On colonial grounds: a comparative study of colonialism and rural settlement in first millennium BC west central Sardinia

Dommelen, P.A.R. van

3 Figures in the landscape. Landscape and archaeology in west central Sardinia

L'uomo sardo si muove sullo sfondo di uno scenario naturale che lo limita, lo controlla, lo indirizza e lo condiziona: con la sua vastità, con la sua asprezza, con la fatica che richiede per essere addomesticato e governato.[1]

M. Brigaglia, La geografia nella storia della Sardegna (1987), 35

3.1 Landscape and Archaeology in Sardinia

References to Sardinia are often cast in terms of its physical conditions as 'an island of mountains' and frequently stress the overwhelming impression of the Sardinian landscapes on its inhabitants and visitors (e.g. Le Lannou 1979, 11). Braudel's claim that the 'archaic' appearance of Sardinia can largely be attributed to the mountains alone is typical in this respect (1972, 39; cf. p. 12). In this view, the mountains supposedly not only dominate the physical environment of the island but are also regarded as a key factor in the isolation and backwardness of the island which has profoundly penetrated the inhabitants' lives.

Yet, Sardinia hardly seems to be the *isola montana* it is claimed to be (fig. 3-1): only 18% of the island exceeds the altitude of 600 m above sea level and only some isolated peaks reach an altitude over 1,200 m above sea level, as e.g. the Monte Linas (1,236 m) in the Iglesiente massif of west central Sardinia. Exceptionally, the Punta La Marmora in the Gennargentu massif of eastern central Sardinia rises to 1,834 m above sea level, thus constituting the highest peak on the island. The mean altitude on Sardinia is only 334 m above sea level and half of the island lies even below 300 m. From a geomorphological point of view, as much as 86% of Sardinia must be classified as hilly to mountainous land, while only 13% of the island can claim a genuinely mountainous relief (Pracchi 1971, 14).

While the term 'mountainous' in its classic sense may therefore be somewhat inappropriate for Sardinia, its landscapes are hardly less impressive and overwhelming; but this effect derives rather from the small-scale complexity of the relief than from the overall aspect of the island. The Sardinian relief is dominated by relatively level highlands that give it a characteristic horizontal appearance, which has often puzzled visitors approaching the island. A 19th century traveller for instance remarked that 'Sardinia, compared with the peaks of Corsica and the gigantic Etna, appears at the horizon as a vast blue plain located in the centre of the Mediterranean' (Pasquin Valéry 1835, cited in Le Lannou 1979, 11). The impact of the Sardinian relief, however, stems from a dramatic fragmentation of the landscape caused by deep gorges, high uprising ridges and steep cliffs that dissect the highland plateaus into distinct tablelands and smaller plateaus (Le Lannou 1979, 11). This landscape has been compared to 'a mosaic of which the tesserae have been jumbled up' (Le Lannou 1979, 13), which is all the more appropriate given the primarily tectonic origin of this fragmentation (see below). Although in Sardinia the mountains may therefore, strictly speaking, not be 'real' mountains after all, their impact is still considerable, because the relief of the island is generally experienced and portrayed by inhabitants and visitors as if it were mountainous.

The perceived impact of the Sardinian 'mountains' may seem exaggerated compared to their actually limited occurrence but it does focus attention on the influence of the physical environment on socio-economic developments. Braudel's emphasis on the role of the mountains in the Sardinian case in particular follows from his emphasis on the constraining and at the same time enabling presence of the environment. His definition of the *longue durée* structures in primarily geomorphological and climatological terms is grounded in a general preoccupation with the natural environment which goes back to the French geographer Paul Vidal de la Blache and which is still dominant in French geography, archaeology and history (Berdoulay 1989). In this view, the physical environment effectively sets the limits of the possibilities of land use in a given region and thus influences all forms of socio-economic organization without entirely determining them: in Lucien Febvre's words, the natural environment constitutes 'the permanent forces that operate upon the human will and weigh upon it without its knowledge, guiding it along certain paths' (Febvre 1949, 37).

The relationships with the environment have been recognized in archaeology and geography already long ago as a vital aspect for understanding human settlement and its developments (cf. Goudie 1987, 20). In archaeology in particular,

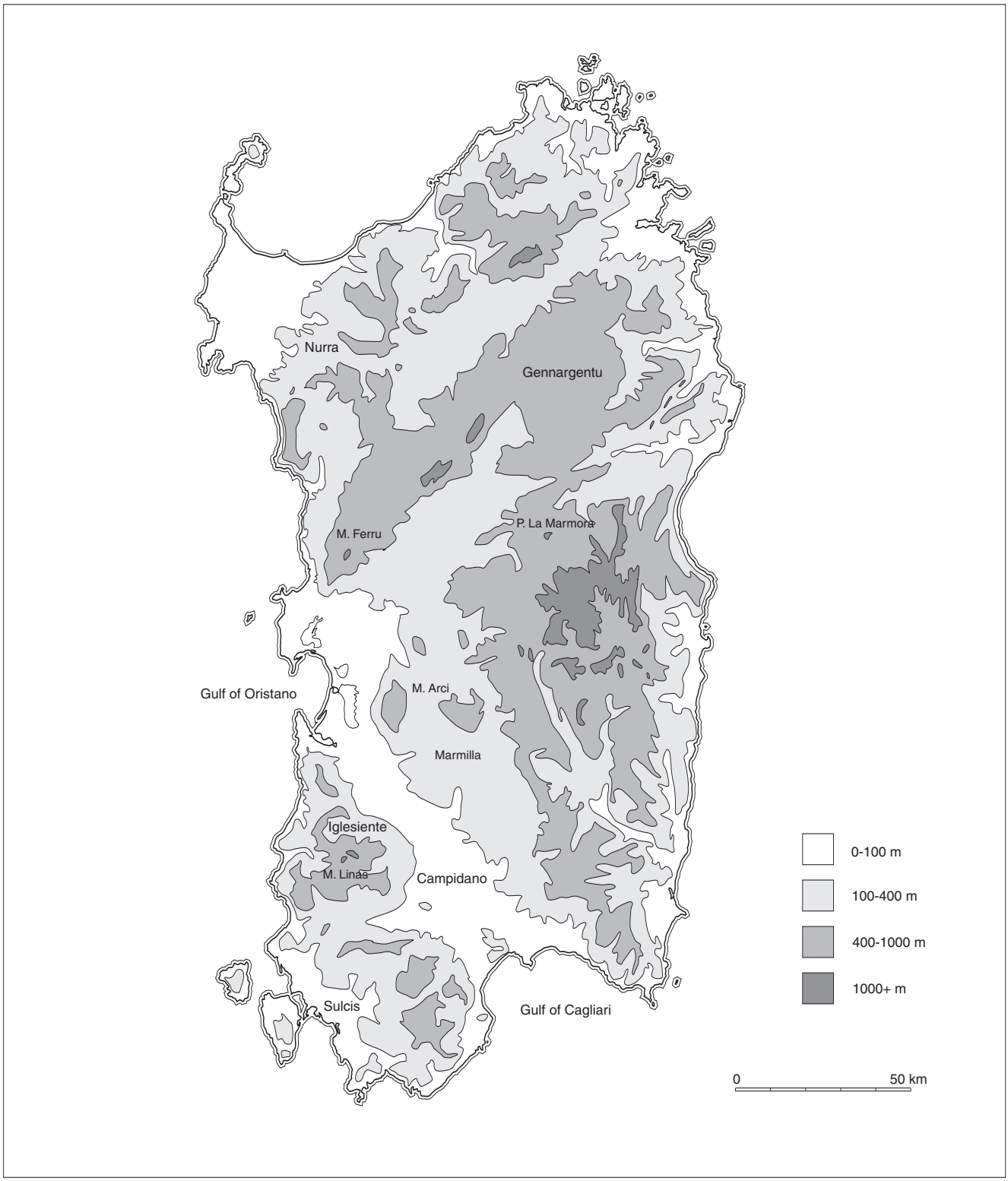

Fig. 3-1. Map of Sardinia showing the general relief and the principal regional names (drawing P. Deunhouwer).

attention has been concentrated on matters of subsistence which were defined as the 'primary human adaptation to the environment' (Higgs/Jarmann 1975, 4). As a consequence, the environment — or, in particular, the physical landscape — has generally been examined in terms of constraints imposed on the existence of human groups. It resulted for instance in the claim that the physical surroundings of a settlement site are necessarily related to the main economic activities undertaken at and around that site. It follows from this view that a 'site catchment analysis' can provide insight in the socio-economic dimensions of human settlement (Higgs/Jarmann 1975). Compared to this approach, the Braudelian view offers a set of notions such as the shorter term economic *conjonctures* which relate the natural environment to human settlement in more subtle ways (Bintliff 1991). For survey archaeology in particular, the *Annaliste* perspective has been taken up as a means for conceptualizing the impact of the physical surroundings on and its connections with shorter term developments in land use (Barker 1995, 1, 308). In most archaeological work, in particular in regional analysis and landscape studies, the influence of the natural environment on human settlement has remained a dominant theme. The brief discussion of the Sardinian situation above, however, is a reminder of the distinction which can be made between perceptions of landscape and the actual physical characteristics of the natural environment. In this way, it ties in with recent alternative conceptualizations of the relationships between people and the landscapes they inhabit, which emphasize the unity of the natural and cultural dimensions of landscape and which look into the meanings and implications literally embodied by the landscape (Bender 1993; Tilley 1994). At the heart of this novel approach stands the notion of landscape itself which has been subjected to critical scrutiny. On the one hand, conventional usage of the term 'landscape' has been exposed as a specifically modern and Western construction which as such need not — or is even unlikely to — have a bearing on premodern societies (Lemaire 1997). As a corollary, the notion of landscape has on the other hand been explored in terms of 'cultural process', in which social life and cultural values take a first place (Hirsch 1995). In this light, it seems obvious that a study of colonialism in Sardinia should come to terms with the landscapes of the island in both physical and cultural terms: colonial relationships between groups of people are (re)produced in the context of these landscapes, which on the one hand may offer certain attractive physical aspects (e.g. fertile land, minerals etc.) but which on the other hand are also likely to be experienced differently by colonizing and colonized groups, in connection with e.g. the perception of — possibly abandoned — precolonial settlement.
While these issues will be discussed extensively in later chapters, in this chapter I start by describing the contexts of the region under discussion, which is that of west central Sardinia. The regional context is in the first place made up by the physical landscapes of west central Sardinia and secondly by the archaeological remains in the area. The former are presented in the next, i.e. second section of this chapter. In this section, I shall discuss the geological and geomorphological framework of the physical landscapes with particular attention to the changes that have taken place during the last millennia. The latter constitute the subject matter of the fourth section of this chapter which is dedicated to the archaeological record of west central Sardinia. In order to examine the state of preservation and documentation of the available archaeological remains, attention is primarily focused on the physical landscape in which the archaeological remains are found and on the archaeologists who discovered the finds. It is, however, preceded by the third section on Sardinian archaeology and its main figures in order to provide the necessary background for the presentation and discussion of the available archaeological data set in west central Sardinia in the fourth section. In the fifth and final section, both the development of the physical landscape and the history of archaeological studies will be considered in relation to the available archaeological information in order to understand and evaluate the latter's strong points and biases.

3.2 The Physical Landscapes of West Central Sardinia

The region of west central Sardinia (fig. 3-2), adjacent to the Gulf of Oristano, has been selected as the study area for the reasons mentioned in the first chapter (p. 13). It has been in defined such a way that all three major geomorphological landscapes of Sardinia are well represented. Broadly speaking, the region is delimited to the South and to the West by respectively the high and steep mountains of the Iglesiente and the Gulf of Oristano, while the northern and eastern margins are dominated by the Monte Arci massif and two vertically rising *giare* or table mountains. A prominent central place in the region is occupied by a vast plain, roughly orientated NW-SE, which constitutes the middle part of the much larger Campidano plain. To the West of it, a sizeable coastal area verges on the Gulf of Oristano, while to the North the central Campidano is separated from its northern counterpart by a string of lagoons, small rivers and ponds near Santa Giusta. The southern limit of the central Campidano is constituted by a low and originally marshy saddle that divides the rivers draining the central Campidano from those discharging in the southern Gulf of Cagliari.
The low and gently rolling relief of the central Campidano is incised by two NW-wards running rivers (*Riu Mannu* and *Riu Mògoro*) and their tributaries that drain the hills and mountains on either side of the plain. The northern half of

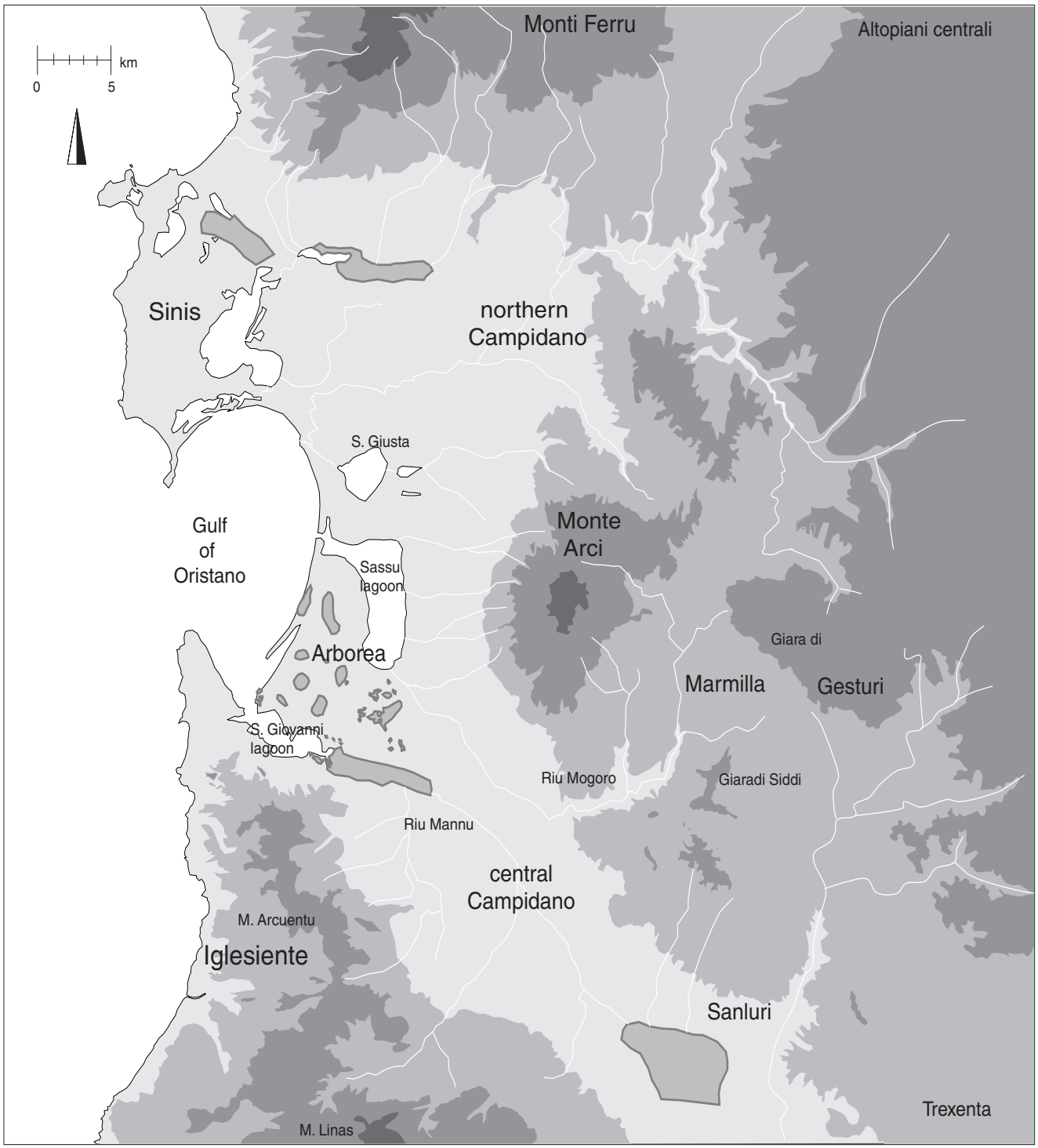

Fig. 3-2. Map of the study area of west central Sardinia showing the general relief and the place names mentioned in the text.

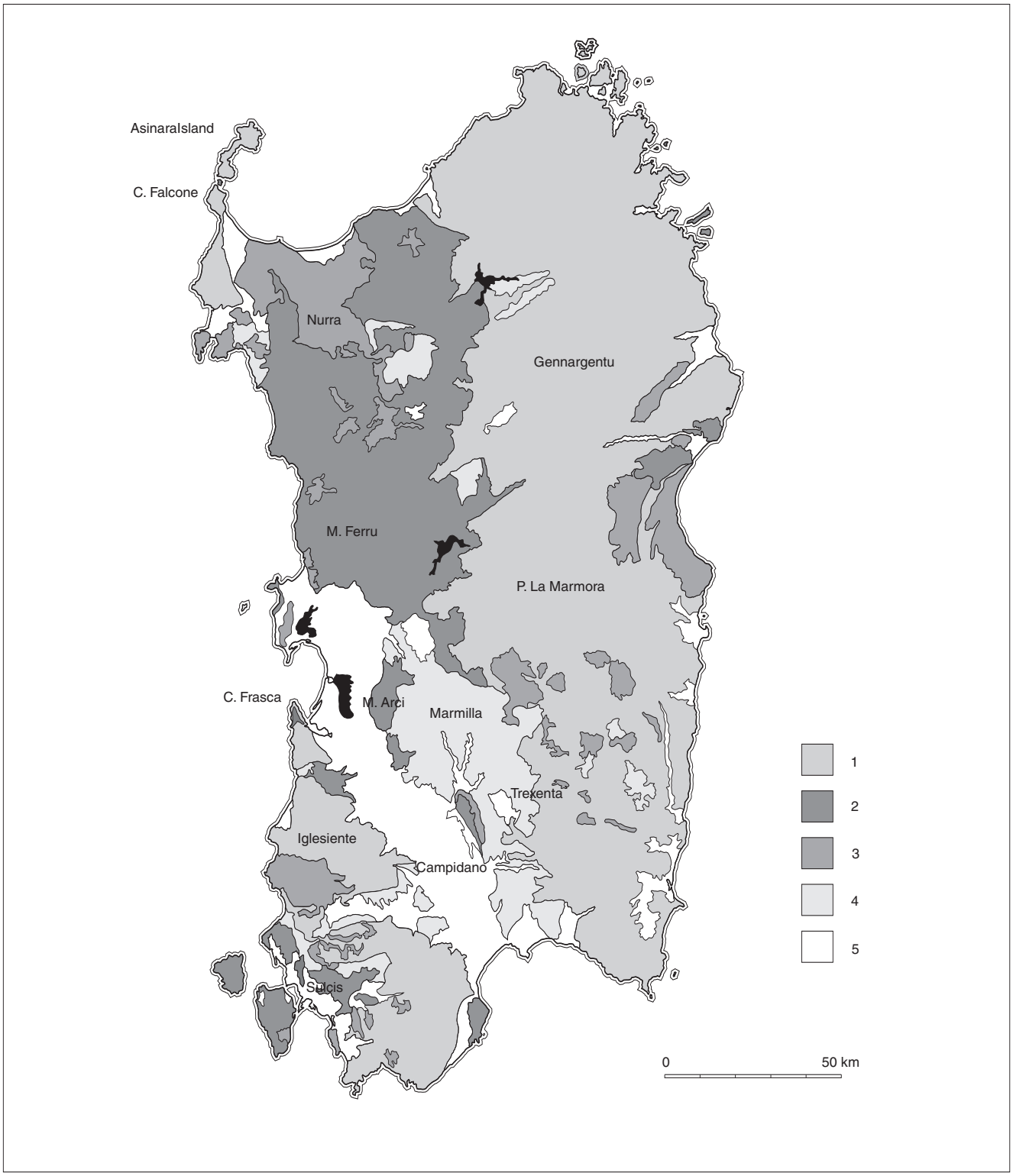

Fig. 3-3. Map of Sardinia showing the principal geological formations mentioned in the text. See figures 3-1 and 3-2 for place names (drawing P. Deunhouwer). Legend: 1: Palaeozoic granites; 2: Pliocene basalts and related vulcanic deposists; 3: Miocene limestones; 4: Miocene calcaric marls; 5: Holocene alluvial and colluvial deposits.

the central Campidano plain is dissected by numerous torrents which directly flow towards the sea from the Monte Arci. The now reclaimed wetlands of the Arborèa, which make up the coastal area of this region, are situated between the northern half of the central Campidano plain and the Gulf of Oristano. It must originally have represented a low-lying area of large dunes interspersed with both brackish and sweet water lagoons, creeks and fens. It is bordered to the East by a strip of slightly but yet significantly higher grounds.
The uplands of west central Sardinia are located on either side of the Campidano plain, and are made up of impenetrable mountain ridges and gentle, easily accessible hills. The former are to be found both to the West of the Campidano plain, where the Monte Arcuentu and Monte Linas represent the Iglesiente mountain range, and to the East of it, where the Monte Arci rises somewhat isolated. The hills of the Marmilla make up a more or less enclosed basin to the East of the Campidano, adjacent to the Monte Arci, and can only be reached through two river valleys. The gentle relief of the Marmilla is intertwined by numerous small and some larger valleys and is delimited in the North and East by the towering tablelands of the *giare* of Gesturi and Siddi.

3.2.1 STRUCTURAL GEOLOGY

A prominent feature of the Sardinian physical landscapes is its relief that has given rise to the experiences and comments mentioned above (fig. 3-1). An explanation of its characteristics can be found in their origins and subsequent geological developments. From a structural geological point of view (fig. 3-3), Sardinia constitutes together with Corsica a primarily Palaeozoic formation, which mainly consists of intrusive granites, raised during the Hercynian orogenesis (ca 300 million yrs BP: Beccaluva et al. 1985, 59). These granites form an immense N-S running mountain chain, which makes up the entire central and northeastern parts of Sardinia as well as the tiny peninsula of Capo Falcone together with the accompanying island of Asinara in the extreme North-West of Sardinia. Since nearly all mountain massifs and peaks of Sardinia are made up of these granites, they can rightly be labelled as the backbone of the island (fig. 3-3.1). With the dwindling of the effects of the Hercynian orogenesis in the Tertiary era, these formations became increasingly fragmented and abundant magma flows streamed out of the faults. The resulting three major blocks — the Nurra in the North, the Iglesiente and Sulcis in the South and the whole of eastern Sardinia — were separated by an enormous rift valley stretching N-S from the gulf of Asinara to the gulf of Cagliari.
The subsiding graben was quickly backfilled by volcanic debris and magma as well as by marine and lacustrine deposits, when in the Miocene (26-7 million yrs BP) a transgression submerged most of the rift valley (Pecorini 1971, 8). Simultaneously, limestone deposits and calcaric marls accumulated in respectively the extreme North of the graben (around Sassari) and in its southern half, where these nowadays make up Capo Frasca and the gentle hills of the Marmilla and Trexenta (Cocozza et al. 1974, 129-134; fig. 3-3.2, 3-3.3). Its major contribution to the shaping of Sardinia, however, must have been that of the flattening of the Sardinian relief, because the abundant magma flows not only filled up faults and valleys but also sealed older deposits, preventing these from being further eroded away (Cocozza et al. 1974, 127).
At a later stage, from the early Pliocene onwards (ca 6 million yrs BP), a phase of renewed tectonic activity began, when rifting within the Sardinian block imposed new fault lines in the southern part of the by then backfilled Oligocene graben (Assorgia et al. 1976, 375;Seuffert 1970, 10; fig. 3-4). As a result, the Campidano rift valley started subsiding and tectonic activity resumed. This phase of so-called 'younger vulcanism' corresponded closely with the new fault

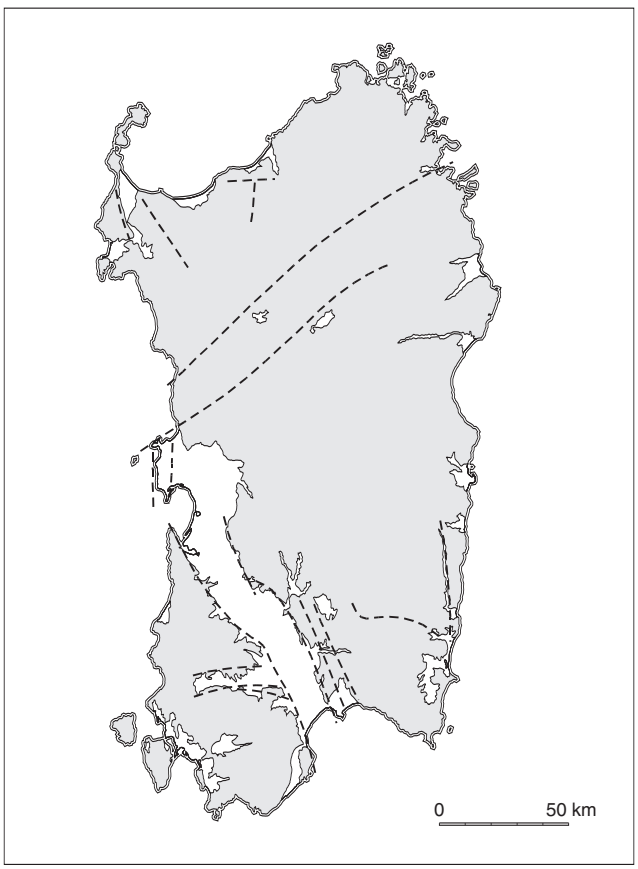

Fig. 3-4. Map of Sardinia showing the major Pliocene fault lines; for the related structural geology, see figure 3-3 (drawing P. Deunhouwer).

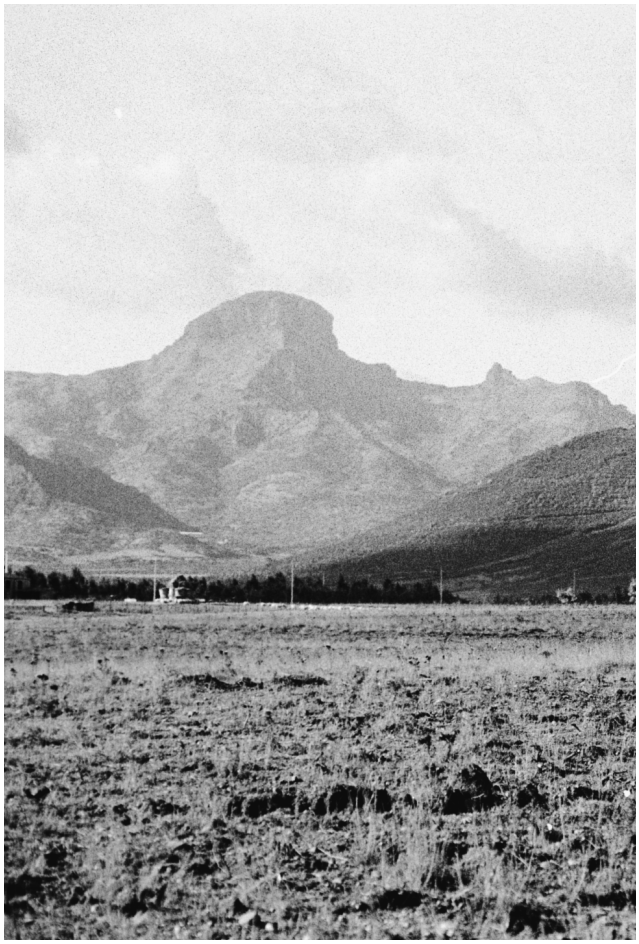

Fig. 3-5. View of the trachytic cone of the Monte Arcuentu in the northern Iglesiente range as seen from the Campidano plain to the East (photo P. van de Velde).

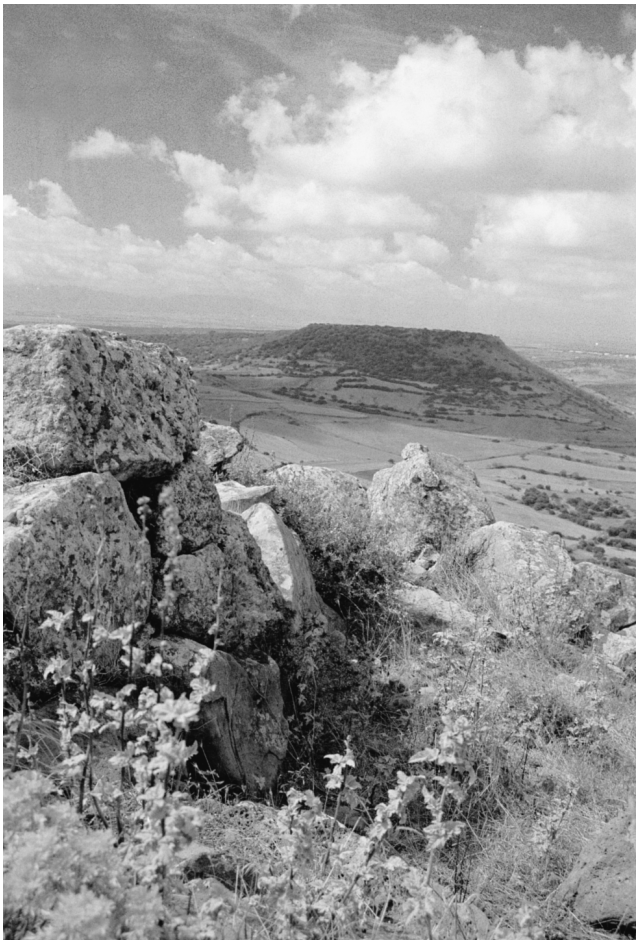

Fig. 3-6. View of the steep northern slope *(sa Costa Manna)* of the Collinas *giara* towering high above the hills of the lower Marmilla (photo P. van de Velde).

lines and gave rise to two large volcanoes, the Monti Ferru and Monte Arci, the upland plain of the present-day Altopiani centrali and several minor volcanic cones such as that of the Monte Arcuentu (figs 3-3.4, 3-5). It is in some of these magma flows which built up the Monte Arci that obsidian was formed (Assorgia et al. 1976, 383; cf. Tykot 1992).
In the adjacent Marmilla several small volcanoes sealed limited areas of the marl deposits, that thus were protected from erosion. As the surrounding Miocene sediments have worn away, these now stand apart as isolated tablelands or so-called *giare* (figs 3-2, 3-6).
Both tectonic and volcanic activity continued for some time in the Quaternary but their intensity steadily declined in the course of the Pleistocene. The 'younger vulcanism' has remained limited to the lower Pleistocene and seismic activity on Sardinia is nowadays restricted to some thermal springs such as that at Sardara in west central Sardinia (Cocozza/Schäfer 1974, 155). Although the eastern half of the Campidano rift valley in particular was again subjected to a relatively strong subsidence in the course of the upper Pleistocene, tectonics has become a nearly negligible factor in the general moulding of the Sardinian relief (Cherchi et al. 1978, 10; Seuffert 1970, 50). Extensive Holocene deposists which constitute the most recent group of geological formations dominate the two rift valleys of the Campidano and Cixerri. Smaller patches occur at various places along the coast (fig. 3-3.5).

3.2.2 THE SHAPING OF WEST CENTRAL SARDINIA

The physical landscapes of Sardinia are primarily defined by the structural geological framework, of which the Campidano rift valley and the volcanoes bordering its fault lines are the

Fig. 3-7. View of the eastern pediment of the Iglesiente mountains stretching into the Campidano near Gonnosfanadiga and the Monte Linas, which shows the concave profile (photo P. van de Velde).

most prominent ones. Yet, both the actual and (pre-)historic landscapes have acquired their shapes only in the course of the Quaternary era, primarily through the geomorphological processes of degradation and aggradation. The particular physical landscapes of west central Sardinia that constituted the outcome of these processes in the first millennium BC, the period of primary interest here, can roughly be considered akin — but not similar — to the actual ones, if the radical human interventions of the 20th century are left aside.

The most widespread geomorphological process in west central Sardinia which has most contributed to the moulding of the relief, is that of the formation of *pediments*. These are extensive, gently sloping colluvial deposits at the foot of higher mountains or hills, that are usually more or less concave and consist of coarse, ill-sorted shingle. If the parent material consists of weaker sediments, the term *glacis* is preferred; pediments are exclusively formed out of resistant rock such as granites (Seuffert 1970, 16). Both pediments and glacis effectively constitute a transitional zone between a mountain slope and a plain or valley bottom. The upper part of a pediment or glacis tends to be rather shallow but it increases considerably towards the lower end. Although single pediments or glacis are not exceptional, in most cases they consist of several superimposed pediments of different ages. Since these are separated from each other by a small step, they make up several sloping terraces. The overall concave profile is always maintained, however (Seuffert 1970, 18; fig. 3-7).

Pediments and glacis represent the most extensive deposits in the west central region of Sardinia but yet hardly constitute a uniform formation. Significant differences can be discerned between various areas of the region that are mainly due to distinct parent materials of the hinterland, because climatic conditions are similar within the region: the relatively weak Miocene marl hills of the Marmilla are bordered by rather level glacis (4-5°), while much steeper pediments (> 10°) have been built against the high granites of the Iglesiente (fig. 3-7). The depth of the pediment or

glacis is moreover largely determined by the number and size of streams that drain the mountain slopes (Seuffert 1970, 25). Further variations are a consequence of the differential effects of climatic fluctuations during the building up of the pediments and glacis in the course of the Quaternary. As a consequence, two major zones of pediments and glacis can be distinguished along respectively the western and eastern edges of the Campidano (Seuffert 1970, 62).
Other geomorphological processes that have contributed to the shaping of the west central Sardinian landscapes are confined to particular conditions that are less regular and have therefore generally been more locally active. These include the formation of fluvial terraces along the Riu Mannu and the Riu Mògoro and that of the incision of these terraces and the pediments and glacis in the Campidano (Seuffert 1970, 51, 108). In the Marmilla, fluvial deposits exclusively occur in the two somewhat wider valley bottoms. These are not terraced and usually mixed with colluvial sediments. Slope processes such as rain wash, soil creep and mud flow have been of prime importance in the erosion and aggradation of the relief in this area (Aru et al. 1991, 47).
Marine terraces can only be found in a few specific places, because either the subsiding rift valley has prevented the formation of any or the graben infill has buried those that did develop. Around the Gulf of Oristano, moreover, a rather narrow cordon of dunes has been formed during the Holocene, while an extensive area of older (Würm) eolian deposits (dunes) stretched in the interior, constituting the low-lying Arborèa area and the higher sandy rise of Terralba (di Gregorio 1977, 115 and map). Sea level variations may moreover be expected to have played a significant role in the shaping of the low-lying coastal Arborèa. While the post-glacial sea level rise of the earlier Holocene period has roughly been documented along the Sardinian west coast (Carboni/Lecca/Ferrara 1989, 513; Fanucci et al. 1976), details for the more recent (pre)historic periods are still lacking. The local evidence includes the location of some coastal barriers and the presence of a palaeosol which suggest a stagnating low sea level of −1 or −2 m around 2,600 BP, followed by a short phase of continued high sea levels only slightly below present-day level in the Roman Republican period (ca 2,200 BP) and a low stillstand at again −1 or −2 m during later Roman times which may have lasted until ca 1,500 BP.[2] This means that the lower parts of the Arborèa which were wet and marshy until the last century may have been somewhat drier during the earlier part of the 1st millennium BC.

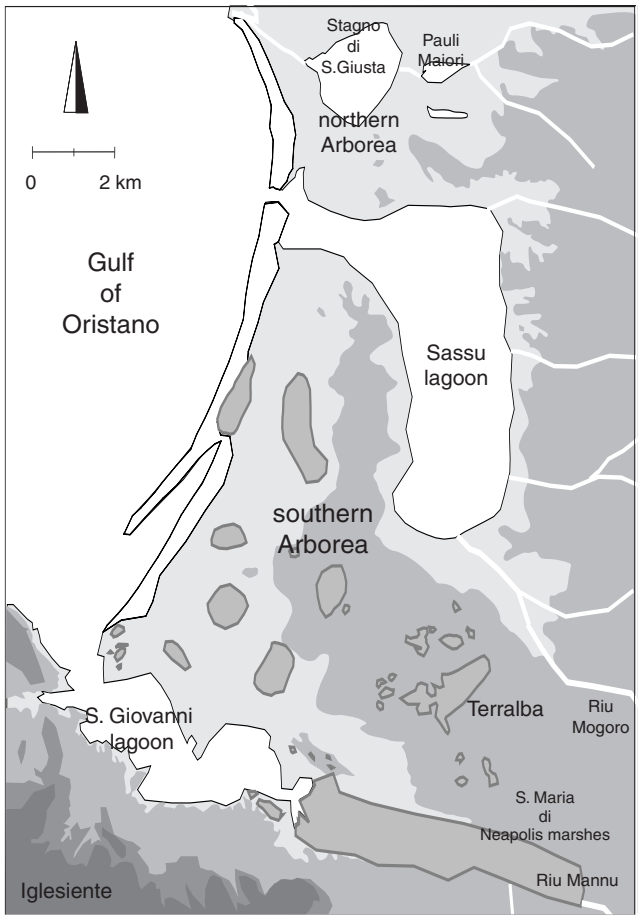

Fig. 3-8. Detailed map of the coastal Arborèa area showing the relief and principal physical features mentioned in the text.

3.2.3 THE LANDSCAPES OF THE ARBORÈA, CAMPIDANO AND MARMILLA

The three landscapes of the Arborèa, Campidano and Marmilla may appropriately be summarized as those of the coastal lowlands, the plains and the hilly uplands respectively. Yet, from a geological and geomorphological perspective they constitute far from uniform regions, which have not remained unchanged in the course of the last three millennia. Although such minor variations may be negligible at a regional scale, they often locally create significant possibilities or obstacles. It therefore seems preferable to consider these areas as three interrelated and akin but yet distinct regions, each with its particular opportunities and problems for human settlement and exploitation.
The *Arborèa* is a primarily Quaternary environment, made up of fluvial and eolian sediments (fig. 3-8). The area (ca 140 km^2) is basically delimited by the stream valleys of the Riu Mannu and Riu Mògoro, the two major rivers of west central Sardinia, that separate the eolian sands of the interior Arborèa from the higher pediments of the Campidano to the East and to the South. As both rivers enter the region in the South-East and flow from there parallel at a close distance

Fig. 3-9. View of the lowlying southern Arborèa with in the foreground the S. Giovanni lagoon and in the background the Monte Arci volcano (photo P. van de Velde).

(ca 3-5 km) for several kms, the southern part of the Arborèa is a predominantly fluvial area. The Riu Mannu heads westward and discharges through several marshes in the lagoon of S. Giovanni. Its meanders have shaped the entire area between the higher eolian grounds of the Arborèa and the northwestern pediment of the Campidano (Monte Arcuentu). Before it was diverted to the S. Giovanni lagoon as part of extensive land reclamation works in the 1930s (see Mancosu 1968, 521), the Riu Mògoro bent to the North and ran into the Sassu lagoon, as is clearly demonstrated by pedological maps of the area (Aru et al. 1991).
Between these rivers and the Gulf of Oristano, the landscape has largely been moulded by the frequent NW *Maestrale* winds which have accumulated and reworked the extensive Würm deposits of eolian sands. A prominent feature of this area is an extensive eminence of banked up eolian sands of Holocene age in the East of the area around modern Terralba (Aru et al. 1991, 54). It is slightly but significantly higher (ca 3-6 m) than the surrounding low-lying fossil dunes and river sediments. It is gently inclined towards the low-lying area in the West, that continues sloping until it practically reaches sea level at the foot of the present-day dunes (fig. 3-9). It has been suggested that the northern end of this rise is effectively constituted by a tail end of the Monte Arci pediment below the eolian sands (di Gregorio/ Marini 1987, 178). Throughout the sandy area as much as 220 small and some larger depressions originally constituted as many ponds or bogs of sweet or sometimes brackish water (Le Lannou 1979, 315). Practically all of these have now been drained.
As a typical wetland, the Arborèa represents a highly dynamic landscape and its present state may locally differ considerably from its prehistoric conditions. Yet, as essentially the same formation processes have been at work over the last millennia, it must have retained its basic characteristic features until early this century, when extensive land reclamations have changed the area beyond recognition (Le Lannou 1979, 313). Whereas the lower and wetter parts of the area must have been suitable for grazing only, the sandy Terralba rise offers fine-grained and easily workable soils, which because of the lagoonal and eolian subsoil are remarkably fertile (cf. Belluomini et al. 1986, 110).

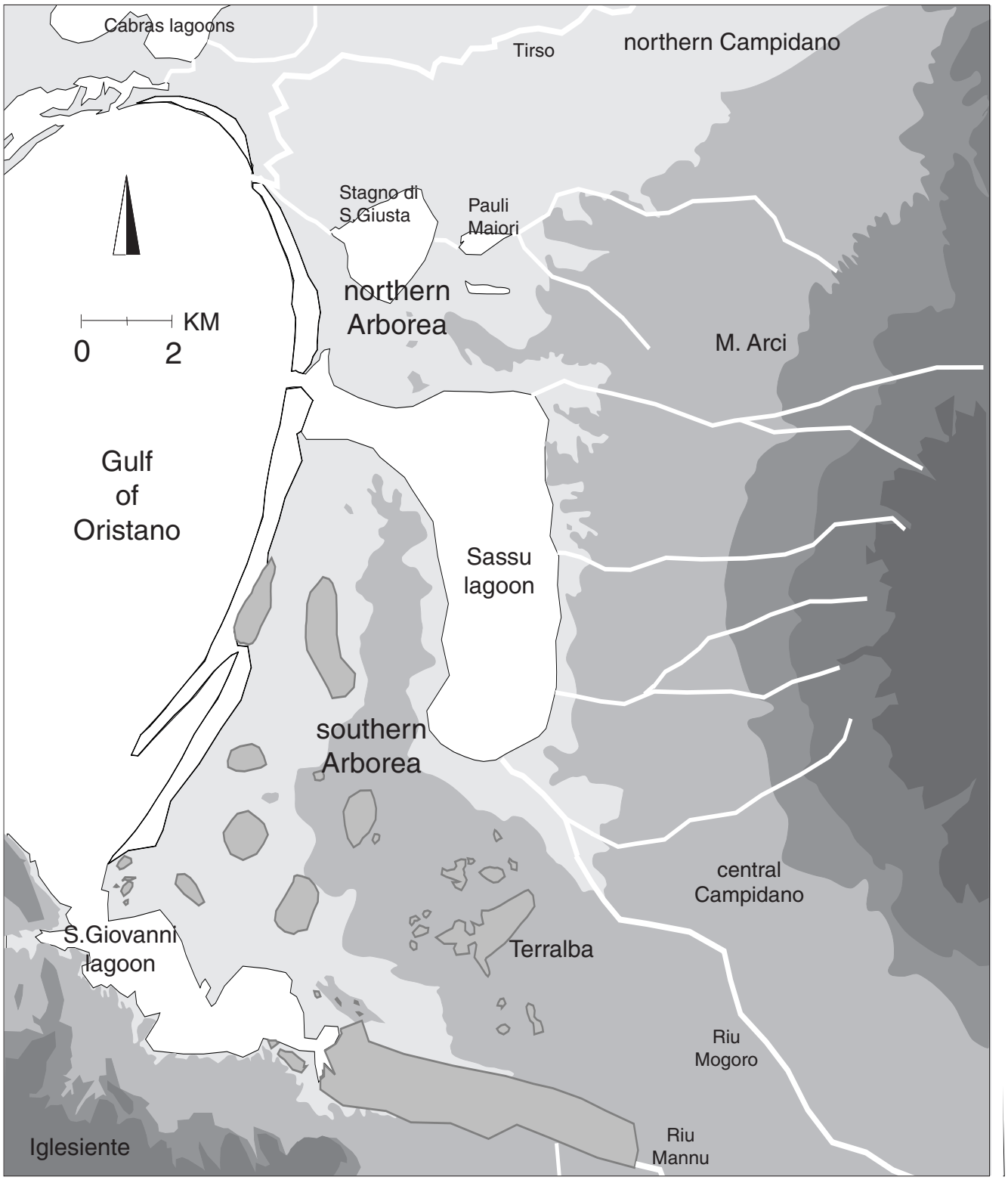

Fig. 3-10. Detailed map of the northern part of the central Campidano plain showing the relief and principal physical features mentioned in the text.

Fig. 3-11. View across the central Campidano from the Iglesiente mountains in the West towards the Marmilla in the East (photo P. van de Velde).

The *Campidano* is by far the largest region of west central Sardinia (ca 565 km^2). Its landscape has largely been defined by the extensive pediments and glacis that from either side stretch into the ca 10 km wide rift valley. The considerable differences of these formations, as discussed above, and some specific geological formations have given rise to a varied landscape with numerous local particularities. In correspondence with the classification of the entire Campidano valley, the west central Sardinian plains are usually grouped together as the central Campidano. This area can in turn be distinguished into a northern and a southern half, roughly on either side of the Monte Arci. At this point the Monte Arci pediment gives way to the protruding basalts near Uras and Mògoro and the stream valley of the Riu Mògoro. The smaller northern Campidano is situated between the western slopes of the Monte Arci massif, the eolian sands and the Sassu lagoon (fig. 3-10). In the North, it is delimited by a string of lagoons, ponds, fens and rivers, of which the Santa Giusta and Paùli Maiori lagoons are the principal ones (di Gregorio/Marini 1987, fig. 4). The much larger central Campidano is bordered by the mountains and hills of the Iglesiente and the Marmilla. Its southern limit is constituted by a low and originally marshy saddle which acts as a watershed.

The central Campidano (fig. 3-11) is dominated by the Riu Mannu and, to a lesser degree, by the Riu Mògoro: while the influence of the latter is restricted to the northeastern fringe, the former represents a central feature in the central Campidano (fig. 3-12). The Riu Mannu has built a wide stream valley with various terraces along its entire course from the Sanluri area to the Arborèa. It originally rose in the Sanluri swamps in which several minor streams flew together before these were drained early this century (Mancosu 1968, 521). The northern Campidano basically consists of a single pediment which is dissected by numerous ephemeral braided streams and which is primarily affected by lateral erosion and slope denudation. The western end is a rather steep drop of several meters which has been eroded by the Sassu lagoon.

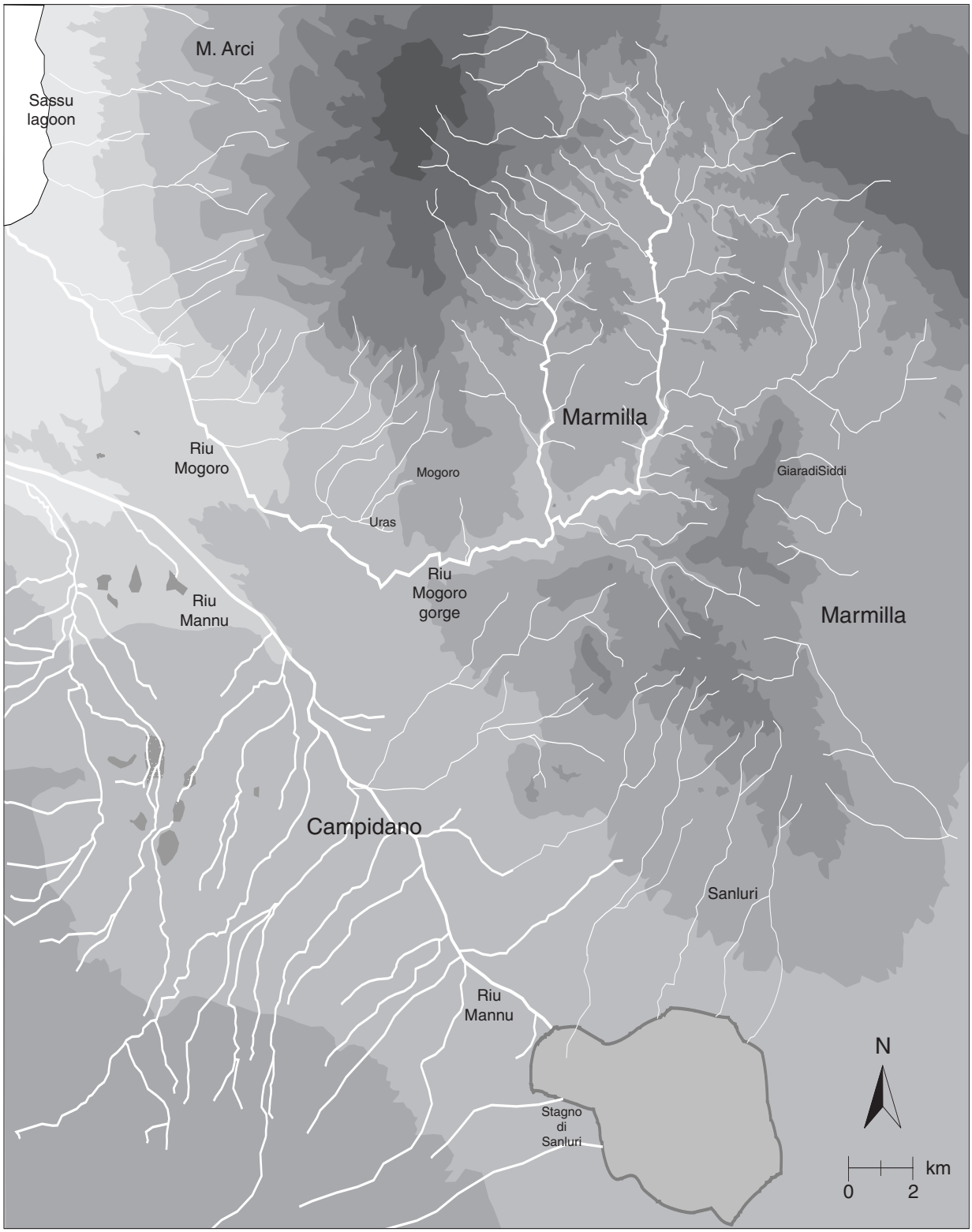

Fig. 3-12. Detailed map of the southern part of the central Campidano and the adjacent Marmilla hills showing the relief and principal physical features mentioned in the text.

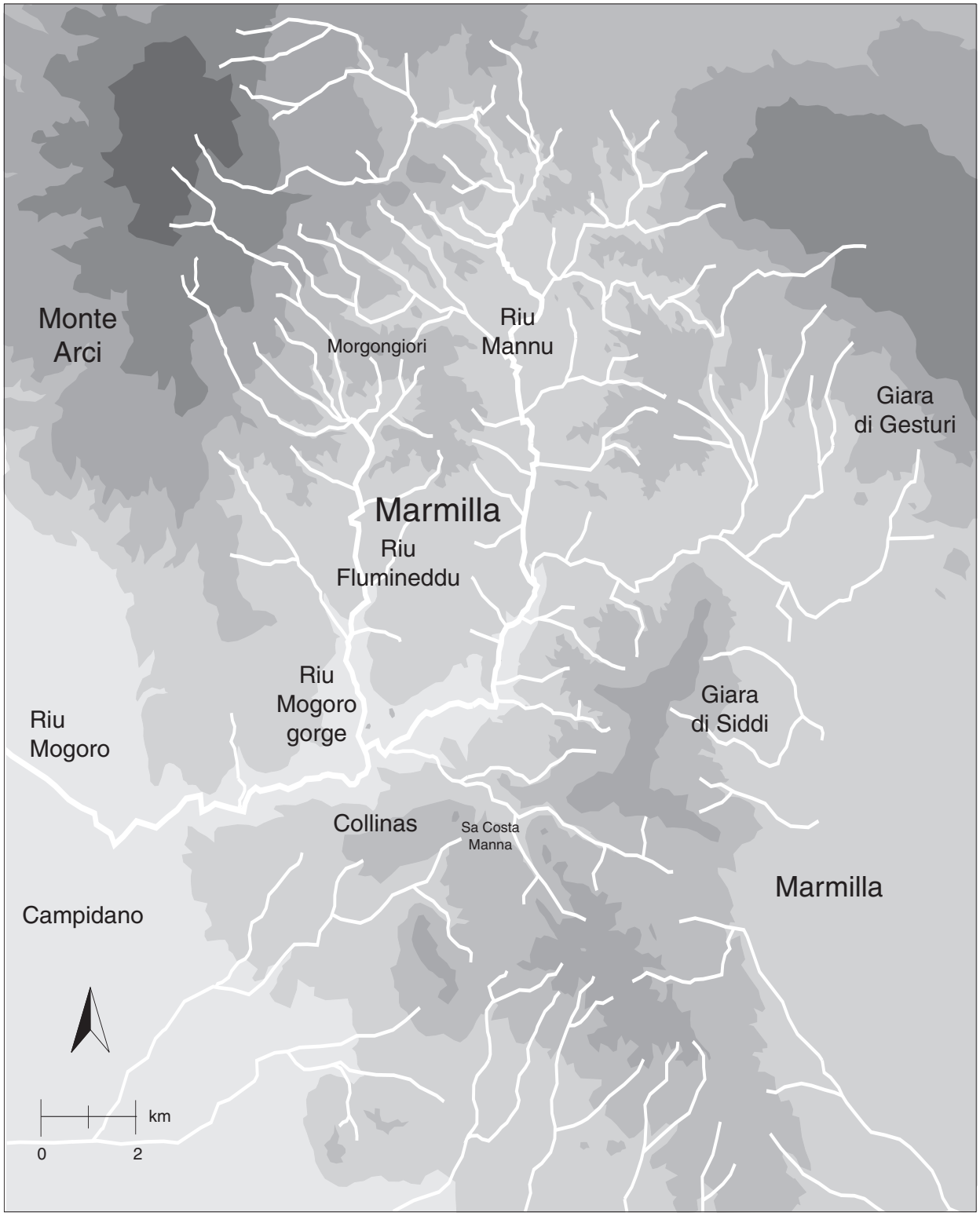

Fig. 3-13. Detailed map of the Marmilla hills showing the relief and principal physical features mentioned in the text.

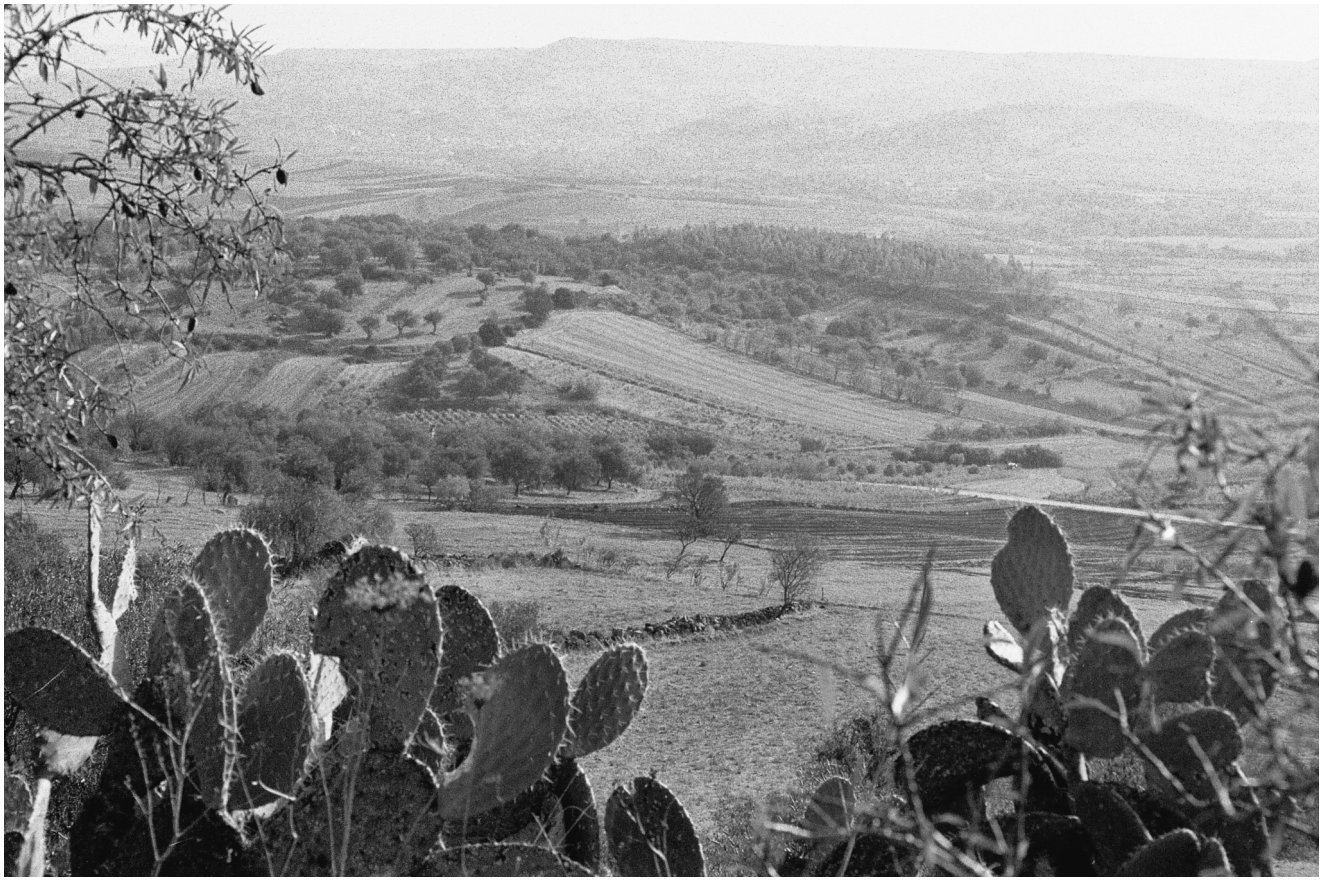

Fig. 3-14. View across the Riu Mògoro gorge in the lower Marmilla. In the background the small alluvial plain at the confluence of the two upper branches of the Riu Mògoro (photo P. van de Velde).

Having been formed on pediments, the soils of the central Campidano on the west bank of the Riu Mannu as well as those of the northern Campidano contain many coarse gravels and are generally ill drained (Aru et al. 1991, 50). They are consequently not particularly well suited for cultivation and have traditionally mainly been used as pasture (Le Lannou 1979, 176). The soils on the east bank of the Riu Mannu and along the Riu Mògoro in contrast are much finer textured and are moreover covered by a shallow blanket of eolian sands which have been drifted inland by the NW *Maestrale* winds (Aru/Baldaccin/Ulzega 1975, 130). This area is consequently much more suited to agricultural exploitation of various kinds (Aru et al. 1991, 50).
The *Marmilla* presents yet another landscape, which is that of the hilly uplands (fig. 3-13). The relatively low calcareous marl hills with particularly rounded contours form a gently rolling relief. The Marmilla proper exceeds the region of west central Sardinia and, together with the Trexenta region to the South, makes up a 20-25 km wide intermediate area between the Campidano plain and the granite mountains of the Barbagia and Sarcidano. The Marmilla in the narrower context of west central Sardinia basically consists of two drainage basins enclosed by the Monte Arci in the West, the Gesturi *giara* in the North-East, the Siddi *giara* in the East and the Campidano plain in the South.
Within the region, the principal features are two fluvial valleys winding through the hills with approximate N-S orientation and two tableland-like basalt formations. The latter make up the high towering basalt outcrop of Collinas (fig. 3-6) as well as the basalt plain of Mògoro, which is split in two by the Riu Mògoro gorge (fig. 3-14). The two river valleys which are separated by a relatively low watershed of marl hills represent the upper courses of the main tributaries of the Riu Mògoro. The western one of these, which is called either (upper) Riu Mògoro or Riu Flumineddu, is the shorter one and rises in the hills near Morgongiori, ca 8 km N of the confluence. It primarily drains the eastern slopes of the Monte Arci, following closely its steep basalt face high

above the marl hills. The valley itself is rather narrow and presents no significant floodplain. The eastern tributary is referred to as the Riu Mannu (which should not be confounded with the homonymous river in the Campidano!) and drains the remainder of the Marmilla basin. It rises ca 15 km to the North at the watershed between the Monte Arci and the tableland (*giara*) of Gesturi and traverses the eastern half of the basin from North to South. The stream valley is not particularly wide but yet offers a valley floor of some extent along most of its length. At the confluence of the two tributaries just North of the Riu Mògoro gorge, a small alluvial plain has been formed (fig. 3-14).

Although the two fluvial valleys are prominent features of the Marmilla, their influence has not been decisive in moulding the landscape. Besides the geological peculiarity of the dominating basalt tablelands, the so-called slope processes of rain wash, soil creep and mud flow have most contributed to the specific shapes and features of the landscape. In fact, the Marmilla marl hills present a specific sequence (or 'string') of soils that is indicative of slope erosion. These soils typically range from shallow, stony soils and exposed rock at the hill top and on the upper slopes to moderately deep sandy loam at the lower slopes to deep heavy, clayey soils on the valley bottom (Aru 1991, 62). In the Marmilla, the latter soils are strictly confined to the small flood plains along the Riu Mannu and at the confluence of the two tributaries. The lighter sandy and loamy soils occupy a much larger part of the region, but are closely related to the two fluvial valleys because of their genesis at hill footslopes. These soils offer excellent agricultural opportunities, as they are light and well drained, hence easy to work and fertile (Aru et al. 1991, 48). They rank among the best arable soils of west central Sardinia and have traditionally intensively been exploited for cereal cultivation (Le Lannou 1979, 56). The shallower and poorer soils higher up the hills were traditionally used for small-scale orchards or secondary cereal cultivation (Le Lannou 1979, 191) but the recent abandonment of terraces has speeded up erosion, almost completely stripping these slopes of all soil cover. The shallow stony soils and bare rock of the upper slopes and hill tops are mostly used as pasture.

This overview of sub-recent land use shows on the one hand that each of the three landscapes offers a substantial variety of soils which allows both agricultural and pastoral exploitation. The historically documented close connections between farmers and shepherds therefore need not cause surprise (Lai 1994, 21). On the other hand, the conventional characterization of the Marmilla as the fertile 'granary' of Sardinia can be related to the eminently arable footslope soils. Intensive agricultural exploitation of the entire Campidano today, however, must be regarded as a modern innovation, because the heavy soils of the pediments are difficult to work with simple means and may have been preferred as pasture in the past. Some parts, such as the Monte Arci pediments of the northern Campidano, are still regarded as extremely poor soils today. The most varied setting must have been that of the Arborèa wetlands, as they were before the land reclamations of the 1930s, since they comprised both extensive pasture lands and reasonable agricultural soils. A problematic aspect of this area, however, is the endemic malaria which has inhibited settlement in historical times. While there are indications for malaria in Roman Imperial times, it is uncertain — in particular because of the possibly drier conditions — whether the area was as unhealthy and malarial during the 1st millennium BC as it was in this century (cf. Brown 1984).

Finally, not much has been said about the vegetation and fauna of the region, mainly because there is no reliable evidence. Nevertheless, given the general climatic and geomorphologcal conditions and considering evidence from Corsica, it is likely that 1st millennium BC Sardinia was covered by a typically Mediterranean vegetation which comprised species such as olive, wild fig, wild pear, elm, laurel, vines etc. In the lowlands, cork oak and white poplar remained the most common trees until the 19th century (cf. Le Lannou 1979, 55). With regard to the study area, the wild fauna presumably included wild boar, deer, fox and rabbit. The sea and lagoons moreover contained various kinds of molluscs and fish, including tuna (see Webster 1996, 31 for an overview). Having thus presented the physical characteristics of the west central Sardinian study area, I now turn to the archaeological contexts of the region in order to examine the background of the available archaeological information.

3.3 A Brief History of Sardinian Archaeology

Outlining the development of the regional archaeological traditions and achievements is a well-established way to create a starting point for further detailed study. The aim of the following overview of Sardinian archaeology, however, goes beyond a mere *Forschungsgeschichte* as I intend not only to gain a better understanding of the nature and formation of contemporary archaeological knowledge in west central Sardinia but also to consider the characteristics of the concrete archaeological data base. An historical perspective seems the most appropriate approach for doing so, because it 'offers a special vantage point from which the changing relations between archaeological interpretations and its social and cultural milieu can be examined' (Trigger 1989, 4). More specifically, an historical perspective may help to identify those elements of the archaeological record which have tended to be emphasized and those which were often underestimated, thus contributing to a fuller understanding of the formation of archaeological thinking about the Sardinian past. As a framework for this outline, I shall adopt the broad

scheme of the development of Italian, Mediterranean and European archaeology proposed by Trigger and elaborated by Guidi for the Italian situation (Guidi 1988; Trigger 1989).

3.3.1 FROM ANTIQUARIANISM TO SCIENTIFIC ARCHAEOLOGY

An interest in the history of Sardinia and its material remains was aroused in the wake of the wider European appreciation of classical antiquity from the 15th century onwards, when Pompeii was first explored. The first account of Sardinian antiquities was published in 1550 by an outsider, the Swiss scholar Sigismondo Arquer from Basel. His *Sardiniae brevis historia et descriptio*, which was exclusively based on classical authors, represents the first attempt to arrange the peoples and events of these sources into a relative chronological sequence. His is also the first effort to explain the nature and origin of the nuraghi. Shortly afterwards in 1580 Giovanni Francesco Fara, the erudite bishop of Bosa, was the first Sardinian author *de rebus Sardois*. He meticulously studied and compared the evidence offered by Greek and Latin authors and was able to propose a surprisingly refined chronology for the Carthaginian and Roman periods, which to a great extent coincides with the conclusions of more recent historical work. During the following 16th and 17th century the same classical sources continued to constitute the sole framework for constructing a Sardinian past and understanding the visible antiquities of the island. The latter, in particular those relating to the prehistoric period, were also frequently explained with reference to etymological or mythological considerations (Lilliu 1962; Ugas 1980, 299).

When North-European travellers started to explore the Mediterranean in the 18th century, calling at Sardinia among other places, a number of travel accounts referred more or less extensively to the island and its marvels, including of course the 'mysterious nuraghi' (e.g. Pasquin Valéry 1835). Because of the broad scope of these *voyages*, Sardinia and its monuments were frequently compared to other Mediterranean regions, adding to theories of oriental *(ex oriente lux)* or 'Pelasgian' origins of the inhabitants and monuments of the island (Lilliu 1981, 491). It is in the tradition of precise descriptive accounts, influenced by 18th century French encyclopedic achievements and encouraged by Piemontese statistical concerns, that a number of abundantly illustrated studies were produced by both Sardinian and Piemontese scholars. Among these, V. Angius and Alberto Della Marmora particularly stand out. The former wrote several contributions, among which *I Nuraghi* (1839), for the *Dizionario storico-geografico* published by Goffredo Casalis between 1833 and 1853, while the three volumes and accompanying Atlas of the latter's *Voyage en Sardaigne* were published in 1840. In these two studies, detailed description was combined with an unprecedented encyclopedic and analytical approach, which resulted in rich surveys of the antiquities of Sardinia going well beyond the usual mystification of nuraghi. Both authors paid attention not only to prehistoric monuments such as nuraghi and tombs *(domus de janas, tombe di giganti)* but also to important sites of Phoenician, Carthaginian and Roman age such as Sant'Antioco and Tharros. Della Marmora in particular amassed a data set which allowed him to increase the estimated number of nuraghi up to some 5,000 and to propose a classification based on their groundplan (Lilliu 1981, 493). The importance of the precise descriptions and drawings today is that they show the monuments in a much better state of conservation than they are nowadays.

By the end of the 19th century Sardinian archaeology underwent a fundamental change under the influence of the so-called 'scientific archaeology' which in the course of the 19th century had worked out a chronological framework based on archaeologial finds and excavations instead of classical sources (Trigger 1989, 73). This shift is embodied by the canon Giovanni Spano who was the first to undertake systematic excavations in Sardinia. His participation in the International Congress of Prehistory of 1871 in Bologna, which would prove to be instrumental in the development of (prehistoric) archaeology in Italy, clearly showed his familiarity with the 'scientific' approach (Guidi 1988, 27). In his paper for the conference, he reformulated the Sardinian past in terms of the various Stone and Metal ages *(Paletnologia sarda. Ossia l'età preistorica segnata nei monumenti che si trovano in Sardegna*, 1871). Spano also started to apply the new stratigraphic method in his excavations (such as at Nuraghe Attentu in 1874: Lilliu 1981, 498). It is important, however, to bear in mind that his prolific activities were not restricted to prehistoric (Nuragic) archaeology but also include the first systematic and comprehensive explorations of major Phoenician and Roman sites (e.g. Sulcis, Tharros and Neapolis). Spano's work was complemented by that of the historian Ettore Pais, whose *Sardegna prima del dominio romano. Studi storici e archeologici* (1881) drew a clear distinction between the Nuragic and the Phoenician-Punic cultures. Pais in particular demonstrated the mythical nature of most classical evidence for pre-Roman Sardinia and thus promoted the adoption of the 'scientific' methodology. Although Pais, as a historian, did not carry out any fieldwork himself and preferred the study and publication of finds and excavations, he established a group of skilled field archaeologists, who would contribute much to Sardinian archaeology (in particular Vivanet, Nissardi and Crespi). Pais also continued to publish the *Bollettino Archeologico Sardo* which had earlier been founded by Spano, and which now represents an invaluable source of information about the achievements of these early days of Sardinian archaeology (Lilliu 1981, 502). Whereas the Piemontese authorities had influenced Sardinian archaeology only indirectly, the new unified Italian State

(since 20 September 1870) interfered much more directly in the archaeological matters of the island. When Sardinia became increasingly integrated in the Italian state structures from 1871 onwards, new laws were enacted and a centrally organized bureaucracy was created in order to secure the presence of the new State in the most remote corners and the most diverse aspects of its realm. This included the promulgation of a series of laws covering the archaeological heritage of the new State and the concomitant creation of the office of a *Direzione del Museo e degli Scavi di Antichità* in each region (Arias 1995; Guidi 1988, 52). These increasingly intensive contacts proved to be particularly constructive for Sardinia at the turn of the century: archaeologists with a continental background (Zanardelli, Orsoni, Collini) attested open-air neolithic settlement in the coastal areas of the Sìnis, while Giovanni Pinza's *Monumenti primitivi della Sardegna* (1901) constituted a remarkable synthesis of the new insights and the archaeological remains known at the time (Lilliu 1981, 506). The publication of Giovanni Patroni's *Nora. Colonia fenicia in Sardegna* in 1904 was the first comprehensive study of Phoenician Sardinia and showed that the historical periods had not been overlooked by these developments (Tronchetti 1995a, 714).

3.3.2 THE PROFESSIONALIZATION OF SARDINIAN ARCHAEOLOGY

In 1902, Antonio Taramelli arrived in Sardinia to take up the office of 'Director of the Museum and of the Excavation of Antiquities'. When he left the office of *Soprintendente Archeologico per la Sardegna* in 1933, he had not only profoundly reshaped Sardinian archaeology but he had also laid the foundations for modern archaeology on the island. His principal achievement was that he systematically explored the entire island, bringing to light myriads of new sites and finds of both prehistoric and historical periods, thus becoming the unrivalled *grande rivelatore* ('great discoverer') of the archaeological record of Sardinia (Lilliu 1981, 511). His contribution to Sardinian archaeology is therefore primarily one of field archaeology and was of such expanse and accuracy that even today most new fieldwork projects cannot overlook his work.

Taramellli regarded himself first and foremost as a field archaeologist ('a worker with the pickaxe') whose job it was to 'inquire the soil' without historical prejudice (Lilliu 1981, 512). His fieldwork activities stand out by the sheer number and extent of the excavations he carried out and because of the wide range of sites which he explored across the entire island. His activities ranged from extensive open-area explorations of classical sites such as the urban centre of Punic and Roman Nora and the vast excavations of the complex nuraghi Palmavera and Santu Antine (Alghero and Torralba) to the meticulous excavations of the Punic necropolis of Tuvixeddu (Cagliari) and the Neolithic *Domus de janas* burials of Anghelu Ruju (Alghero). Perhaps more important still are the topographical surveys which he conducted in many areas across Sardinia, which not only added substantially to the known archaeological record but which also gave rise to an entirely new direction in (field) archaeology. The exploration of the *giara* of Gesturi (between 1903 and 1906), during which some two hundred nuraghi were registered, was one of the first topographical studies and set the standard for a subsequent tradition in Sardinian archaeology. This work eventually laid the foundations for a far more ambitious project to compile an archaeological map of the whole of Sardinia, of which unfortunately only ten 1:100,000 sheets, all located in North and Central Sardinia, could be published.[3] Most of the activities undertaken were conscientiously documented by Taramelli in a prolific flow of publications in the most distinguished Italian archaeological journals of the time. Perhaps because of his preference for fieldwork and his relative lack of interest in wider historical issues these are predominantly field reports; Taramelli did not even attempt to write a new major synthesis of Sardinian archaeology, although his activities had contributed much to outdate the existing ones. An acute outline of such a new conceptualization of Sardinian archaeology can nevertheless be found in Taramelli's keynote address to the Archaeological Conference in 1926 which was published in 1929 under the neutral title *La ricerca archeologica in Sardegna* (Lilliu 1981, 511). Taramelli's preference for field archaeology was probably not accidental, however, as it corresponds to a general focus on excavations during the Fascist years (1922-1943). While Taramelli's celebration of the Nuragic past of Sardinia differed from the conventional Fascist glorification of Rome, it does fit in the general representation of the past as a glorious example for contemporary Fascist undertakings (cf. Manacorda 1982).[4]

A second, perhaps less celebrated but none the less equally significant achievement of Taramelli was his organization of Sardinian archaeology as a professional institution. Although earlier archaeologists had already frequently relied on local informants and Pais in particular had already trained a team of professional fieldwork archaeologists, it is Taramelli's merit not only to have institutionalized these practices but also to have forged a coherent whole out of these existing elements. He established an island-wide network of professional and lay inspectors, who carried out fieldwork for him and kept him informed of finds in particular areas. Although he initially engaged professional collaborators for specific projects (e.g. Nissardi for his survey of the Gesturi *giara* in 1903), he had set up a system of territory-based inspectors early on. These persons usually lived in the district of their responsibility where they had better access to local knowledge of archaeological finds and could carry out fieldwork in

the name of Taramelli. In west central Sardinia, it was Francesco Soldati who from the 1920s onwards was Taramelli's professional representative. These officials were complemented by many honorary inspectors, who usually were wealthy amateur archaeologists or more often collectors of antiquities, who kept Taramelli informed of what went on in their region. His principal informants in west central Sardinia were Ernesto Diana in Sardara and Francesco Lampis in Guspini.[5] Taramelli moreover effectively drew on his authority as a senior State official, collecting numerous reports of illegal finds confiscated by the police: on the basis of the police reports and the finds sent to him in Cagliari, he could usually decide whether or not to undertake further action. Many brief notifications of sites represent the outcome of such reports, as shows the immense correspondence preserved in the Archives of the *Soprintendenza Archeologica* in Cagliari.[6] In a similar vein, Taramelli collaborated closely with the Mining Society of Montevecchio, to the directors and engineers of which he entrusted the excavation of a *Tomba di giganti* in Funtanazza (published by Taramelli in 1927 in the *Notizie degli Scavi)*. His position also enabled him to summon all mayors in Sardinia to supply him with relevant archaeological information for his Archaeological Maps (1926, ASC 19). It is this system which which gave Taramelli detailed insight in the local archaeological record and which allowed him to closely monitor what had been found; it moreover explains his prolific activities which otherwise would have been physically impossible for one man.

Finally, Taramelli played an important role in the conservation of the archaeological record, not only by reordering and enlarging the National Museum in Cagliari and founding in 1931 its northern counterpart in Sassari, but also by stimulating local awareness of the archaeological heritage through his network of informants. Having stepped down from office in 1933, Taramelli continued to publish until his death in 1939.

3.3.3 POSTWAR DEVELOPMENTS

Under these conditions of high professional standards and a strong emphasis on fieldwork and local detail, Giovanni Lilliu was trained during the 1930s and it was with these standards that he would set the scene for postwar developments in Sardinian archaeology. Although he started his career in the Archaeological Service, continuing Taramelli's work for the Archaeological Maps in the Marmilla, he soon took up the chair of Sardinian Antiquities at the University of Cagliari. In this function he carried on his topographical work and started the excavation of nuraghe Su Nuraxi near Barumini in 1949. From that time onwards, Lilliu increasingly concentrated on prehistoric archaeology. From roughly that time, too, the Archaeological Service would be directed by archaeologists with a classical background (Giovanni Pesce and Feruccio Barreca) who strongly focused their activities on Phoenician-Punic remains (e.g. Bithia, Tharros, Antas etc.: Tronchetti 1995a, 714). Consequently, the 'Great Divide' between classical and prehistoric archaeology in general (Renfrew 1980) also opened up in Sardinia, whereas it had previously been bridged by Taramelli's emphasis on the local archaeological record which included both prehistoric and classical components. During the later 1960s, when the *Soprintendenza* became more bureaucratized and was transformed from a pure research institute towards a heritage management office, its large-scale projects on historical sites were taken over by the *Istituto di Studi Fenici e Punici* of the Italian National Research Council (C.N.R.); more recently, the research-oriented collaborators of the Archaeological Service have started to leave for academic institutes, both in Sardinia and on the mainland. The *Soprintendenza* itself was moreover thoroughly reorganized by establishing a new branch in Sassari (1956), which took up responsibility for the two northern provinces of Sardinia (Sassari and Nuoro), leaving the Cagliari and Oristano provinces in the South to the Cagliari office. To some extent, this division has enhanced the separation between prehistoric and classical archaeology, as it roughly coincides with those parts of the island, where most Phoenician-Punic and Roman remains are concentrated (the South) and those, where prehistoric remains dominate and Roman finds are usually encountered in indigenous contexts (the North).

Today, Sardinian archaeology is effectively split by this local version of the 'Great Divide' as is demonstrated by the separate chronologies used for the earlier centuries of the first millennium BC: Lilliu's five-phases framework for the nuragic period (phases 4 and 5) and the conventional classical periodization in historical (Phoenician etc.) or art-historical terms (such as 'orientalizing'). At the same time, the split between the northern and southern parts of the island has been mitigated, because on the one hand both the earlier (Neolithic) and later (Iron Age) prehistoric periods in the South have received much more attention. The merit for this goes to archaeologists of both the university where Enrico Atzeni holds the chair of Sardinian Antiquities, and of the *Soprintendenza*, which for the first time since Taramelli has a prehistorian, Vincenzo Santoni, at the helm, whereas in the North, awareness of the significance of the Phoenician, Punic and Roman occupation phases of Nuragic sites has steadily grown.

Whereas Phoenician and Punic archaeology in Sardinia have remained in touch with developments in Mediterranean archaeology at large through the widespread activities of the Italian C.N.R. institute for Phoenician studies, both prehistoric and Roman archaeology in Sardinia have apparently lost contact with mainstream prehistoric and Roman archaeology outside the island. Nor does the latter have much in common

with its historical counterpart in Sardinia.[7] As a consequence, these subdisciplines still adhere to a framework of increasingly outdated methods and concepts and have appeared unable to participate in developments which occurred in NW European and Italian archaeology of the 1970s and 1980s. Not surprisingly, therefore, prehistoric Sardinian archaeology has been characterized as 'in the best of cases, the invention of anecdotical, pseudo-historical narratives or, in the worst of cases, the compilation of tedious catalogues of monuments and finds as a goal in itself' (Lewthwaite 1990, 97). One cannot avoid the conclusion that Sardinian archaeology has effectively remained stuck in a cultural-historical framework (Trigger 1989, 148), which continues to define the past of the island in typo-chronological terms and related cultural horizons which are based on outdated notions of culture (cf. Lewthwaite 1990, 97). Although Sardinian archaeology is evidently no longer as closely related to mainstream archaeology in Italy and Europe as it was in Taramelli's days, it can nevertheless be argued that in other respects Taramelli's legacy still is a dominant force in 'modern' Sardinian archaeology: the strong emphasis on fieldwork and a certain disregard of interpretative issues are certainly a case in point. Although nearly all archaeological work must be classified as monument-oriented, no matter whether prehistoric or classical, it is the distinctive tradition of topographical explorations and territorial studies as initiated by Taramelli and promoted by Lilliu which no doubt represents the strong suit of Sardinian archaeology.

3.4 The Archaeological Record in West Central Sardinia

Turning more specifically to the region and period under discussion, west central Sardinia during the first millennium BC, it is now possible to make an assessment of the regional archaeological record. The geomorphological survey of the region on the one hand has provided the means for considering in which parts of the region the archaeological record is likely to have been distorted by postdepositional processes and in which ones it may be relatively unaffected; the overview of Sardinian archaeology on the other hand has given insight in its weak points and strong suits, allowing an evaluation of the data accumulated in the course of its history. From a postdepositional point of view, the archaeological record dating from the first millennium BC can by and large be expected to have been reasonably well preserved in west central Sardinia. Nevertheless, two areas have been identified, where the risk of postdepositional distortions of the archaeological record is appreciably higher. One of these is the Marmilla, where slope processes may have eroded archaeological deposits on the higher reaches of hill slopes, while burying those at the foot of the same slopes. The construction and successive abandonment of terraces on the steeper marginal slopes (as e.g. at the west slope of the Siddi *giara*) has no doubt only added to these processes (cf. Pope/Van Andel 1984). The situation appears to have deteriorated even further as a consequence of deep-ploughing for laying out vineyards, which was particularly intensive in the 1960s. The other area is the Arborèa, where recent eolian deposits may have covered up archaeological deposits. The experiences of the *Riu Mannu* survey fieldwork campaigns and of several more extensive explorations suggest that erosion may indeed present a serious problem for the higher hill slopes in the Marmilla, while the problems posed by deposition of colluvium and eolian sands in the Marmilla and Arborèa respectively appear to be of more limited consequences. Both the depth of colluvial and eolian deposits and the intensity of agricultural activities (in particular ploughing) are important additional factors in determining the visibility of archaeological remains in the latter two situations. In the case of the Arborèa, the radical reclamation activities (Mancosu 1966, 521) constitute a potentially far more destructive source of postdepositional distortion of the archaeological record in this area. On the whole, however, it may safely be concluded that there are no large contiguous areas in the region which must *a priori* be classified as blanks in the archaeological record. While true on a regional scale, this does not exclude, however, numerous cases of *local* postdepositional disturbances affecting the archaeological record, such as modern construction works and natural processes of erosion and aggradation. The modern built-up areas, which have expanded considerably over the past three decades, are an obvious case in point.

This means that the distribution map of known archaeological remains in the region has primarily been biased by the nature of archaeological research which has been going on in this region during the last century or so. A brief glance at this map, a simple plot of all sites for all periods considered (fig. 3-15), suggests that the region as a whole has been reasonably well covered: there are no obvious blanks in the distribution of find-spots. At the same time, however, several conspicuous concentrations of dots (e.g. southern Arborèa, eastern central Campidano) cannot simply be accepted at face value as indicating significant settlement clusters; they may also represent the results of locally more intensive research. In short, in order to make these data acceptable for study purposes, they need to be assessed in some detail. One way to do so, is to examine the formation of this data set: how and when have these data been collected? Alternatively, the composition of the data can be evaluated and compared either internally or preferably with other independently and more systematically recorded results in order to shed light on the representativeness and biases of the data (cf. Van Dommelen 1992, 864). In Sardinia, intensive and systematic field survey projects which can produce

Fig. 3-15. Distribution map of all 544 sites included in the database (cf. appendix).

such data sets are restricted to the *Bonu Ighinu* survey, the *Nora* survey and the *Riu Mannu* survey projects. While the first two of these are confined to a limited area — the Bonu Ighinu valley and the hinterland of Nora respectively (Rendeli/Botto 1993; Trump 1990) —, it is in fact only the *Riu Mannu* field survey in west central Sardinia (see below) which is a truly regional project. Such a regional scope has also been adopted by two other projects carried out in the northern parts of west central Sardinia (but largely outside the study area under discussion): yet, the fieldwork strategies and methods adopted in the Sìnis and adjacent northern Campidano (Tore/Stiglitz 1994) and in the middle Tirso stream valley and nearby Marmilla (Rowland/Dyson 1991) appear to lack the necessary intensity to achieve representative results, despite many otherwise significant findings. In order to obtain an insight in the characteristics and biases of the available evidence in west central Sardinia, the over-all composition of and collection methods used for all known relevant archaeological finds will first be considered; the fieldwork strategy of the *Riu Mannu* field survey project will then be examined and finally a general assessment of the available archaeological evidence will be made.

3.4.1 A SURVEY OF ARCHAEOLOGICAL FINDINGS IN WEST CENTRAL SARDINIA

The direct sources which I have consulted to build a database of known findspots in west central Sardinia are basically all available publications,[8] the Archives of the *Soprintendenza Archeologica* in Cagliari and written and oral communications of local amateur archaeologists. From the available documentation, it appears that west central Sardinia was included in the earliest archaeological undertakings in Sardinia: Della Marmora drew accurate views and plans of several Nuragic monuments in the 1830s and Spano excavated at the site of Neapolis as early as 1858. Extensive archaeological research in west central Sardinia, however, basically goes back to Taramelli's involvement in the region. The issues of the *Notizie degli Scavi, Bollettino di Archeologia Sarda, Monumenti Antichi dei Lincei* and *Studi Sardi* of those days contain numerous brief notifications of the finds and findspots Taramelli was informed of in Cagliari. His most important informants in west central Sardinia were the honorary inspectors Francesco Lampis, whose informations were restricted to the territory of Guspini, and Ernesto Diana, to whom he dedicated his account of Nuragic Sardara. The sites reported by Taramelli tend to cluster accordingly either in the Montevecchio and Ingurtosu mining districts of the Iglesiente mountains and the area just below the mountains (territory of Guspini) or in the area around Sardara and Sanluri (along the *Carlo Felice* highway to Oristano and beyond from Cagliari). These areas largely coincide with areas where modernization first took place in this part of Sardinia, viz. the mining districts and related roads and railways: these were supervised by Italians (or Italianized Sardinians) who were conscious of the archaeological heritage they might encounter. In a lenghty article in which he presented the excavations of the well-sanctuary of S. Anastasia in Sardara (cf. p. 87), Taramelli explained his interest in this region in terms of the evidence he had found for Nuragic tribal organization: in his view, the physical unity of the region was matched by the distribution of large nuraghi grouped around a major sanctuary.[9] For this reason, he deemed the extensive decription of the region (fig. 3-16) a necessary preamble to his study of the site of S. Anastasia (Taramelli 1918a, 6-33).

A second important contribution to the knowledge of the regional archaeological record goes back to the late 1930s and 1940s, when Lilliu was active in two areas within in the region. In the central part of the Campidano near San Gavino Monreale he recorded a number of Punic and Roman settlements and partially excavated one of these. Several topographical explorations by Lilliu and his collaborators in the northern part of the Marmilla (Tuili, Setzu) and adjacent areas (Barumini, Gesturi) added the existence of several Roman settlements in this area to the archaeological record. The annually published *Notiziario archeologico* of the *Studi Sardi* reflects this surge in activities with many brief but precise notifications of finds. During the 1940s and 1950s large parts of the central and southern Campidano were explored by students of Lilliu, who typically covered two or three 1:25,000 I.G.M. sheets (each roughly 150 km^2), often in the territory of their home village. As this meant good access to local knowledge, these topographical studies presumably represent the existing knowledge of archaeological find-spots fairly well. Although most of these *tesi di laurea* have remained unpublished, it appears that the archaeological descriptions of these sites tend to be rather generic and unreliable, in particular for the historical periods, as most attention is focused on nuragic evidence.[10] Significantly, the only published topographical study within the region of west central Sardinia does not mention historical finds at all (Puxeddu 1958). Nevertheless, the single one existing publication on Roman settlement in the Marmilla (Puxeddu 1975) stems directly from these topographical explorations initiated in the Marmilla by Lilliu, since Cornelio Puxeddu was a close collaborator of Lilliu and had access to all available evidence: his survey of Roman settlement therefore lists all Roman sites known in the area at that time (cf. p. 195). The studies of the territories of Gesturi (Lilliu 1985) and Sanluri (Paderi/Putzolu 1982) represent more recent examples of this tradition of topographical explorations inspired by Taramelli. More recently, the archaeological record of most of the region has again carefully been examined: in his study of the alleged territory of the Punic-Roman city of *Neapolis*,

Fig. 3-16. Map of west central Sardinia drawn by Taramelli (1918, fig. 1) showing the so-called *Rivus Sacer* basin which coincides with the present study area.

Raimondo Zucca has not only compiled and published an extensive site catalogue of all known find-spots, which in most cases have been revisited and described, but he has also added a number of yet unknown sites (Zucca 1987a, 115-147). The latter contribution is to a large extent dependent on the activities of several groups of amateur archaeologists, in particular in Guspini and in Sardara. Neither of these groups, however, have published their findings, although local museums are currently being set up for the presentation of the knowledge of these groups.[11] Zucca's

publication also contains references to the few instances of professional work (usually rescue excavations) in the region, which have otherwise remained unpublished (e.g. the late Roman villa at Muru is Bangius near Marrubiu). The prehistoric findings of Lampis and the contemporary amateur group in the territory of Guspini have recently been collected and listed in a German doctoral dissertation (Koberstein 1993). Particular mention must finally be made of the topographical study of the territory of Terralba by Gino Artudi and Sandro Perra, who have covered a crucial sector of the southern Arborèa. They have described their work in a series of largely unpublished essays, some of which have now appeared in a local magazine, including an extended listing of all Punic and Roman sites in the area (Artudi/Perra 1994, 1997).[12] They have been able to enhance their work in the tradition of Taramelli by frequently revisiting of sites and fields following fresh agricultural activities and thanks to a profound knowledge of the area, combined with a keen eye for detail. As a consequence, their work clearly ranks as the best available in the region.

Largely outside the study area as defined above, two regional archaeological projects have provided interesting and highly relevant results, which are useful for comparison. These cover the extensive areas of the Sìnis and adjacent northern Campidano (Tore/Stiglitz 1994) and of the middle Tirso stream valley and nearby northern Marmilla (Rowland/Dyson 1991). Both projects must be counted among the Sardinian topographical tradition, despite the foreign background and claims to the opposite of the latter project, as fieldwork is restricted to selected nuraghi (cf. p. 101).

Considering this variegated compilation of topographical studies, it is evident that *all* archaeological evidence in west central Sardinia, whether professional or amateur work, has been based since the days of Taramelli on a non-systematic procedure of collecting information. Both prehistoric and classical archaeology in Sardinia have also remained monument-oriented, focusing exclusively on monumental nuraghi and equally impressive urban and villa sites. As most studies are based on first-hand experience with the archaeological finds as well as on enduring personal involvement in the area, the quality of the description of both the find-spot and the individual finds is generally quite good: usually, a standard level of description as set by (again) Taramelli is adhered to. An unfortunate deviation from the norm is Puxeddu's description of Roman settlement in the Marmilla (1975), which, presumably because of the author's relative unfamiliarity with the period, on the one hand appears rather unreliable and wanting in terms of the description of the finds, while on the other hand there is little reason to doubt the location and over-all definition of the sites. Descriptions in Taramelli's tradition typically mention the find categories encountered, the (broad) chronological range of finds, including the most significant diagnostic objects, and a general description of the site location, often with an estimate of site size. The general reliability and precision of these data have been checked and confirmed in the field by visiting several sites mentioned by the various reports and sources.[13] It was, however, noted that recent (postwar) site reports frequently fail to meet the topographical precision of Taramelli by only providing toponyms and by using disproportionally large dots on small featureless maps. Precise topographical references using I.G.M. grid-based coordinates are never used, which has introduced a margin of error of sometimes up to several hundreds of meters in the location of sites. Although this can be ignored at a regional scale, it poses serious problems for revisiting or protecting sites. The site descriptions by Artudi and Perra again stand out because of their small-scale and detailed maps, systematic estimates of site size and consequent use of well-defined ceramic fine wares as chronological indicators.

3.4.2 THE *RIU MANNU* FIELD SURVEY PROJECT

In contrast to the traditional monumental and urban focus of much Mediterranean and Sardinian archaeology, the *Riu Mannu* survey was set up in 1991 with the explicit aim of exploring the human dimension of rural landscapes (Annis/Van Dommelen/Van de Velde 1995, 133-137).

The research strategy of the project has been based on the assumption that remains of human presence can be found almost everywhere: it therefore combines an overview of regional trends in settlement patterns with a detailed focus on small-scale artefact distributions. Because it is difficult to distinguish between more or less bounded activity areas and activities covering larger stretches of land (e.g. herding), the distinction between *off- site* and *on-site* finds has been abandoned (cf. Cherry 1983, 394-397). In order to keep track of human activities in different places in the landscape, the distribution of surface finds should be studied *across* the landscape with variations in find densities and concentrations. The *Riu Mannu* survey represents such an attempt to study variations in surface find densities across the landscape as a coherent whole and to examine human activities in it as being interrelated.

The *Riu Mannu* sampling strategy has been designed in such a way as to be sufficiently broad with regard to the general objectives, while also allowing for more specific questions. These requirements necessitate a differentiated sampling design. Sampling a landscape is most efficiently achieved through transects at right angles to the 'grain' of the terrain which is set by features as river courses, valley bottoms and ridges. West central Sardinia, however, is geomorphologically a mosaic and no single line can be identified as 'the' grain of it. The region has therefore been subdivided into nine areas, which are internally more or less coherent from a

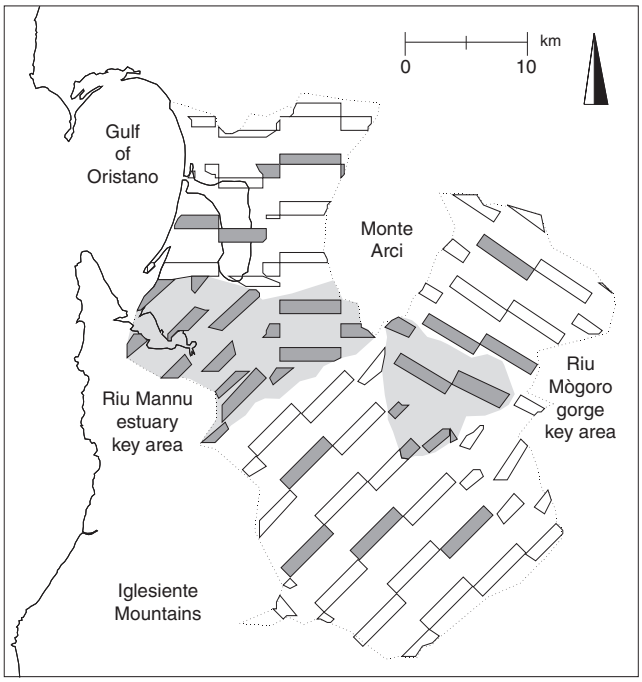

Fig. 3-17. The *Riu Mannu* sampling strategy showing in dark shading the sample actually examined, which is a weighed intersection of a probabilistic sample taken from the entire region (all transects) and two key areas (in light shading).

geomorphological point of view. Perpendicular to the axes of these areas transects of 1 × 5 km have been plotted, in order to incorporate most of the environmental variation of each area along their length. As a first step in this design one out of every four transects has been systematically selected for incorporation in the basic sample (fig. 3-17). As can be expected, many of these transects are smaller than the standard 1 × 5 km as the borders of the landscape units are quite irregular. In the second step of the design the survey region has been subdivided into primary and secondary areas for strategic, historical and archaeological reasons. The primary or key areas have been singled out where the major landscapes of the Arborèa wetlands, Campidano plain, and Marmilla hills meet, the secondary areas are the landscapes beyond these. The first key area is where the Campidano and the Arborèa meet at the lower reaches and the estuaries of the Mògoro and Mannu rivers. Easy access from the sea to both areas is historically and archaeologically attested.
The second key area centres on the escarpment which bounds the Campidano plain to the east, where Campidano and Marmilla meet. Especially the Riu Mògoro gorge cutting this boundary must have been a thoroughfare between hills and plain. The secondary areas are situated to the North (Arborèa, northern Central Campidano), to the East (Marmilla), and to the South (southern Central Campidano). The primary/secondary division works out in a statistical stratification of the sample: within the two key areas all transects in the basic sample are examined, whereas in the secondary landscapes only a limited number of centrally located transects are investigated. In the primary stratum there are 22 transects, and in the secondary stratum 11 transects are to be walked (fig. 3-17).
It might be objected that the final sample is not truly random because stratification has been introduced, the strata delimited on non-statistical criteria, and weighted differently. But it can be argued — it has been demonstrated in comparative research as well — that this sample is more effective with regard to the specific research aims than a random selection, precisely *because* use has been made of existing knowledge about the region in conjunction with a systematic and probabilistic sample. Sampling is one means towards an end, and other means — systematic scheme, stratification and weighting, but also the application of existing knowledge to delimit the region and its subdivisions — are equally pertinent and may contribute substantially to a more efficient achievement of the research purposes.
The fieldwork methods in the *Riu Mannu* survey are fundamentally different from those conventionally used. The difference regards the underlying statistical principle of data collection: instead of a continuous linear observation as with conventional line walking, a point-by-point registration principle has been adopted. In excavation archaeology, a similar approach has been used for so-called 'test pitting' methods. With regard to field survey, point-by-point finds collection deals with the problem of archaeological visibility: since only discrete small spots (usually measuring 2 m^2) are examined, visibility is much less affected by factors such as overgrowth. By this method the recovery of surface finds is likely to remain much more consistent despite different visibility conditions. A second advantage is of a statistical nature: collecting quantitative information on continuous *off-site* distribution patterns of surface finds is hardly feasible with conventional line walking. Collecting samples with the point-by-point principle overcomes problems of visibility and reliability, as *all* finds from *each* point can be processed afterwards without having to cope with insurmountable amounts of finds. Methodologically, the figures derived from *line* walking are difficult to convert to *surface* densities; practically, variable visibility conditions preclude comparison.
Statistical and practical considerations have led to the definition of the following fieldwork procedure (fig. 3-18): in each transect, a local grid is defined with the x- and y-axes orientated along the long and short sides of the transect respectively. To allow generalizations, a 120 m wide sample grid is randomly located along the length of the transect (y' in fig. 3-18, above). Within this sample grid collection

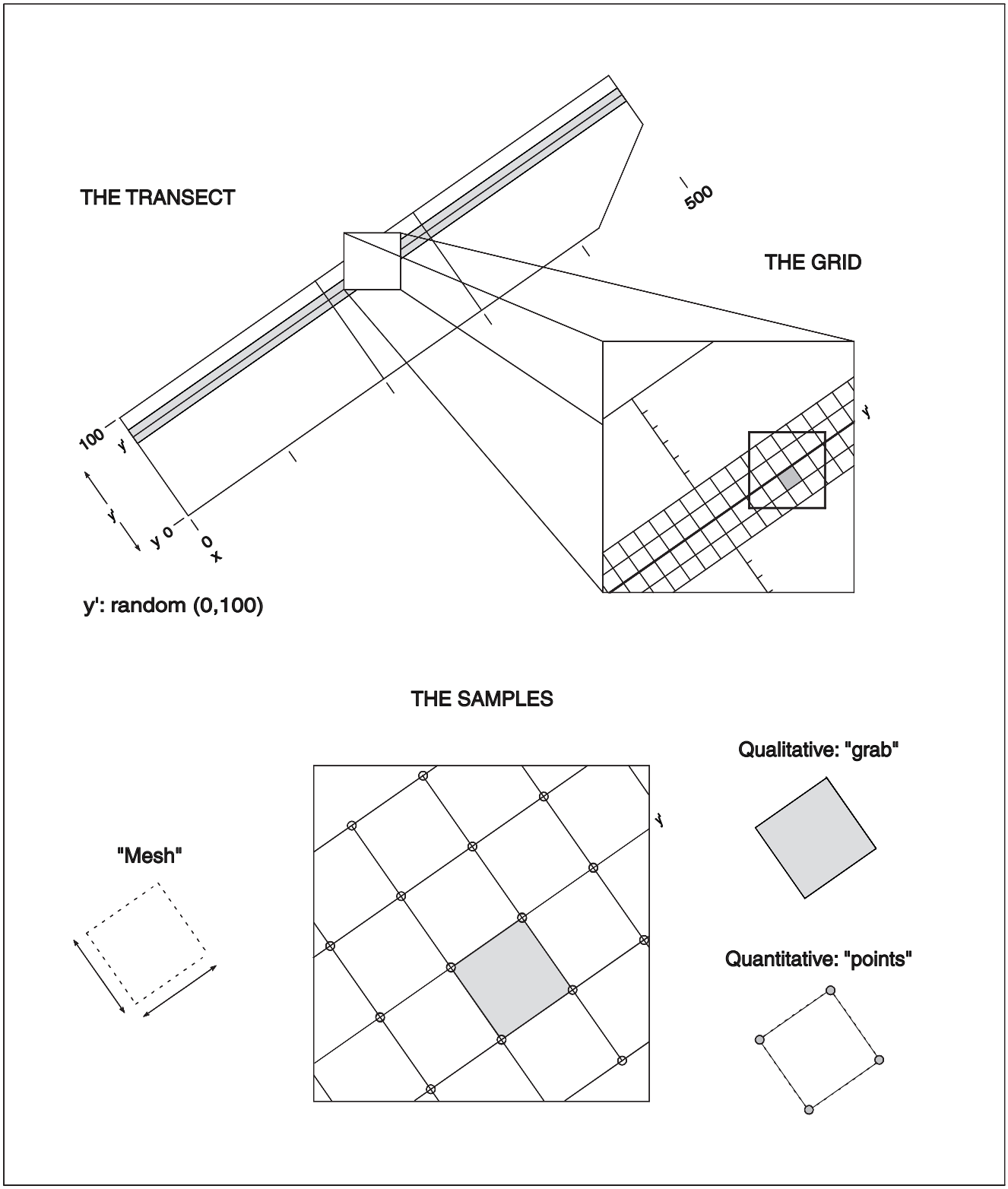

Fig. 3-18. Sketch of the fieldwork methods used and the sample grid involved, showing the 2 m^2 collection points at 30 m intervals (each square thus measures 30×30 m; x and y scales of the transect in decameters) (drawing P. Deunhouwer).

points (usually measuring 2 m^2) are set out at intermediate distances of 30 m (fig. 3-18, below). Whenever higher find densities are encountered, this 'mesh' is reduced to 10 m in order to register more detailed distribution patterns. At each collection point, *all* portable finds are collected, bagged and labelled. These finds make up the *quantitative* collection for primarily statistical use. Between the collection points, artefacts are taken only if they have diagnostic value.
In those cases where the grid spacing has been reduced, such diagnostic materials are systematically collected per 10 × 10 m square, bagged and labelled and kept separate as the so-called *qualitative collection* (also known as 'grab sample'). Since these finds are not part of the statistical sample, they are not included in statistical analysis; they do, however, provide important 'qualitative' (e.g. typo-chronological) information for the finds of the 'quantitative' sample. Information about overall visibility, local geomorphology, soil, land use, weather conditions and other details is separately recorded on standard sheets.
Fieldwork of the *Riu Mannu* project started in 1992 with a small-scale pilot season. Since then, fully-fledged campaigns of ca 5 weeks with teams of ca 10 persons have been carried out annually. So far, 15 transects have been investigated which together make up a total length of 53.7 km (fig. 3-19). While they include practically all of the transects in the two key areas, they represent about half of the entire sample to be surveyed (111.2 km). As over 7,000 collection points have been examined, these data are statistically reliable and representative (Van de Velde 1996). Initially, fieldwork has been concentrated in the Riu Mannu estuary key area in the southern Arborèa but in recent campaigns attention has been focused on the Riu Mògoro gorge key area. The study and analysis of finds still mainly regard the southern Arborèa and adjacent Campidano areas (see Annis/Van Dommelen/Van de Velde 1996 for a recent overview). This means that for all transects basic data regarding the presence and broad chronology of sites as well as the general characterisctics of the off-site material are available, while more detailed evidence for both on-site and off-site situations has only been made accessible in a number of transects of the Riu Mannu estuary key area, i.e. in the southern Arborèa and adjacent parts of the Campidano. Detailed analyses of pottery have likewise only been carried out on finds from these transects (nos 02, 04, 05 and 07: see Annis, in press).

3.4.3 MATCHING STRAY FINDS AND SYSTEMATIC COLLECTIONS

The available evidence on the archaeological record of west central Sardinia thus basically consists of two distinct data sets, which are fundamentally different but which can yet be confronted to provide information beyond the limits of each individual data set. One coherent set of evidence is provided by the results of the *Riu Mannu* field survey; the other, more or less congruous body of data consists of the whole of small-scale topographical explorations and chance finds from the last century or so. I shall refer to the latter as the *topographical* database as opposed to the one of the *Riu Mannu* survey. In both data sets, all entries have as strictly as possible been confined to the chronological period under discussion (first millennium BC). While the *Riu Mannu* evidence is strictly confined to the study area, however, the topographical database includes not only all finds recorded in the study area but also comprises significant discoveries made elsewhere in the wider region of west central Sardinia. The latter sites are mostly located in the Sìnis, northern Campidano and the upper Marmilla. These entries, which are separately discussed in the following chapters, are exclusively based on a limited number of publications (e.g. Lilliu 1985; Tore/Stiglitz 1994) and are by no means exhaustive: no attempt has been made for these areas outside the study area to take into account local publications or amateur evidence.
The entire data set considered in this study consists of 552 entries, 31 of which are part of the data collected by the *Riu Mannu* survey and 471 of which can be labelled as topographical evidence. (The remaining 20 sites are excavations.) In all, 204 entries remain outside the study area proper.
A complete listing of all available evidence, including extensive bibliographic references and information about specific finds, can be found in the appendix, while concise period-specific overviews are added to the chapters four, five and six. In each of these, the relevant evidence is also discussed in some detail. In both data sets, sites occupied in more than one period have been counted once if settlement was continuous; in case of two or more distinct occupation phases, each of these has been included separately (cf. appendix).
The most obvious distinction between the *Riu Mannu* and the topographical databases is no doubt the discrepancy in numbers of records: while the topographical database counts over five hundred entries, the *Riu Mannu* results amount to a mere 6% of this number. A much more fundamental and therefore far more significant distinction between the two data sets must nevertheless be made on the basis of the fieldwork strategies and methods with which the archaeological evidence was collected: as stated above in more detail, the set of topograhical data has been collected in a non-systematic way and must be considered as biased by uneven coverage of the region and varying intensity of fieldwork, usually as a consequence of assumptions about preferred site locations and defintion of study area by the researchers (often a village territory). The *Riu Mannu* survey, in contrast, is based on a probabilistic sampling strategy and the results are accordingly statistically representative. Apart from 8 sites recorded outside the statistical sample *sensu stricto* (i.e. outside the 120 m wide sample grid in each transect)

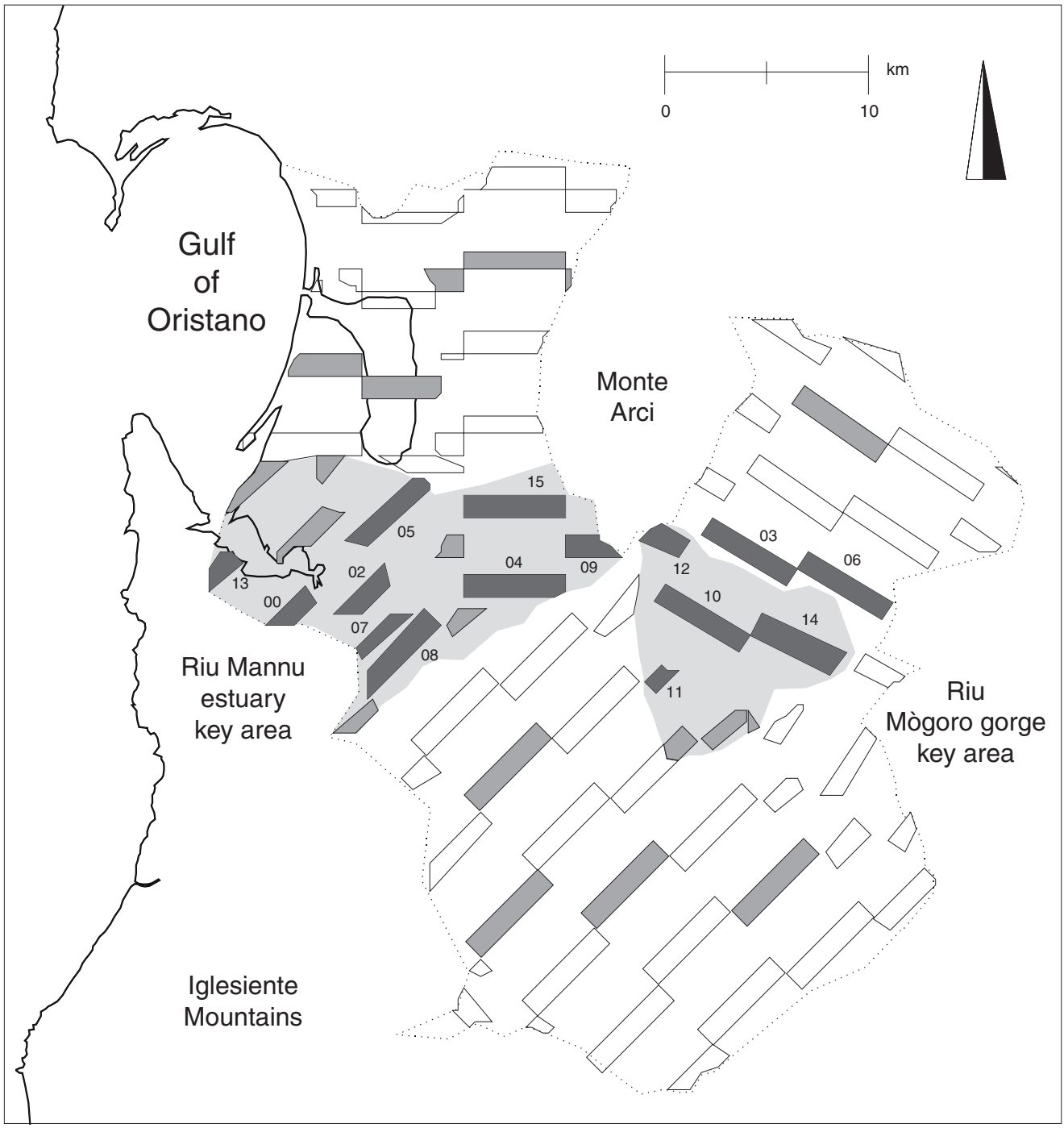

Fig. 3-19. Map of the *Riu Mannu* survey sample showing the 15 transects so far examined (for the sites located in these transects, see the relevant maps in chapters 4, 5, 6).

which must be classified as qualitative findings, the actual number of statistically reliable and representative relevant sites registered by the *Riu Mannu* is 19 (Annis, in press; cf. Annis/Van Dommelen/Van de Velde 1995, 140-142). Although both bodies of evidence relate to the entire west central Sardinian study area, a further major difference is that the *Riu Mannu* survey results as yet primarily concern the two key areas which were defined around the Riu Mannu estuary and the Riu Mògoro gorge: nearly all transects surveyed up to date are located in one of these key areas and the representative and detailed data of these systematic collections essentially relate to these more restricted areas. In the remainder of the study region outside these key areas only two transects in the Marmilla have been surveyed, which means that *direct* systematic field survey evidence for large parts of the region is still limited; the results from the key areas nevertheless also relate *indirectly* to the secondary area outside the key areas, as the composing elements of the key areas are also part of the three regional landscapes of the Arborèa, Campidano and Marmilla. The topographical evidence, on the contrary, basically concerns the entire study area, although the biased nature of the data means that some areas are better represented than others. One more intensively examined area (Terralba) coincides at least partially with the two key areas of the *Riu Mannu* survey sampling scheme, while a second one around Sanluri remains virtually unrelated to the systematic survey results.

It is this spatial overlap of the two databases which in the first place allows a complementary use of both data sets based on a combination of the distinct characteristics: while on the one hand the topographical data as in the southern Arborèa (Terralba) give insight in the wider distribution patterns of settlement, the *Riu Mannu* survey results on the other hand offer a representative picture of settlement in the same area in primarily quantitative terms (e.g. site densities and sizes). Comparison between the two data sets shows to what extent and in which sense the topographical data are likely to be biased (cf. Van Dommelen 1992, 864-870). Dependent on the degree of correspondence between the topographical data and the representative survey results, the distributional information provided by the former may then be added to the quantitative evidence of the latter (Van Dommelen 1992, 870-874). As the degree of representativeness may vary considerably for different periods depending on the nature of the finds most frequently attested — in particular on the varying erodibility of ceramics from different periods (see Taylor, in press; cf. Annis/Van Dommelen/Van de Velde 1993-1994, 40) —, these comparisons and combinations of relevant parts from the two databases are discussed separately per period in the following chapters four, five and six. In other situations, on which the *Riu Mannu* survey results have no or only an indirect bearing, and in which the topographical data therefore cannot be 'measured' in any way, the evidence of the latter must therefore be evaluated on its internal consistency and compared to all other relevant information regarding collection strategies and postdepositional processes.

3.5 Figuring out Landscape and Archaeology in West Central Sardinia

Overlooking the west central Sardinian landscape in relation to the archaeological record and the surveyors figuring in it, a twofold relationship can be identified between the three elements: in the first place, from an interpretative point of view, the interrelationships between the landscape in the wider sense of the term, i.e. comprising both natural and cultural dimensions, and the people dwelling in the region; secondly, the impact of the physical landscape on the archaeological record in terms of its formation and deformation. While the first sphere of relationships occupies a important place in the discussion of the various colonial situations of west central Sardinia in the next chapters, it is the second type of relationships which has been an important aspect of this chapter.

This chapter has also shown that the formation and deformation of the archaeological record cannot be reduced to 'natural', usually geomorphological, processes only. Equal, if not more, importance has to be attributed to the influence of research strategies and collection methods used. Both processes act as important 'filters' of the material culture which was originally available to the inhabitants of the region and which has progressively been reduced to the collections of archaeological finds which in the end are available for study (Van Dommelen 1992, 861-864; Taylor, in press; cf. fig. 3-20). In the situation of west central Sardinia and for the specific period under consideration, the available archaeological evidence has arguably suffered more from the research strategies and collection methods than from geomorphological processes such as erosion and alluviation. While the human impact has generally remained limited (e.g. ploughing), the more recent impact of activities such as road and house building have considerably contributed to the destruction of ploughsoil assemblages. In many cases, subsoil features may equally be ruined. An important factor in this respect is constituted by the pottery used during most of the first millennium BC: this was in the first place of a much better quality than that produced during the previous periods and consequently much more resistant to physical post-depositional processes; the predominantly reddish colours of pottery produced during the historical periods are also more liable to detection on the surface than the dull tones of earlier products. And secondly, many of these ceramics are likely to have been available in much larger quantities than in earlier periods; the abundant presence of

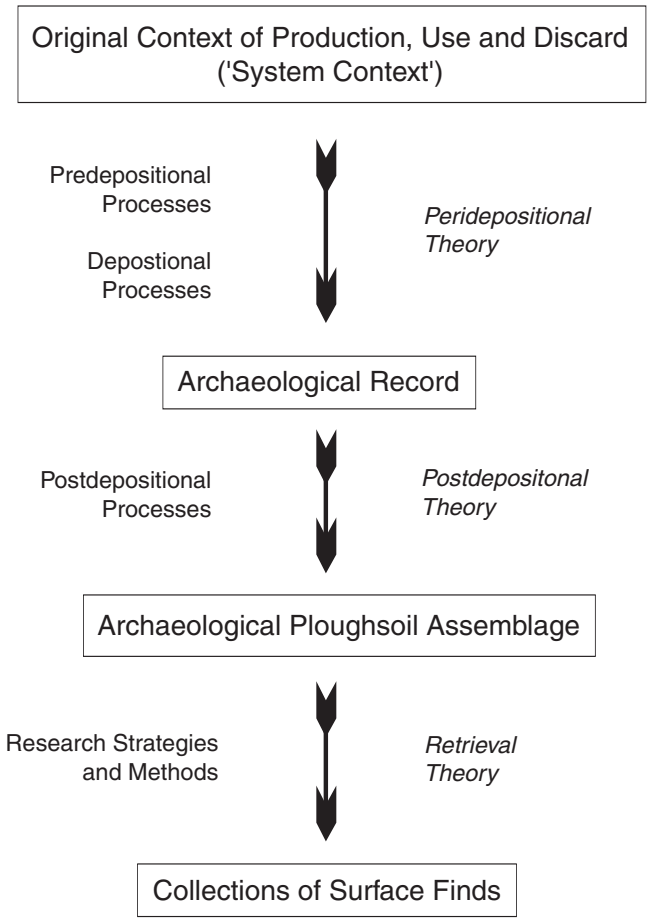

Fig. 3-20. Diagram of subsequent postdepositional and other deformation processes of archaeological surface finds.

roof tile fragments on Punic and Roman sites in particular is a well known feature.

This chapter therefore focuses on the 'human' background of the available archaeological evidence, i.e. on the impact of what has been termed 'retrieval theory' (Clarke 1973, 16-17); hence the attention for the part played by the archaeologists, whether professional or laymen, who collected the archaeological finds both in the past and in the present. A figure clearly standing out in this 'landscape of archaeologists' is Antonio Taramelli: not only has he been longer in office than any other *Soprintendente*, but he has also given rise to an entirely new approach for studying archaeological remains, viz. the topographical exploration: he has set the standard for what has become a distinctively Sardinian tradition of field archaeology. The extensive explorations undertaken by him and his successors have also largely determined the composition and nature of today's information about the archaeological record which in this study necessarily occupy an important place. It is only the very recently started *Riu Mannu* field survey project which, in west central Sardinia at least, has provided an independent and representative data set. Priority will therefore be given to the findings of the *Riu Mannu* survey, contrasting the topographical data with the systematic survey results whenever possible.

notes

1 Sardinians go about in a natural scenery that limits, controls, guides and conditions with its vastness, harshness and the trouble it takes to be domesticated and managed.

2 In the case of west central Sardinia during the last three millennia, the situation is rather complex, as the subsiding Campidano rift valley adds to the influence of the eustatic sea level rise. Since analysis of a large number of submerged archaeological sites in the western Mediterranean has suggested that the influence of the eustatic rise of sea level over the last two millennia in the Mediterranean has maximally been 50 cm and that all other (major) displacements of such sites must be ascribed to local tectonic activity, the contribution of local subsidence to *local* sea level variations in the Arborèa is likely to have been considerable (Flemming 1969, 85; Frau 1985, 97; Pirazzoli 1976, 520).

3 This project was part of a wider scheme embracing all of Italy supported by the Military Geographical Institute (I.G.M.). The Archives of the *Soprintendenza* still contain the original inventories compiled by Taramelli and his informants, which show that he had not yet been able to study the region of west central Sardinia (only sheet 205-206 comprises the southern slopes of the Monti Ferru in the far North of the region).

4 This is most explicit in a paper probably published in the 1930s in the journal *Il Sud*, in which he celebrated the bellicose nature of the Sardinians as a virtue for the war of his days, which presumably was that in Ethiopia: see frontispiece for an extended quote.

5 Most (if not all) of the letters describing archaeological discoveries and interpretations in the territory of Guspini by Lampis to Taramelli are contained in the Archives of the *Soprintendenza Archeologica* as well as in Lampis's private archives, now kept by relatives in Montevecchio (cf. Agus/Lampis 1992, 266; Koberstein 1993, 112).

6 Hereafter and in the appendix abbreviated as ASC. Unless explicitly stated otherwise, references are to the *Archivio Storico* by the number of the relevant folder and, if necessary, to any subdivisions of it (usually Roman numerals and/or date).

7 Recent innovative historical research on the Roman period in Sardinia (in particular by A. Mastino and C. Vismara) has had remarkably little impact on archaeological approaches and representations, as show recent surveys of historical and archaeological work (Mastino 1995 and Zucca 1995 respectively).

8 Consulted in the libraries of Leiden University, University College London, *Soprintendenza Archeologica* and University of Cagliari and in the *Biblioteca Comunale di Villanovaforru*.

9 Taramelli referred to the region as the *Rivus Sacer* basin, as he related this name provided by the Roman topographer Ptolomaeus

(III.3.5) to the local toponym *Sitzerri* which is used for either a tributary or the lower course of the Riu Mannu (1918a, 15).

10 These *tesi di laurea* are kept in the University of Cagliari, where they are virtually inaccessible (in particular for non-Sardinians); I have been able to consult only one *tesi*, written by Carlo Porru in 1947 on the area around Sanluri, which was kindly made available by Ubaldo Badas (Villanovaforru). Comparison of the data of this *tesi* to the evidence of more recent work in the same area (Paderi/Putzolu 1982) underlies the evaluation of this and presumably other similar *tesi* (cf. p. 194).

11 Significant exceptions are Tarcisio Agus's work on mining (Agus 1985) and the excavation of a Roman villa of Terra 'e Frucca near Guspini (*Scavo didattico* 1990). Work of both groups has frequently been referred to or even published by professional archaeologists (in particular by R. Zucca and G. Ugas).

12 As with other amateur work, their results have also frequently been published by professional archaeologists, notably by R. Zucca for the classical periods (in particular Zucca 1991) and by E. Atzeni for the prehistoric periods.

13 Primarily during a two-week period in June 1995 and, whenever possible, during the annual fieldwork campaigns of the *Riu Mannu* survey. These visits have also shown the impact of erosion: some sites had been eroded away almost completely.