lauropoli, is easily eroded and is prone to slumping especially where sandy layers abound; the permeability of the deposits is generally low; and

4) Well-cemented coarsely stratified conglomerates consisting of large calcareous pebbles and rounded sandstones, on occasion of pebbly or large-grained sands, locally with silty or clayey lenses. With a generally high permeability, the local sensitivity to erosion of this formation depends on its degree of cementation.

2.2. Climate and land use/land cover

A fairly detailed discussion of the current climate and land use of the Sibaritide can be found in D'Angelo and Oràzie Vallino (1994: pp. 785–792), who note that the climate of the terraces and foothills is more pleasant than that of the coastal plain, with more frequent rains because of the surrounding mountain, and less oppressive heat in the summer and autumn because of the wind and altitude. The highland is even more wet and cool, and is suitable for transhumance in summer. The larger part of the survey transect nowadays is given over to arable land and a mixture of old and new olive groves, the latter giving rise to extensive soil disturbance (deep ploughing, levelling) and cultivation of previously marginal zones (especially steep slopes). The arable is apparently used for grain crops and, in at least one recorded case, maize for which a previous vineyard had recently been uprooted. Other lesser types of land use in the survey zone include grassland, a rubbish dump,

and small almond groves, but a considerable amount of land especially in and around the dry gullies is still unused and covered in the local thorny *macchia*. The prevalence of the latter increases with elevation, whilst the accessibility decreases. A marked contrast exists with the land utilisation types mapped in the early 1950s (CNR 1956a, b); at that time, less intensive forms of agriculture such as olive groves and grassland occurred over larger parts of the survey zone, at the expense of the arable (macchia appears not to have been mapped).

3. RESEARCH HISTORY

Following the discovery of Sybaris and its Hellenistic and Roman successor towns through the combined efforts of the University of Pennsylvania Museum and the Lerici foundation (Lerici, 1960: pp. 303–337; Rainey & Lerici, 1967; Rainey, 1969: pp. 261–273), an approximately 21 by 24 km (500 km²) area⁴ in the centre of the region was surveyed by a team under the direction of the young Lorenzo Quilici, who is now a senior professor at the University of Bologna. Quilici aimed both to provide a context for the excavations starting at Sybaris in 1969 and to record surface archaeology in advance of land development schemes funded by the Italian *Cassa per il Mezzogiorno* (De Rossi et al., 1969: p. 147). In what follows we shall refer to this survey, for brevity's sake, as the 'Quilici survey', and to its results as the 'Quilici data set'. Following their desktop study of the records held by the Soprintendenza archeologica della Calabria, the study area was divided into three zones, each 'topographically' surveyed by one or two members of the team. In addition to revisiting and evaluating the known sites, many new sites and monuments were discovered as well. The results were recorded on a total of 858 forms and 23 sheets of the 1:10,000 map series published by the 'Cassa per il Mezzogiorno', but were considerably condensed for publication. The whereabouts of the original survey archive are currently unknown. The nearly 800 sites of archaeological interest collected from documented evidence or recorded in the field by this team still provide the bulk of the archaeological record for the region — later additions being of a piecemeal nature — and are therefore the primary subject of the study reported here (see fig. 2).

Additional work on the protohistoric settlement history of the Sibaritide was published by the excavator of Broglio di Trebisacce, Renato Peroni, based on a series of surveys conducted since 1979 by the University of Rome in conjunction with the Superintendency for Calabria (Bergonzi et al., 1982; Peroni, 1994; Peroni & Trucco, 1994).⁵ By contrast, very little primary research has been done on either the classical and Hellenistic Greek period, or the

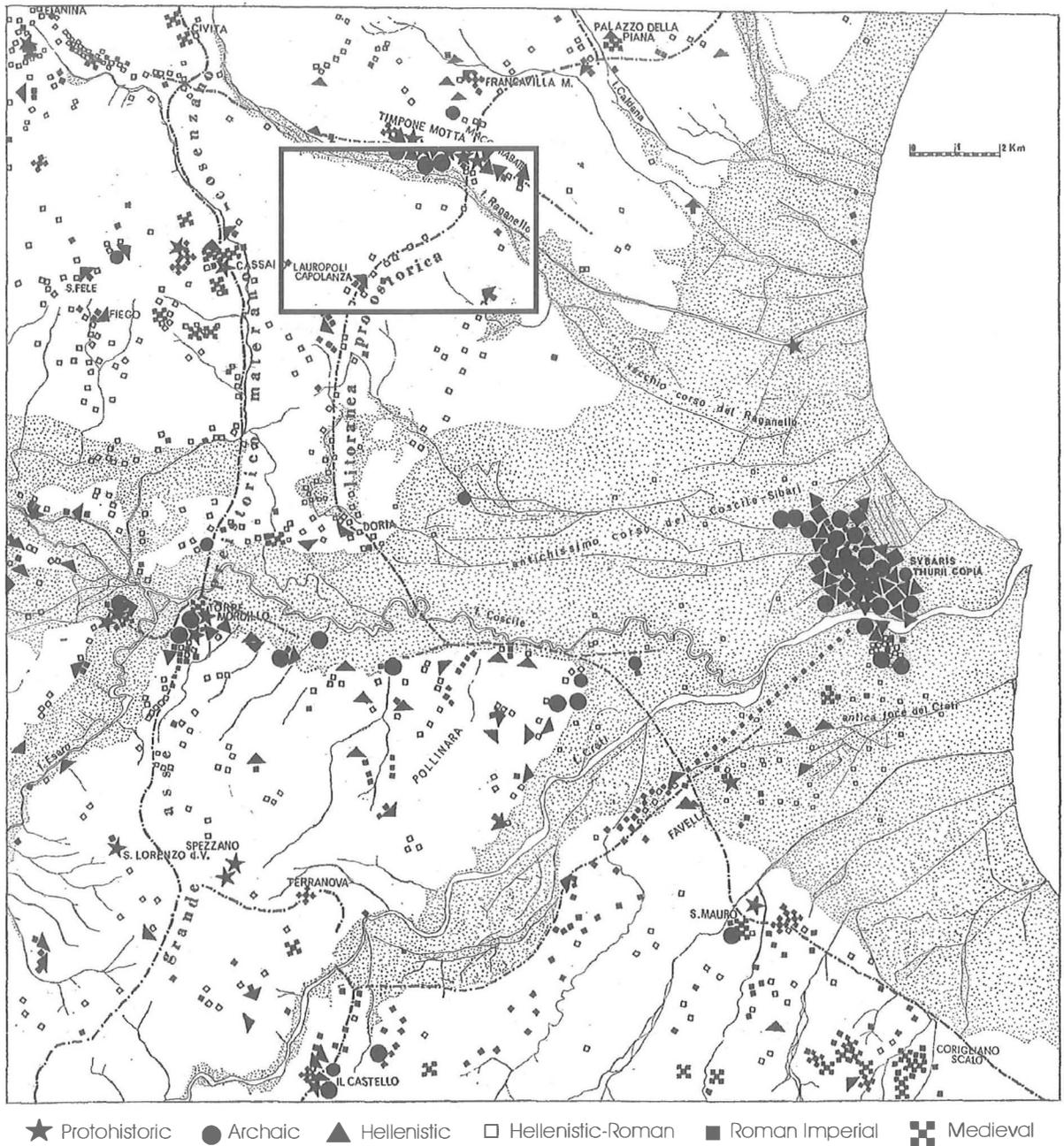


Fig. 2. Distribution of settlements by period from the Quilici survey (after De Rossi et al., 1969: fig. 3). Dithered areas: alluvial deposits. The rectangle indicates the area in which the RPC survey took place.

subsequent late Republican and Imperial Roman period in the Sibaritide outside of Sybaris itself; here we must rely on the general literature regarding Magna Graecia and the Roman Empire. Since 1991, the Groningen Institute of Archaeology has been involved in excavations at the protohistoric/Archaic hilltop sanctuary of Timpone della Motta and its settlement. These excavations have given rise to

largely unpublished preliminary and exploratory surveys in the immediate surroundings of the Timpone Motta, extending on occasion to neighbouring Monte Sellaro (Feiken & Weterings, 1998) and further along the foot slopes towards Broglio di Trebisacce (Haagsma, 1996).

In 1994, Haagsma and Delvigne conducted unsystematic field checks on settlement sites identified

by the Quilici survey between the Timpone Motta and Broglio (Haagsma & Delvigne, unpublished notes). These revealed that the lowest-lying of the marine terraces were already settled in the Middle Bronze Age while the upper parts of the coastal plain were not; a Late Bronze Age site was found on the Timpa del Castello, a rocky outcrop above the present village of Francavilla Marittima.⁶ Their survey yielded no identifiable Iron Age or Roman material, but did locate some of the 6th century BC Archaic *impasto* missing from the earlier Quilici survey results. Based on this work Haagsma (1996) suggested that Roman intensive land use may have avoided the foothills and may have been concentrated in the coastal plain. In 1995, and again in 1998, several small field surveys were conducted by students of Kleibrink in settlement and cemetery zones around the foot of the Timpone Motta. The 1995 survey by Kleibrink and Waterbolk (reported in Haagsma, 1996) found a lot of material then interpreted as having been 'washed off the Timpone', but only one small Archaic site; Haagsma and Attema also located a 6th century wall segment and kilns associated with a settlement on the lowest plateau of the Timpone della Motta. A subsequent reassessment of the stored material from this survey by Attema and De Haas resulted in the definition of several new sites, including the Archaic/Classical extension to the Iron Age cemetery of Macchiabate belonging to the settlement on the Timpone della Motta (De Haas, 2001: pp. 18–19).

Despite covering only very small areas and few sites, these surveys provide significant additional information in the form of evidence for periods 'missing' from the Quilici data set, such as the Archaic (6th century BC), and for continuity and change in the processes of centralisation and acculturation between the indigenous Oenotrians and the Greek colonists.

4. PATTERNS AND BIASES

The interpretation of regional archaeological records in terms of a history of settlement and landscape must be informed by an assessment of the biases that might conceal or produce patterning in those records. A cursory look at the geological map of the Sibaritide shows that alluviation of the coastal plain must have been a factor of major significance, resulting in an almost total lack of find spots below a quota of 25 m asl and in the alluvial plains of the Crati and Coscile rivers extending into the hinterland (dithered areas in fig. 2). Other factors which previous studies have suggested to be *a priori* causes of significant biases in the archaeological record are: the land use and land cover (abbreviated in what follows to 'LULC') at the time of the survey, the accessibility given the contemporary infrastructure, and the se-

lectivity inherent in the methodology employed for the survey.

Accordingly, the main aim of the SIBA'00 survey campaign has been to assess the influence these factors had on the quality of the extant archaeological record, that is, primarily of the Quilici data set. Since we were unsuccessful in obtaining the necessary information, this assessment had to be obtained through a combination of targeted desktop and field studies.

In order to assess the influence of land use/land cover around the time the Quilici survey took place, a land utilisation map depicting the situation of the early 1950s at a scale of 1:200,000 was digitised and georeferenced (CNR 1956a, b).⁷ This map shows that the Sibaritide plain was dominated at that time by arable (*seminativo asciutto*) but that a fair amount of grazing land (*pascolo ed incolto prodottivo*) was also present; olive groves and arable dominated the foothills (to which fruit- and vineyards may be added especially in the area around the town of Cassano allo Ionio); while the higher slopes of the Pollino were mostly down to wood- and grazing land.

The frequency of Quilici sites with regard to land use was tested for deviations from randomness, using the χ^2 -test after removing all alluvial areas below 25 m asl. Table 1A lists the preliminary results of this test, which indicate that there is a strong correlation between land use and site density.⁸ As we can see, the frequency of sites in woodland (cats 13 and 14 combined) is low with only nine observed sites where 22 would have been expected given that 3.3 percent of the study area is covered in woodland. Similarly, 52 observed sites in mixed vineyard-olive grove (cat. 9) against an expected number of 24 represents a significant deviation from randomness. Of the land use types that occur most frequently, dry arable with trees (cat. 2) is slightly favoured with 56 sites against an expected 39, while productive grass- and uncultivated lands (cat. 19) is slightly avoided with 75 sites against an expected 103. However, in order to satisfy all of the requirements for this test, some land use types must be grouped together so that the expected number of sites per category is less than five in less than 20% of categories (see fig. 3).

The results of a second χ^2 -test (table 1B) confirm that land use and site location correlate very significantly (far above the 0.1% level of significance). However, they also show that none of the three most frequent land use types (dry arable, olive groves, and rough grazing lands) has had a dramatically positive or negative influence on the number of sites discovered. Interpretation of these results is not straightforward, not just because land use at the time of the Quilici survey may have been significantly different from the land use that was mapped in 1956, but also because the clustered nature of archaeological site

Table 1. Results of a χ^2 test of 666 Quilici sites against 1956 land utilisation types. 751 sites in region of 350 km².

Site characteristics	% cover	Expected sites	Actual sites	χ^2
<i>(A) Raw results</i>				
(0) No data			85	
(1) Seminativo (asciutto)	46.4	309.1	325	0.817
(2) Seminativo arborato (asciutto)	5.9	39.1	56	7.348
(3) Seminativo irriguo	0.6	4.2	4	0.010
(4) Seminativo arborato irriguo	0.5	3.3	0	3.318
(7) Vigneto	2.1	13.8	12	0.231
(8) Uliveto	20.5	136.8	122	1.597
(9) Vigneto-Uliveto	3.5	23.6	52	34.225
(10) Agrumeto	0.3	2.0	2	0.000
(11) Frutteto (frutta polposa)	0.1	0.5	0	0.494
(13) Bosco ceduo	1.1	7.2	1	5.387
(14) Bosco d'alto fusto	2.2	14.7	8	3.042
(19) Pascolo ed incolto produttivo	15.5	102.9	75	7.568
(20) Sterile	0.2	1.2	0	1.240
(21) Insediamenti ed altre forme	0.8	5.2	9	2.854
(99) Acque	0.4	2.4	0	2.449
Totals	100.0	666.0	666	70.579
<i>(B) Results after reclassification</i>				
(0) No data			85	
(1 & 2) Seminativo asciutto	52.6	350.1	381	2.727
(3 & 4) Seminativo irriguo	1.1	7.6	4	1.683
(7) Vigneto	2.1	13.9	12	0.250
(8) Uliveto	20.7	137.5	122	1.756
(9) Vigneto-Uliveto	3.6	23.7	52	33.721
(10 & 11) Agrumeto / Frutteto	0.4	2.5	2	0.094
(13 & 14) Bosco	3.3	22.1	9	7.727
(19) Pascolo ed incolto produttivo	15.5	103.5	75	7.838
(21) Insediamenti ed altre forme	0.8	5.2	9	2.795
Totals	100.0	666.0	666	58.591

records makes them notoriously subject to spatial autocorrelation effects.⁹

As an example of the former, it seems *a priori* unlikely that the Quilici team could have observed even as many as 75 sites under the very adverse visibility conditions of grass- and uncultivated land (see table 1B, cat. 19). And indeed it may not be coincidental that the Quilici sites falling within the SIBA'00 survey transect (see Section 7 below) appear to cluster within one such zone of grass- and uncultivated land. Perhaps these areas had already been brought under the plough by the time the Quilici team surveyed the area in the late 1960s. Access to the original survey records will play a very important role in assessing the significance of the land use changes that may have taken place in the 1960s.

Quilici himself adduced an example of the latter effect, interpreting one dense cluster of sites located near the town of Eianina as part of a large roadside settlement within the territory of the Roman colony

of *Interannium* (De Rossi et al., 1969: pp. 9–10).¹⁰ Figure 3 shows the land use around the cluster to be the otherwise rare category of mixed vine- and olive yards (table 1B, cat. 9). In combination with the fact that neither vineyards nor olive groves in monoculture (cats 7 and 8) give rise to anything like the observed high frequency of archaeological site locations in the mixed unit, the high frequency must be caused by the spatial clustering of the sites rather than by particularly favourable land use at the time of the survey — whatever that may turn out to have been.

The distinct linear clustering of sites, which Quilici himself interpreted as an indication of the existence of 'villages' along proto- and early historic routes, could also be caused by biases in the Quilici survey itself. With a survey universe (excluding the coastal plain) of some 350 km² it is clear that the survey team could not possibly have systematically covered everything. It would instead have had to focus on those areas that were most likely (from

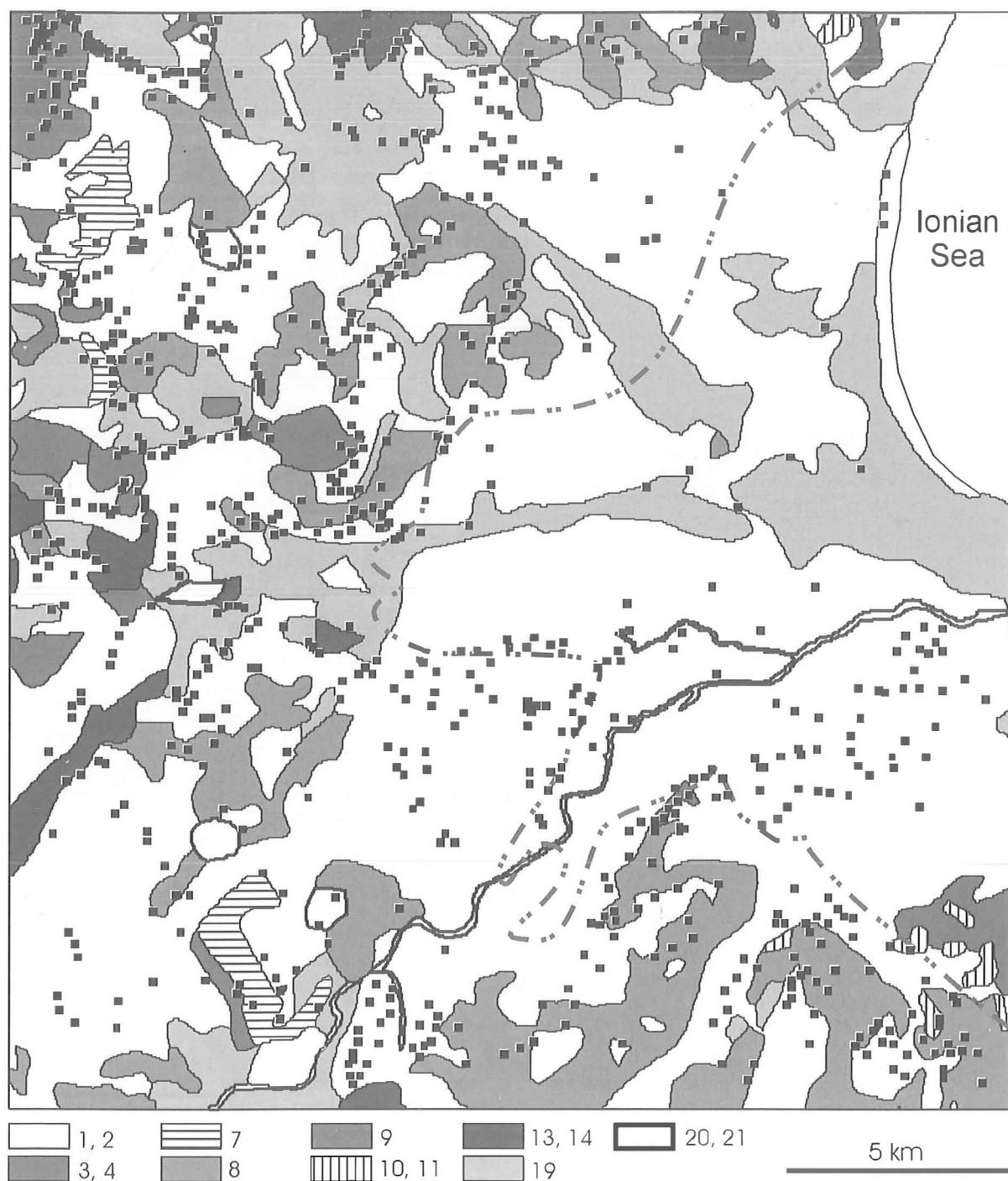


Fig. 3. Distribution of Quilici sites across 1956 land utilization types. Legend: see table 1B. Dashed line indicates approximate location of the 25 m elevation contour.

previous finds) to contain sites and which could be reached within a reasonable amount of time by road or track. Figure 4 again shows the Quilici data set, this time against the background of a relief map, and in relation to towns and metalled and semi-me-

talled roads digitised off the IGM 25V map series. The proximity of sites to infrastructure seems fairly straightforward in some areas, especially if we remember that minor tracks were not digitised.



Fig. 4. Association of the Quilici data set (dots) with modern accessibility circa 1956 (paved roads only); 25 m elevation contour indicated by dashed line.

These preliminary studies therefore indicate that the potential of further bias modelling for the Quilici data set must be explored when the original research archive has been located. The second method for assessing biases in the Quilici data set is through field studies designed to detect archaeological materials present in areas, or from periods, that Quilici and his team might have ignored or been unable to detect. These studies are the subject of the next section.

5. THE SURVEY: APPROACHES

The approach taken by us was to select a representative transect through the transitional zone between the coastal plain and its mountainous hinterland, consisting of marine and fluvial terraces (the first and second geological formations discussed above), and to see how the recorded sizes, locations, interpre-

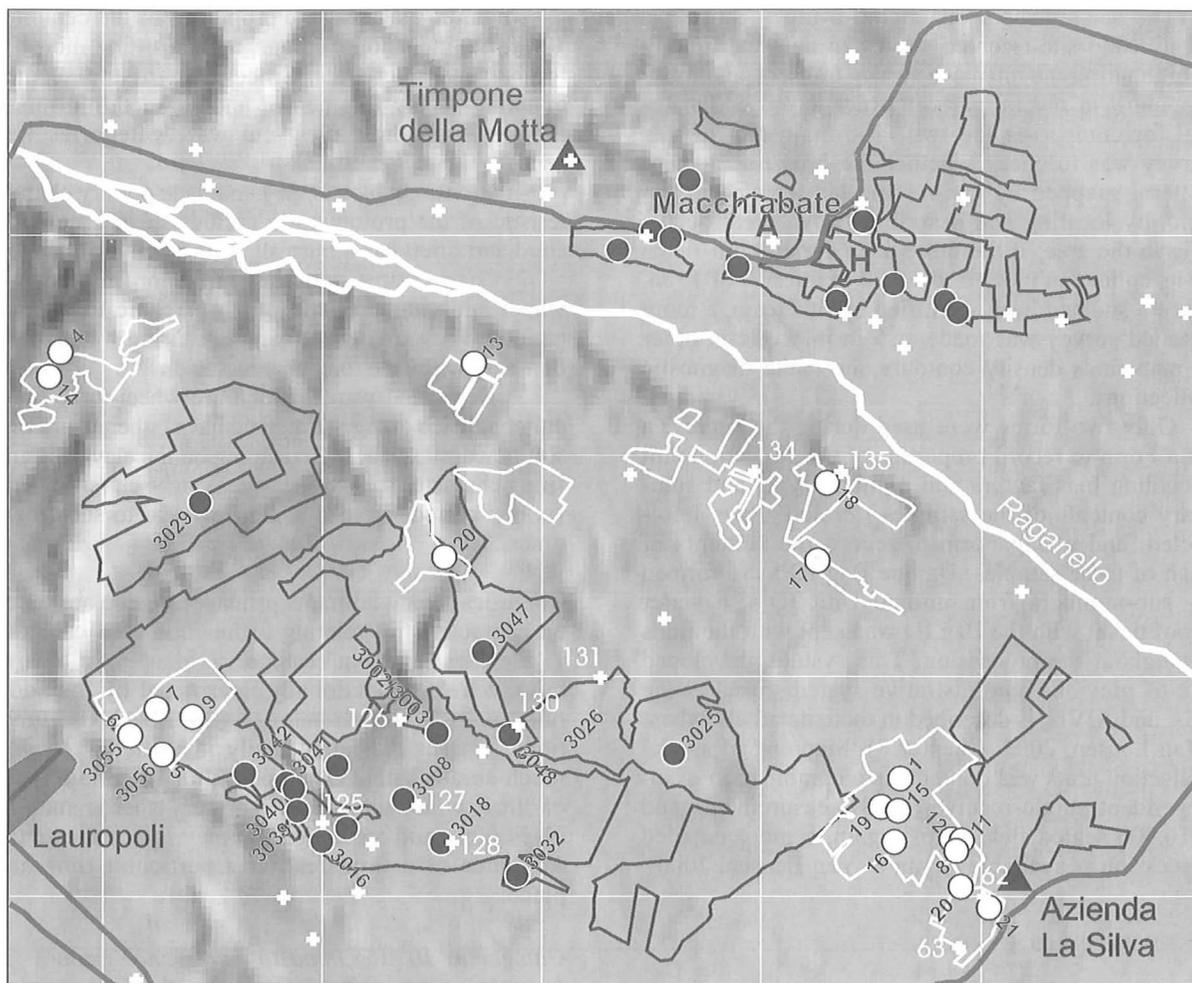


Fig. 5. The SIBA2000 fieldwork transect (excluding Monte San Nicola). Extensive (black) and intensive (white) survey areas. Plus signs: Quilici sites; circles: RPC sites and scatters.

tations and dating of the sites mapped by Quilici and his team compare with the current archaeological surface record. The transect was approximately 6 km long and 1.5 km wide and located between the valley of the Raganello river and the modern town of Lauropoli (fig. 5). The second geological formation, which is morphologically divided into four distinct levels or 'terraces', is today used for the most intensive forms of agricultural exploitation, consisting of mostly arable fields but with large sections given over to olive culture; due to the extremely restricted surface visibility in the other three units, our survey took place almost entirely within this unit. Archaeological sites mapped by Quilici and his team are also exclusive to this unit.

The SIBA'00 survey was conducted using two teams working independently and studying the same general area at two different spatial scales. The first team used methods developed in recent years for a

high-intensity survey of all available fields within a 5 by 1 km transect running parallel to the Raganello river, and covering all four main geomorphologic units (fluvio-marine terraces). In this survey, agricultural fields were subdivided by pacing into units approximately 50 by 50 m (0.25 ha) in size, and these were walked at 10 m intervals, with all manmade materials collected except those that were of obviously recent date. Further samples were collected if circumstances (such as an increase in finds density) warranted. In order to assess the effect of differential visibility on the recovery rates, five factors affecting the recovery of archaeological materials were recorded separately for each collection unit, on a scale of 1 to 5: stoniness, shadiness, vegetation cover, tillage/dust, and amount of recent material on the surface; an estimate of the total visibility, again on a scale of 1 to 5, was also made.

The second team conducted a much more extensive and site-oriented survey in an area directly neighbouring the intensive survey transect, and overlapping it in several parts in order to provide material for comparing the two. The main aim of this survey was to check whether the *broad* settlement patterns mapped by Quilici and his team were upheld, by locating and describing any 'sites' occurring in the area; it therefore used agricultural fields as its collection units, and a walker interval of 15 m. Once a site had been identified by this team, a more detailed survey was made at 5 m intervals in order to map finds density contours and make diagnostic collections.

Only two forms were used during the survey: a Unit Form to record properties of the collection unit including bias factors and number, type, and summary contents of the samples (termed 'Bags') collected; and a Bag Form to record the contents of each of these samples. Unique Bag ID's are formed by sub-numbers from unique Unit ID's; a water proof ticket with the Bag ID was kept with the finds throughout the processing. This system, developed out of previous administrative systems used at the GIA and AIVU, is described in more detail elsewhere (Van Leusen, 2002: Chapter 8). Mapping of spatial collection units was done using a combination of independent single-receiver GPS measurements and 1:10,000 scaled field maps; again, a more detailed discussion is available (Ryan & Van Leusen, 2000).

6. FINDS PROCESSING

Rather than making any decisions about the significance of the finds in the field, the intensive survey team simply collected the finds for processing and interpretation at the survey base. For the purpose of tracking individual finds bags, a simple system of check-boxes was used on the field forms for each collection unit. Processing at the survey base began with washing and drying, after which all finds were classified by the second author according to the system laid out in table 2. Both survey teams together collected some 210 kg of material (some 6000 finds) from 610 collection units, of which 70 kg were classified during processing as largely recent or sub-recent tile/brick (subsequently discarded). Table 2 provides the breakdown of these totals by material category. The column headed '%arch' gives the relative weights per category when considering only pre-modern ceramics (totalling 129.2 kg).

6.1. System of classification

The main aim of the classification of ceramic wares used in the SIBA'00 survey was to assign dates and functions to the material found. The classification is

based on the macroscopic properties of the ceramics — fabric, inclusions, colour, thickness and morphological characteristics. Since most of the surface material is very fragmented and abraded, a primary division into three clear-cut ware categories was used:

1) *Impasto*, which is the handmade pottery characteristic of the protohistoric periods. It is irregularly fired and often has a burnished surface;

2) Coarse wares, which are turned or finished on a wheel and characteristic of the Archaic to Roman periods. They are generally orange firing wares made of a clay with fine to coarse inclusions;

3) Depurated wares, which are wheel-turned and either pale- or orange firing and have either a hard or a soft powdery surface. Depending on the clay base and firing characteristics, these wares can be classified into various periods from the late Iron Age to sub-recent times.

Classifications within this primary division are based on characteristics relating to function (e.g. category 1 'tile' is a functional category; category 2a 'coarse thick ware' is functionally interpreted by the addition '*pithos*'). Sherds belonging to these broad functional classes are fairly easily identified even in a much-abraded state. The association of certain types of tiles, *pithoi* and datable pottery sherds such as black gloss and *terra sigillata* may then indicate the existence of a farmstead at a particular time and place.

Categories 10, 13: Impasto wares and 'grumi'

Impasto wares are hand-formed, with coarse temper and varying types of surface finish. In principle they can be classified by form, thickness, finish and decorations into various wares, but the SIBA'00 material allows only a simple division to be made between the well-burnished early to middle Iron Age ware found near Monte San Nicola and the undiagnostic and often abraded sherds of late Iron Age ware found elsewhere. *Grumi* (burnt daub) appears as orange-red low-fired crumbs in ploughed fields and by itself cannot be dated; in association with *impasto* or dated archaic wares it may be assigned to one of these periods.

Categories 1a, 2a-c, 5a: Coarse wares

These are coarse wheel-made wares of red firing fabrics containing visible temper, production of which began in the Archaic period and continued through the Hellenistic period. Wares can be classified by form and thickness into tiles, storage, kitchen, and table wares. A further form-based subdivision of coarse wares is envisaged, but must await closer study of the material (cf. Attema et al., 2000: Appendix 1) and comparison with collections from regional excavated contexts.¹¹ In total, coarse material

Table 2. Material categories used in summary classifications of the RPC field survey campaign 2000 survey finds, with preliminary total counts, weights, and percentage by weight of pre-modern ceramics.

Cat.	Description	Count	Weight (g)	% arch
<i>I</i>	<i>Tile</i>	230	36300	—
1a	Coarse tile	144	22955	17.8
1b	Depurated antique tile	84	13220	10.2
d	(sub-) recent tile	2	125	—
<i>2</i>	<i>Coarse wares</i>	1208	45321	—
2a	Coarse thick ware (pithos)	175	27970	21.6
2b	Coarse medium thick ware	942	16820	13.0
2c	Coarse thin ware	91	531	0.4
<i>3</i>	<i>Depurated wares</i>	2134	23335	—
3a	Depurated orange ware	457	4783	3.7
3b	Depurated pale ware	1677	18552	14.4
<i>4</i>	<i>Fine wares</i>	70	718	—
4a	Black gloss/banded ware	62	638	0.5
4b	Terra sigillata	6	75	0.1
4c	Thin hard painted fine ware	2	5	0.0
<i>5</i>	<i>Indeterminate wares</i>	2102	91712	—
5a	Indeterminate coarse ware	300	8532	6.6
5b	Indeterminate depurated ware	396	13567	10.5
5c	Indeterminate (sub-) recent ware	1406	69613	—
<i>6</i>	<i>Combed wares</i>	10	140	0.1
<i>Other wares and materials</i>				
7	Glazes ware	11	225	0.2
8	Hard red ware, medium thick	32	485	0.4
9	Lithics	10	75	—
10	Impasto wares	42	730	0.6
13	Grumi	72	2625	—
14	Glass	5	55	—
15	Waster	8	2760	—
16	Slag	19	6215	—
	Totals	5936	210696	100.1

(cats 1a, 2a–c) makes up almost 53% by weight, and the Hellenistic to Roman material (cats 1b, 3, 4, 5a, b) some 46%. Wheel-turned coarse wares lacking ‘archaic’ characteristics of colour, temper and surface finish may date from the Hellenistic or Roman periods, but cannot be dated independently.

Categories 1b, 3, 5b: Depurated wares

Depurated tiles and wheel-turned pottery wares are made out of levigated clays, to which temper may be added to achieve specific properties. These wares range in colour from orange to pale buff; different wares and forms may be distinguished on the basis of form and thickness. Roof tiles, which usually have added temper, tend to be preserved in relatively large fragments and can be distinguished by overall shape and rim profile.¹² The remaining depurated material mostly consists of orange or pale firing amphora fragments, and a small amount of ‘fine’ wares which can easily be recognised by their surface treatment, fabric, form, thickness, and decoration. All of these also occur in severely fragmented and/or abraded

form and, being undiagnostic, are then assigned to category 5b.

Categories 4 and 6: Fine and Combed wares

The fine wares encountered during the survey consist for the most part of a pale or orange firing depurated clay with a glossy surface decoration of black slip, either (archaic/classical) banded ware or (Hellenistic) black gloss ware. A majority of the sherds had, however, lost most or all of its surface finish; if these could not be identified as a fine ware by form (e.g. ‘*kylix*’) they were classified as category 5b ‘indeterminate depurated ware’. Other fine wares occurring in very small numbers are *terra sigillata* and an unidentified thin painted ware. Only 10 sherds with a ‘combed’ decoration were found during the survey. The material, which is hard and has either an orange or a pale colour, suggest a late (possibly post-antique) date but no parallels have been found yet. It is expected that further study of categories 4 and 6 will result in a finer typo-chronological division of the material.

Category 9: Lithics

No lithics were previously known from the study area, and indeed the SIBA'00 survey collected only a very few, most of which were judged to be probably of natural origin in view of their irregular negatives and retouches.¹³ Only three are clearly intentional flakes, one of which is a large white patinated flake whose distal end was intentionally retouched into a scraper. Although no firm date can be given, the Levallois-like technique employed suggests an attribution to the Middle Palaeolithic (however, the piece is atypical). The other two flakes cannot be dated.

7. RESULTS

7.1. The intensive survey

The intensive survey teams covered some 125 hectares (552 collection units) spread over the four marine-fluvial 'terraces' within the survey transect in a total of 121 person/days (inclusive of administration, GPS measurements, etc), for an average of 1 hectare per person/day. This is somewhat slower than the speeds achieved during similar surveys elsewhere (cf. Attema et al., 2002, in press) and was mainly due to the extra time needed to cope with mapping problems. Table 3 and figure 5 give an overview of the fields covered by the intensive survey.

In order to produce distribution maps by period, the raw counts per material category per collection unit were corrected for unit area, percent coverage, and visibility, using the formula $D = N * (100 / C) * (100 / V) / A$ where D = corrected finds density, N = raw finds count, C = estimated percent coverage, V = estimated percent visibility, and A = unit area in hectares. It is recognised that this procedure, while producing normalised finds densities expressed in numbers per hectare, tends to exaggerate small density variations where low numbers of finds are involved; appropriate care must therefore be taken when interpreting the distribution maps reproduced here in figure 6.

The distribution of protohistoric material shown in figure 6a is characterised by small amounts of material in all surveyed fields, generally associated spatially with the major terrace edges. The material tends to consist of undiagnostic *impasto* pottery, except on the higher terraces near the Monte San Nicola where denser concentrations of more identifiable burnished Bronze Age and Iron Age wares occur. Here the presence of a large protohistoric site (Peroni & Trucco, 1994: pp. 819–820, site 31) was confirmed.

Coarse (unburnished) protohistoric *impasto* fabrics are very difficult to find in arable fields under the conditions prevalent in the Sibaritide foothills. Their recovery was made extremely difficult because

most fields were full of bits of ploughed-up conglomerate rock of a colour and shape often mimicking potsherds. It is noteworthy that this material tended to be found only when surveyors were sitting down or were looking especially for it; we can therefore not be certain that the map shown in figure 6a is an accurate reflection of the distribution of this material.

For both the coarse (fig. 6b) and the Hellenistic-Roman material (fig. 6c), the corrected finds distributions show a quite intensive use of all terrace edges (including minor 'internal' ones), except perhaps those that are very small or inaccessible. The two distribution patterns themselves are very similar, any differences being quantitative rather than qualitative: no concentrations of coarse wares occur away from concentrations of Hellenistic-Roman material. It therefore remains to be determined whether the coarse wares should be interpreted as evidence for an early (6th–4th century BC) settlement expansion followed by a Hellenistic phase of continuity, or as just another category of Hellenistic wares. In the latter case, little direct evidence for Archaic–Classical rural settlement remains, and the first substantial rural expansion in the foothills could have occurred as late as the late 4th–3rd century BC. Among the fine wares, one small group of 'banded ware' *kylix* fragments has already been tentatively assigned to the Archaic period on the basis of comparable material present in the museum at Amendolara, but this needs further study.

It may be noted further that the Hellenistic to Roman material in the survey transect consistently points to dates in the range 325 BC–AD 100, and only rarely into the later Imperial period. This contradicts received wisdom regarding the historic settlement dynamics in Calabria, referred to in Section 9.

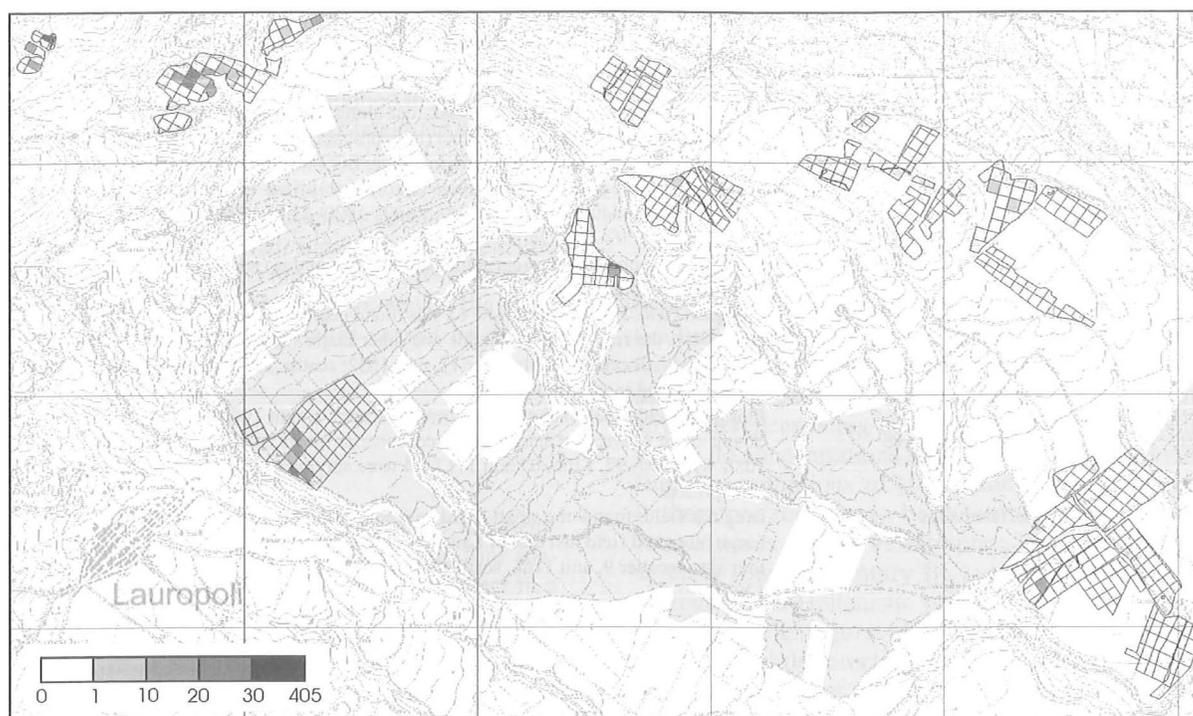
7.2. The extensive survey

The extensive survey team covered some 50 agricultural fields (315 hectares) in an estimated 38 person/days, for an average of 8.3 hectares per person/day. Table 4 lists and describes the sites located by this team and the sites mapped by Quilici in the same area.

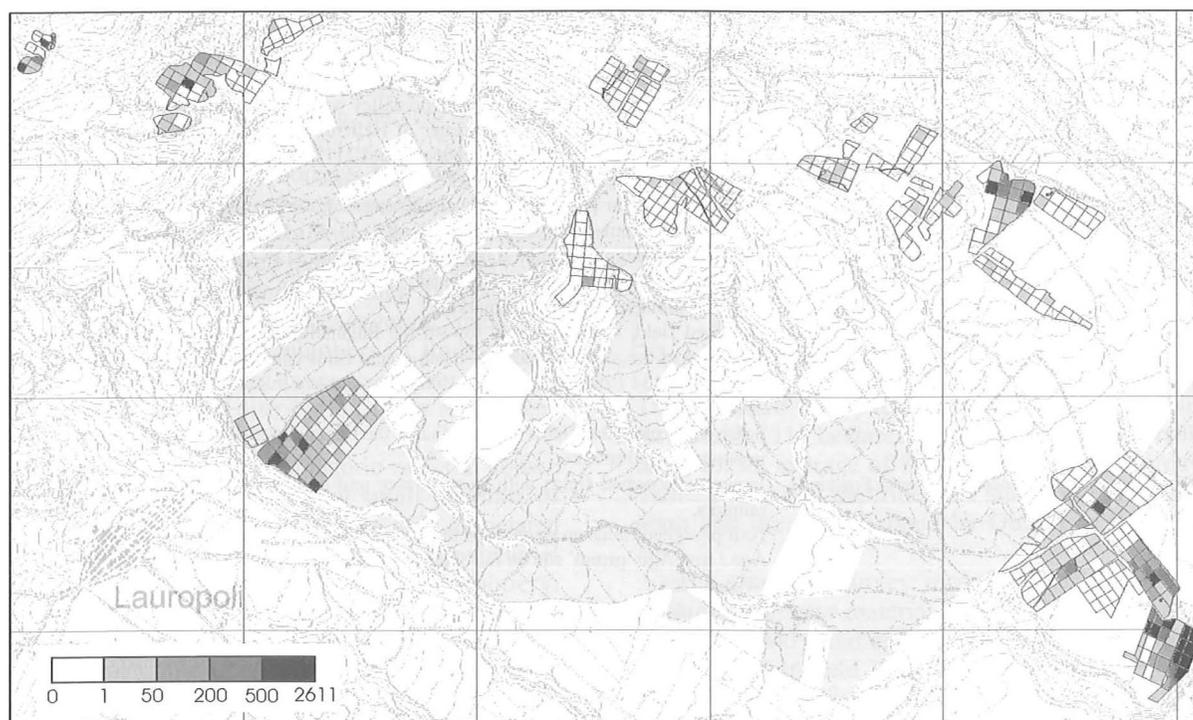
The extensive survey recorded a small concentration of *impasto* material on site 3042 (extending into field 3043), and another one of coarse *impasto*-like material in field 3056. The large majority of the material and sites were dated to the Hellenistic period. Sites 3002/3003 appeared to consist of recently ploughed-up high-quality material, possibly belonging with Quilici site 126 (located some 100 m upslope but of which almost no remains could be found); confirmed 4th–2nd c. BC sites include 3008, 3016, 3026, 3041, and 3055; generic Hellenistic ma-

Table 3. Preliminary results of the RPC intensive field survey campaign 2000, by field.

Units	Toponymic	Notes
1001– 1031	Azienda La Silva West	An old olive grove with stands of oak, cut along the slope by a wide concrete-lined V-shaped ditch and a U-shaped aqueduct (both probably dating to the 1930s). Quilici site 62 ('scatter of Hellenistic-Roman sherds, including BG') was found again but appears 'smeared out' across a large part of the field; two out of several finds concentrations are sufficiently distinct for individuation (scatter 20 in units 1020–23 and 1030–31, scatter 21 in units 1001–04 and 1009–11). Quilici site 63 ('scatter of Hellenistic-Roman material, including grey ware'), supposedly present at the western edge of this field, could not be found despite specific searching.
1032– 1058	Azienda La Silva North	Ploughed field. Part of Quilici site 62 was found nearest the Azienda buildings (scatter 20, unit 1045); the rest of field contains one other major (scatter 8, units 1048–49) and two minor finds concentrations (scatter 11, unit 1052; scatter 12, unit 1050). Concentration of recent material in unit 1037.
1059– 1087	–	Ploughed field; one small site was located (scatter 1, unit 1060).
1088– 1117	Aloisi Olive grove	Young olive grove, just harrowed; used concrete posts to set out grid; units 1108–09, 1088–89, 1094–97, 1106–07 and 1113–14 were surveyed by team 2 before harrowing; no sites present.
1118– 1142	Sferra-cavallo	Irregular field; found one small sherd concentration with impasto (scatter 10, unit 1133).
1143– 1208	–	Large ploughed field just east of Lauropoli; steep slopes into valley on two sides; contains four sites (scatter 9, unit 1168; scatter 7, units 1186–87; scatter 5, unit 1202; scatter 6, unit 1207).
2001– 2036	Aloisi North	2001–2022 irregular ploughed field with evidence of deep ploughing; mapped two concentrations of thin wares (scatter 15, unit 2001; scatter 16, units 2005–06), the latter continuing across a recent path into units 2025–7, and further disturbed by works relating to the driveway and garden of the house belonging to Dr Aloisi. 2023–2036 were surveyed in a young olive grove before harrowing.
2037– 2055		Irregular ploughed field; units 2038–39 contains a finds concentration (scatter 19) which might be a kiln but also contains recent material; 2049 contains a sub-recent tile kiln.
2055– 2064		Irregular ploughed field; no remarks.
2065– 2089	Rubbish dump	Elongated ploughed field with unploughed sections; contains a very diffuse scatter of coarse and thin wares in the topmost units (scatter 17, units 2079–81 and 2084–86).
2090– 2105		Ploughed field along Raganello valley; no remarks.
2106– 2125		Irregular ploughed field along Raganello valley with adjoining units along lower terrace slopes; found Quilici site 135 ('scatter of Hellenistic-Roman material, including some large sherds'; is scatter 18, units 2106–08 and 2112–15), some impasto sherds, and off-site material provenient from the next higher terrace.
2126– 2148		Group of irregular ploughed fields along lower edge of terrace; three independent grids were used (for units 2126–35, 2136–37, and 2138–48); finds were concentrated along the north-eastern edge facing the Raganello valley (units 2126–27, 2126, 2128, 2136), but no distinct concentrations could be defined.
2149– 2161		Irregular ploughed field; no remarks.
2162– 2177		Ploughed field, sloping steeply toward the Raganello valley, plus units adjoining path along top of the slope; found only a sub-recent finds concentration approximately where Quilici site 134 ('diffuse scatter of Hellenistic-Roman material') should have been (unit 2176).
2178– 2184		Some small ploughed fields on slope facing the Raganello valley, with unploughed section in between; no remarks.
2185– 2234	Rebecca (Masseria Frascino)	Irregular ploughed fields with steep terrace and gully slopes on their eastern side; no remarks.
2236– 2268		Four ploughed fields on steep slope facing the Raganello valley; located a possibly Bronze Age / Iron Age 'grumi' site on fairly level bottom section of slope (scatter 13, units 2263–64 and 2268).
2270– 2275	–	Part of a ploughed field, surveyed rather too quickly because of failing light (= low quality). No finds concentrations.
2276– 2289		Two irregular ploughed fields on terrace along Raganello valley; no remarks.
2290– 2330		Three irregular ploughed fields on terrace along Raganello valley; steep slopes on southern edges; located finds concentrations in two fields (scatter 4, unit 2306; scatter 14, units 2312–13 and 2316–17).
2331– 2344	Monte S Nicola	Three small irregular ploughed fields just below the unnamed hilltop on which stands the radio tower; containing one previously unknown Hellenistic site (scatter 2, unit 2344). Found part of Peroni Bronze Age / Iron Age site 31 on the saddle (scatter 3, units 2332 and 2334) and on the south-east slope of Monte S Nicola (grab sample).

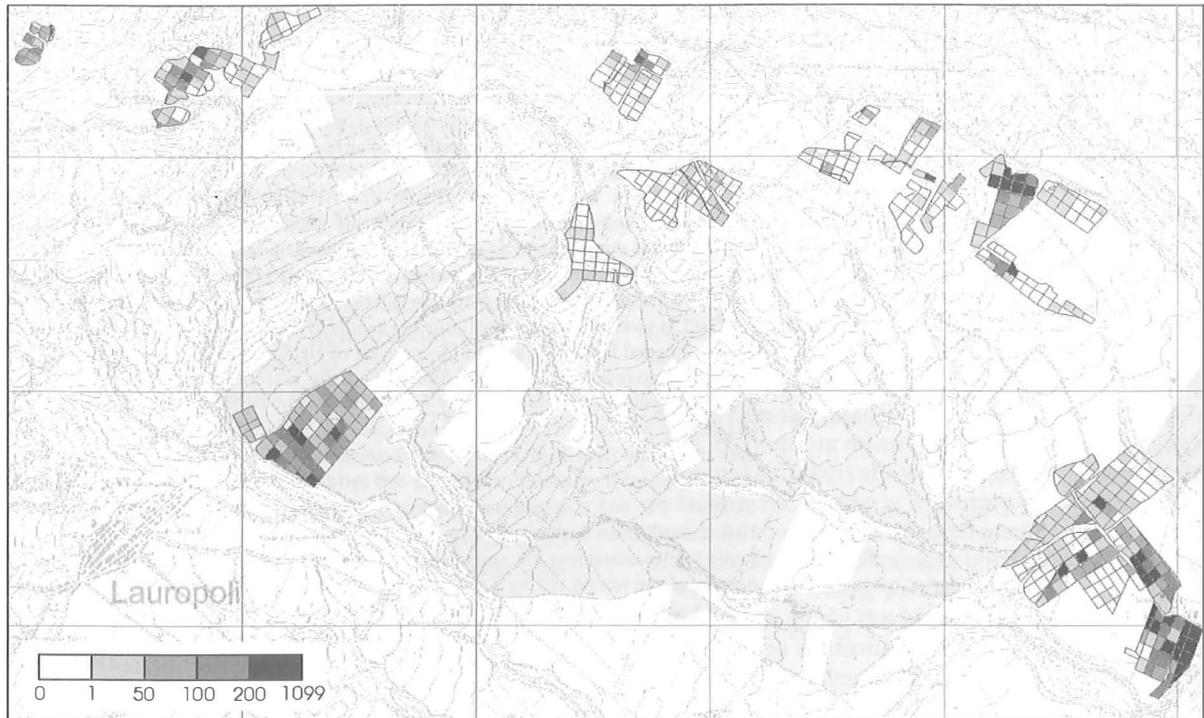


6a.



6b

Fig. 6. Corrected finds density distributions resulting from the intensive survey. Grid spacing: 1 km. (a) Protohistoric period (cats 10, 13); (b) 'Archaic' material (cats 1a, 2a-c); (c, overleaf) Hellenistic to Roman material (cats 1b, 3, 4, 5a, b).



6C

Fig. 6. Continued.

terial occurs at sites 3025, 3029, 3039, 3047 and 3048; early Roman (2nd–1st c. BC) at sites 3032, 3039; and Roman Imperial wares (1st–3rd c. AD) are found at sites 3016 and 3018.

8. SETTLEMENT AND INFRASTRUCTURE

Whilst the results of the SIBA'00 survey should first and foremost be compared to those of the Quilici survey which they were intended to test (De Rossi et al., 1969: pp. 147–155), the general lack of rural settlement data pertaining to the coastal and alluvial plains of the Sibaritide means that we must also view them in the less specific geographical and historical context of Roman Calabria, as provided by Accardo's recent study (2000). It bears repetition that most of the surface material found north of the Crati-Coscile was ascribed by Quilici either to the late Hellenistic (late Republican) period or to the Roman Imperial period. Even sites and scatters not expressly dated by him were to be ascribed to these three centuries (150 BC–AD 150). Most of these appeared to represent small farms continuing into the Imperial period, and tending to cluster into 'villages' located on the lowest parts of the foothills; there were also a few small villages lying along the water-rich valleys

south-west of Cassano allo Ionio, and a few widely scattered larger farms (*fattorie padronali*) which may be recognised by architectural remains. The territory as a whole was therefore littered with settlements (villas and villages) in the Roman period, clusters of which 'define a finely branched network of routes', until at least the second century AD. However, the material itself was described by Quilici as 'quite unpretentious, even poor, indicating local production and use' — recalling Strabo's (VI, 253) judgement of Sybaris in his time as 'barbaric'.

At the regional scale, Quilici contrasted the pattern of autarchic 'villages' to the north of the Crati-Coscile with that of single farms to the south and west, and wondered if this might not also express a difference of social, even ethnic, units rather than being purely a consequence of the differing geomorphologic structures of these areas. He suggested (De Rossi et al., 1969: p. 149) that the difference may be related to the presence of 'colonial' landscapes of single villas emanating from the Roman colonies of Interamnium (Eianina and the upper Coscile) and Copia Thurii (the hills south of the Coscile), while the area of larger villages in the foothills north of the Coscile represents a survival from the pre-Roman Hellenistic society. If true, the Hellenistic settlement pattern recovered by the SIBA'00 survey should

Table 4. Site list for the RPC field survey campaign 2000 extensive survey. BG = black glazed ware; TS = *terra sigillata*.

RPC ID	Quilici ID	Max <i>N</i> /m ²	Area (m)	Notes
3002	126?	50	5×5	These two concentrations possibly constitute a new site, but are more probably related to Quilici 126 (a 'Hellenistic-Roman scatter containing tile frs'). They contain both 'archaic' coarse ware and BG ring bases, <i>pithos</i> sherds, and tiles, including one half of a terracotta mould for votive feet. Site 'halo' extends into fields 3004/3010, including Hellenistic imbrex, but mostly consisting of tiles with many quartz inclusions. Nearby in this same field is a large dump of stones, presumably ploughed up locally.
3003		30	5×4	
3008	127	10	10×15	Site contains 'archaic' coarse tile and pottery, Hellenistic and Republican roof tile, and 4nd–3rd c. BC <i>pithos</i> . Separate from this in field 3007, but concentrated along the modern road bed, is some off-site material: rim and handle of a late 4th c. BC <i>skyphos</i> , and a loom weight. Logged by Quilici as a 'diffuse scatter of Hellenistic-Roman material'.
3016	125	35	50×30	Scatter of coarse 'archaic' ware and Hellenistic material located on terrace edge overlooking the Franceschiello valley, partly obscured by modern path and rubbish dump: BG pottery, <i>pithos</i> , foot of 3rd c. BC <i>kantharos</i> , early 2nd c. plate. Site 'halo', extending over 100 m into field 3015, contains some concentrations of cobbles: Hellenistic–Roman material, material of late 4th c. BC BG cup and Corinthian B amphora, 2nd–3rd c. AD 'African' TS, and a coarse ware loom weight. Logged by Quilici as a 'large dense Hellenistic-Roman scatter including BG'.
3018	128	35	50×75	Large scatter containing tile, storage pots, coarse and fine wares. Located on an elevated portion of the terrain cut by a modern field boundary. It is very homogeneous in fine wares and contains a/o several 1rd c. AD Roman TS frs (<i>CFTS</i> form 21.3), some with plastic decoration, and a column fragment. Diffuse material occurs off-site in fields 3017 and 3019; dump of stones, tile and dolium frs in eastern tip of 3019. Logged by Quilici as a 'Hellenistic-Roman scatter and villa with floor in <i>opus spicatum</i> (information from farmers)'.
3025	New	5	15×15	Scatter of Hellenistic material, <i>dolium</i> , BG, loom weight, all material of similar fabric; also a number of river cobbles present.
3026	131?	–	75×125	Large area of diffuse finds in northern corner of field; mostly amphora, but also containing 4th–3rd c. BC Corinthian material, and one loom weight. Note: not intensively walked (perhaps off-site). Identification with Quilici 131 (a 'diffuse Hellenistic–Roman scatter containing an amphora handle'), which could not be found in the neighbouring field 3027, rests on the assumption that the latter may have been inaccurately mapped; the core of site 3026 is probably located in the neighbouring field to the north (not surveyed).
3029	New	2	2×2	Small scatter of Hellenistic tile, coarse and depurated wares.
3032	New	25	30×20	Vitrified kiln material, wasters, a 2nd c BC amphora spike and neck of a jar in <i>pasta grigia</i> , and 2nd–1st c. BC Roman roof tiles.
3039	New	5–10	10×20	Scatter located on edge of terrace overlooking the Franceschiello valley. Material of 'archaic' coarse ware, Hellenistic cooking pots, Roman roof tiles, possibly TS.
3040	New	–	10×10	Site contains a great many river cobbles; coarse 'archaic' tiles and thick-walled pottery present but not diagnostic, hence no clear dating evidence. May be related to site 3041 nearby.
3041	New	–	40×40	Site is strategically placed, with a good view of the terrace. Contains Hellenistic tile, BG ceramics, Corinthian A/B, <i>dolium</i> , and recent fabrics. Note: visibility low because of bushes.
3042	New	–	20×10	Very diffuse scatter of shapeless <i>impasto</i> sherds on terrace edge overlooking the Franceschiello valley; this material occurs lower down the valley slope in field 3043 as well.
3047	new	5–10	10×20	Scatter of possibly Hellenistic material, contains no clear diagnostics. Depurated orange firing roof tiles with some inclusions; various medium and thin coarse wares; a few depurated orange firing sherds with some inclusions.
3048	130	–	90×30	Sizeable scatter of Hellenistic material found on both sides of the modern road bed: coarse 'archaic' roof tiles and medium thick wares, 1× BG, one coarse loom weight. Note: very low visibility because of olive trees. Logged by Quilici as a 'diffuse Hellenistic–Roman scatter'.
3055		2–5	40×20	Scatter of Hellenistic material collected <i>after</i> intensive survey (= scatter 6): coarse tiles, medium thick and thin wares. Site contains relatively many luxury items: late 4th c. BC Corinthian A/B amphora frs, BG including foot of cup, and other depurated pale and orange firing sherds of table wares.
3056		–	10×10	Low-density scatter of coarse material, probably including Late Iron Age <i>impasto</i> , collected <i>after</i> intensive survey (= probably scatter 5). Coarse tiles, medium and thin wares, including one rim with comb motives on the lip.

consist of sporadic villages along major thoroughfares. The location of roads connecting the coast to inland regions would have been dictated by the major valleys and passes in the uplands and mountains (De Rossi et al., 1969: p. 151); a system of fortlets and watchtowers safeguarded Hellenistic Thurioi and may have done the same for Archaic Sybaris, but so far no evidence for this has been found.

Although actual finds predating the late Hellenistic period were rare at the time of his survey, Quilici also attempted to reconstruct protohistoric patterns of settlement and, especially, infrastructure (*viabilità*) in the Sibaritide (De Rossi et al., 1969: pp. 97, 152–155). Several of his routes either cross or come near to the SIBA'00 survey area. Using an 18th century parallel, he postulates the existence in the early Iron Age of a 'coastal' route following the foothills, connecting the large protohistoric centres, and avoiding the (marshy) plain.¹⁴ A second route is postulated parallel to this along the lower lip of the lowest 'terrace'; a third route follows the 'radial' morphology of the terrain and the line of a known Roman road from Castrovillari to Frascineto and further on to Civita and, presumably, Thurioi/Copia in the plain; a fourth route connecting Torre Mordillo, Cassano, and Civita forms part of a postulated protohistoric long-distance 'mountain route'. Quilici derived this protohistoric infrastructure from the locations of known sites and the terrain morphology, interpreting rivers as barriers, ridges as routes, and valley floors as difficult terrain because of water and vegetation. The peaks and gorges are orientation points, sulphurous springs meeting places. The formation of routes under 'free' conditions, he maintains, would have been similar to that of the Middle Ages which is preserved today in ancient mule paths. Some of the latter (between Francavilla Marittima, San Lorenzo Bellizi, and Alessandria del Carretto) were explored during the SIBA'00 campaign and were found to have protohistoric sites along them, but it is not yet proven that such sites cluster on these routes. Figure 2 shows the two main protohistoric routes postulated by Quilici.

9. CONCLUSIONS

The results of the SIBA'00 survey can successfully be used to re-interpret the geographical and chronological patterns of settlement suggested in the late 1960s by Lorenzo Quilici. Both the intensive and the extensive surveys have recovered about twice the number of sites mapped by Quilici in the same area, despite the deterioration of the soil archive in the intervening decades. The resultant site distribution suggests, but does not prove, that Quilici's 'villages' are artefacts of research and visibility biases. A definite answer to this question will require targeting a wider area for

extensive survey in the future, and obtaining access to the original research. Although routes may well have existed where he posits them, sites also occur well away from these along all 'minor' terrace edges. With respect to dating, the materials collected in the SIBA'00 survey also suggest consistently earlier dates (Archaic to early Roman) than those suggested by Quilici (late Hellenistic to early Imperial); and these results may tentatively be extrapolated across all of the Sibaritide.

9.1. Protohistoric to Archaic

The adverse conditions for retrieval of protohistoric ceramics on the intensively worked terraces must be taken into account when interpreting the archaeological record of relatively well preserved upland protohistoric sites. There is currently no evidence that protohistoric (BA–EIA) settlement occurred anywhere in the survey transect but at the very highest elevations (the Monte San Nicola at 500 m asl stands some 150 m above the highest terrace). This can be interpreted as confirmation of existing thought about protohistoric settlement patterns, but it leaves unexplained why the most important hilltop settlements should be located on hills overlooking the Sibaritide plain. Could the needs of pastoralism — winter grazing in the plain, which at this time would have been a heavily wooded and seasonally flooded marginal area with soils too stony or clayey for palaeotechnic agricultural use — have been so vital as to be the determining element in settlement type and location choice? Alternatively, the postulated 'ring' of protohistoric centralised settlements around the plain may, in part, prove to be chimerical, the result of biases in academic research and interpretation. One indication that this may have been the case is the apparent concentration of protohistoric research on the hilltops of the *fascia collinara* (see note 5). Vanzetti recently again stressed the tendency of the Roman school of protohistoric studies to assume the presence of a settlement where the evidence permits rather than suggests this (Vanzetti, 2000: pp. 7, 23; 2002). For example, Broglio di Trebisacce is seen as one single large settlement rather than as the two nuclei separated by 250 m for which archaeological evidence exists. Equally, settlements are assumed to be as large as the geomorphologic units (plateaux) they occupy, and 'missing' periods are assumed to be present even in the absence of evidence. Taken together, these assumptions may mask more complex realities in the protohistoric evidence. We feel the possible continuation of the prehistoric settlement pattern into the hinterland must be studied before further regional interpretations can be made.

For the Later Iron Age and Archaic periods, the evidence from the survey is equivocal. Despite the historical evidence for the establishment of Sybaris

around 720 BC and the archaeological evidence for continued use of the sanctuary and necropolis at neighbouring Timpone Motta into the late 6th century BC (Attema et al., 2000), no securely datable materials from this period have been found in our survey. Given our experience with the very low visibility of coarse impasto wares among the naturally occurring stones in the survey area, we must conclude that neither our own surveyors nor the Quilici team were able to identify such material with any degree of reliability; we cannot therefore infer anything from its absence. Further fieldwork will be needed to produce a more reliable distribution map of this material. For the Archaic, much will depend on a closer dating of the coarse wares, which make up more than half of the finds by weight, through association with datable fine wares or through typological comparison with excavated material within the region.

9.2. Hellenistic to Roman Imperial

No such visibility problem occurred with the classical Hellenistic and Roman ceramic types. It appears from the results of our field work that the large-scale spatial patterns mapped by Quilici in the 1960s are, at least for the transitional zone between the plain and the hinterland, partially correct. Large and small sites of the Hellenistic–Roman period do occur in elongated clusters along ‘major’ terrace edges. However, such sites also appear to cluster locally along the edges of small valleys cut into the terraces; this is at least the case along the eastern edge of the *Vallone Organata /di Franceschiello* which runs just to the east of Lauropoli. The possibility that Quilici’s site clusters are caused by, rather than merely correlated to, modern accessibility and land use must remain a hypothesis at this stage; it may eventually be confirmed or rejected when we obtain access to his survey archive.

Among the ‘new’ small classical sites identified by the intensive survey, several are located within the clusters initially identified by Quilici while others are scattered all over. It was observed both by the Quilici team and in the SIBA’00 survey¹⁵, that many of these Hellenistic–Roman ceramic scatters are relatively small and poor, with a ‘standard’ assemblage consisting of some coarse and depurated storage and kitchen ware, a few bits of fine ware including Black Glaze, and one small pyramidal loom weight. To confirm this impression, a comparative study of the assemblages taken from several such sites both in the Sibaritide and in the Brindisino is being planned.

It now remains to put these results into the general context of Roman Calabria (after Accardo, 2000). Despite the settlement expansion apparently ongoing from the late 4th century BC, the Greek colonies of

southern Italy were already under pressure from the equally expansive indigenous Bruttii by the early 3rd century BC, and the Romans became involved when they were called in against a coalition formed by the Bruttii, the colony of Taras, and Pyrrhus of Epirus. We are told that, when this coalition was finally defeated in 272 BC, much land in Calabria was already confiscated from the Bruttii; resistance flared up again during the second Punic war and by the end of the 3rd century the remaining Bruttii are enslaved. Both these wars and the advent of malarial disease caused a severe decline of the Greek city-states during that same period.

Following a period of military occupation and administration, Roman colonies were established on *ager publicus* (and other towns revived or refounded) in Calabria in the course of the 2nd century BC — Copia Thurii being one of the first. From this time until the 2nd century AD, medium to large-sized agricultural villas spread in Calabria mainly in the territories of these *coloniae*. The Via Popilia, extending the Via Appia from Capua to Rhegium and probably built in 132–131 BC, ran through the Sibaritide from Muranum in the north to Consentia in the south, probably following the valleys of the middle Coscile and Crati rivers¹⁶ and with secondary roads to Copia. These roads and rivers must have been extremely important in enabling the marketing of agricultural produce, and archaeological indicators of colonisation and Romanisation are therefore likely to cluster on them.¹⁷ In the centuries AD, the last traces of the institutions of Magna Graecia were supplanted by those of the Roman state, and areas of extensive (*latifundia*) and intensive (villa) cultivation developed.

However, besides the land designated for the colonies, large tracts of land were also sold to rich Romans who developed slave estates from about 100 BC. High land prices and the capital outlay needed for market-oriented production of wine and olive oil induced many small farmers to sell their land. A slave-based capitalist villa economy developed in Calabria, as elsewhere, into the early Empire. From the beginning of the 4th century AD Calabria suffered from the general crisis of the Roman Empire, and some 40% of villas were abandoned or subsumed into *latifundiae* founded on a combination of cereal farming and pastoralism. By the end of that century these had developed into independent and fortified power bases for the *potentiores*, foreshadowing the feudal estates of the middle ages. However, literary references indicate that the region in general continued to be productive into the 7th century AD.

Only one clearly Roman villa, possibly of the platform type, was (re-)located (from Quilici site 123) during our survey, confirming the results of the 1995 survey on the terraces between Francavilla

and Broglio di Trebisacce and the pattern of widely spaced villas with no off-site distribution as observed in the survey by Lorenzo Quilici. While it is possible that a denser pattern of villas was located in the plain, its depositional history currently precludes us from finding proof of this; a study of Medieval and sub-recent historical documents may be helpful in back-tracing Roman settlement patterns. The same goes for the Byzantine and medieval periods, for which no physical evidence was recovered at all during the survey although several chapels and a monastery are known to have existed in the region.¹⁸ Future research should be targeted at those local geomorphologic units in the plain for which there is evidence or at least a possibility that antique and later remains might be observable.

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11. NOTES

1. The campaign was conducted as part of a collaboration project with the archaeological superintendency of Calabria. We would like to express our gratitude to the Soprintendente, Dr.ssa Silvana Luppino, for arranging the necessary permissions. Some aspects of the SIBA2000 field campaign, such as the highland reconnaissance survey and the experiments with context-aware portable digital field assistants, are not discussed here (see Ryan & Van Leusen, 2002).
2. The RPC project (1997–2002) is part of the research program 'Landscape and settlement' of the Netherlands Foundation for Scientific Research NWO, doss. nr. 360-61.000.
3. A recent manual auguring program in the plain, to depths of up to 7.5 m, has obtained absolute (radiocarbon) dates of up to 2100 BP for peaty layers, providing *post quem* dates for the more recent sedimentation phases (pers. comm. Jan Delvigne).
4. The study area corresponds to the following (partial) sheets of the IGM 1:25,000 map series, 1958 edition: 221 II NE & SE, 222 III NO & SO, the eastern half of 221 II NO & SO, the north-eastern quadrant of 229 I NE, and just over the northern

half of 229 I NO and 230 IV NO. This area is bounded by the following co-ordinates — North: 4410000; South: 4386000; East: 2650000; West: 2628000.

5. Although this is not clearly stated in the published accounts, it appears that these surveys were largely limited to the *fascia collinara* (foothill zone), and were intended to locate protohistoric settlements similar to those at Amendolara, Francavilla Marittima, and Torre Mordillo.
6. The terminology used in this paper is the 'early' one advocated by Peroni, in which protohistory includes the MBA to IA periods, and history begins with the early Greek colonisations of the 7th and 6th centuries BC. A more conservative chronology would have protohistory begin with the late Iron Age (8th century BC), and the historic period with the late Classical and Hellenistic historians of the 5th and 4th centuries BC.
7. Georeferencing is the procedure whereby digital map data are tied to an area of the Earth's surface by specifying the map projection and co-ordinate system. Here, the Gauss–Boaga projection and the Italian national co-ordinate grid according to European Datum 1940 are being used.
8. The total χ^2 of 71 at 14 degrees of freedom is significant at the .001 level.
9. Spatial autocorrelation refers to the fact that observations made in close proximity to each other tend to have similar geographical attributes; thus land use observations made at two archaeological sites separated by only 100 m have a much higher chance of turning out to be identical than if the sites were separated by a distance of 1000 m.
10. Quilici identified the modern town of Castrovallari, on the upper reaches of the Coscile river, with Interamnium; but the distances, of 13 and 8 miles respectively, provided by the Antonine Itineraries and the Tabula Peutingeriana for the stretches of the Via Popilia between Muranum (modern Murano), Interamnium, and Taurasia (modern Tarsia) make it unlikely that this identification is correct. They instead indicate a location in the middle Coscile valley.
11. Subsequent closer inspection and cataloguing of the diagnostic material by scatter during the campaign of September/October 2001 has confirmed the existence of sites with an origin in the (later) archaic period, supporting an early date for the associated coarse wares.
12. These rim profiles will be the subject of a closer study in the near future.
13. The nearest Neolithic site is at Favella della Corte, south of the Crati river. The lithics collected by the SIBA2000 survey were studied in April 2001 by Marcel Niekus of ARC (Centrum voor Archeologische Research & Consultancy).
14. The use of historic parallels in the reconstruction of prehistoric routes is justified on the assumption these routes are the 'most natural' and by the supposed conservatism of their use; compare Small et al., 1998: p. 338 for a similar argument concerning transhumance routes in Apulia.
15. Quilici remarks that "black gloss is encountered only rarely and generally the assemblages are poor with no evidence for substantial constructions; there are no cisterns and graves are very unassuming as well" [my translation].
16. Accardo (2000: pp. 30–39). Thought to have been navigable, the former for a distance of 18 km until the confluence with the Esaro; the latter for 40 km, at least halfway to Consentia.
17. According to Accardo (2000: p. 56), villas in the territorium of Thurii lie mostly in these valleys, are medium-sized and specialise in the production of wine and oil. Almost all date

from the 2nd century BC to the 2nd century AD; some continue into the 4th and 5th centuries AD.

18. One Byzantine chapel was located on top of the Timpone della Motta at Francavilla Marittima.

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