DECODING NEOLITHIC ATLANTIC AND MEDITERRANEAN ISLAND RITUAL

For Bronislaw Malinowski - an island man throughout

Coastal sailing as long as it is perfectly safe and easy commands no magic. Overseas expeditions are invariably bound up with ceremonies and ritual. Man [humans] resorts to magic only where chance and circumstances are not fully controlled by knowledge.

Bronislaw Malinowski (1931)

AN OFFPRINT FROM

DECODING NEOLITHIC ATLANTIC AND MEDITERRANEAN ISLAND RITUAL

Edited by

GEORGE NASH & ANDREW TOWNSEND

Hardcover Edition: ISBN 978-1-78570-050-7
Digital Edition: ISBN 978-1-78570-051-4

Oxford & Philadelphia

www.oxbowbooks.com

Published in the United Kingdom in 2016 by
OXBOW BOOKS
10 Hythe Bridge Street, Oxford OX1 2EW

and in the United States by
OXBOW BOOKS
1950 Lawrence Road, Havertown, PA 19083

Hardcover Edition: ISBN 978-1-78570-050-7
Digital Edition: ISBN 978-1-78570-051-4

A CIP record for this book is available from the British Library

Library of Congress Cataloging-in-Publication Data

Names: Nash, George, editor of compilation.
Title: Decoding neolithic Atlantic and Mediterranean island ritual / edited by George Nash & Andrew Townsend.
Description: Philadelphia : Oxford Books, [2016] | Includes bibliographical references and index.
Identifiers: LCCN 2015041253 (print) | LCCN 2015047759 (ebook) | ISBN 9781785700507 (hardback) | ISBN 9781785700514 (epub) | ISBN 9781785700521 (mobi) | ISBN 9781785700538 (pdf)
Subjects: LCSH: Neolithic period–Europe. | Prehistoric peoples–Europe–Rites and ceremonies. | Island archaeology–Europe.
Classification: LCC GN776.2.A1 D43 2016 (print) | LCC GN776.2.A1 (ebook) | DDC 930.1/4094–dc23
LC record available at http://lccn.loc.gov/2015041253

Printed in the United Kingdom by Short Run Press, Exeter

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Front cover image: Diego Meozzi
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Andrew Townsend was awarded a PhD from the University of Bristol during the mid-1990s. His research included the ritual Neolithic of Malta and Gozo. He directed excavations in Libya, Cyprus, Jordan, Israel, Spain, the Maltese islands and the West Indies, and in 1997–98 he was Jerusalem scholar at the British School of Archaeology in Jerusalem. In the latter years of his life, Andrew worked for the Avon Archaeological Unit, Bristol and Region Archaeological Services, Bath Archaeological Trust and SLR Consulting. In his professional career, Andy did much to bridge the gap between commercial archaeology and the construction industry, devoting much of his precious time and energy, turning archaeology from an insular academic subject to a profession.

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Dedication: Andrew Townsend

It is with great sadness that co-editor Dr Andrew Townsend passed away during the final editorial stages of the book. Among many of Andrew's interests, he had a wealth of knowledge concerning island archaeology, in particular research into Neolithic mortuary practices on Malta and Gozo. It is a fitting statement that his interests of prehistoric societies in an island context should be his last publication. Although Andrew has now gone, his legacy through publication and reputation will remain for many years to come. This book is dedicated to Andrew and the inheritance he has given to archaeology.

9

Rite to memory: Neolithic depositional histories of an Adriatic cave

Timothy Kaiser and Stašo Forenbaher

Excavations at Grapčeva Cave, a major eastern Adriatic Neolithic site, yielded evidence of ritual activities during the 5th millennium B.C. Structured deposits in the cave's main interior chamber included large burnt areas with extremely high frequencies of animal remains and artefacts, notably richly decorated Late Neolithic 'Hvar-style' pottery, as well as scattered human remains. It is argued that Grapčeva was a mortuary ritual site, where feasts, offerings, and secondary burials took place. These same activities produced and reproduced memories. At Grapčeva the materialization of memories came at a time when group histories and genealogies were gaining importance among the newly settled Neolithic food producers of the Adriatic.

Ever since scholars first began investigating the prehistoric cultures of the eastern Adriatic, the caves of Dalmatia have been the subjects of increasing archaeological interest. However, many of these caves are rather prosaic places, archaeologically speaking; nothing remarkable appears to have taken place within most of them during the distant past. Judging from the material remains accumulated over long periods of time inside the caves, it would appear that, for humans, the most attractive characteristic of Dalmatian caves was the shelter they afforded. Caves protected men, women, and their animals from storms, the midday sun, predatory animals, and/or unfriendly people. Still, the evidence suggests that some caves also served purposes beyond the basic requirements of human survival, as will be illustrated in this chapter.

Grapčeva Cave on the central Adriatic island of Hvar is one such site (Fig. 9.1). Structured deposits at Grapčeva reflect ritual offerings, feasting, and secondary burials that took place over the course of several centuries during the 5th millennium BC (all dates in this chapter are calibrated). Large burnt features found at the site yielded high frequencies of animal bones and richly decorated pottery, as well as scattered human skeletal remains. By comparison with other periods at this cave, and with other contemporary Adriatic cave occupations, a preoccupation with ritual activities can be inferred at Late Neolithic Grapčeva. We argue that such activities created memories whose accretion was part of the formation and maintenance of identity in the Late Neolithic of the Adriatic.

Pottery styles have traditionally defined the chronology of the East Adriatic Neolithic: the 'Early Neolithic' is characterised by Impressed Ware pottery; a complex of pottery variants called Danilo is equated with the 'Middle Neolithic'; and the 'Late Neolithic' is defined by pottery known as Hvar style. The available radiocarbon determinations suggest that Impressed Ware came into use in the eastern Adriatic shortly before 6000 BC and went out of use about five centuries later, an impression that is supported by Bayesian modelling of the dates (Forenbaher *et al*. 2013). While several dates suggest a possible temporal overlap between Impressed Ware and the Danilo complex around the middle of the 6th millennium BC, these two distinct pottery styles do not mix at any clearly stratified cave site. To the contrary, several dates suggest that in some areas assemblages with only undecorated pottery separate the Impressed Ware and Danilo complexes around 5600 BC. In Dalmatia, most of the dates associated with Danilo pottery, considered 'Middle Neolithic', fall between 5300 and 4800 BC.

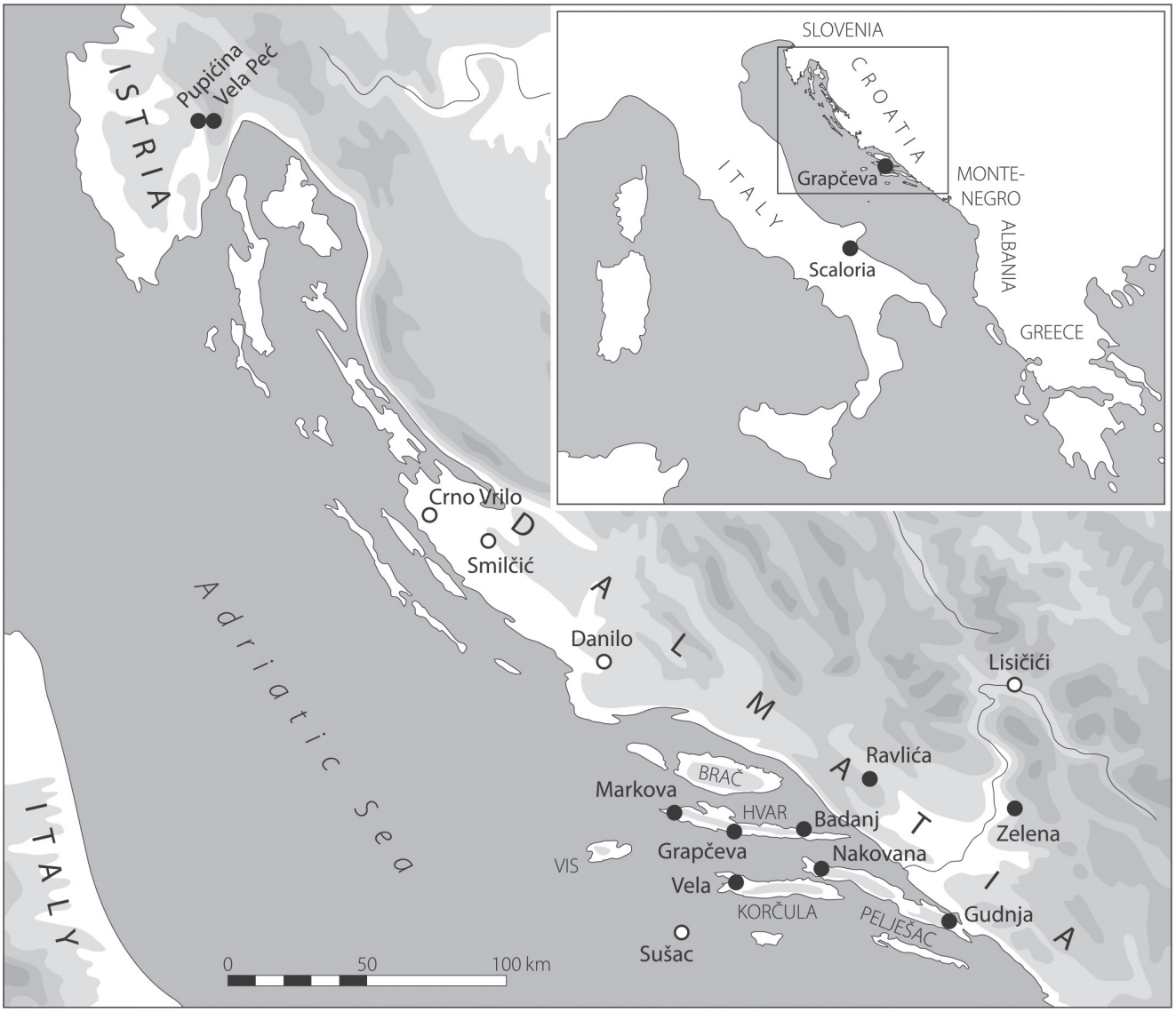

Figure 9.1 The Adriatic, showing the location of Grapčeva Cave and other sites mentioned in the text. Black: caves; white: open air sites

Late Neolithic assemblages with Hvar style pottery date between 4800 and 4000 BC. Soon thereafter some elements of a new pottery style, Nakovana, began to appear in Dalmatia, heralding the transition from the Neolithic to the Copper Age (Forenbaher *et al.* 2013).

The setting

The Mediterranean region boasts several island groups which in prehistoric times comprised hubs of social, economic, and cultural activity. Of these, the eastern Adriatic's islands form the Mediterranean's second largest archipelago, with more than 1100 islands of varying size and configuration, following some 1200 km of coastline. Arranged in several rows roughly parallel to the coast, the islands are distributed across an area that is some 400 km in length (from Dubrovnik in the south-east to Pula in the north-west) and between 20 and 50 km in width (Fig. 9.1).

The Adriatic archipelago was formed in the relatively recent past. Before the present interglacial period, virtually all today's islands were part of the mainland, with only a few exceptions. After 12,000 BC, the rising sea-level produced by the Earth's melting icecap began to flood what were then the Dinaric Mountains' coastal valleys, and by 6000 BC the majority of the islands had more-or-less attained their current configuration (van Andel 1989; 1990; Forenbaher 2008a).

The islands' natural resources vary, but generally they are resource-poor, with little arable soil or fresh water available.

As with the mainland, the islands' landscapes are karstic, which means that agriculture requires a major investment of intensive labour to clear rocks from fields and to create terraces and cisterns – activities that go back at least to the Bronze Age (Chapman *et al.* 1996). Extensive tracts of stony land, and sometimes entire islands, are extraordinarily difficult to farm and are more productively exploited by turning to animal husbandry. Only a very few islands have relatively large expanses of land that can be farmed. Given the limits of traditional subsistence economies and technologies, a number of the larger islands could, however, have supported permanent populations subsisting on a mixture of agriculture, herding and fishing.

Although the archaeological evidence is variable, it appears that all the large islands were settled early in the Neolithic. Finds from Lošinj (Komšo *et al.* 2004), Dugi Otok (Brusić 2004), Brač (Miracle 1995), Hvar (Kaiser & Forenbaher n.d.; Forenbaher 2008a), and Korčula (Čečuk & Radić 2005), indicate that they were inhabited by humans before the Holocene transgression separated them from the mainland. Most, if not all, appear to have been occupied continuously from Neolithic times to the present (Benac 1979–1987). This is not surprising given their proximity to the mainland or to the neighbouring islands. In prehistoric times, each one of those islands potentially supported up to a few thousand inhabitants (Stančič & Gaffney 1996; Forenbaher 2002).

Many of the smaller islands and islets have also yielded archaeological evidence of prehistoric human activity. While most may have been too small to sustain, unaided, a human population, they were usually only a short distance from a larger island or the mainland, which enabled 'commuting' islanders to exploit external resources (Bass 1998). One way or another, Adriatic island communities were essentially self-sufficient. This does not mean, however, they were totally isolated. Interaction networks linking the islands, the islets, and the mainland were easily maintained across short stretches of sea, and the Adriatic archipelago provided a convenient natural setting for experiments in seafaring and navigation (Kaiser & Forenbaher 1999; in press; Forenbaher 2008a; 2009).

One of the most prominent islands, in terms of its physical geography and settlement history, is Hvar, situated roughly in the central area of the archipelago. Sixty-eight km in length, Hvar is a narrow island, only 12 km at its widest point. Topographically, it is dominated by a mountainous rocky spine that runs the length of the island and an extensive low-lying plain in the north-central section, the Starigrad *polje*, which is the largest single tract of arable land to be found on any of the Dalmatian islands, and (for prehistoric and ancient farmers) conveniently close to outcrops of large chert-nodules (Marinčić 1997). The southern coastline is mostly very steep, in places sheer cliffs, while the northern shore is indented by numerous short valleys terminating as coves and bays. At present, there are no rivers on the island, but there are several small freshwater springs, the largest example situated near Jelsa. Marshes that were close to the coast near Jelsa dried up in the mid-19th century.

Present-day Hvar has a typical Mediterranean climate with an annual mean temperature of 16.5° C and an average rainfall of 701 mm per annum. The forest in the littoral belt is mostly Aleppo pine (*Pinus halapensis*) and Holm oak (*Quercus ilex*), while the uplands are forested with Dalmatian pine (*P. nigra* subs. *Dalmatica*) (Trinajstić 1985; 1993). There are no pollen analyses from Hvar to provide information concerning the changing vegetation of the island during the Neolithic and/or thereafter. Recent palynological investigations of deposits from Malo Jezero, a lake on the island of Mljet south of Hvar, along with a recent synthesis of the development of postglacial vegetation in coastal Croatia from the Boreal Period do, however, provide some insights for the reconstruction of potential vegetation on Hvar, and Dalmatia generally (Jahns & van den Bogaard 1998; Jahns 2002; Šoštarić 2005).

The prehistory of Hvar is both well-known and, at the same time, poorly understood. Prehistoric archaeological research has a lengthy history on the island, extending back at least to the late 1800s (Buccich 1885, 1–3; Gasperini 1887, 5, 11–13; 1888; Rutar 1888). Some of the best-known archaeological sites in Croatia are situated on Hvar, mainly due to the fact that a number of the most comprehensively published Croatian excavations of the 20th century are on the island (Novak 1955, 1959). Prior to mid-century, however, the archaeologists who studied the island's prehistory were inside-the-box practitioners, employing unsystematic recovery techniques of the time and fanciful interpretive schemes. The past half-century since has witnessed major changes to these approaches. Modern archaeological surveys, albeit focused on Hvar's Greco-Roman heritage, began with the work of Branko Kirigin and Petar Popović in the 1970s (Kirigin & Popović 1988). Surveys of the island's prehistoric remains commenced in the 1980s (Bintliff *et al.* n.d.; Gaffney & Stančič 1991) and, in the next decade, even as the Croatian War of Independence raged, culminated with the Adriatic Islands Project which documented the presence of more than 1000 archaeological sites and monuments (Gaffney *et al.* 1997). Excavations employing more up-to-date techniques and chronometric dating methods were also adopted (e.g. Darmanin *et al.* 1997; Forenbaher & Kaiser 2000).

Today, however, our knowledge of Hvar's prehistoric period results mainly from the investigation of 3 of the island's caves (Grapčeva (Novak 1955; Forenbaher & Kaiser 2008a), Markova (Novak 1959) and Badanj-Veli Pokrivenik (Kaiser *et al.* 1992; Kaiser & Forenbaher n.d.)) and the

Adriatic Islands Project surveys (Gaffney *et al.* 1997; 2000). In the first instance, excavations demonstrated that there was in fact a Late Upper Palaeolithic presence on Hvar (backed bladelets and microgravettes dated to the 16th millennium BC from Badanj-Veli Pokrivenik (Forenbaher 2002; Kaiser & Forenbaher n.d.)). Excavations at known sites and fieldwalking demonstrated the presence of Early Neolithic settlers and the developing elaboration of Neolithic material culture, but little more. Not a single open-air settlement of the period has been located and investigated, at least not professionally. C. Diedrich, a paleontologist, reports what appears to have been a series of possibly illegal – certainly unauthorised – summertime surface collections of pottery, lithics, shell, and bone he carried out from 2004 to 2006 (?) at a midden site on the beach west of Maslenica Bay on the north coast of Hvar (Diedrich 2011). Later prehistoric periods are known primarily from the presence of burial cairns, hillforts, and finds associated with them.

On Hvar, one site is pre-eminent, despite its geographic obscurity. Grapčeva Cave, situated on a hill on the southern coast of Hvar, presents at first no more than an inconspicuous opening in the karst. This entrance is close to the top of a steeply sloping gully that descends approximately 230 m to a fresh water spring and the small cove of Virak; a sweeping view from the cave takes in the neighbouring islands of Šćedro, Korčula, Vis, Sušac, and a wide expanse of the Adriatic Sea beyond (Fig. 9.2).

The mouth of Grapčeva Cave is almost entirely blocked by vast limestone slabs that once formed the vault of a much larger cavern, now partly eroded and buried by roof-falls that took place in the distant past. While a large part of this cavern collapsed in the remote geological past, the slabs presently blocking the entrance may have shifted to a degree over the last few millennia. Only an extensive excavation of the rock-fall would clarify their likely position during the Neolithic.

Entering the cave today, a person reaches the cave interior by crawling through the western-most of several small, narrow passages that are present between the limestone slabs. Beyond the passage, the cave comprises a single chamber some 25 m in width, 22 m in length and up to 5 m in height. It is divided by stalagmitic pillars and curtains into a number of unequal, labyrinthine spaces (Figs 9.3 & 9.4).

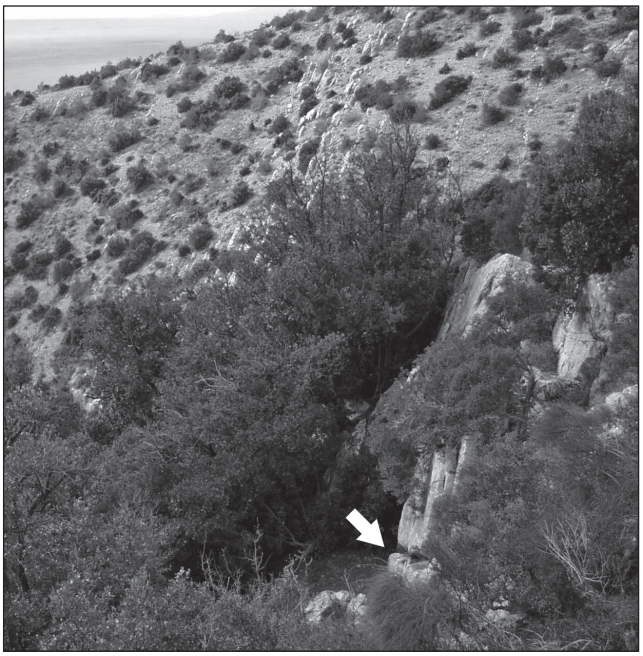

Figure 9.2 An arrow marks the entrance to Grapčeva Cave, hidden on the southern slope of the island of Hvar. The Adriatic Sea is in the background

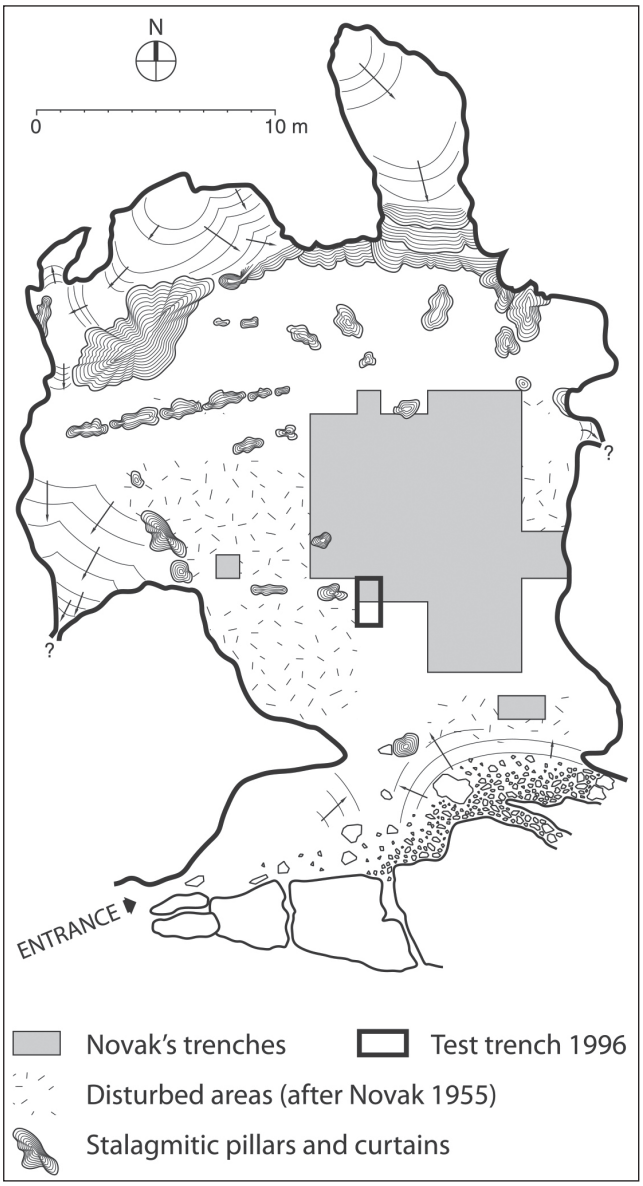

Figure 9.3 Plan of Grapčeva Cave showing excavated areas

Figure 9.4 Stalagmitic pillars and curtains in the main chamber of Grapčeva Cave

A passage, completely encased in stalagmitic crust, climbs steeply from the northern end of the chamber, terminating in a dead end after approximately 10 m.

The chamber itself acts as a sediment trap and presently incorporates a thick accumulation of deposits containing archaeological material. Its total surface area is approximately 390 m^2, of which roughly 70 m^2 are stalagmites, massive stalagmitic crusts, or bedrock. Early explorers reported that, prior to their excavations, the entire surface had been covered by carbonate crusts approximately 10 cm in thickness.

Research history

Grapčeva Cave has attracted the attention of archaeologists for many years. The most extensive excavations undertaken at the site to date were those carried out by the renowned Croatian archaeologist Grga Novak who, between 1947 and 1950, excavated approximately 100 m^2, or one-third, of the cave's floor surface, completing earlier work interrupted by the Second World War. Novak excavated down 'to bedrock' which he encountered at depths ranging between 1.0 m and 3.5 m. The distinctive Late Neolithic pottery that Novak discovered at the cave inspired him to adopt the term 'Hvar Culture', a designation that was subsequently applied to similar Late Neolithic assemblages throughout the eastern Adriatic. Novak was impressed by the richness of the pottery finds and by the presence of human bones. Following his excavations, Novak published the results in a comprehensive, lavishly illustrated monograph (Novak 1955) which established the 'Hvar Culture' as one of the most important cultural entities of the eastern Adriatic Neolithic (Ehrich 1965, 424; Batović 1979; Trump 1980, 133; Wilkes 1992, 34). Novak proposed that Grapčeva Cave probably functioned as a cult site or sanctuary during the Neolithic, and thus was not used for habitation purposes, at least during this period.

All of Grapčeva's excavators – i.e. Novak and his predecessors – recovered and reported their finds in an unsystematic manner typical of the time in which they worked. Their interpretations of the site were based primarily on loosely attributed stylistic traits observed on the pottery. Other classes of evidence were virtually ignored and, of course, there were no independent chronometric controls available at the time. For such an important site, so extensively excavated, relatively little was known about Grapčeva.

In 1996 a new archaeological intervention at Grapčeva commenced, the chief aim of which was to fill gaps in knowledge about the site using modern excavation techniques (Darmanin *et al.* 1997; Forenbaher & Kaiser 2000; 2008a; Borojević *et al.* 2008; Forenbaher *et al.* 2010). Given that previous excavations at the cave would have removed significant quantities of intact archaeological features and deposits, it was realised from the outset that the remaining archaeological resource was likely to be relatively minimal. Thus, the strategy adopted was to excavate as small a test trench as was possible at a carefully selected location. The anticipated depth of deposits (approximately 3 m) dictated the minimal surface dimensions of the test trench (1 × 2 m). Novak had published sufficient information to afford a reconstruction of the horizontal extent of his excavation (Novak 1955, 17–30). It was decided to locate the new trench in Novak's Squares A'6 and A'7, straddling one of the edges of his excavation, at a point where the underlying strata were relatively deep. As hoped, in Square A'7 evidence was found of Novak's backfilled trench, while in Square A'6, undisturbed deposits were encountered. With such a limited intervention, the results could be said to reflect the situation at only a single unrepresentative point of an extensive site. Careful comparison with published information from earlier excavations suggests, however, that what this test-trench revealed should be considered archaeologically representative of the remainder of the cave.

Stratigraphy

The northern portion of the 1996 trench (Square A'7) had been excavated by Novak only to a depth of about 0.5 m and subsequently backfilled. At that depth, he encountered the tip of a large *in situ* stalagmite. Novak reduced the width of his excavation accordingly and continued to excavate deeper in a 25 cm wide strip situated along the northern edge of Square A'7. As a result of this, the majority of the deposits encountered in the present trench were found intact, except for a few minor disturbances, presumably caused by burrowing animals (Fig. 9.5).

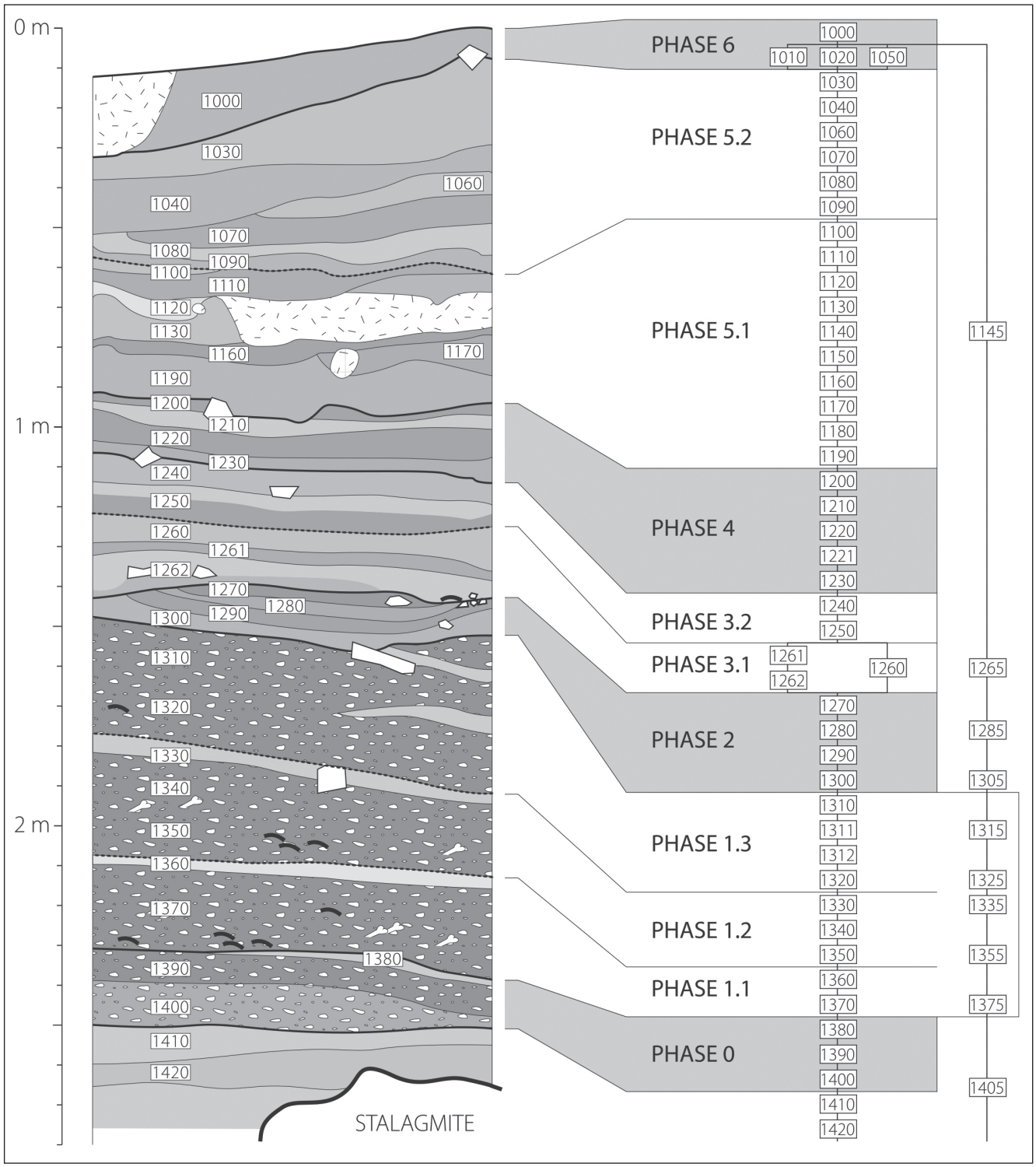

Figure 9.5 Section, stratigraphic diagram, and phasing of the test trench excavated in 1996

At a depth of approximately 2.6 m below the present-day surface, a massive stalagmitic crust appears to have been precipitated directly over the bedrock; it defined the bottom of the present excavation. Overlying the crust, stratigraphic units 1420 and 1410 comprised very compact silt permeated by calcium carbonate, having a combined thickness of 15 cm. These deposits did not, however, yield any evidence of human activity.

Directly above these deposits lay a series of stratigraphic units (from SU 1400 to SU 1310; total thickness 0.9 m)

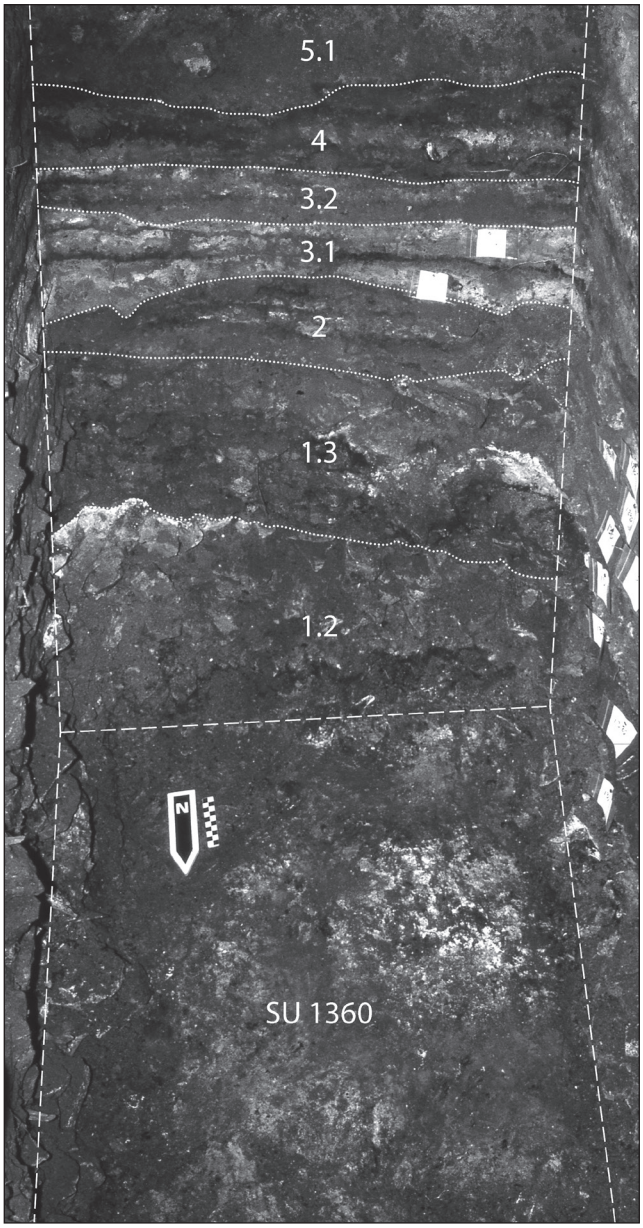

Figure 9.6 A circular hearth marking the top of Sub-phase 1.1. Visible in the section above SU 1360 is the loose accumulation of black humus and angular rocks: sub-phases 1.2 & 1.3, separated by another hearth, overlaid by the soot-and-ash lenses (phases 2, 3 & 4)

that consisted primarily of angular lumps of limestone embedded in very loose humus-like black deposit. These units contained abundant artefacts, animal bones, and wood charcoal. Occasional thin lenses of yellow clay divided this sequence into several horizontal segments. Some of these lenses had clearly defined circular areas burnt to a reddish colour, which were interpreted as fireplaces (Fig. 9.6). The abundant charcoal was considered to be the result of *in situ* combustion. The angular lumps of limestone, on the other hand, were thought to come from the cave's immediate environs and deliberately brought into the cave. There seemed little doubt that this dark, loose layer corresponded to Novak's 'Great Layer' (or Layer I) (Novak 1955, 32–33, figs 8, 18 & 30).

Above this, the character of the sediment changed radically. It was more compact and lighter in colour; there were numerous, thin, inter-fingered lenses of silt-sized sediment, carbon, and ash (from SU 1300 to SU 1060; total thickness 1.1 m), containing relatively few archaeological finds and only a very few natural stones. Such deposits, suggesting multiple episodes of low-intensity burning, are common in caves throughout the region (as for example at the nearby caves of Markova (Novak 1959), Badanj-Veli Pokrivenik (Kaiser *et al.* 1992; Kaiser & Forenbaher n.d.) and Nakovana (Forenbaher & Kaiser 2003; Kaiser & Forenbaher 2012)). These deposits probably were formed by the episodic burning of layers containing herbivore droppings (Boschian & Montagnari Kokelj 2000, 340–343). This sequence of deposits roughly corresponds to Novak's Layers III, IV and V (Novak 1955, 31–32, figs 8, 18 & 30); a closer correlation with his stratigraphic scheme is not possible. Nothing, however, was encountered resembling Novak's 'sterile' Layer II, and there are reasons to doubt its existence.

Stratigraphic units 1040 and 1030 (with a combined thickness of 30 cm) near the top of the sequence were characterized by loose brown-humus, roughly corresponding to Novak's Layer VI (Novak 1955, 31). The uppermost units 1010 and 1000 (with a combined thickness of 15 cm) comprised the backfill from earlier excavations.

Phases and dates

As part of the present investigations, the cave's stratigraphic sequence was divided into seven main phases and several sub-phases, based on major breaks in stratigraphy and formal traits observed in the pottery (Fig. 9.5).

Phase 0

The deepest contexts were designated Phase 0. Pottery finds in this phase were rare but included an Impressed Ware sherd (Müller 1994), a few sherds decorated by Danilo style incision (Batović 1979, 541–544), and a polychrome-painted sherd of buff-yellow, fine-grained, burnished, evenly fired fineware of the type known as *figulina* (Spataro 2002, 13). These finds were interpreted as the results of sporadic visits that took place in the Early and Middle Neolithic (Fig. 9.7A). Of the two radiocarbon dates available for Phase 0, one corresponds to the early 6th millennium BC and the other to the early 5th millennium BC (Table 9.1).

Phase 1

Phase 1 was represented by a thick layer of loose, dark humus incorporating fist-sized rocks. The layer contained exceptionally large quantities of potsherds, faunal remains,

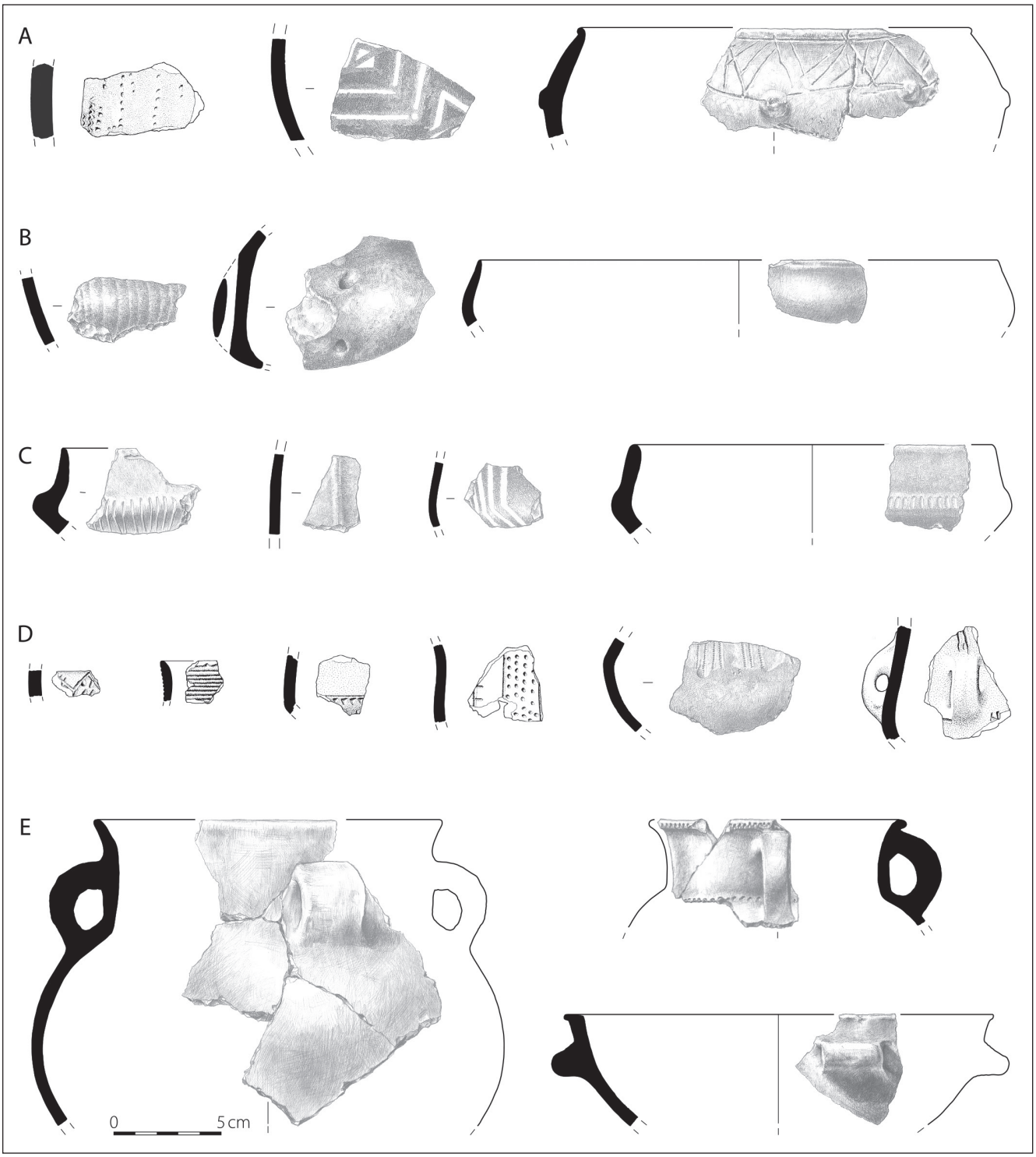

Figure 9.7 A selection of characteristic potsherds from Grapčeva Cave: A) Phase 0; B) Phase 2; C) Phase 3; D) Phase 4; E) Phase 5

and charcoal, as well as occasional thin lenses of yellow clay. The three major clay-lenses are presently employed as the basis of three sub-phases for Phase 1 (i.e. 1.1, 1.2 & 1.3). Late Neolithic Hvar bowls (Batović 1979, 599–601) dominate the assemblage. Five radiocarbon determinations place Phase 1 in the 5th millennium BC, approximately between 4800 and 4300 BC (Table 9.1). The dates do not match the stratigraphic sequence precisely, and one example, 6130±80 BP (Beta 103485) in uncalibrated radiocarbon years, is almost certainly too early. These inconsistencies

Table 9.1 Radiocarbon dates from Grapčeva Cave

Lab no.	*Age BP*	*Age cal BC (1 σ)*	*SU*	*Phase*	*Associated pottery*
Beta 103474	3410±110	1879–1529	1040	5.2	Middle Bronze Age
Beta 103475	3480±50	1881–1695	1080	5.2	Middle Bronze Age
Beta 103476	3970±50	2565–2459	1130	5.1	Early Bronze Age
Beta 103477	3880±120	2551–2144	1200	4	Cetina
Beta 103478	4190±50	2882–2678	1220	4	Cetina
Beta 103479	4510±50	3352–3097	1250	3.2	Nakovana
Beta 103480	4700±100	3637–3363	1262	3.1	Nakovana
Beta 106625	5210±40	4041–3972	1280	2	Late Hvar
Beta 103481	5650±100	4584–4359	1290	2	Late Hvar
Beta 103482	5460±60	4350–4249	1310	1.3	Classic Hvar, modest decoration
Beta 103483	5720±70	4686–4460	1320	1.3	Classic Hvar, modest decoration
Beta 103484	5420±70	4340–4167	1330	1.2	Classic Hvar, standard decoration
Beta 103485	6130±80	5226–4861	1350	1.2	Classic Hvar, standard decoration
Beta 103486	5900±60	4838–4712	1370	1.1	Classic Hvar, outlined decoration
Beta 103487	6000±80	4960–4780	1390	0	Polychrome *figulina*
Beta 103488	7030±60	5987–5811	1400	0	Impressed Ware

SU = Stratigraphic unit. All samples are wood charcoal

may result from the migration of charcoal within the loosely deposited sediment and/or 'old wood effect.' Sub-phase 1.1 probably belongs to the first half of the 5th millennium BC, while sub-phases 1.2 & 1.3 belong to its second half.

Phase 2

Phase 2 was represented by a series of ash lenses alternating with deposits of soil. The relatively small pottery assemblage is best described as plain, generic Hvar style (Fig. 9.7B). This phase has the highest relative abundance of burnished pottery, over half of which was fired in a reducing atmosphere. A conspicuous and common attribute of the pottery is channelled decoration, not encountered earlier. Two radiocarbon determinations date this phase to near the end of the 5th millennium BC (Table 9.1).

Phase 3

Phase 3 was represented by sediments similar to those of the previous phase (i.e. Phase 2) and has been assigned 2 sub-phases (i.e. 3.1 & 3.2). A possible stratigraphic discontinuity separates Sub-phase 3.1 from Sub-phase 3.2. Traditional Late Neolithic vessel shapes and decorative elements, which are still relatively common in the earlier sub-phase (3.1), virtually disappear by the later sub-phase (3.2). They are replaced by a variety of new vessel shapes and decorative elements (Fig. 9.7C) that are considered typical of the Early Copper Age 'Nakovana' style (Dimitrijević 1979). Two radiocarbon determinations date Sub-phase 3.1 to the mid-4th millennium BC and Sub-phase 3.2 to the late 4th millennium BC (Table 9.1).

Phase 4

Phase 4 is represented by types of deposit similar to the previous 2 phases (i.e. phases 2 & 3). A distinguishing feature is its small pottery assemblage with incised-and-impressed or coil-impressed geometric designs (Fig. 9.7D). These attributes are characteristic of the Late Copper Age 'Cetina' style (Marović & Čović 1983). Two radiocarbon determinations suggest that Phase 4 may have lasted for the greater part of the 3rd millennium BC (Table 9.1).

Phase 5

Phase 5 is represented by a 1-m-thick sequence of clearly stratified deposits and has been assigned two sub-phases (i.e. 5.1 & 5.2). A possible discontinuity separates Sub-phase 5.1 from Sub-phase 5.2. Almost all of the pottery is plain (Fig. 9.7E). The quantity of jars found is approximately double that for bowls and vessels frequently incorporate handles, the latter often quite elaborate. Essentially, Sub-phase 5.1 is attributed to the Early Bronze Age, and Sub-phase 5.2 to the Middle Bronze Age. According to radiocarbon determinations, Sub-phase 5.1 dates to the late 3rd millennium BC and Sub-phase 5.2 to the first half of the 2nd millennium BC (Table 9.1).

Phase 6

Phase 6 is represented by backfill from Novak's 1950s main trench, backfill from a smaller pit, spoil from earlier excavations re-deposited on top of the original cave-floor, and disturbed soil at the present cave-floor level (Fig. 9.5). These deposits contained numerous plain, non-diagnostic

potsherds, as well as animal bones and mollusc shells, in essence reflecting the somewhat haphazard and unsystematic nature of the early excavators' recovery practices.

Patterns of deposition

The radiocarbon determinations from Grapčeva (Table 9.1) suggest that the 0.9 m thick deposit of dark, loose, and rocky sediment from SU 1390 to SU 1310 took some 500 years to accumulate. This implies an average rate of deposition on the order of approximately 18 cm per century. By contrast, the overlying 1.1 m of lighter and more compact, ashy sediments from SU 1300 to SU 1040 appears to have been deposited over a period of some 2500 years, i.e. at an average rate of c. 4.4 cm per century. This fourfold decrease in the average accumulation rate coincides with the radical change in sediment characteristics observed for the end of Phase 1.

Grapčeva Phase 1 would appear to differ from all other phases in the quantity and variety of finds that suggest a more intensive and qualitatively different use of the site. Pottery and animal bones are more frequent in Phase 1 than in any other phase (Fig. 9.8), and the same phase also has the highest density of wood charcoal and plant macro-remains (Borojević *et al.* 2008, figs 7 & 8). This contrast is sharper when compared with average rates of discard, which decrease tenfold from over 4 kg to less than 0.3 kg per m^2 per century for pottery and from approximately 1.5 kg to less than 0.12 kg per m^2 per century for animal bones.

When compared to other phases, the potsherds from Phase 1 are larger on average and are decorated more frequently (Fig. 9.8). The larger of the sherds may be the result of different depositional environments and site-formation processes, but may also result from deliberate breakage, after which they may have been left relatively undisturbed. It has been possible to reconstruct large portions of several vessels by conjoining sherds, but no vessel could be reassembled in its entirety. It should be acknowledged, however, that a minor excavation trench rarely yields extensive pot-conjoins, even in cases where vessels were smashed and left where this took place.

Decorated sherds are not only more frequent in this layer than in the others, but they are also more common at Grapčeva than at any other eastern Adriatic Late Neolithic cave site with comparable data. Fifteen per cent of Grapčeva's sub-phases 1.1 and 1.2 pottery is decorated, as compared to 6% at Pupićina (Forenbaher & Kaiser 2006a), or 4% at Vela Peć (Forenbaher *et al.* 2008, 15, table 2).

Pots and stones, plants and bones: the Late Neolithic at Grapčeva

Pottery

Phase 1 yielded over 3200 potsherds, 445 of which we considered diagnostic in view of their shape, decoration, or both (Forenbaher & Kaiser 2008a). Vessels were crafted using locally available calcareous clays, heavily tempered with crushed marble, calcite and/or limestone. The vessels were probably fired in bonfires or fire-pits, and many were burnished before undergoing firing. The majority were smudged during firing; others were fired in a reducing atmosphere. Surfaces are often dark, ranging from black to reddish-brown, although lighter colours are not uncommon. Note that black-burnished pottery is generally considered a hallmark of the Hvar style.

Wide shallow bowls dominate the pottery assemblage. The 4 major bowl-types differ primarily in the degree of restriction of their mouths (Fig. 9.9). The slightly restricted (closed) bowl is the most common Late Neolithic

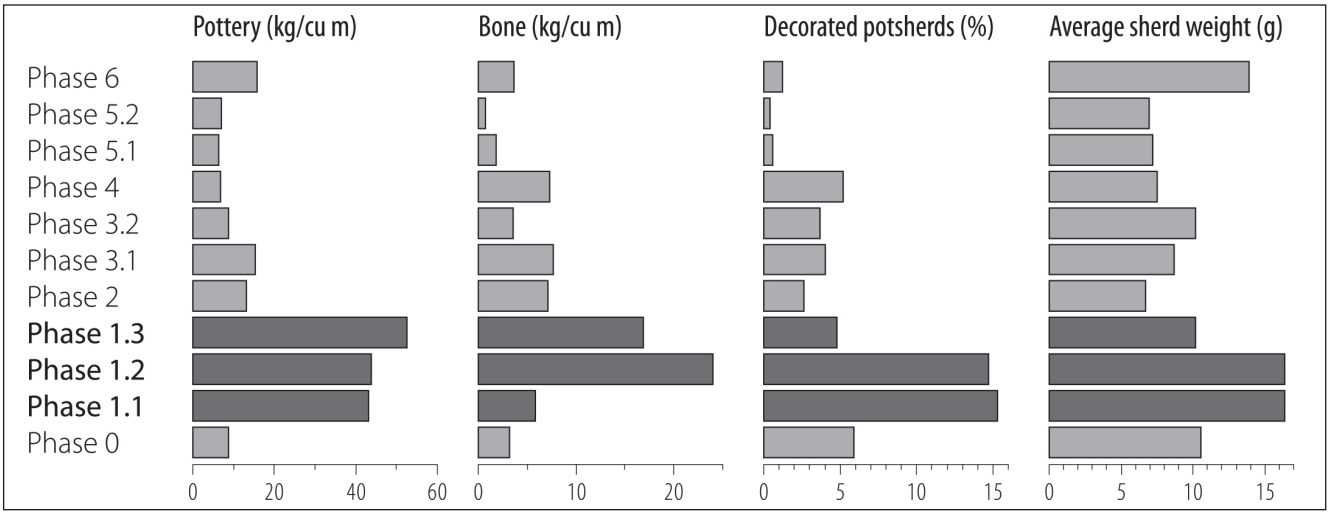

Figure 9.8 Relative frequency by phase and sub-phase of pottery, animal bone and decorated potsherds, as well as the average sherd size by phase, in Grapčeva Cave test trench deposits

vessel shape, making up approximately two-thirds of all reconstructed vessels. The majority of the bowls are of medium size (rim diameter ≈ 20 cm), although a wide range of sizes is represented. Jars are much less common, and other vessel shapes are very rare.

Decorations take the form of abstract geometric motifs: rectilinear, curvilinear, spiral, and complex geometric arrangements. They are usually located at the rim and immediately below it, often forming a zone that flows around the vessel between the rim and the shoulder (**Fig. 9.10**). The frequency of decoration varies. There is a marked decrease in decorated sherds, from over 20% in the earliest contexts of Sub-phase 1.1 to less than 3% by the end of Sub-phase 1.3.

The two major decorative techniques, often used in combination, are incision and painting. Paint, which was always applied after firing, did not adhere to the surface very well, and many sherds exhibit only the ghost-marks of painted designs. Several kinds of pigments were used, most based on either mercury (cinnabar, or mercuric sulfide, HgS) or iron (red ochre, Fe_2O_3) (Karšulin 1955, 293; Twilley, pers. comm.). While red ochre occurs commonly throughout Dalmatia, cinnabar is not as readily available and is likely to have been procured through long-distance exchange networks. There are several potential cinnabar sources in the mountainous hinterland of the eastern Adriatic. The well-known ore deposits at Idrija in Slovenia (Drovenik *et al.* 1990) and a minor one at Tršće in Croatia (Frančišković-Bilinski *et al.* 2005) are situated a considerable distance to the northwest. The extensive deposits in the ore-rich mountains of central Bosnia, in the areas of Dusina and Čemernica (Jurković 1996; Jurković *et al.* 1999), are likewise situated some distance inland. Interestingly, however, these Bosnian cinnabar sources are located near Lisičići, a major Late Neolithic settlement attributed to the 'Hvar Culture' (Benac 1958). In contrast to the majority of 'Hvar' sites, which are generally coastal in terms of their location, Lisičići is situated some distance inland.

Finally, several sources have been reported from Montenegro (Ministarstvo za ekonomski razvoj Crne Gore 2008, 23). One of them, Sutomore, is situated on the Adriatic coast. Some of these ores have been mined since Late Medieval times, but whether any were exploited in prehistory remains unknown.

Since the physical-chemical analysis of Grapčeva pottery undertaken was limited to only a small sample taken from the entire ceramic assemblage (n = 32), painted decoration was classified as 'red', 'faded red', or 'white', the first two of which correspond roughly to cinnabar-based and ochre-based pigments respectively; 'white' appears to be a relic of an as yet unidentified pigment. A common simple and characteristic decoration comprises a red-painted band along the lip of the rim, its lower edge often demarcated by an incised line. Notably, the 'white' paint was never used for these 'lip-bands'. A characteristic feature of Sub-phase 1.1 is 'outlined decoration'. Here, a geometric motif was first incised, then the area outside the motif burnished, while the interior of the motif was painted in a bright red (Fig. 9.10A). In Sub-phase 1.2, all traditionally recognized Hvar-style decorative traits continue except 'outlined decoration' (Fig. 9.10B). Rare 'white' painted sherds first appear in

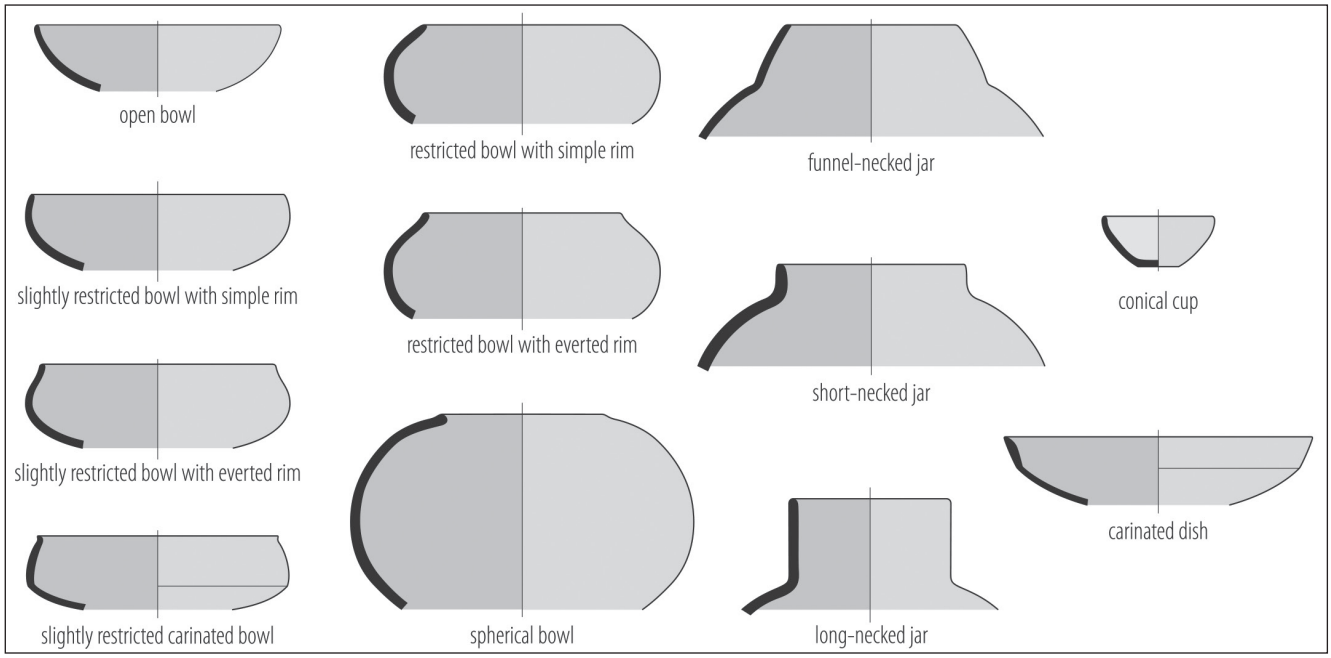

Figure 9.9 Shapes of vessels from Phase 1 of Grapčeva Cave

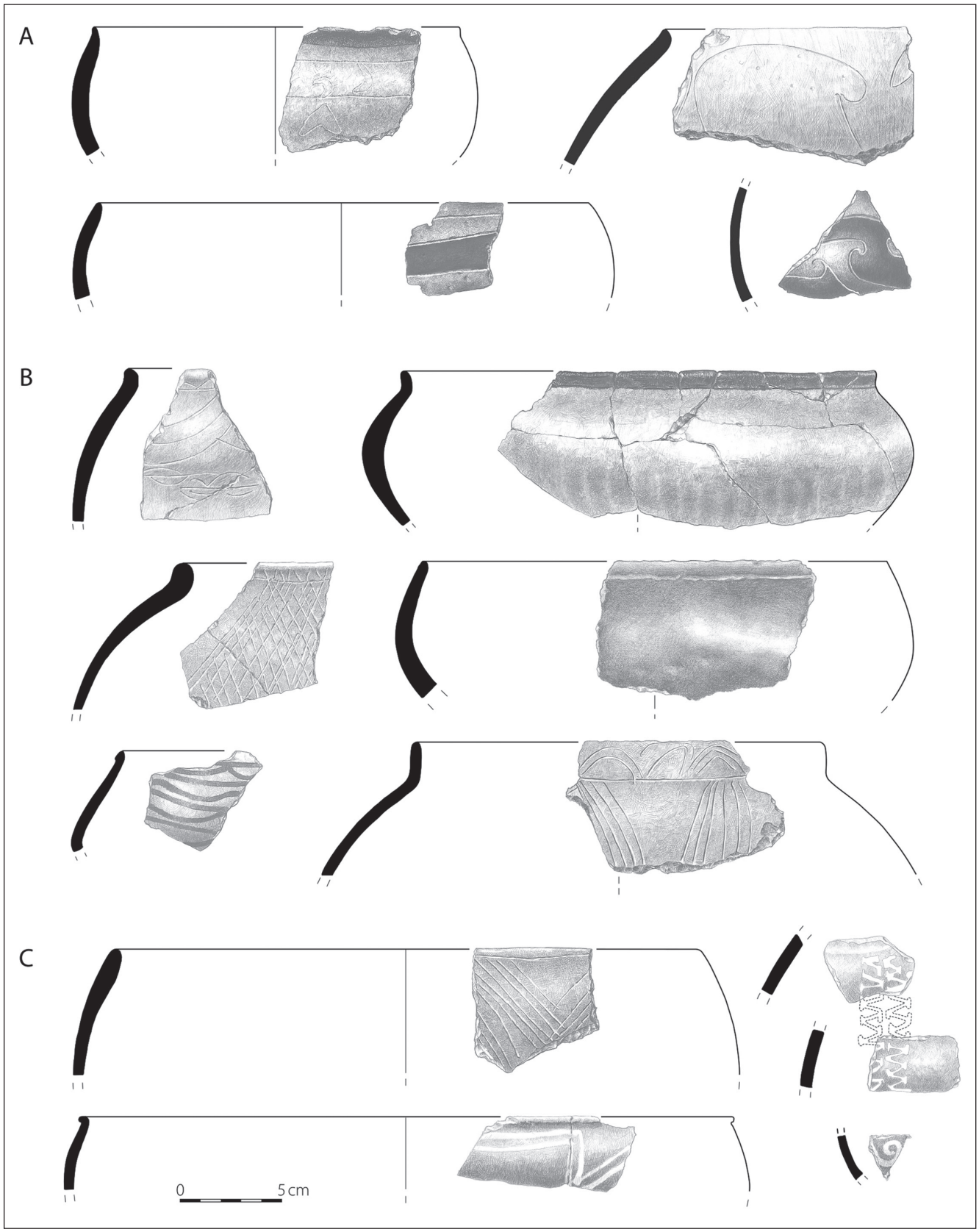

Figure 9.10 A selection of characteristic potsherds from Phase 1 of Grapčeva Cave: A) Sub-phase 1.1; B) Sub-phase 1.2; C) Sub-phase 1.3

its topmost stratigraphic unit and continue throughout the following sub-phase. The pottery from Sub-phase 1.3 is ornamented less frequently, and painted decoration becomes more common than incision (Fig. 9.10C).

While Hvar style pottery is well known from many sites, only Vela Cave (Čečuk & Radić 2005) offers material comparable in terms of its relatively fine temporal resolution. Grapčeva's sub-phases 1.1 & 1.2 roughly correspond to Vela's Phase 4/2, while Grapčeva's Sub-phase 1.3 and Phase 2 equate to Vela's phases 4/3 & 4/4.

Macromammalian fauna

More than two-thirds of the 1714 bone samples from Grapčeva identified to genus or species were recovered from Phase 1 and include those of sheep, goat, cattle, deer, pig, marten, dog, hare, and humans. Although the range of taxa is similar throughout the sequence, there are notable differences between the Neolithic and post-Neolithic levels. Faunal remains provide evidence for the specialized use of the cave during Phase 1 (Frame 2008).

The uniformity of the species distribution over the course of 25 centuries is remarkable (Fig. 9.11). In every phase, the bones of sheep and goat dominate, making up 83–85% of the assemblage. Over time, little changes – except that there are more goats and fewer sheep in post-Neolithic times. Hare and humans are the only species that are restricted in their distribution, both occurring primarily in Phase 1 or just above it. There is also some temporal variation in the frequency of pig, which is more common in later levels. Cattle bones are found throughout the sequence, but approximately half of the identified specimens come from just two Phase 1 contexts (SU 1310 & SU 1340). The pattern for deer is almost identical to that of cattle.

The faunal assemblage recovered comprises mainly post-consumption remains. It appears that initial butchery was carried out somewhere other than in the cave and there was little processing of the bones after the meat had been consumed. Cattle, deer, and hare are represented primarily in the form of limb bones. The distribution of elements and the cut-mark patterns suggest that large joints of meat were cooked and consumed at the site. Hares were apparently skinned elsewhere; or at least no evidence of their pelts was left in the cave. Sheep and goat skeletons are more complete, but their meat-bearing bones are overrepresented, while small foot-bones and metapodials are underrepresented. Since the latter are preferentially used in manufacturing bone tools, their absence suggests that initial butchery and secondary use of the butchery waste did not take place at the site.

There is evidence for a preferential selection of left goat-limbs and right sheep-limbs. The evenly balanced number of those elements strongly suggests that these categories (left/right, and sheep/goat) had a cultural significance. The high rate of juvenile culling, with a possible emphasis on young female sheep, may point to another culturally meaningful selection. None of this can be rationally explained by standard herd-management strategies or taphonomic pressures. Together with the taphonomic data, this sets Phase 1 deposits apart from those of later phases in that they reflect specialized activities rather than simple post-consumption discard (Frame 2008).

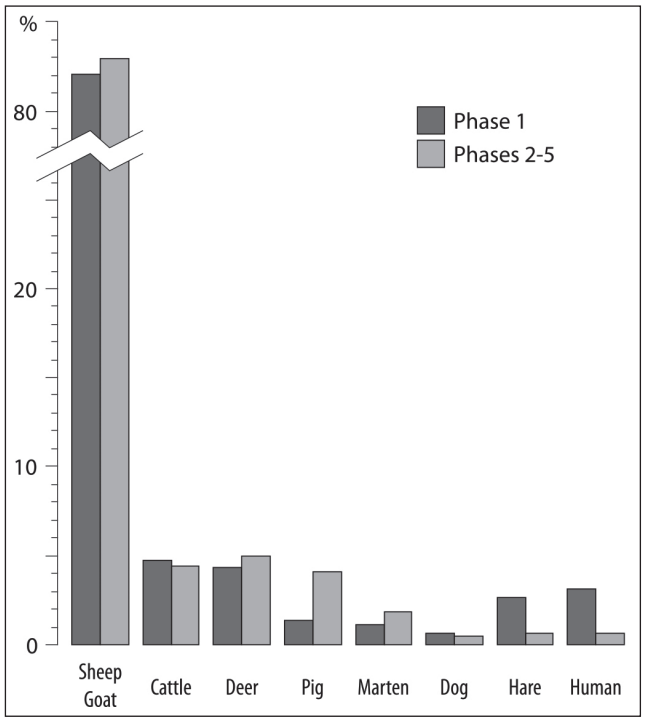

Figure 9.11 Relative frequency of taxa in Phase 1 and all later phases combined, counted by diagnostic zone (Watson 1979)

Human remains

Throughout the Mediterranean region, disarticulated human bones are often found in Neolithic middens, sometimes in addition to complete burials or as the only human remains (Malone 2003; Robb 2007). They are usually interpreted as disturbed burials or as bodies, casually disposed. Neither explanation seems plausible in the case of Grapčeva. The human bones are clearly part of the same rapid deposition as the animal bones, and yet none of the human skeletons are complete.

The recent test-trench yielded 77 fragments of human bone (Table 9.2). Of these, only nine small specimens post-dated Phase 1. All body parts were present, but no individual was completely represented. The few articulations tended to occur where ligament attachments are strongest. There were surprisingly few carpals, tarsals, or metapodials. These robust and numerous bones were usually among the most commonly found, but are easily lost when a skeleton is moved. The low number of anatomical connections, and the

Table 9.2 Human remains from Grapčeva Cave

Element	*Side*	*n*	*Age/Sex*	*Comment*
Temporal		2		
Temporal/occipital		1		
Occipital	R	1		Appears polished
Occipital	R	1	Female?	Mastoid process very delicate, appears polished
Occipital		1		
Parietal		1		Burnt
Parietal	L	1	Young	Pre-excavation break along suture, Wurmian bones
Parietal (2 pieces)		1	Child	Age estimate based on size
Maxilla	R	1	Infant	Tiny, immature
Upper incisor	L	1	Adult	Some calculus
Upper first incisor	R	1	Young adult	Overbite
Upper second incisor	R	1	Young adult	Overbite
Lower second incisor	L	1	Adult	Some calculus
Upper canine	L	1	Mature adult	Very worn
Upper canine	L	1	Young – adolescent	No calculus, unworn
Upper canine	R	1	Young adult	Overbite
Lower canine	R	1	Adolescent/Young adult	Unworn
Lower molar 2 or 3	L	1	Young – adolescent	No calculus, unworn
Atlas		4		
Cervical vertebrae		6	30+	2 with slight arthritis
Seventh cervical vertebrae		2		
Thoracic vertebrae		12		
Thoracic vertebrae		1	Child	Small
Lumbar vertebrae		7		3 with arthritis
Lumbar vertebrae		1	30+	Compressed
First or second rib	R	1		
Scapula	R	1	Late adolescent	Olecronon process just fused
Clavicle	R	2		
Clavicle	L	1		
Clavicle	L	1	20+, female	Fused
Humerus	L	1		
Humerus	R	1		
Ulna	L	1	Adult 30+	Hint of degenerative joint disease
Ulna	R	1	Adult 30+	Hint of degenerative joint disease
Radius	R	1	>15, probably adult	23 cm
Radius	L	1		
IV metacarpal	R	1	10–15 years	Unfused epiphysis
IV metacarpal	R	1		
IV metacarpal	L	1		
Intermediate phalanx (hand)		1		
Femur	L	1		
Femur	R	1		
Tibia	R	1	Child	Age estimate based on size
Tibia	R	1	Young child	Very small, some immature bone
Tibia	L	1	Young child	Very small, some immature bone
Talus	R	1		Articulates with below
Calcaneum	R	1		Articulates with above
Proximal phalanx (foot)		1		

fact that the missing elements cannot be explained as lost through attrition, together suggest that the human remains represent secondary burials.

The minimum number of individuals (MNI) was seven, estimated from the range of ages: an infant, a young child, a child, an adolescent, an adolescent/young adult, an adult, and a mature adult. Only two individuals could be biologically sexed: one individual was definitely attributed as female and the other probably female.

A review of past reports (Gasperini 1888; Rutar 1888; Novak 1955; Sakarž 1955) suggests that the distribution of human bones was similar throughout the cave. The majority of the bones from previous excavations came from Novak's 'Great Layer' (Novak 1955). The total quantity of remains, particularly if measured by the minimum number of individuals represented, is surprisingly high. A precise calculation is not possible due to incomplete data, but a rough estimate can be attempted. Taking into account that disturbed skeletal remains will generally appear less numerous than undisturbed burials in terms of the minimal number of individuals (Robb 1991, 122), Grapčeva probably contained the fragmentary remains of a few dozen people of all ages.

Taphonomically, some of the human bones are similar to those in the faunal assemblage. Two specimens have a slightly polished surface, possibly the result of having been buried with some of the flesh protecting and oiling the bone; none of these specimens have, however, the end-polishing of fractures typical of 'pot polish'. Another question raised by the human remains, scattered within what appears to be a feast midden, is the possibility that cannibalism took place. This does not necessarily contradict the argument that these bones are a result of burial, as endocannibalism has been shown to take place as a part of mortuary rites (Parker Pearson 1999, 52–53). Cannibalism, however, is notoriously hard to demonstrate (White 1992; Robb 1994, 37; Parker Pearson 1999, 54), and it is not surprising that no conclusive evidence was found for it in the present sample.

Flaked stone artefacts

When compared to the pottery, the lithic assemblage of Phase 1 is quantitatively small and relatively unremarkable. Only 16 flaked-stone artefacts were recovered: seven retouched tools (Fig. 9.12), seven pieces of debitage (four flakes and three blade segments) and two amorphous core-fragments, all crafted from various fine-grained cherts whose sources remain unknown. The absence of debris suggests that flint-knapping was a rare activity and it appears the cave was a place where a few finished tools were used and subsequently discarded.

The most common tool-type comprises a retouched blade with normal, semi-abrupt retouch extending along part or the entire length of one or both lateral edges, converging to a point at the distal end. One example (Fig. 9.12: 5)

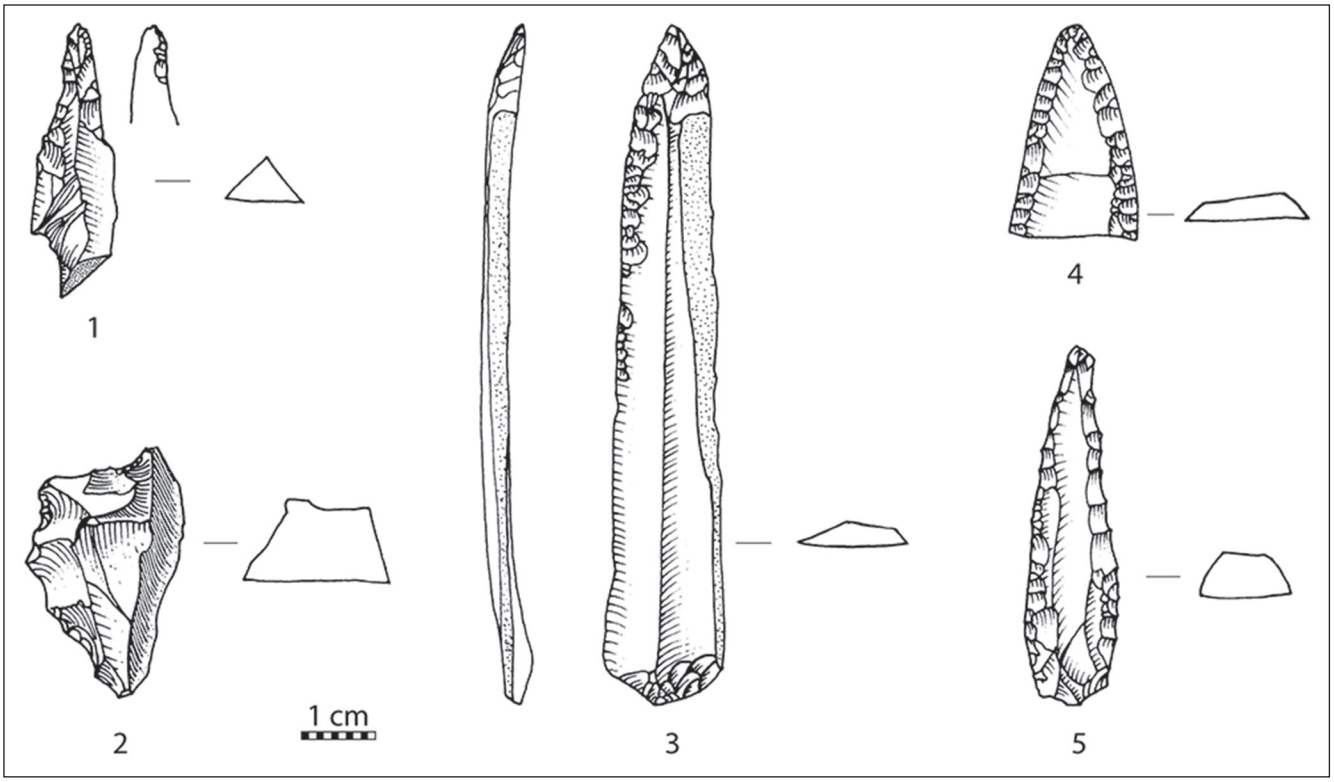

Figure 9.12 A selection of flaked stone artefacts from Grapčeva Cave: 1) drill; 2) denticulate; 3–5) retouched blades

resembles Early Neolithic 'shell-openers' from Sušac and Coppa Nevigata (Bass 1998, 169, fig. 4), but comparative material is also to be found at Middle Neolithic settlements such as Danilo (Korošec 1958, pls 53–54), or Late Neolithic settlements such as Lisičići (Benac 1958, pl. 3, 13–15). The assemblage does not contain a single scraper, a class of tool that usually dominates Neolithic assemblages (Forenbaher 2006; Forenbaher & Nikitović 2010). Their absence suggests that some of the more common Neolithic domestic activities were not practiced at Grapčeva (Forenbaher 2008b).

Plant macro-remains

Analysis indicates that plant macrofossils are more abundant and diverse in Phase 1 than in any of the other phases identified. Wild plants heavily outnumber domesticates. Acorn meat fragments, cypress seeds and cone fragments, and juniper-berry cones are common, while charred juniper-berry cones and almond nutshell fragments appear in this phase only. The few fragments of carbonized material that were analyzed probably came from juniper and an evergreen oak. Rare crop-remains include a few grains of emmer, einkorn, bread wheat, barley, and lentils (Borojević *et al.* 2008).

It would appear that the Neolithic inhabitants of Grapčeva Cave generally procured wild foodstuffs from their immediate environs but, less frequently, also processed domesticated produce brought in from more distant fields. Evergreen Mediterranean vegetation was exploited for fuel. Acorns may have been used as a buffer food or for their healing properties (attested at least since Classical Antiquity: Vencl 1996). Wild almonds could have been eaten after the toxic glycoside amygdaline they contain had been removed by leaching. Like acorns, almond oil may have been used medicinally or in rituals. It is known that juniper's aromatic foliage and resins were often used in the past for spiritual purposes, burnt for incense in temples, and used in traditional medicine (Heilmeyer 2007, 62–63; Menković *et al.* 2011).

Ritual at Grapčeva Cave

The earliest visits to Grapčeva Cave by humans appear to have taken place at around 5900 BC, a time when farming had only just arrived in the southern Adriatic, its rapid spread marked today by finds of Early Neolithic Impressed Ware pottery (Forenbaher & Miracle 2005; 2014; Forenbaher *et al.* 2013). There is no evidence available to suggest that Grapčeva was then anything other than a rather unimportant location in the Early Neolithic landscape, used only occasionally as a convenient shelter on a casual basis. Such sporadic visits to the cave continued during the Middle Neolithic (the second half of the 6th millennium BC).

Intensive activities began abruptly at approximately 4800 and continued until about 4300 BC (i.e. Grapčeva Phase 1). During this phase, the cave was not in use merely as a casual shelter or sheep-pen but, instead, appears to have been in use primarily for ritual activities and its function changed yet again after approximately 4300 BC. Beginning with Phase 2, the deposits at Grapčeva Cave are virtually indistinguishable from those commonly encountered at other post-Mesolithic cave sites in the region (Boschian & Montagnari Kokelj 2000; Boschian 2006; Kaiser & Forenbaher n.d.; Forenbaher & Kaiser 2003), and their artefactual contents are unremarkable. Grapčeva was now used as a shelter by herders and their animals.

Aspects of ritual behaviour appear to be evident in the archaeological remains of Grapčeva's Phase 1. The subject of the archaeological correlates of ritual behaviour has been debated widely in the archaeological literature; recently, specific attention has been given to the subject of ritual behaviour in caves (for a sample of the range of discussion see Moyes (2012); see Whitehouse (1992), Skeates (2012), and Tomkins (2012) for discussions of Mediterranean Neolithic caves and rituals). The particular expositions that we follow in this chapter are those by Renfrew (1985, 16; 2007) and Blake (2005) who identify liminality, ways of focusing attention, the presence of transcendent beings or spirits, offerings, and participation in symbolic activities as among the indicators of ritual in archaeological contexts.

While the majority of Adriatic caves may be considered to occupy a liminal zone between the familiar surface world of everyday life and the unfamiliar world of the underground, Grapčeva's extraordinary location and features of its morphology render it a more likely candidate for sequestered ritual behaviour than most. Its topographic setting is spectacular, and its entrance is small and well hidden. A short, narrow passage restricts access to the cave's dark interior, adding to an atmosphere of secrecy and mystery. The large main-chamber, with its massive stalagmitic columns and curtains, provides a striking setting. Grapčeva shares with certain Italian sites attributes of two of the three major 'ritual themes' ('secrecy' and 'abnormal water') identified by Whitehouse (1992) in her study of Neolithic southern Italy, a region that was demonstrably in contact with Dalmatia. Following Whitehouse, a group of Grapčeva's characteristics (underground situation, hidden location, difficulty of access, darkness, restriction of space) would constitute the 'secrecy theme' (Whitehouse 1992, 129). Abnormally behaving water (in our case, moving, dripping, liquid water becoming solid, immobile stalagmites) would represent transition and marginality (Whitehouse 1992, 133). These may be considered particularly appropriate characteristics of a place intended for cult use.

Artefacts or natural objects that might be interpreted as symbolic representations of the supernatural were not recovered at Grapčeva. Unlike nearby Nakovana Cave on the neighbouring Pelješac Peninsula, where Iron Age/ Hellenistic period ceramics have been found to cluster very

clearly around a ritual focus (Forenbaher & Kaiser 2006b; Kaiser & Forenbaher 2012), there is no particular pattern in the spatial distribution of finds in the present test-trench that would suggest a ritual focus of any kind. Of course, nothing of the sort may ever have existed at Grapčeva; alternatively, spatial patterns in the distribution of artefacts may now be lost, overlooked by earlier excavators.

The macro-botanical assemblage includes a number of wild-plant remains with potential medicinal and/or ritual uses, such as acorns, juniper berries and almonds (Borojević *et al.* 2008). The aromatic, resin-rich juniper foliage may have been burnt as incense. While an attractive argument, the evidence for the use of plants at Grapčeva as attention-focusing or consciousness-altering devices remains inconclusive.

The majority of the evidence related to ritual practice at Grapčeva Cave appears to concern human participation and offerings to the supernatural. The sediment itself offers the first set of indicators. It differs markedly from the usual eastern Adriatic Neolithic cave deposits and their residues of everyday life. It also differs sharply from all underlying and overlying layers at Grapčeva, and appears to have accumulated much more rapidly than those layers. Its overall composition resembles those of 'combustion features' found on many Italian Neolithic sites and interpreted by Robb (2007, 149–152) as earth ovens used to roast large cuts of meat, possibly on a large scale. Earth ovens are ethnographically and archaeologically documented as the slow-cookers of many societies; they are especially useful when preparing food for many consumers. This mode of cooking entails placing fire-heated rocks above and below packages of food (e.g. joints of meat, roots and tubers, molluscs) wrapped in leaves or grass. Sealed under a bank of earth, or sometimes seaweed, the food roasts (braises, actually) over a long period of hours, or even days. The result is a tender, flavourful meal quite different from those produced by other methods of cooking (Sillitoe 1997). If the rocky, charcoal-laden deposits of Grapčeva Phase 1 did indeed result from the construction of earth ovens, then evidently they involved bringing in several metric tons of rocks from the cave's immediate surroundings. Why the Neolithic occupants of Grapčeva did not re-use stones already delivered to the cave is not clear, but as a cultural choice the effect was quite literally to pile up memories of past culinary events. Repeated deliveries of rock may also have had the effect of disturbing, or purposefully masking, the traces of earlier ritual performances (Kyriakidis 2007, 20). Deliberately constructed hearths are also contained within this deposit. Extrapolating from the present test-trench, and taking into account the information available from earlier excavations, it is estimated that carefully built hearths were constructed at Grapčeva every few years.

In these deposits, pottery is several times more abundant than in other phases of the site; the average rates of pottery discard are one order of magnitude greater than in the later phases. Sherds are relatively large, possibly reflecting deliberate breakage. Approximately 80% of all diagnostic sherds whose original vessel shape can be inferred come from medium-sized bowls. Very few of these bowls show signs of having been used for cooking (such as carbonized residues or post-firing, heat-induced colour variations on external surfaces). It is likely that the majority of bowls were used for serving, or for food-preparation that did not involve cooking.

Vessels were more highly decorated than in other phases at Grapčeva or at other contemporary eastern Adriatic cave sites (Forenbaher & Kaiser 2006a; Forenbaher *et al.* 2008, 15, table 2). Many of the medium-sized bowls had a bright-red band painted on, or just below, the rim. The pigment often used in this case was made with cinnabar, a poisonous mercury-compound. Bowls with cinnabar-painted lips would have been inappropriate for serving or for the preparation of food. They may have been decorated in this manner with the explicit intention of preventing utilitarian use, used instead for (or as) offerings. Not all painted bowls were, however, decorated with a mercury-based pigment; in our sample, approximately half were painted with an iron-based colourant. Since sources of cinnabar are comparatively rare, and sources of ochre are common, it is possible that ochre was used as a cheap substitute. Could a casual Neolithic observer discern the difference?

It would seem likely that, upon seeing the decorated vessels displayed in Grapčeva's dark zone, the observer would have experienced a feeling of recognition, perhaps on several simultaneous levels. From the simple red-bands painted on, or just below, the rims of bowls to the rectilinear, curvilinear, and even more elaborate geometric patterns, pottery decoration at Grapčeva was part of a centuries-old tradition and so must have been executed repeatedly (annually? more often?) down through generations, becoming instantly identifiable by members of the community. A sense of familiarity accompanied these ornamented vessels. Presumably, the selection of decorated pots to be used and left behind in the cave would have involved a judgment as to their appropriateness. They may well have been selected in order to convey an impression of tradition and of suitability for the occasion. Just the sight of such pottery would act as a cue, triggering memories, associations, and behaviour – likely including whatever behaviour would have been culturally appropriate for a ceremony or feast.

The faunal assemblage provides another set of clues. As with the pottery, animal bones are generally found in abundance in Phase 1, the average rates of their discard being an order of magnitude greater than in later phases. It appears that lamb and goat, as well as prime cuts of beef, venison, and hare were brought to the cave to be

consumed. There is no evidence that meat was boiled; it was either spit-roasted over open fires in hearths and/or was braised in earth ovens. The use of special methods of cooking is important in many ethno-cuisines which link certain modes of preparation to specific foods and specific consumers (Wiessner & Schiefenhövel 1996). The preferential representation of left goat-limbs and right sheep-limbs, as well as the over-representation of young female sheep, further suggest symbolically charged behaviour. The structured nature apparent in the faunal assemblage suggests that it was created during repeated enactments of a communal cultural event such as a feast or other form of ceremonial activity.

The Phase 1 remains of Grapčeva Cave incorporated the disarticulated remains of a few dozen people of all ages. A comparable situation was also encountered at Scaloria Cave, a southern Italian Middle Neolithic ritual site, where the disarticulated remains of some 30 people, as well as a few partially articulated or complete skeletons, were recovered (Robb *et al.* in press). Although the assemblage has been variously explained (for example, as having probably originated with the disturbance of single primary inhumations: Winn & Shimabuku 1988), Robb *et al.* (2015) have recently argued that taphonomic evidence establishes that the cave was a place where bones and whole bodies were re-deposited from communities near and far. At Scaloria, as at Grapčeva, intentional disorder appears to have been created by mixing the bones of multiple individuals over time. At Grapčeva, there is no evidence of primary burials, disturbed or otherwise. Instead, the evidence is clear that selected human bones from a range of individuals were brought to the cave for secondary burial where they became mixed with others.

Death and burial are considered to be where cosmological belief, group solidarity, individual and group status, and certain practical factors of economy and settlement intersect (Parker Pearson 1999, 142–147; Robb 1994, 27). Central to the human experience though they might be, the material evidence of mortuary practices, as preserved archaeologically, is rarely easy to interpret. At Grapčeva Cave some ritual activities appear to have involved the disposal of human remains. Other rituals may also have been performed there, but remain archaeologically invisible (Kyriakidis 2007, 15). Still, some ritual patterns stand out.

Grapčeva Cave constitutes a natural setting within the landscape that is visually striking. At the same time, it is sequestered, secretive, and otherworldly. Once every few years, hearths were constructed in the cave and substantial quantities of meat were cooked in earth ovens. There is no evidence that cereals, legumes, or other plant-foods were prepared on the same scale. Meat appears to have been consumed at feasts, with some of the more unusual patterns observed with the faunal data best explained as the result of symbol-laden behaviour. Medicinal plants may have been ingested and aromatic shrubs used as incense. Many highly decorated medium-sized bowls, some of them made in such a manner as to be dysfunctional, were brought to the cave and purposefully removed from circulation. Disarticulated human bones from multiple individuals were also brought to the cave and deposited there. All of these activities appear to have been repeated many times over a period of several centuries at Grapčeva Cave.

Mortuary ritual, other rites, and Neolithic society in the eastern Adriatic

Ritual behaviour is framed and conducted under specific historical, social, cultural, and material conditions. Unfortunately, while we know a little about the general contours of eastern Adriatic Neolithic society, much less is known about specific conditions and events, not least local mortuary customs. Consequently, in terms of the present discussion, it is necessary to refer to the extensive body of evidence from Neolithic Italy, an area evidently in contact with the eastern Adriatic region (Forenbaher 2008a; 2009).

Neolithic mortuary evidence from the eastern Adriatic comprises approximately a dozen formal burials and a number of isolated bones (Zlatunić 2003, 57–68). Information is often sketchy and uncertain, and detailed forensic reports are scarce (Mikić 1981). The existing data suggest that cave burials are rare. Two near-complete adult skeletons in flexed positions, and an isolated mandible, were found in the Late Neolithic levels at Vela Cave on the island of Korčula (Čečuk & Radić 2005, 160–161). The scattered remains of a child burial were recovered from the Late Neolithic levels of Ravlića Cave (Marijanović 1981, 12–13), while 3 other caves yielded a few human bones attributable to the Neolithic: Badanj (Benac 1962, 7), Markova (Novak 1959, 53) and Zelena (Benac 1957, 65; Batović 1979, 495).

Primary burials are slightly more common at open-air settlement sites, such as Smilčić, Danilo, and Crno Vrilo, where they were often found situated near, or within, structures interpreted as habitations (Batović 1967, 264–270; Korošec 1958, 25–26; Moore *et al.* 2007, 17; Marijanović 2003). In addition to formal burials, open-air settlements also yielded fragmented human remains, including the skull fragments of about 10 individuals at Smilčić (Batović 1967, 270–272), a single skull-fragment at Danilo (Korošec 1958, 26) and a mandible at Lisičići (Benac 1958, 90).

The most commonly reported skeletal elements among the isolated human remains are skull fragments and mandibles. These were previously considered to be evidence of a 'Skull Cult' (Benac 1962, 7; Batović 1967, 275) which would be consistent with a more recent claim that skull re-burial, or curation, was sometimes practiced in Neolithic Italy (Robb 1991, 114–115; 2007, 58–60). It is suggested here, however, that the recovery techniques formerly employed in eastern Adriatic excavations, in which selective

recovery appears to have been the norm, biased the sample in favour of easily recognizable skulls and mandibles. By contrast, in the present systematically recovered sample from Grapčeva, skull and mandible fragments are not overrepresented.

The relatively small number of primary inhumations and the complete absence of formal cemeteries in the eastern Adriatic Neolithic cannot be attributed to inadequate research alone and, to a degree, is likely to reflect predominant mortuary customs. Neolithic communities may have disposed of their dead in ways that have left little or no archaeological signature. While some of the human bones found scattered around settlements and caves may constitute the remains of disturbed formal burials (Robb 2007, 58), others – such as those from Grapčeva – provide clues relating to different kinds of mortuary practices.

There is evidence to suggest that, occasionally, a number of other caves in central Dalmatia were used also for mortuary purposes, but the highly unusual contents assigned to Grapčeva's Phase 1 emphasize this site's extra-special significance. Grapčeva may have been chosen for use as a ritual centre due to its extraordinary landscape setting and its suitable internal morphology. The communal feasts that appear to have been held in the cave involved an unusual abundance of otherwise ordinary food items. A number of ethnographic studies suggest that in societies where inequalities are weakly developed it is the quantity of food (rather than its style or quality) that expresses the special nature of a ceremonial feast (van der Veen 2003; Dietler & Hayden 2001). Thus, the abundance of otherwise ordinary food remains of Phase 1 at Grapčeva could be construed as evidence of ceremonies aimed at reinforcing social homogeneity and/or resisting the emergence of social ranking.

It would appear that the feasts were not seasonal and took place only every few years, possibly in relation to the death of a particular member of the community. This is borne out by the fact that Grapčeva also served as a communal burial site, providing the setting for ancestral remains to be revisited, celebrated, augmented, possibly rearranged or even taken away and circulated. These are among the common attributes of an ancestor cult (Blake 2005, 112). The apparent mixing of multiple individuals strongly suggests a ceremony that implicates some aspect(s) of a shared group identity, reinforcing and re-affirming a sense of 'us'. While burial at Grapčeva may have been reserved for particular members of a local community, the (re)buried presence of individuals of all ages suggests that it was not restricted to some subset of that community.

Why did ritual activities at Grapčeva commence in the early 5th millennium BC? Since we know so relatively little about the regional social dynamics of Neolithic central Dalmatia, we turn to the western side of the Adriatic for informative analogies. With the latter, the transformation of prehistoric societies from the heterarchies of the Early Neolithic to the unstable hierarchies of the Bronze Age was a very gradual process, unfolding in fits and starts, with no necessarily common pattern among the communities and regions affected. Robb (2007, 339) has argued that: '... the conceptual components of this change arose in several distinct phases in Italy, with… a shift to burial to mediate social relationships in the Late Neolithic and the concept of personal prestige competition via display of valuables in the Copper Age'. The paths taken by the communities involved were complex and followed no single trajectory since they were made up of variably constrained, locally specific, individual, and collective solutions to life's problems. Essentially, new social relationships reconfigured the attachments between people, places, and their pasts.

Repetitive acts of ritual participation or observation have the effect of creating lasting memories, at first specific and then general as they recede into the past, submerged by other iterations. These memories can be accessed, interpreted, and employed differently by individuals, but in one way or another they serve to guide people through the myriad choices to be made in pursuing the realisation of personal goals and/or group projects.

While men and women have resorted to ritual as a very effective means of re-affirming the status quo – the aggregate of goals and projects realised and unrealised – ritual can also stabilise and reinforce a new social configuration as it emerges from the choices people have made (Renfrew 2007, 118). Thus, the social changes that marked the onset of the Italian Late Neolithic in the later 5th millennium BC coincided with an overall increase in ritualised burial practices (Robb 1994; 1999; 2007). Essentially, over time, a landscape of villages was replaced by a landscape of the dead as communal tombs replaced settlements as the physical repositories of the common history of the group.

As these changes began to gain prevalence on the Italian mainland, on the other side of the Adriatic Grapčeva Cave became a focal point in the mortuary (and other?) ritual practices of a group, or groups, on the island of Hvar. The cave may have provided a setting at which specific shared memories were (re)produced and maintained at a time when group history and genealogy were gaining in importance. The mixing of body parts, artefacts, and other remains, and vestiges of activities at the cave, may be considered as a representation of non-specific, unbranded, times past. Repeated episodes would imbue in the minds of Neolithic *Hvarani* a sense that this place, this cave, was steeped in the past, and thus important to their senses of themselves.

Why did such cultural practices at Grapčeva cease at approximately 4300 BC? Was it just another outcome of 'people simply getting on with their own lives' (Robb 2007, 2)? There are no indications of anything dramatic occurring in the eastern Adriatic around that time. 'Hvar' style pottery continued to be produced throughout the

region for centuries to come, and the radical changes of the Late Copper Age lay over a thousand years in the future. The first monumental structures in the eastern Adriatic's version of a 'landscape of the dead' − burial mounds − together with the earliest clear expressions of social ranking, did not appear until some point in the 3rd millennium BC. As with mainland Italy, these changes were likely to have been the aggregate result of local conditions, choices, and events. The explanation for Grapčeva's brief moment as a ritual place probably lies with the as-yet undiscovered evidence of everyday Neolithic lives on the islands of central Dalmatia.

Acknowledgments

Archaeological research at Grapčeva Cave was supported by grants from the Committee for Field Archaeology of the Royal Ontario Museum, the National Geographic Society, and York University, and by the Ministry of Science, Education and Sports of the Republic of Croatia (project number 196-1962766-2740). We are grateful to Sheelagh Frame, upon whose zooarchaeological research we have relied, and to Ksenija Borojević for her palaeobotanical analyses. Andrew Moore and Curtis Runnels provided stimulating comments on an earlier version of this paper, for which we are thankful. We are, of course, responsible for any remaining shortcomings and errors.

Bibliography

Bass, B. (1998) Early Neolithic offshore accounts: remote islands, maritime exploitations, and the Trans-Adriatic cultural network. *Journal of Mediterranean Archaeology* 11(2), 165–190.

Batović, Š. (1967) Pokapanje pokojnika u Smilčiću i kult mrtvih u neolitu Dalmacije. *Arheološki radovi i rasprave* 4–5, 263–298.

Batović, Š. (1979) Jadranska zona. In A. Benac (ed.) *Praistorija jugoslavenskih zemalja*, Vol. 2, *Neolit*, 473–635. Sarajevo: Akademija nauka i umjetnosti Bosne i Hercegovine.

Benac, A. (1957) Zelena pećina. *Glasnik Zemaljskog muzeja* 12, 61–92.

Benac, A. (1958) *Neolitsko naselje u Lisičićima kod Konjica*. Sarajevo: Naučno društvo Bosne i Hercegovine.

Benac, A. (1962) Tragovi kultnog sahranjivanja u neolitu jadranske oblasti. *Diadora* 2, 5–11.

Benac, A. (ed.) (1979–1987) *Praistorija jugoslavenskih zemalja,* vols 2–5. Sarajevo: Akademija nauka i umjetnosti Bosne i Hercegovine.

Bintliff, J., Gaffney, V., Kirigin, B. & Slapšak, B. (n.d.) *The Starigrad Survey*. Unpublished.

Blake, E. (2005) The material expression of cult, ritual, and feasting. In E. Blake & A. B. Knapp (eds), *The Archaeology of Mediterranean Prehistory*, 102–129. Oxford: Blackwell.

Borojević, K., Forenbaher, S., Kaiser, T. & Berna, F. (2008) Plant use at Grapčeva Cave and in the eastern Adriatic Neolithic. *Journal of Field Archaeology* 33, 279–303.

Boschian, G. (2006) Geoarchaeology of Pupićina cave. In P. T. Miracle & S. Forenbaher (eds) 2006, 123–162.

Boschian, G. & Montagnari Kokelj, E. (2000) Prehistoric shepherds and caves in the Trieste Karst (northern Italy). *Geoarchaeology: an International Journal* 15(4), 331–371.

Brusić, Z. (2004) Pećina Vlakno. *Hrvatski arheološki godišnjak* 1, 197–199.

Buccich, G. (1885) Richerche preistoriche sull'isola di Lesina. *Bolletino di archeologia e storia dalmata* (Supplement) 8, 1–11.

Čečuk, B. & Radić, D. (2005) *Vela spila: višeslojno pretpovijesno nalazište – Vela Luka, otok Korčula.* Vela Luka: Centar za kulturu.

Chapman, J., Shiel, R. & Batović, Š. (1996) *The changing face of Dalmatia*. Leicester: Leicester University Press.

Darmanin, M., Kaiser, T. & Kirigin, B. (1997) Bilješke o flotaciji arheoloških ostataka. *Obavijesti Hrvatskog arheološkog društva* 29, 65–70.

Diedrich, C. (2011) The first Neolithic open air shore and shell midden site of chert explorers of the Hvar-Lisičići Culture on the island of Hvar, Croatia. *Journal of Island & Coastal Archaeology* 6, 51–71.

Dietler, M. & Hayden, B. (eds) (2001) *Feasts: archaeological and ethnographic perspectives on food, politics, and power*. Washington DC: Smithsonian Institution Press.

Dimitrijević, S. (1979) Problem eneolita na istočnoj jadranskoj obali. In N. Tasić (ed.), *Praistorija jugoslavenskih zemalja*, vol. 3: *Eneolit,* 367–379. Sarajevo: Akademija nauka i umjetnosti Bosne i Hercegovine.

Drovenik, M., Dolenec, T., Režum, B. & Pezdič, J. (1990) On the mercury ore from the Grübler ore body, Idrija. *Geologija* 33, 397–446.

Ehrich, R. W. (1965) Geographical and chronological patterns in east central Europe. In R. W. Ehrich (ed.), *Chronologies in Old World Archaeology*, 403–458. Chicago: University of Chicago Press.

Forenbaher, S. (2002) Prehistoric populations of the island of Hvar: an overview of archaeological evidence. *Collegium Antropologicum* 36, 361–378.

Forenbaher, S. (2006) Neolithic flaked stone industries of the eastern Adriatic: the assemblages from Pupićina and Grapčeva caves. *Atti della Società per la Preistoria e Protostoria della regione Friuli-Venezia Giulia* 15, 81–116.

Forenbaher, S. (2008a) Archaeological record of the Adriatic offshore islands as an indicator of long-distance interaction in prehistory. *European Journal of Archaeology* 11, 223–244.

Forenbaher, S. (2008b) Kamene izrađevine. In S. Forenbaher & T. Kaiser (eds), *Grapčeva špilja: pretpovijesni stan, tor i obredno mjesto,* 73–84. Split, Književni krug.

Forenbaher, S. (ed.) (2009) *A Connecting Sea: Maritime Interaction in Adriatic Prehistory.* Oxford: British Archaeological Report S2037.

Forenbaher, S. & Kaiser, T. (2000) Grapčeva spilja i apsolutno datiranje istočnojadranskog neolita. *Vjesnik za Arheologiju i Historiju Dalmatinsku (Bullétin d'Archéologie et d'Histoire Dalmate)* 92, 9–25.

Forenbaher, S. & Kaiser, T. (2003) *Spila Nakovana: Ilirsko svestište na Pelješcu/Nakovana Cave: an Illyrian sanctuary on the Pelješac peninsula.* Zagreb: V.B.Z.

Forenbaher, S. & Kaiser, T. (2006a) The pottery of Pupićina Cave. In P. T. Miracle & S. Forenbaher (eds) 2006, 163–224.

Forenbaher, S. & Kaiser, T. (2006b) Spila Nakovana: an Illyrian sanctuary from the Hellenistic period In N. Tasić & C. Grozdanov (eds), *Homage to Milutun Garašanin,* 571–582. Beograd: Serbian Academy of Sciences and Arts.

Forenbaher, S. & Kaiser, T. (eds) (2008a) *Grapčeva špilja: pretpovijesni stan, tor i obredno mjesto*. Split: Književni krug.

Forenbaher, S. & Kaiser, T. (2008b) Lončarija. In S. Forenbaher & T. Kaiser (eds) 2008a, 36–72.

Forenbaher, S. & Miracle, P. T. (2005) The spread of farming in the eastern Adriatic. *Antiquity* 79, 514–528.

Forenbaher, S. & Miracle, P. T. (2014) The spread of farming in the eastern Adriatic in the light of new radiocarbon dates. *Diadora* 26/27, 117–113.

Forenbaher, S. & Nikitović, D. (2010) Neolitičke izrađevine od cijepanog kamena iz Vele peći kod Vranje (Istra). *Histria archaeologica* 38–39, 5–35.

Forenbaher, S., Kaiser, T. & Frame, S. (2010) Adriatic Neolithic mortuary ritual at Grapčeva cave, Dalmatia. *Journal of Field Archaeology* 35(4), 337–354.

Forenbaher, S., Kaiser, T. & Miracle, P. T. (2013) Dating the East Adriatic Neolithic. *European Journal of Archaeology* 16(4), 589–609.

Forenbaher, S., Rajić Šikanjić, P. & Miracle, P. T. (2008) Lončarija iz Vele peći kod Vranje (Istra). *Histria archaeologica* 37, 5–46.

Frančišković-Bilinski, S., Bilinski, H.,Tibljaš, D. & Rantitsch, G. (2005) Effects of mercury mining regions from NW Dinarides on quality of stream sediments. *Fresenius Environmental Bulletin* 14, 913–927.

Frame, S. (2008) Prehrana i gozbe u Grapčevoj špilji. In S. Forenbaher & T. Kaiser (eds) 2008a, 85–121.

Gaffney, V. & Stančič, Z. (1991) *GIS approaches to regional analysis: case study of the island of Hvar.* Ljubljana: University of Ljubljana Research Institute of the Faculty of Art.

Gaffney, V., Kirigin, B., Petrić, M., Vujnović, N. & Čače, S. (eds) (1997) *The archaeological heritage of Hvar, Croatia*. Oxford: British Archaeological Report S660.

Gaffney, V., Kirigin, B., Hayes, J., Kaiser, T., Leach, P. & Stančič, Z. (2000) The Adriatic Islands Project: contact, commerce and colonisation 6000 BC–AD 600. In R. Francovich & H. Patterson (eds), *Extracting meaning from ploughsoil assemblages: the archaeology of Mediterranean landscapes, v*ol. 5*,* 185–198. Oxford: Oxbow Books.

Gasperini, R. (1887) Secondo contributo alla conoscenza geologica del diluviale dalmato. *Godišnje izvješće C. k. velike realke u Splitu 1886–1887*, 5–26.

Gasperini, R. (1888) Relazione sugli scavi fatti nella spelonca di Grabak sull' isola di Lesina nell' autunno del 1887. *Bulletino di archeologia e storia dalmata* (Supplement) 11, 1–8.

Heilmeyer, M. (2007) *Ancient Herbs.* Los Angeles CA: J. Paul Getty Museum.

Jahns, S. (2002) An improved time scale for the Holocene history of vegetation and environment of the south Dalmatian island of Mljet. *Vegetation History and Archaeobotany* 11, 315–316.

Jahns, S. & van den Bogaard, C. (1998) New palynological and tephrostratigraphical investigations of two salt lagoons on the island of Mljet, south Dalmatia, Croatia. *Vegetation History & Archaeobotany* 7, 219–234.

Jurković, I. (1996) Barite, hematite and cinnabar ore deposits in the Dusina area, mid-Bosnian schist mountains. *Rudarsko-geološko-naftni zbornik* 8, 51–65.

Jurković, I., Ramović, M. & Zec, F. (1999) Chemical and geochemical characteristics of the Čemernica antimonite deposit in the mid-Bosnian schist mountains. *Rudarsko-geološko-naftni zbornik* 11, 1–16.

Kaiser, T. & Forenbaher, S. (1999) Adriatic sailors and stone knappers: Palagruža in the third millennium B.C. *Antiquity* 73, 313–324.

Kaiser, T. & Forenbaher, S. (2012) Recognizing ritual in the dark: Nakovana cave and the end of the Adriatic Iron Age. In H. Moyes (ed.) 2012, 263–274.

Kaiser, T. & Forenbaher, S. (n.d.) *Badanj-Veli Pokrivenik: a prehistoric cave on the island of Hvar*. Unpublished.

Kaiser, T. & Forenbaher, S. (in press) Navigating the Neolithic Adriatic. In K. T. Lillios & M. Chazan (eds) *Fresh Fields and Pastures New: Papers Presented in Honor of Andrew M. T. Moore*. Leiden: Sidestone Press.

Kaiser, T., Vujnović, N., Darmanin, M., Forenbaher, S., Frame, S. & Marijanović, B. (1992) Istraživanje u Badnju (Veli-Pokrivenik), 1991. *Obavijesti Hrvatskog arheološkog društva* 24(2), 33–44.

Karšulin, M. (1955) Sastav, struktura i tehnologija neolitičke keramike u Grapčevoj spilji na otoku Hvaru. In G. Novak (ed.), *Prethistorijski Hvar, Grapčeva spilja*, 281–294. Zagreb: Jugoslavenska akademija znanosti i umjetnosti.

Kirigin, B. & Popović, P. (1988) Maslinovnik – a Greek watch tower in the *Chora* of Pharos. A preliminary report. In J. Chapman, J. Bintliff, V. Gaffney & B. Slapšak (eds.) *Recent developments in Yugoslav archaeology*, 177–189. Oxford: British Archaeological Report S431.

Komšo, D., Miracle, P. T. & Boschian, G. (2004) Vela spilja. *Hrvatski arheološki godišnjak* 1, 172–175.

Korošec, J. (1958) *Neolitska naseobina u Danilu Bitinju*. Zagreb: Jugoslavenska akademija znanosti i umjetnosti.

Kyriakidis, E. (2007) Finding ritual: calibrating the evidence. In E. Kyriakidis (ed.), *The archaeology of ritual*, 9–22. Los Angeles CA: University of California.

Malone, C. (2003) The Italian Neolithic: a synthesis of research. *Journal of World Prehistory* 17(3), 235–312.

Marijanović, B. (1981) Ravlića pećina (Peć Mlini*). Glasnik Zemaljskog muzeja Bosne i Hercegovine u Sarajevu (arheologija)*, nova serija 35–36, 1–97.

Marijanović, B. (2003) 'Crno Vrilo' – novi grob starijeg neolitika u Dalmaciji. *Opuscula archaeologica* 27, 34–41.

Marinčić, S. (1997) Tectonic structure of the island of Hvar (Southern Croatia). *Geologia Croatica* 50(1), 57–77.

Marović, I. & Čović, B. (1983) Cetinska kultura. In B. Čović (ed.), *Praistorija jugoslavenskih zemalja*, vol. 4: *Bronzano doba*, 191–231. Sarajevo: Akademija nauka i umjetnosti Bosne i Hercegovine.

Menković, N., Šavikin, K., Tasić, S., Zdunić, G., Stešević, D., Milosavljević, S. & Vincek, D. (2011) Ethnobotanical study on traditional uses of wild medicinal plants in Prokletije Mountains (Montenegro). *Journal of Ethnopharmacology* 133, 97–107.

Mikić, Ž. (1981) *Stanje i problemi fizičke antropologije u Jugoslaviji: praistorijski periodi*. Sarajevo: Centar za balkanološka ispitivanja Akademije nauka i umetnosti Bosne i Hercegovine.

Ministarstvo za ekonomski razvoj Crne Gore (2008) Prostorni plan Crne Gore do 2020. godine. (http://www.buljaricabay.me/DOC/Prostorni-plan-Vlada-Crna-Gora_03-2008.pdf)

Miracle, P. T. (1995) Diversification in Epipaleolithic subsistence strategies along the eastern Adriatic coast: a simulation approach applied to zooarchaeological assemblages. *Atti della Societá per la Preistoria e Protostoria della Regione Friuli-Venezia Giulia* 9, 33–62.

Miracle, P. T. & Forenbaher, S. (eds) (2006) *Prehistoric herders of Northern Istria, the archaeology of Pupićina Cave*, Vol. 1. Pula: Arheološki muzej Istre.

Moore, A., Menđušić, M., Smith, J. & Podrug, E. (2007) Project 'Early Farming in Dalmatia': Danilo Bitinj 2004–2005. *Vjesnik Arheološkog muzeja u Zagrebu* 40, 15–24.

Moyes, H. (ed.) (2012) *Sacred darkness: a global perspective on the ritual use of caves*. Boulder CO: University of Colorado Press.

Müller, J. (1994) *Das Ostadriatische Frühneolithikum: Die Impresso-Kultur und die Neolithisierung des Adriaraumes*. Berlin: Volker Spiess.

Novak, G. (1955) *Prethistorijski Hvar, Grapčeva spilja*. Zagreb: Jugoslavenska akademija znanosti i umjetnosti.

Novak, G. (1959) Markova spilja na otoku Hvaru: novo nalazište neolitske obojene keramike. *Arheološki radovi i rasprave* 1, 5–60.

Parker Pearson, M. (1999) *The archaeology of death and burial*. Stroud: Sutton.

Renfrew, C. (1985) *The archaeology of cult: the sanctuary at Phylakopi*. London: British School at Athens.

Renfrew, C. (2007) Archaeology of ritual, of cult, and of religion. In E. Kyriakidis (ed.), *The archaeology of ritual*, 109–122. Los Angeles CA: University of California.

Robb, J. (1991) Neolithic skeletal remains from Grotta Scaloria: the 1979 excavations. *Rivista di Antropologia* 69, 111–124.

Robb, J. (1994) Burial and social reproduction in the peninsular Italian Neolithic. *Journal of Mediterranean Archaeology* 7, 27–71.

Robb, J. (1999) Great persons and big men in the Italian Neolithic. In R. H. Tykot, J. Morter & J. Robb (eds), *Social dynamics of the prehistoric central Mediterranean*, 15–45. London: Accordia Research Institute.

Robb, J. (2007) *The early Mediterranean village: agency, material culture, and social change in Neolithic Italy*. Cambridge: Cambridge University Press.

Robb, J., Elster, E., Isetti, E., Knüssel, C. J., Tafuri, M. & Traverso, A. (2015) Cleaning the dead: Neolithic ritual processing of human bone at Scaloria Cave. *Antiquity* 89, 39–54.

Robb, J., Tafuri, M. & Knűsel, C. (in press) The human bones. In E. Elster, E. Isetti, J. Robb. & A. Traverso (eds.) *Scaloria Cave.* Los Angeles CA: Cotsen Institute of Archaeology (UCLA).

Rutar, S. (1888) Najnovija predhistorička odkrića na Hvaru. *Bulletino di archeologia e storia dalmata* 11, 13–15.

Sakarž, J. (1955) Analiza osteoloških nalaza i morske faune u otkopima Grapčeve spilje. In G. Novak (ed.), *Prethistorijski Hvar, Grapčeva spilja*, 269–280. Zagreb: Jugoslavenska akademija znanosti i umjetnosti.

Sillitoe, P. (1997) The earth oven. In J. Kuper (ed.), *The anthropologist's cookbook*, 224–231. London: Kegan Paul.

Skeates, R. (2012) Constructed caves: transformations of the underworld in prehistoric southeast Italy. In H. Moyes (ed.) 2012, 27–44.

Šoštarić, R. (2005) The development of postglacial vegetation in coastal Croatia. *Acta Botanica Croatica* 64, 383–390.

Spataro, M. (2002) *The first farming communities of the Adriatic: pottery production and circulation in the Early and Middle Neolithic*. Trieste: Edizioni Svevo.

Stančič, Z. & Gaffney, V. (1996) GIS based analysis of the population trends on the island of Brač in central Dalmatia. In A. Bietti, A. Cazzella, I. Johnson & A. Voorrips (eds), *Thirteenth International Congress of Prehistoric and Protohistoric Sciences, Forlì (1996), vol. 1 (Theoretical and Methodological Problems),* 169–183. Forlì: A. B. A. C. O.

Tomkins, P. (2012) Landscapes of ritual, identity, and memory: reconsidering Neolithic and Bronze Age cave use in Crete, Greece. In H. Moyes (ed.) 2012, 59–80.

Trinajstić, I. (1985) Fitogeografsko-sinataksonomski pregled vazdazelene šumske vegetacije razreda Quercetea ilicis Br.–B1. u Jadranskom primorju Jugoslavije. *Poljoprivreda i šumarstvo* 2–3, 71–96.

Trinajstić, I. (1993) Vaskularna flora otoka Hvara, *Acta Botanica Croatica* 52, 113–143.

Trump, D. H. (1980) *The Mediterranean in prehistory*. New Haven CT: Yale University Press.

van Andel, T. H. (1989) Late Quaternary sea–level changes and archaeology. *Antiquity* 63, 733–745.

van Andel, T. H. (1990) Addendum to Late Quarternary sea-level changes and archaeology. *Antiquity* 64, 51–52.

van der Veen, M. (2003) When is food a luxury? *World Archaeology* 34(3), 405–427.

Vencl, S. (1996) A Znovu: Žaludy Jako Potravina. *Památky archeologické* 87, 95–111.

Watson, J. P. N. (1979) The estimation of relative frequencies of mammalian species: Khirokitia 1972. *Journal of Archaeological Science* 6, 127–137.

White, T. E. (1992) *Prehistoric cannibalism at Mancos 5MTUMR–2346*. Oxford: Princeton University Press.

Whitehouse, R. D. (1992) *Underground religion: cult and culture in prehistoric Italy*. London: Accordia Research Centre.

Wiessner, P. & Schiefenhövel, W. (1996) *Food and the status quest: an interdisciplinary perspective*. Oxford: Berg.

Wilkes, J. (1992) *The Illyrians*. Oxford: Blackwell.

Winn, S. & Shimabuku, D. (1988) *The heritage of two subsistence strategies: preliminary report on the excavations at Grotta Scaloria, Southeastern Italy, 1978.* Halifax, Nova Scotia: Saint Mary's University.

Zlatunić, R. (2003) Neolitički pogrebni ukopi na prostoru istočne jadranske obale i njezinu širem zaleđu (prijelazna zona): tipološko-statistička analiza. *Vjesnik Arheološkog muzeja u Zagrebu* (3. serija) 36, 29–95.