

## Early Neolithic settlement of the Po Plain (northern Italy): Vhò and related sites

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**ABSTRACT** – Around the mid-19<sup>th</sup> century, several groups of archaeologists active in northern Italy discovered a few sites characterized by the presence of 'hut-floors' or 'pit-dwellings' (fondi di capanna), which they attributed to a well-defined period of their Stone Age sequence. Research in the central Po Plain of Lombardy was resumed in the 1970s, allowing one to attribute some of the older discoveries to the Early Neolithic Vhò cultural aspect. The scope of the excavations, which started on one of the Vhò di Piacenza sites in 1974, was to interpret the function of the previously discovered features, establish their radiocarbon chronology, and compare the finds with those of the Fiorano culture distributed across the eastern regions of the Po Plain. The main goal of this paper is to provide an international audience with novel information about one of the still poorly known Early Neolithic cultural aspects of northern Italy, namely that of the Vhò.

**KEY WORDS** – North Italy; Po Plain; Early Neolithic; Vhò sites; pit-dwelling sites; radiocarbon dating

### **Zgodnje neolitska naselbina v Padski nižini (severna Italija): Vhò in druga podobna najdišča**

**IZVLEČEK** – V sredini 19. stoletja so številne skupine arheologov, ki so delovale v severni Italiji, odkrile nekaj najdišč, za katere so bile značilne zemljanke (it. fondi di capanna), ki so jih pripisali dobro definiranimu obdobju njihove sekvence v kameni dobi. Raziskave so se na območju osrednje Padske nižine v Lombardiji nadaljevale v 70. letih 20. stoletja in so pokazale, da lahko starejša odkritja pripišemo zgodnje neolitski kulturi Vhò. Namen izkopavanj, ki so se začela na enem od najdišč na območju Vhò di Piacenza leta 1974, je bil razložiti namen teh struktur, določiti njihovo radiokarbonsko kronologijo in primerjati najdbe s kulturo Fiorano, ki je razprostranjena na vzhodnih območjih Padske nižine. Glavni namen našega članka je, da mednarodnemu občinstvu predstavimo najnovejše podatke o tej sicer slabše poznani zgodnje neolitski kulturi Vhò iz območja severne Italije.

**KLJUČNE BESEDE** – severna Italija; Padska nižina; zgodnji neolitik; najdišča kulture Vhò; najdišča z zemljankami; radiokarbonsko datiranje

## Introduction

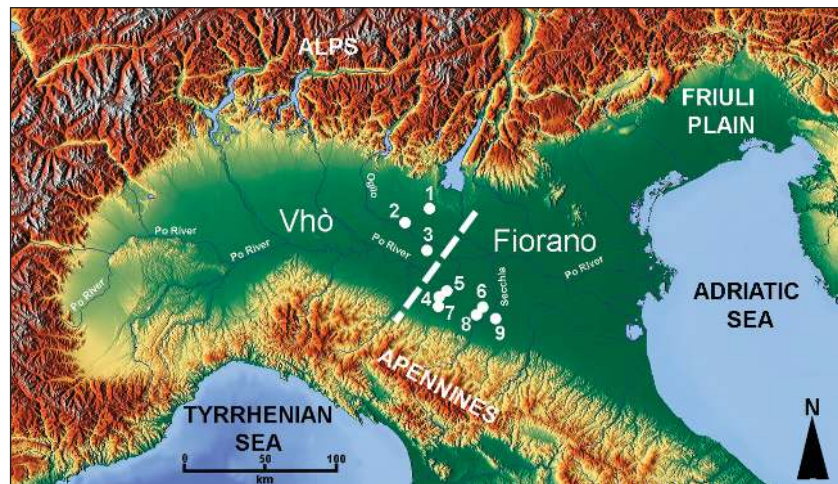
It is during the last decade that some scholars began to recognize that northern Italy plays a key role in prehistoric research, since this region acts as an interface between the Mediterranean world and continental Europe (Pearce 2013.10). Despite this, the origin and spread of the first farming communities in this territory have always been less of a focus for international scholars compared with southern Italy (Mazurié de Keroualin 2003). The first up-to-date synthesis on the beginnings of the Neolithic in the Po Plain was published only recently (Starnini et al. 2018).

To give an example, in his synthetic monograph entitled *The Early Mediterranean Village, Agency, Material Culture, and Social Change in Neolithic Italy*, John Robb shows the location of Vhò in one of his maps (Robb 2007.31.Fig. 3), though he avoids discussing the topic, since he admits that northern Italy does not fall into the core area of his study. In his book, Vhò is briefly mentioned again when discussing Early Neolithic figurines (Robb 2007.49.Fig. 6.d, 53). Rightly complaining about the shortage of radiocarbon dates, Robb provides the reader with a table of the Early Neolithic cultures based on 'typical' ceramic chronology (Robb 2007.167.Tab. 16) where the north Italian Early Neolithic is represented only by Emilia-Romagna Impressed/Linear wares. We suggest that by 'Impressed' this author meant the Adriatic aspect of the Impressed Ware culture, while by 'Linear' he most probably refers to the Fiorano culture, although this term is not explicitly mentioned. Some of the Fiorano vessels, in particular the characteristic carinated handled cups, are indeed decorated with motifs composed of paired grooved lines and wheat-like impressions (*chicchi di grano*), though they have nothing in common with the typical decorative patterns of the more famous Central European Linear Pottery culture (henceforth LBK) (see e.g., Tringham 1971.Figs. 21 and 22). Therefore, it is necessary to pay attention when writing about linear motifs, though we know that the LBK hypothesis has been inherited from Antonio Mario Radmilli,

who, back in the 1970s suggested certain cultural aspects that flourished in some regions of north and central Italy, namely those of Fiorano, Sasso and Sarteano, derived from the transalpine LBK (Radmilli 1972.150). Moreover, in the chronological chart of Neolithic Europe recently published by Sarunas Milisauskas the only mentioned Early Neolithic culture of northern Italy is that of Fiorano (Milisauskas 2011.154.Fig. 7.1). More discussion about Vhò, Fiorano and related cultures can, however, be found in a synthesis provided by Caroline Malone (2003.Tab. 1, 243, 263.Fig. 5).

A further problem regards nomenclature. Mark Pearce (2013.159), another Anglo-Saxon author, discusses the radiocarbon chronology for the spread of the Neolithic in the Po Valley and notes that Italian scholars distinguished several Early Neolithic 'groups' or 'facies' (Vhò, Fiorano, Gaban, Fagnigola, Isolino, etc.) almost exclusively based on ceramic vessel forms and decorations (see Bagolini, Biagi 1977; 1979), as well as on the characteristics of the knapped stone assemblages (Bagolini, Biagi 1987). Pearce suggests that these groups should be called cultural aspects. However, the same author correctly observes that the terms 'group' or 'facies' have been employed simply to avoid the term culture (Pearce 2013.159), though this problem was already taken into serious consideration and discussed in 1976, when the new research at Vhò had just started (Bagolini, Biagi 1976.56).

It is difficult to contradict the claim that "*traditionally, the cultures of Neolithic Italy have been de-*



**Fig. 1.** Distribution map of the Po Plain Neolithic sites mentioned in the text: 1 Isorella, 2 Ostiano, 3 Vhò di Piadena, 4 Campegine, 5 Castelnuovo Sotto, 6 Albinea, 7 Calerno, 8 Rivalentella, and 9 Fiorano. The dashed line marks the suggested border between the two aspects (drawing by E. Starnini).

*finned through ceramics, rather than other criteria of economic, environmental, or technological distinction ... Ceramics and, to a lesser extent, lithics provide ample scope for involved and highly focused debates on the cultural sequence of Neolithic Italy, often without much regard to time scales. This typological research tradition owes much to the Germanic tradition of typology, and to the study methods of Classical material. However, fragmentary pottery is not necessarily the most appropriate material upon which to write the history of Neolithic Italy, when many other relevant factors should be included in the overall interpretation” (Malone 2003.272).*

In effect, the traditional culture-historical approach applied by Italian prehistorians to develop cultural sequences based on pottery styles and their relative chronology (Pessina, Tiné 2008) received several critiques, and undoubtedly shows severe limitations (Malone 2003.274; Robb 2007.161–162). In particular, regarding northern Italy, in his ‘rethinking’ of the Early Neolithic, Pearce (2013.8) rightly points out that the last synthesis on this important topic was the monographic work written by Bernardino Bagolini 40 years ago (Bagolini 1980). In his volume, Bagolini described different ceramic styles of the Early Neolithic of northern Italy as ‘groups’ and Fiorano as a ‘culture’ (Bagolini 1980.97), following Fernando Malavolti’s original definition (Malavolti 1953.4).

Other authors simply justify the use of the term ‘culture’ for the early phases of prehistory since “... archaeological traces of human groups living in such a remote past are relatively scarce and do not enable us to identify social, political and ethnical entities, which produced, in a given time and space, a specific material culture” (Danckers et al. 2019.9). Moreover, these authors admit that the terms ‘facies’ and ‘culture’ are often presented in the narrative as categories of analysis, more or less explicitly as real historical agents.

After 40 years, several problems and questions proposed in Bagolini’s first synthesis have remained substantially unanswered (Bagolini 1980). The reason for this mainly relates to the

lack of any systematic programme of radiocarbon dating aimed at building up a reliable chronological seriation, the various terminations of formerly ongoing and planned research agendas, and the dispersal of knowledge due to the proliferation of several small rescue projects, and the slow process or absence of post-fieldwork analysis, study and publication of the results of old excavations (see e.g., Steffé, Degaspero 2019).

At present, some of the basic issues regarding the Neolithization of the Po Valley remain unsolved. Among these are the origins of this cultural phenomenon, as well as the organization and social dimensions of settlements, of which we know very little. Some authors still think that we have to invoke a local Mesolithic background (Binder 2000.128; Gabriele, Tozzi 2017), despite the absence of any reliable evidence, as already reported two decades ago (Biagi 2001.81). There is also the fact that the ceramic pyrotechnology of the Early Neolithic Po Valley cultures is quite advanced and varied (Starnini et al. 2018.313; Pallecchi 2019), unequivocally being the result of generations of people who transmitted technical skills, not to mention the sudden appearance of polished stone technology and new elements in subsistence practices, such as the presence of different species of domesticated cereals and animals, or material and spiritual culture, such as clay figurines (Bagolini, Biagi 1977a).



**Fig. 2. Distribution map of the Neolithic Vhò culture sites excavated around Piadena (Cremona) since 1880: 1 Campo Costiere, 2 Campo Costiere Orefici, 3 Campo Guercio, 4 Campo del Ponte, 5 Campo Cappellino, 6 Campo Cinque Fili, 7 Campo Sera-Mattina, 8 Campo Ceresole (drawing by P. Biagi).**

Lawrence H. Barfield and Antonio M. Radmilli were the first to suggest that the origin of the Fiorano culture might be sought in central Italy (*Barfield 1972; Radmilli 1972*), recognizing some parallels with the Sasso cultural aspect (*Grifoni Cremonesi, Radmilli 2000–2001*) and the Adriatic Impressed Ware cultures (*Broglio, Lollini 1963*). Further, the central Italian Ripoli culture (*Cremonesi 1965*) probably played an important role in the development of the Fiorano culture and the origin of the Neolithization process in the Po Valley (*Barfield 1972.193*). This is confirmed by the presence of figulina painted and unpainted wares (*Spataro 2009*), beside certain similarities that can be observed between the Fiorano and the Ripoli I style pottery (*Cremonesi 1965; 1974; Barfield 1981.32*). More precisely the figulina ware is a characteristic product of the Early and Middle Neolithic cultures of both Adriatic coastlines. It is a very specific type of pottery with very fine or fine inclusions and pink to cream or orange surfaces (*Teoch et al. 2014.353*), potsherds of which have also been recovered in northern Italy.

This paper discusses some problems regarding three Early Neolithic sites attributed to the Vhò culture, which were excavated by two of the present authors (PB and ES) between the 1970s and the 1990s in southern Lombardy: Vhò di Piadena-Campo Ceresole, Ostiano-Dugali Alti, and Isorella-Cascina Bocche. The results achieved from the excavations and preliminary study of the materials contribute to improving our knowledge on the beginnings of the Neolithic in the central Po Plain, defining the chronological framework, and framing it in the wider

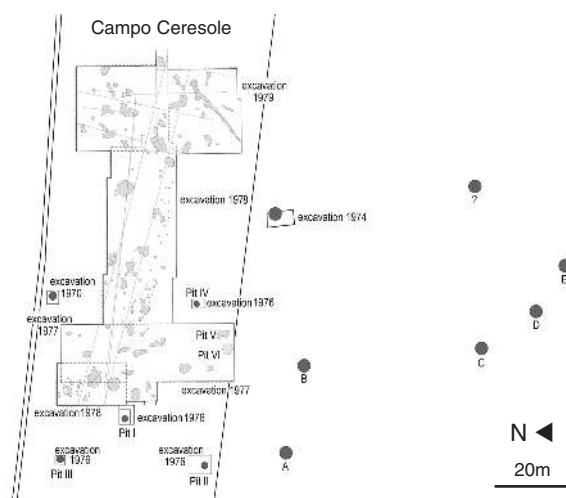
context of the Neolithic archaeology of southern Europe. Moreover, this paper describes the way these Early Neolithic sites were discovered, excavated, and interpreted by 19<sup>th</sup>-century archaeologists, and the reasons why they have been important in prehistoric archaeology ever since.

Therefore, the main goal of this contribution is to provide an international audience with novel information about one of the still poorly known Early Neolithic cultural aspects of northern Italy, namely that of the Vhò culture group.

### Research history

Italy has played an important role in the study of European prehistory since the middle of the 19<sup>th</sup> century. In this country, prehistoric archaeology was called palaeoethnology (paleo-etnologia) under the influence of the French Academic tradition, or the ‘New Science’, the study of which began to develop in that period (*Guidi 1988.27; Cova 2010*). In those years, heterogeneous groups mainly composed of scientists, among whom were geologists and naturalists, though also humanists, positivists, illuminists and Catholics, were attracted by the discovery of very ancient remains taking place in various European countries, and by the new theories put forward by Charles Lyell and Charles Darwin (*Guidi 1988. 25– 29; Trigger 1989.92–94*).

Some important discoveries attracted the attention of groups of prehistorians who were active in north Italy, and in Parma and Reggio Emilia in particular: (1) the impressive number of prehistoric mounds distributed along the Via Emilia Roman road that crosses the Po Plain from east to west. Locally, they were called ‘*terramare* or *terremare*’ because of the characteristics of their very dark, organogenic, greasy soil deposit, used as a fertilizer by local farmers (*Strobel, Pigorini 1864; Chierici 1871; Munro 1890; 1912; Desittere 1997*); (2) the presence of lake-dwellings along the ancient shores of the pre-alpine lakes and their related intermorainic basins (*Gastaldi 1865; Lioy 1876; Chierici 1879a; Keller 1886; Castelfranco 1912*); and (3) the discovery of the so-called *fondi di capanna* (‘hut-floor’ foundations or ‘pit-dwelling’ structures) (see *Barfield 1972.189*) in the central Po Plain (*Pigorini 1875; Chierici 1877a*) that took place in 1866 by Gaetano Chierici during the excavation at the settlement of Roteglia in the province of Reggio Emilia (*Malavolti 1956.6*). These sunken pit-structures were common, especially in some areas of Emilia and southern Lombardy, though they



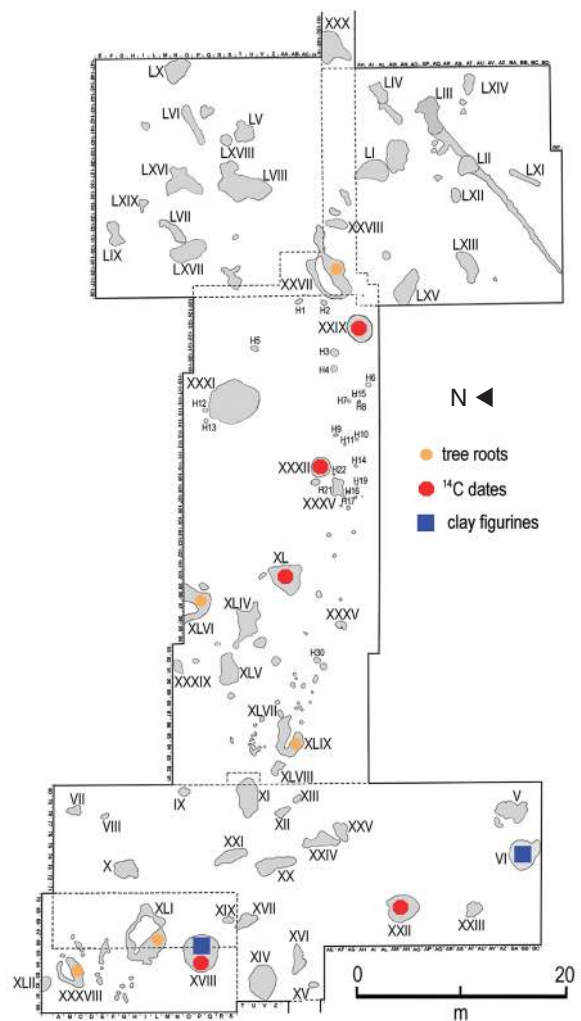
**Fig. 3. Distribution map of the structures excavated at Vhò-Campo Ceresole between 1970 and 1979. The black dots A-E show the location of dark soil marks on the surface of the field (drawing by P. Biagi and E. Starnini).**

were also known, for example, in central Italy, in the Vibrata Valley in the Abruzzi, where they were discovered at Belvedere in 1870 (Rosa 1871. 42–45; see also Malavolti 1956.7; Radmilli 1977.265–335). The *fondi di capanna* problem was widely debated in Italy for about a century, until the results of the excavations carried out at Rivoli Veronese in the Adige Valley were published (Barfield, Bagolini 1976.14–16). The study of the pit-structures brought to light at Rivoli, and their comparison with other pits excavated from other European Neolithic settlements showed that they are to be interpreted as “storage pits lying inside or outside huts” (Barfield, Bagolini 1976.14) and not as habitation structures, as suggested by many authors (see Radmilli 1967; Cavulli 2008.94–95; Cattani 2009).

Moreover, some of the deep pits were interpreted as ‘hut floor-grave’ structures (*capanne-sepolcri*) by some authors because their deeper part had been excavated just below the ‘pit-dwelling’ floor, and in a few cases they contained a globular pot or flask in the centre of the lowermost fill rich in charcoal and ash (see Chierici 1879b; Laviosa Zambotti 1943.92).

In 1873, Luigi Pigorini announced the discovery of four oval and circular ‘hut-floor’ foundations along the banks of the River Crostolo near Albinea in Emilia (Malavolti 1953.4). The structures were excavated by Chierici, who wrote a very detailed description of their shape, black filling rich in charcoal fragments, and archaeological material culture remains. Among the finds, he listed more than 1800 knapped stone artefacts, nine polished greenstone tools, five sandstone polishers, 20 small chert stones, fragments of at least 100 ceramic vessels, animal bones and teeth. He also reported the absence of cereal seeds and grinding stones (Chierici 1875a). Other ‘hut-floor’ sites were discovered in the following years in the same region at Rivalentella, Calerno, Castelnuovo di Sotto, and Campegine (Chierici 1879b; Malavolti 1953) (Fig. 1).

Thanks to these discoveries, Chierici attributed the sites to “a perfectly defined period of the Stone Age ... that finds parallels in the Vibrata Valley, though so far nowhere it has been distinctively described” (Chierici 1875a.109–110, translated from the original in Italian). He also observed that the pit structures were always located at the top of low hillocks, surrounded by lowlands intersected by small streams and marshy areas. Moreover, he clearly stated that the stratigraphic position of the ‘pit-dwelling’ sites



**Fig. 4.** Distribution map of the areas and the structures excavated at Vhò-Campo Ceresole between 1977 and 1979 showing the radiocarbon-dated structures (red dots), the presence of clay figurines (blue squares), and natural tree-root features (ringgruben) (yellow dots) (drawing by P. Biagi and E. Starnini).

had lain at the bottom of the archaeological sequence that had been defined in those days in Emilia (Chierici 1877b). Later, the same author compared these features with those excavated in other regions of northern and central Italy. Chierici also analysed the most important characteristics of the knapped stone assemblages retrieved from the ‘pit-dwelling’ sites in Reggio Emilia province, focussing on a complex of c. 800 artefacts. More precisely, he was the first to interpret and describe the method employed for the production of the most typical knapped stone tools, namely the rhomboid geometrics and the characteristics of their manufacture residuals – the microburins as we call them now (Chierici 1875b; Gori 1932), which he attributed to a precise period of his Stone Age sequence (Chierici 1876).

A few years later, groups of prehistoric ‘hut-floor’ sites, very similar to those excavated in Emilia, began also to be discovered around Vhò di Piadena, a small rural village in southern Lombardy, though we know that structures of this type had already been noticed in the same region at least since 1875 (*Pigorini 1875; Barocelli 1970.22*). The first archaeological research around Vhò was carried out by Pompeo Castelfranco, Giacomo Locatelli, Francesco Orefici, and Antonio Parazzi (*Parazzi 1890; Castelfranco 1892; 1894*). This research led to the discovery of six ‘hut-floor’ sites at Campo Costiere, Campo Guercio, Campo Cappellino, Campo del Ponte, and Campo Cinque Fili (Fig. 2). Their excavation yielded assemblages very similar to those recovered a few years before in Emilia by Chierici and his colleagues (*Bagolini, Biagi 1975*). The only exception was the structure discovered at Campo Donegalo, excavated by Orefici in 1893, with the finds undoubtedly belonging to a different Stone Age cultural aspect (*Castelfranco 1894; Barfield 1975*).

The locations of all of the abovementioned Vhò sites share the same geomorphologic characteristics. They are situated on hydromorphic clayey soils at the top of Late Pleistocene terraces of the Main Level of the Lombard Plain that extends south of the Oglio River, close to its confluence with the Po (*Barker et al. 1987.110*). South and east of Vhò, the terraces are from three to six metres higher than the surrounding plain, and slowly degrade toward the south (*Bagolini, Biagi 1975.Fig. 1a*).

The aforementioned 19<sup>th</sup>-century archaeologists accurately described the structures, their fill and the material culture and faunal remains they uncovered from the Vhò sites. A few more structures were excavated at Campo Sera-Mattina and Campo del Ponte in the early 1960s (*Pasquali 1961; Fusco 1964*), while the first modern research at the neighbouring site of Campo Ceresole began in November 1974 and fieldwork seasons continued until the autumn of 1979. The excavations covered an area of c. 3000m<sup>2</sup> (Fig. 3). They led to the discovery of 69 pit structures of different shapes and sizes (*Bagolini et al. 1987*), five of which were radiocarbon-dated (see Fig. 4). Thanks to the results achieved from the excavations, the most important characteristics of the Vhò cultural aspect were defined for the first time (*Biagi 1980.79–85; Barker et al. 1987*). They were later compared with those of other Early Neolithic complexes of northern Italy, Fiorano in Emilia, in particular (*Laviosa Zambotti 1943.95; Malavolti 1953; Barfield 1972*).



**Fig. 5.** Vhò-Campo Ceresole from the south-west (photograph by P. Biagi, autumn 1975).

Nevertheless, it is important to remind readers that the 1975 paper on Vhò (*Bagolini, Biagi 1975*) was conceived as a first attempt to show the important role that the Early Neolithic sites played in the study of the prehistory of northern Italy since the 19<sup>th</sup> century, to reprint part of original texts taken from century-old papers describing the discoveries made in those years, and to publish for the first time all of the archaeological material brought to light by Castelfranco, Locatelli, Orefici, Antonio Parazzi, and Pellegrino Strobel in 1890 and 1891. At present, these materials are stored in the collections of many national and local museums, and sometimes it is difficult to access them.



**Fig. 6.** Vhò-Campo Ceresole. Excavations underway in Pit XVIII (photographs by P. Biagi, autumn 1978).

## The sites

### *Vhò – Campo Ceresole (Cremona)*

Parazzi was the first to carry out excavations at Campo Costiere in 1890 (Fig. 2.1). This author provided us with a very detailed description of the two ‘pit-dwellings’ he excavated, as well as of the finds he recovered, among which are fragments of ceramic vessels, knapped stone artefacts, polished stone tools, and bones (*Parazzi 1890*). Campo Costiere is located *c.* 500m east of the present village of Vhò, at the northernmost edge of the fluvial terrace facing the old bed of the Oglio River to the north. The ancient river course is marked by a steep escarpment some 10m high. In the autumn of the same year, Castelfranco excavated another site, called Campo Costiere Fondo Orefici, located *c.* 300m north-east of the previous one (Fig. 2.2) (*Castelfranco 1892*). Both sites yielded a rich assemblage of archaeological finds, among which are fragments of light yellowish figulina ware and long end scrapers made from chert. Both items are almost entirely absent from all the other Neolithic sites excavated around Vhò (see *Bagolini, Biagi 1987.Figs. 2–6*).

During the same year, Orefici excavated another ‘hut-floor’ at Campo Guercio, *c.* 2km south of Campo Costiere (Fig. 2.3). Excavations were also conducted in the 8-shaped shallow pit structure discovered at Campo Cappellino (*Castelfranco 1892*) (Fig. 2.5). Again in 1890, Castelfranco and Orefici uncovered another 8-shaped ‘hut-floor’ foundation and one cylindrical, deep well at Campo del Ponte (Fig. 2.4). The research at this site was resumed in 1963 by Vincenzo Fusco (*1964*). The 19<sup>th</sup>-century excavations at Vhò were concluded in 1891 at Campo Cinque Fili (*Castelfranco 1892*). This site, the southernmost ever recovered in the area, is located *c.* 3km south of the old Oglio riverbank, east of the locality called Corte Bel Giardino (Fig. 2.6) (*Bagolini, Biagi 1975.Fig. 1a*).

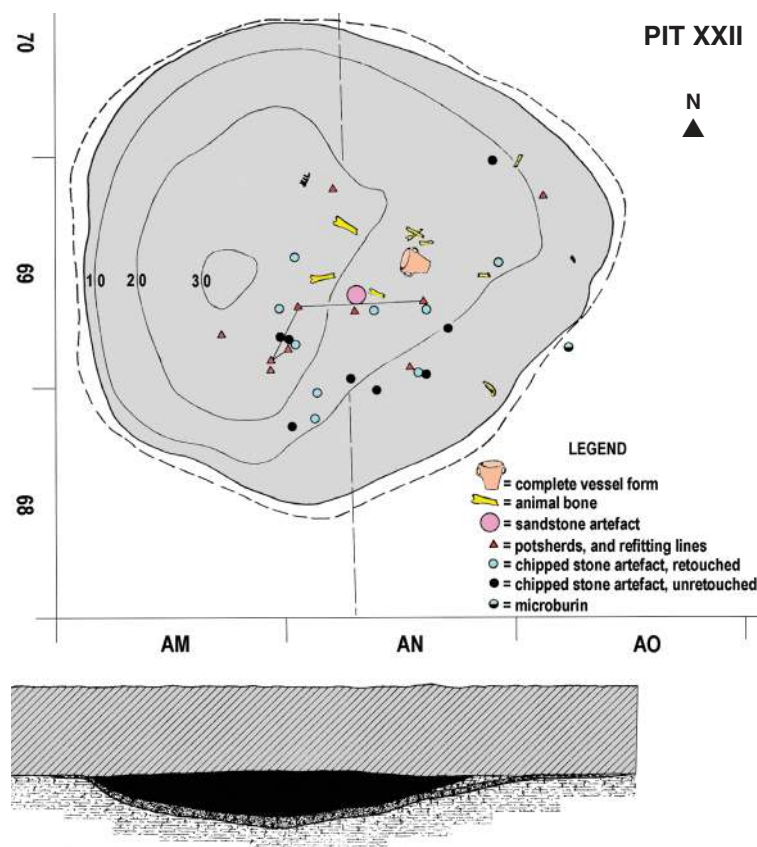
The characteristics of the structures brought to light in the 19<sup>th</sup> century and their cultural attribution started to be reconsidered only in the 1970s (*Bagolini, Biagi 1975.110–116*). The so-called ‘hut-floors’, uncovered during the first studies, are represented by a great variety of types among which are circular, elongated, and 8-shaped shallow features, as well as deep wells (*Bagolini, Biagi 1975.Fig. 38*). Among the latter are almost cylindrical types, one of which was excavated at Campo del Ponte. This feature was accurately described by Castelfranco, who reports the presence of a horizon-



**Fig. 7. Vhò-Campo Ceresole. Part of the 1978 excavation area with two ringgruben in the foreground and a Roman canal in the centre (top), part of the 1979 excavations area with Pit LXI, in the foreground (bottom), and a grey stripe, possibly a straight palisade, in the centre (photographs by P. Biagi, autumn 1978 and 1979).**

tal layer of planks and posts at a depth of *c.* 3m, which he interpreted as the remains of a wooden structure. The function of a second similar structure, *c.* 50cm below, was to seal the lowermost part of the well whose fill was very poor in archaeological finds (*Castelfranco 1892*).

The research at Vhò was resumed in 1960 by local amateurs, who excavated one ‘hut-floor’ at Campo Sera-Mattina (Fig. 2.7) (*Pasquali 1961*). As mentioned before, excavations were reopened in 1970 and 1974 in the neighbouring Campo Ceresole, and continued till 1979 (Fig. 2.8). The investigations were extended to at least 3000m<sup>2</sup>, though from the presence of dark soil marks on the surface of both Campo Sera-Mattina and Campo Ceresole, we can infer that the entire Neolithic site covered a surface of *c.* 35 000m<sup>2</sup> (Fig. 5). The 1974–1979 excavations led to the discovery of 69 structures, among which are pits of different shapes and sizes, with narrow, elongated structures (Fig. 7 bottom), one probable deep well dug down to reach the water table (Pit XVIII; Fig. 6), a few postholes, and tree-root remains (*ring-*



**Fig. 8.** Vhò-Campo Ceresole. Shallow Pit XXII with the distribution of finds recovered during excavation. Excavation grid of 1m. The structure has yielded two radiocarbon dates (Bln-3135 and GrM-15259) (after Bagolini et al. 1977.Fig. 20).

gruben) (Fig. 7 top), and the foundations of one probable straight palisade (Fig. 7 bottom) (Bagolini et al. 1987.456). The characteristics and functions of some of these features have recently been rediscussed (Pearce 2008).

The location of the 1970–1979 excavations, the distribution of the different underground features, and the position of the five radiocarbon-dated features are shown in Figure 4. It is important to point out that the 1977–1979 wide trenches were purposely opened in an area of Campo Ceresole that had never shown any evidence of anthropogenic dark soil marks on its surface, as the main scope of the excavations was to check for the presence of real habitation structures.

A preliminary study of the shape, content, and fill of the excavated features has shown that none of them can be interpreted as a habitation structure (Pearce 2003.44). This topic has already been discussed by Barfield in the context of the study area (Barfield 1975), even though the idea of these features representing habitation structures was strong-

#### PIT XXII



ly supported by some Italian archaeologists in the 1980s (Tinè 1987.324), despite the fact that in the context of European prehistory this issue had already been clarified by Vere G. Childe back in the 1940s (1949). Moreover, some of the Vhò structures were refilled two or three times, as shown by the profiles of Pits V (Bagolini, Biagi 1976.Fig. 4) and XXXII (Pearce 2008.Fig. 3). One shallow feature, Pit XXII, yielded an almost complete vessel in a horizontal position (Fig. 8) (Bagolini et al. 1977. Tav. IV.1). One complete polished axe/adze made of omphacite (Starnini et al. 2004.Fig. 5.7) was collected from the bottom of Pit III; it was partly covered by calcareous concretions (*castracane*), which formed after its deposition exactly in the centre of the structure (Bagolini, Biagi 1976.Fig. 17.3). Other narrow, elongated structures seem to have followed some kind of alignment (see Fig. 4, LIV, LVI and LVII) (see Bagolini et al. 1977.Fig. 6). These elongated features are identical to those interpreted as ‘structured depositions’ or ‘sacrificial pits’, which find parallels in

other European contexts (e.g., Makkay 1987; Pearce 2008).

#### Ostiano – Dugali Alti (Cremona)

The area around Ostiano has been well known for decades due to the presence of archaeological sites and isolated finds (Barocelli 1971). The Neolithic settlement of Dugali Alti is located c. 5.5km north-northeast of Ostiano, c. 2km east of the present course of the Scolo Galbuggine, which flows into the Oglio River some 6km to the south, west of the village itself (Marchetti 1995.Fig. 3) (Fig. 1.2). At present, the area looks like a flat terrace 45m asl. However, according to the locals, the original landscape was characterized by low hillocks until World War II, and it was later levelled for agricultural purposes. The site was discovered in 1979 by local amateur archaeologists, while excavations were carried out here in 1980 and 1981. The excavations led to the discovery of three pit structures of very different shapes and sizes (Fig. 9 top), two of which were radiocarbon-dated. The uppermost fills of these pits were partly damaged by ploughing. They all yielded the remains of characteristic Early Neolithic Vhò ma-



terial culture, which have already been published in an edited monograph (Biagi 1995).

### ***Isorella – Cascina Bocche (Brescia)***

Finally, the site of Isorella was discovered accidentally in 1992, after deep ploughing in a crop field near Cascina Bocche, a farmstead south of the village (Perini, Starnini 1995; Starnini 1995a). The site is located on the gravelly unit of the Middle Lombard Plain, c. 23km north of Vhò di Piadena as the crow flies (Fig. 1.1). In 1993, just after its discovery, a group of local amateurs started illicit excavations on a wide dark soil mark rich in artefacts brought to light by ploughing (Fig. 9 bottom). Therefore, it was necessary to organize rescue intervention to collect the dispersed artefacts and carry out stratigraphic excavations, directed by one of the authors (ES) in 1997. This short fieldwork season brought to light the remains of a large, shallow pit, filled with a very dark, organogenic soil, containing a rich assemblage of artefacts and bioarchaeological remains (Starnini et al. 2000; Perini et al. 2001; 2002; Bon et al. 2006).

### **Environmental setting and subsistence economy**

The problems regarding the distribution and location of Neolithic sites in the central Po Plain have been discussed in a few papers written mainly in the 1980s and 1990s (Cremaschi 1983; 1990; Barker et al. 1987; Biagi et al. 1993). The distribution of the Vhò sites in the central Po Plain north of the river itself seems to have always followed the same pattern. However, a few differences have been noticed over the last two decades, expanding our understanding in a previously unexpected way. Isorella is a typical example. We know that two of the sites discussed in this paper, namely Vhò and Ostiano, are located at the top of slightly higher elevations surrounded either by marshes (Cattani 1975) or lowlands intersected by nowadays dissected rivers and streams, as Chierici already observed in Emilia more than a century ago (see above Chierici 1877a). Moreover, we know that in this part of the Plain, north of the Po River, the sites are always ‘exposed’ (Chierici 1875a.104), which means they are visible from the surface. This is due to thousands of years of deforestation, erosion, and agriculture practices, which have taken place with different levels of intensity since at least the Bronze Age (Barker et al. 1987; Sereni 1989).

Vhò and Ostiano are both located on the hydromorphic clayey soils of the Late Pleistocene Main Level



**Fig. 9. Ostiano-Dugali Alti, Pit I at the end of the excavation (top), and Pit 1 of Isorella-Cascina Bocche (bottom). Note that the upper part of both structures is eroded. Note also the difference in the soil texture inside which the two structures were dug (photographs by P. Biagi, 1980, and E. Starnini, 1997).**

of the Plain (Biagi et al. 1983.165; Cremaschi 1987. Appen. 6), considered not ideal for Early Neolithic agricultural practices. According to the results of soil micromorphological analyses, the settlements were built in a woodland environment (Macphail 1995; Ottomano 1998), though the soil and anthracological studies suggest that the “sites would reflect short-period occupations with a low impact on the local vegetation cover” (Nisbet 2013). Moreover, they were built at the edge of alluvial terraces, close to ancient riverbanks, showing that the ‘conquest of the terraces’ had not taken place at the time, but slightly later during the Middle Neolithic when forest clearance and settlement density increased notably (Cremaschi 1983; Barker et al. 1987). This observation would suggest that Early Neolithic deforestation was restricted to a few zones close to freshwater courses (Biagi et al. 1983.167). The fluvial network most probably represented the easiest way to move in such a difficult, thick woodland environment, composed mainly of ash (*Fraxinus excelsior*) and oak trees (*Quercus* sp.) (Bagolini et al. 1987. 463; Castelletti, Maspero 1990–1991).

This picture, which we can apply to Vhò settlements and other sites known in the lower regions of the

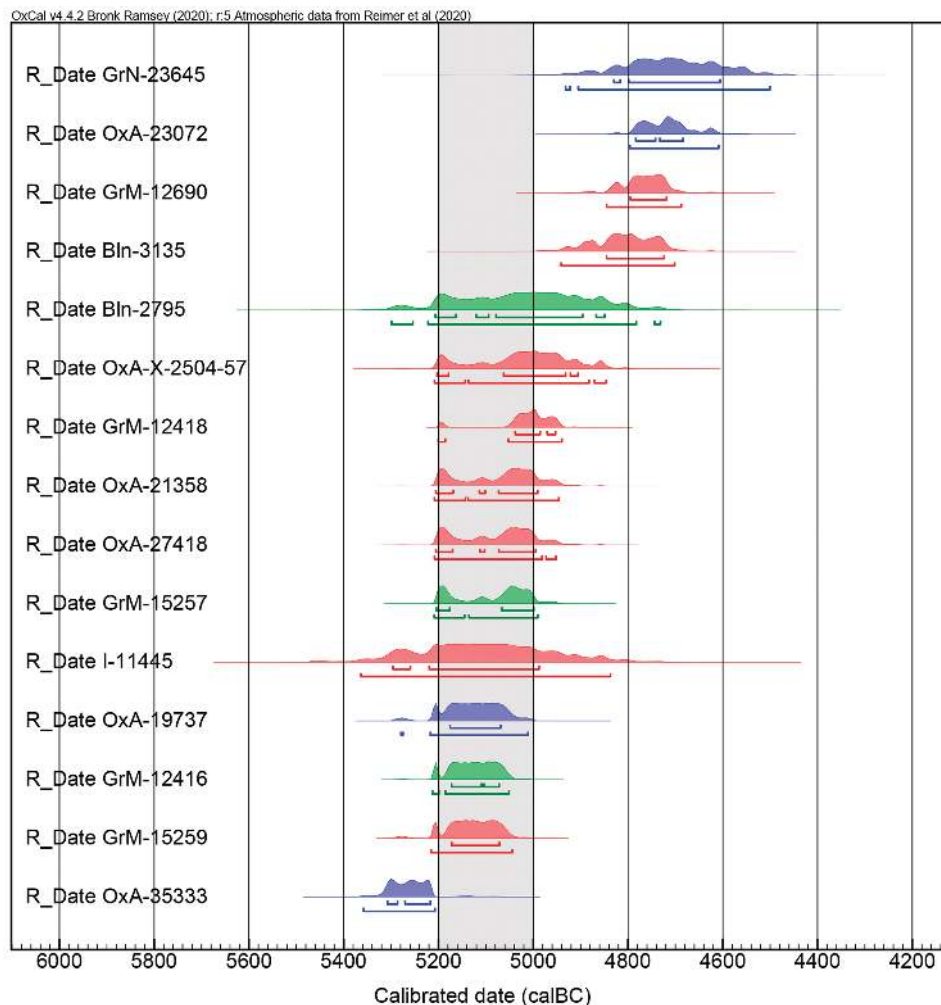
Main Level of the Plain, contrasts with the discovery of a few sites of this cultural aspect on the gravelly soils of the Middle and Upper Lombard Plain, as well as along the pre-Alpine spring zone (see *Starnini et al. 2004:58*). Moreover, we know little about the suggested “*short period occupations*”, and the extensive excavations carried out at Campo Ceresole cannot help us answer the question given the problematic interpretation of the distribution of the pit structures, although in no case do these features intersect. Groups of features and alignments are undoubtedly present, even though our knowledge remains incomplete as the upper part of the deposit into which they were dug is almost everywhere completely eroded.

Agriculture was practised at all of the three Vhò culture sites considered in this paper, as is shown by both archaeobotanical and material culture proxies. The former are represented by a few charred cary-

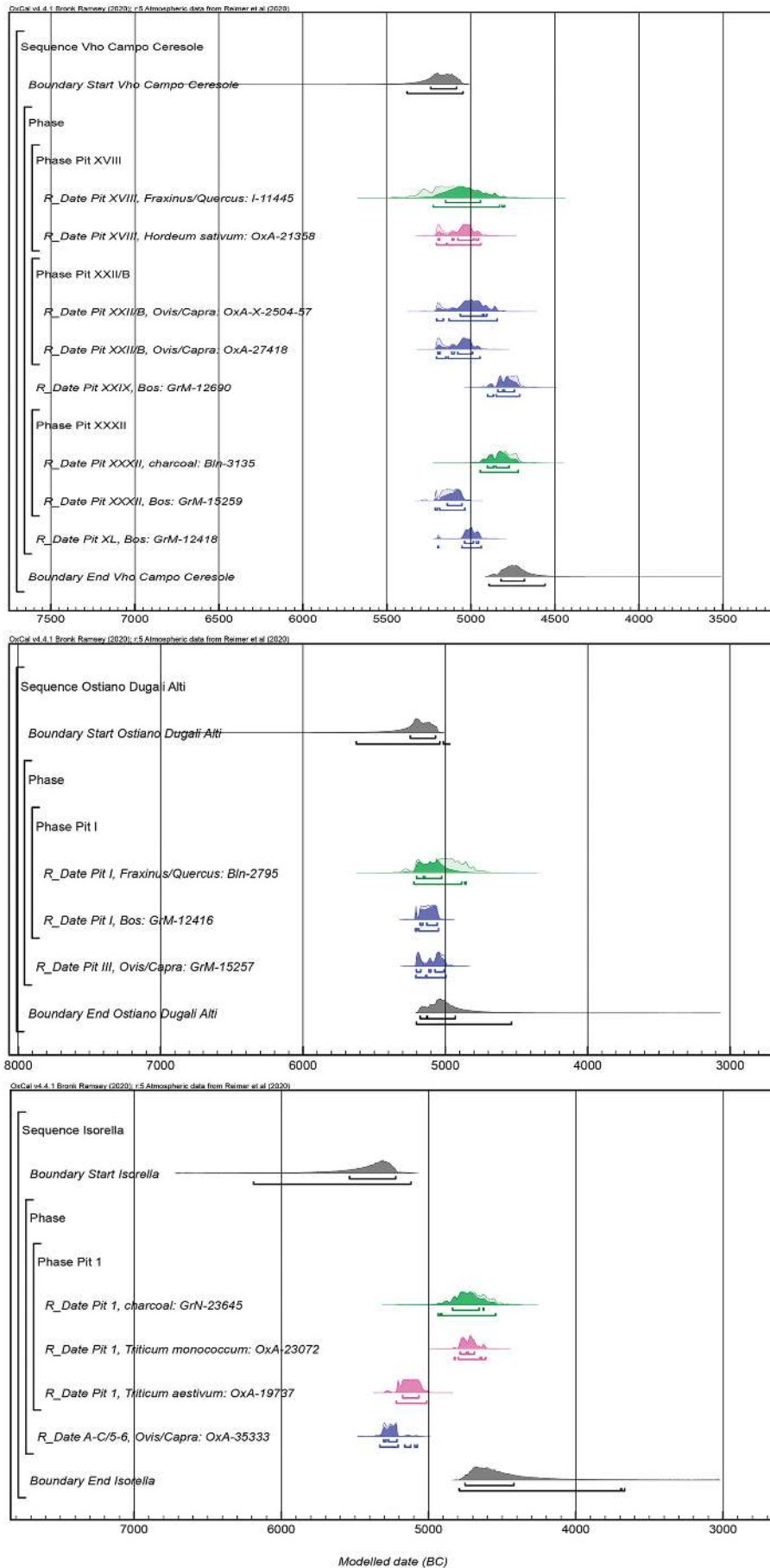
opses of *Hordeum vulgare*, *Triticum monococcum*, *T. dicoccum*, and *T. aestivum/durum/turgidum* (*Maspero, Castiglioni 2009. Tab. 1*), while the latter are epitomized in agricultural implements, among which are sickles and grinding stones (*Biagi 1995; Starnini 1995b; Starnini et al. 2018.Fig. 5*). Husbandry is also confirmed by the presence of domesticated animals, mainly cattle, sheep/goats, and most probably domesticated pigs, though hunting seems to have played an important role in the acquisition of meat at both Vhò and Ostiano. However, it should be repeated that the available osteological assemblages from the three sites are poorly preserved and quite fragmentary (*Barker 1983; Clark 1995; Bon et al. 2006*).

### Radiocarbon chronology

At present, only 15 radiocarbon dates are available from the sites discussed in this paper: eight come



**Fig. 10.** OxCal v4.4.2 plot of the calibrated dates from the sites of Vhò-Campo Ceresole (red), Ostiano-Dugali Alti (green) and Isorella-Cascina Bocche (blue). The 5200–5000 cal BC time-span conventionally assumed to represent the Vhò chronological period is marked by a grey band (plot by T. Fantuzzi, drawing by E. Starnini).

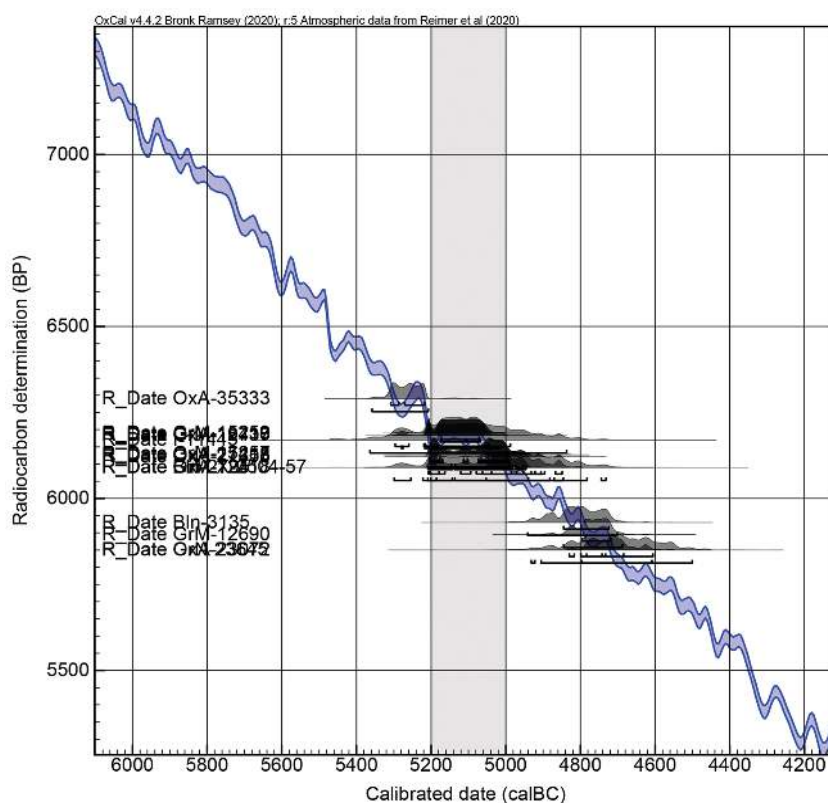


**Fig. 11. Bayesian models with posterior distributions of radiocarbon measurements for Vho Campo Ceresole (n=8) top, Ostiano-Dugali Alti (n=3) centre, and Isorella-Cascina Bocche (n=4) bottom produced using IntCal20 on OxCal 4.4 (Reimer et al. 2020). For the radiocarbon measurements, distributions in outline are the results of simple radiocarbon calibrations, solid distributions are the output from the chronological model. Animal bones (blue); charred seeds (magenta); charcoal (green) (plots by D. Borić).**

from Vhò, three from Ostiano, and four from Isorella (Tab. 1). Four dates are conventional, while the others are AMS (six) or AMS-MICADAS (five). Most dated samples are either caryopses of domesticated cereals (four) or identified bone elements and teeth of domesticated animals (four *Bos* sp., and four *Ovis/Capra*), which have intentionally been selected for dating to improve our knowledge about the spread of farming in the central Po Plain.

Hereafter are presented the outcomes of the calibration of radiocarbon measurement and Bayesian modelling (Figs. 10–12). Some authors have recently pointed out possible methodological problems of the latter approach when discussing absolute chronologies, including problems with the calibration curve, suggesting that all presently available models are insecure (Weninger et al. 2015; Strien 2017; 2019; Weninger 2019; 2020). These caveats are very important, due to the inaccuracies of the calibration curve within the so-called LBK plateau, the interval 5300–5100 cal BC (Weninger 2019). Exactly within this interval falls the corresponding 5200–5000 cal BC period discussed in this paper (Fig. 10). We note that important overall improvements of the calibration curve have been made in the recently released IntCal20 (Reimer et al. 2020). We should also acknowledge that there are differences of opinion on this topic among relevant authors, and an explicit response to the abovementioned criticism of the Bayesian modelling approach has also been voiced, restating the robustness of radiocarbon dating results in general and the validity of Bayesian statistics for archaeological inferences (Bánffy et al. 2018).

The calibrated results presented here have been calculated using the curve of Reimer et al. (2020) and the computer program OxCal (v. 4.4). The ranges cited in the text are quoted with the end points rounded outwards to five years as the error terms are greater than 15 radiocarbon years. The ranges in plain type have been calculated according to the ma-



**Fig. 12. OxCal v4.4.2 curve plot of the AMS dates for the sites included in this study. The ranges are 95.4% probability calibrated. The 5200–5000 cal BC time-span conventionally assumed to represent the Vhò chronological period is marked by a grey band (plot by T. Fantuzzi).**

ximum intercept method. The ranges quoted in italics are posterior density estimates derived from the Bayesian modelling. Two or more measurements coming from a single feature (at all three sites these were pits) were modelled together within a phase. The calibrated probability distributions shown in the figures have been calculated using the probability method (Bronk Ramsey 2009).

The Bayesian modelling indicates that the start of occupation at Vhò-Campo Ceresole (eight measurements, Fig. 11 top) began in 5380–5045 cal BC (95% probability; Start Vhò-Campo Ceresole), probably in 5240–5085 cal BC (68% probability) and it ended in 4895–4555 cal BC (95% probability; End Vhò-Campo Ceresole), probably in 4825–4680 cal BC (68% probability). The estimates suggest that the site was in use for 200–760 years (95% probability), probably between 305–555 years (68% probability). There is a good agreement index for all modelled measurements (Amodel=96.3).

The start of occupation at Ostiano-Dugali Alti (three measurements, Fig. 11 centre) began in 5630–5035 cal BC (95% probability; Start Ostiano-Dugali Alti), probably in 5250–5070 cal BC (68% probability)

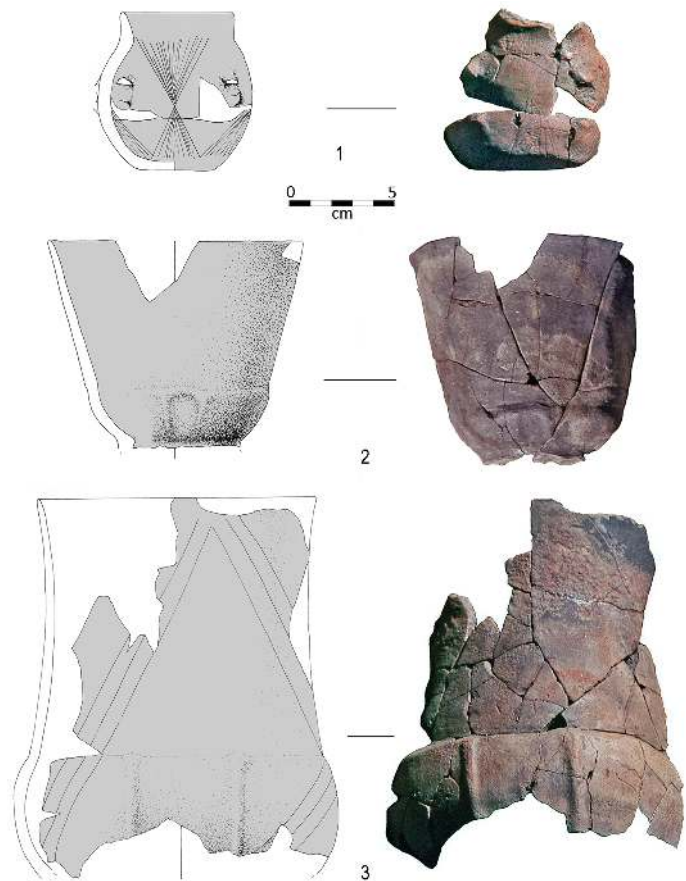
and it ended in 5205–4535 cal BC (95% probability; *End Ostiano-Dugali Alti*), probably in 5180–4930 cal BC (68% probability). The estimates suggest that the site was in use for 0–990 years (95% probability), probably between 0–285 years (68% probability). There is a good agreement index for all modelled measurements ( $A_{model}=97$ ).

The start of occupation at Isorella-Cascina Bocche (four measurements, Fig. 11 bottom) began in 6190–5120 cal BC (95% probability; *Start Isorella*), probably in 5540–5220 cal BC (68% probability) and it ended in 4795–3665 cal BC (95% probability; *End Isorella*), probably in 4755–4420 cal BC (68% probability). The estimates suggest that the site was in use for 425–2175 years (95% probability), probably between 540–1135 years (68% probability). There is a good agreement index for all modelled measurements ( $A_{model}=101.2$ ).

It seems that based on three measurements Ostiano can indeed be dated within the last two centuries of the 6<sup>th</sup> millennium cal BC but the occupation at Isorella certainly started before 5200 cal BC. Likewise, at both Vhò and Isorella the occupation certainly continued after 5000 cal BC – until at least 4790 cal BC at Isorella and 4900 cal BC at Vhò.

At present, the number of available dates is rather small, which limits our ability to provide more than rough outlines of the chronological framework. Further work is thus necessary and should involve a careful selection of samples on short-lived entities from a variety of features for radiocarbon dating. Only in this way can more clarity and precision be achieved in the absolute dating of all three sites.

Concerning Isorella, discussing the dates from an archaeological point of view and considering possible taphonomic processes in the light of the above-mentioned caveats, OxA-35333 could be considered too old, whereas OxA-23072 and GrN-23645 are too young for its occupation to be attributable to the Vhò culture. A possible explanation for these younger dates could be a reoccupation of the site during the Square-Mouthed Pottery culture, the archaeological traces of which (palaeosurfaces, structures, ceramics, and lithics) may have been completely eroded due to post-depositional taphonomic processes. OxA-35333 appears too early for the feature it is dating,



**Fig. 13.** Vhò-Campo Ceresole. Characteristic ceramic vessels from Pit XVIII (drawings and photographs by P. Biagi).

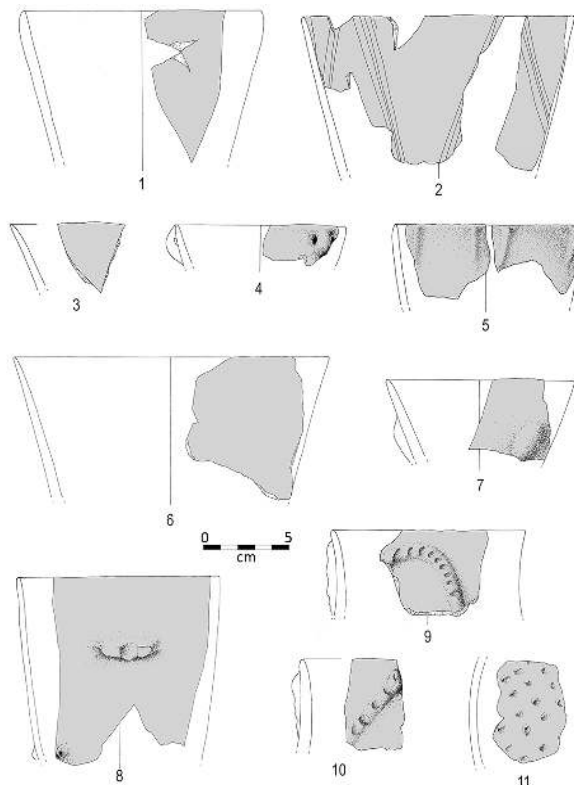
and only further measurements on carefully selected samples from this and other features from Isorella could resolve this conundrum.

The OxCal plot of individually calibrated and not modelled dates shown in Figure 12 highlights the calibration interval (grey stripe) between 5200 and 5000 cal BC, which relates to the expected timespan covered by the Vhò cultural aspect (*Starnini et al. 2018.Fig. 2*).

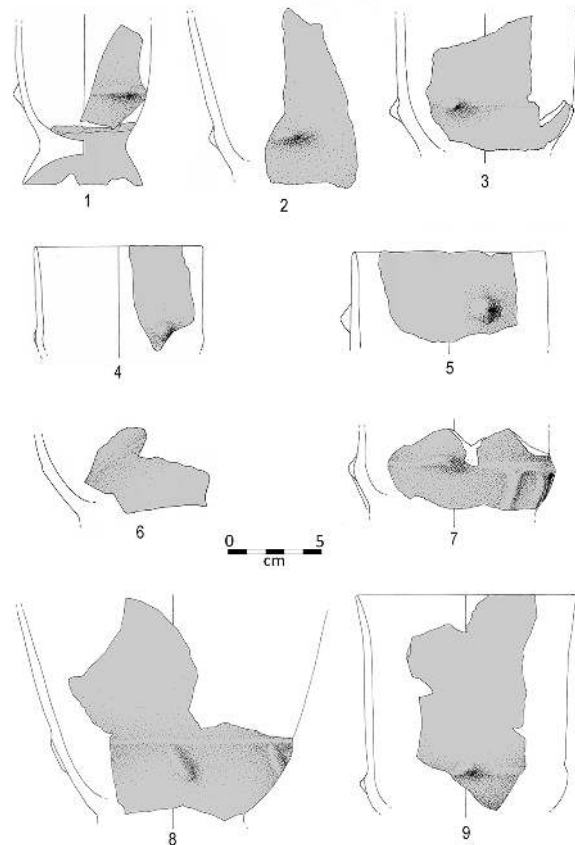
This chronological trend has already been observed in the case of the Vhò and Fiorano sites plotted together (see *Starnini et al. 2018.Tab. 1 and Fig. 2*) and seems robust. However, it is interesting to point out that the results from three single emmer caryopses from the Fiorano culture site of Lugo di Romagna yielded homogeneous dates, slightly earlier than ours, from 6262±38 BP (OxA-23071) to 6212±32 BP (OxA-19735), though the general complex of dates from the same settlement is comparable to that obtained from the three Vhò sites under discussion (see *Steffè 2019.Figs. 3 and 4*). This observation can also be extended to Lugo di Grezzana, a Fiorano culture site in the Veneto pre-Alps (*Pedrotti et al. 2015*).

Also, in this case, the number of measurements that antedate those from Vhò by a few decades is remarkable.

The general impression is that the Vhò culture sites in Lombardy, and also those in Piedmont and western Emilia in general, are slightly more recent than those of the Fiorano culture that flourished in Emilia and Romagna (see *Starnini et al. 2018.Tab. 1*). If this pattern is confirmed, it can help us follow the spread of Neolithization from the south-eastern edge to the western regions of the Po Plain. Moreover, thanks to the available subsistence economy data, we can assume that farming was fully developed in this region by the end of the seventh millennium BP. This is shown by the presence of at least seven species of domesticated cereals (*Rottoli 2019*), as well as domesticated animals, among which cattle played an important role. The data presented above contrast with the widely accepted assumption that the “full Neolithic only arrived in the fifth millennium” cal BC (*Pearce 2013.209–217*). This may be because until the end of the 1980s our knowledge regarding Neolithic agriculture and husbandry, in general, was very scarce (see *Evet, Renfrew 1971; Jarman et al. 1982.Tab. 23; Barker 1985.117*).



**Fig. 15.** Vhò-Campo Ceresole. Characteristic ceramic vessels from Pit XVIII (1–10) and Pit XXXII (11) (drawings by B. Bagolini, P. Biagi, and E. Starnini).



**Fig. 14.** Vhò-Campo Ceresole. Characteristic fine ware pedestalled vessels from Pit XVIII (1–6, 8 and 9) and XXXII (7) (drawings by B. Bagolini, P. Biagi, and E. Starnini).

Recently, a new set of six radiocarbon dates from short-life cereal samples (unidentified caryopses) were published from Pit 104 excavated at the site of Ripoli (*Pessina et al. 2016.173*), where Fiorano style potsherds have also been recovered. They fall between  $6242 \pm 45$  BP (LTL-12738A) and  $6145 \pm 45$  BP (LTL-12734A). These dates are consistent with the OxA- dates obtained from three charred emmer caryopses from the Fiorano culture habitation structure and one related pit excavated at Lugo di Romagna (*Steffè 2019.Fig. 5*). As reported above, they slightly precede most of the results so far obtained from the Vhò culture sites in south Lombardy, though potsherds of characteristic Fiorano style ceramics have been recovered from the radiocarbon-dated Pits XVIII and XXXII at Vhò-Campo Ceresole (Fig. 20) and also from Pit 1 at Isorella-Cascina Bocche (Fig. 21).

### Material culture

The opinion expressed by Malone (2003.274) according to which “generally speaking, Italian scholars have mostly focussed their research on typological aspects of prehistoric pottery production, thus ne-

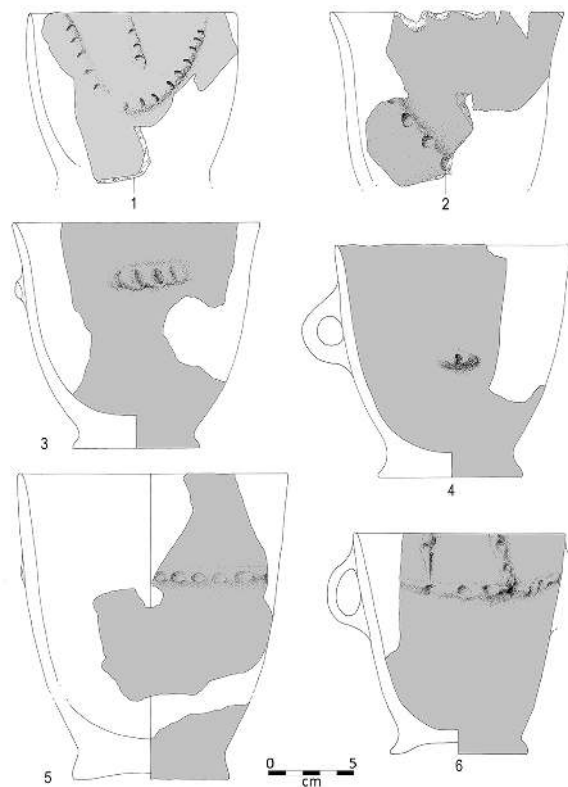
Site name	Coordinates	Altitude asl	Structure	Dated material	Lab. n.	<sup>14</sup> C BP	δ <sup>13</sup> C ‰	δ <sup>15</sup> N ‰	C:N	Calibr. BC (95% conf.)	Posterior density estim. (95% prob. cal BC)	References
Isorella Cascina Bocche	45°17'44.0"N 10°19'54.6"E	+53m	Pit I	<i>Ovis/Capra</i> humerus	OxA- 33333	6290 ±34	-21.7	4.8	3:3	5360–5205	5335–5205 (90.3%) or 5165–5120 (3.7%) or 5095–5075 (1.4%)	This paper
Isorella Cascina Bocche	45°17'44.0"N 10°19'54.6"E	+53m	Pit I	charred caryopsis, <i>Triticum aestivum</i>	OxA- 19737	6183 ±33	-23.378	–	–	5280–5010	5220–5010	Starnini et al. 2018. Tab.1
Isorella Cascina Bocche	45°17'44.0"N 10°19'54.6"E	+53m	Pit I	charred caryopsis, <i>Triticum monococcum</i>	OxA- 23072	5850 ±34	-25.25	–	–	4800–4605	4830–4820 (0.7%) or 4800–4650 (89.5%) or 4645–4610 (45.3%)	Starnini et al. 2018. Tab.1
Isorella Cascina Bocche	45°17'44.0"N 10°19'54.6"E	+53m	Pit I	charcoal	GrN- 23645*	5850 ±80	-24.61	–	–	4935–4500	4935–4915 (1.0%) or 4910–4545 (94%)	Starnini 1995a.232
Ostiano Dugali Alti	45°14'27"N 10°16'08"E	+46m	Pit I	<i>Fraxinus</i> sp. and <i>Quercus</i> sp.	Bln- 2795*	6090 ±100	–	–	–	5300–4780	5225–4855 (95.1%) or 4865–4855 (0.3%)	Biagi, Nisbet 1987.14
Ostiano Dugali Alti	45°14'27"N 10°16'08"E	+46m	Pit I	<i>Bos</i> sp. humerus	GrM- 12416	6184 ±18	-21.00 ±0.05	5.17 ±0.10	3:3	5215–5050	5215–5200 (3.48%) or 5190–5045 (91.6%)	This paper
Ostiano Dugali Alti	45°14'26"N 10°16'07"E	+46m	Pit III	<i>Ovis/Capra</i> femur	GrM- 15257	6130 ±25	-22.55 ±0.16	5.67 ±0.10	3:3	5210–4990	5210–4995	This paper
Vhó Campo Ceresole	45°06'54"N 10°24'35"E	+30m	Pit XVIII	<i>Fraxinus</i> sp. and <i>Quercus</i> sp.	I-11445*	6170 ±110	–	–	–	5365–4835	5225–4830 (94.7%) or 4820–4800 (0.7%)	Biagi 1979.35
Vhó Campo Ceresole	45°06'54"N 10°24'35"E	+30m	Pit XVIII	charred caryopsis <i>Hordeum sativum</i>	OxA- 21358	6122 ±38	-26.32	–	–	5210–4945	5210–5145 (11.6%) or 5140–4940 (83.8%)	This paper
Vhó Campo Ceresole	45°06'53"N 10°24'36"E	+30m	Pit XXII/B	<i>Ovis/Capra</i> tooth	OxA-X- 2504.57	6090 ±55	-23.0	8.9	3:4	5210–4845	5205–5160 (45.2%) or 5135–4840 (90.3%)	This paper
Vhó Campo Ceresole	45°06'53"N 10°24'36"E	+30m	Pit XXII/B	<i>Ovis/Capra</i> metatarsus	OxA- 27418	6127 ±35	-22.4	6.6	3:2	5210–4950	5210–5145 (12.1%) or 5140–4945 (83.3%)	This paper
Vhó Campo Ceresole	45°06'54"N 10°24'39"E	+30m	Pit XIX	<i>Bos</i> sp. molar	GrM- 12690	5895 ±35	-21.87 ±0.15	6.74 ±0.10	3:1	4800–4685	4905–4865 (8.8%) or 4850–4710 (86.6%)	This paper
Vhó Campo Ceresole	45°06'54"N 10°24'38"E	+30m	Pit XXXII	charcoal	Bln- 3135*	5930 ±50	–	–	–	4945–4700	4945–4715	Biagi, Nisbet 1987.14
Vhó Campo Ceresole	45°06'54"N 10°24'38"E	+30m	Pit XXXII	<i>Bos</i> sp. molar	GrM- 15259	6190 ±25	-22.17 ±0.16	7.82 ±0.10	3:2	5220–5040	5215–5200 (42.3%) or 5190–5035 (93.2%)	This paper
Vhó Campo Ceresole	45°06'54"N 10°24'37"E	+30m	Pit XL	<i>Bos</i> sp. molar	GrM- 12418	6090 ±18	-21.02 ±0.05	7.99 ±0.10	3:2	5205–4940	5200–5190 (0.6%) or 5055–4935 (94.8%)	This paper

**Tab. 1. Radiocarbon dates from the three Early Neolithic Vhó culture sites of Lombardy discussed in this paper (\* conventional radiocarbon dates pre-AMS). Calibrated dates BC (95%) are calculated using the IntCal20 calibration curve (Reimer et al. 2020) and the computer program OxCal (v. 4.4); posterior density estimates (95%) have been calculated using the Bayesian probability method (Bronk Ramsey 2009).**

glecting features like the technological aspects of pottery manufacture, raw material acquisition, pottery functions and the social implications of the production process”, is still valid, although during the last two decades new projects actually began to investigate these aspects (Capelli et al. 2017; Gabriele, Tozzi 2017; Gomart et al. 2017).

Since its definition in 1975 (Bagolini, Biagi 1975), the Vhò cultural aspect has been distinguished from the Fiorano culture mainly on the characteristics of some vessel forms and decorations that are peculiar to the former. The most typical ceramic shapes and decorations are pedestalled (Fig. 13.2; Fig. 14) and tulip-shaped vessels (Fig. 13.3), and thin, scratched linear decorations (Fig. 13.1 and 3; Fig. 15.2) on fine and medium wares. Moreover, the medium and coarse wares are represented by deep tronco-conical, handled vessels with a thick base (Fig. 16), handled cups (Figs. 17 and 18) globular necked flasks (Fig. 19), often decorated with vertical or oblique finger-impressed plastic cordons, more rarely with paired grooved lines (Bagolini, Biagi 1979). However, some traits of the pottery production are shared between the two cultures: first of all, technological choices regarding the recipes for the preparation of the paste, among which is the use of chamotte as temper, the production of at least three ware types (fine, medium, coarse), the use of different, albeit local, clay sources (Mannoni 1995; Pallecchi 2019), the occurrence of a few figulina ware vessels (Bagolini, Biagi 1975.Fig. 36), and the presence of carinated handled cups with characteristic ‘Fiorano’ decorative patterns (Fig. 20; Fig. 21.1–7). In contrast, according to our knowledge the production of terracotta statuettes with mushroom heads, in one case double-headed, (Fig. 22) seems to have been restricted to the Vhò cultural aspect (Bagolini, Biagi 1977a; see also Biagi 1994; 1996a).

The lithic assemblages of the Vhò and Fiorano cultural aspects share many identical features. The knapped stone tool-kit of both cultural aspects is made from flint varieties of the pre-Alpine Lessini Hills sources (Barfield 1994.Fig. 7; 2004) and the eastern moraines of the Lake Garda amphitheatre, that were distributed throughout the entire Po Plain (Bagolini, Biagi 1987.Fig. 8). The existence of a network of pre-Alpine flint distribution, involving production areas and consumer sites, and including the circulation of finished products and/or skilled knappers, has been proposed (Pessina 2000; 2006; Santaniello et al. 2020). At Ostiano-Dugali Alti, all phases of lithic reduction were documented locally, in-



**Fig. 16. Vhò-Campo Ceresole. Characteristic tronco-conical vessels from Pit XVIII (1–4) and Pit XXXII (5 and 6) (drawings by B. Bagolini, P. Biagi, and E. Starnini).**

cluding decortication phases (Biagi et al. 1995), suggesting that unworked nodules of pre-Alpine flint were brought to the site. Nevertheless, this does not stand in opposition with the introduction of prepared pre-forms, as both strategies may have coexisted in the same site. In the current state of research, is not possible to assess whether the circulation of raw materials was associated with itinerant specialist craftsmen or whether each site controlled flint knapping activities locally.

New data are also emerging on heat-treatment techniques. Recently, heat-treatment of Scaglia Rossa has been attested at the site of La Vela di Trento in the Adige Valley (Santaniello et al. 2016). Based on preliminary data, heat treatment was most likely also used at Ostiano-Dugali Alti and Isorella-Cascina Bocche, as indicated by the heat-induced lustre on several core and flake removals. However, archaeometric analyses are needed to further test the implementation and extension of this practice at Vhò sites.

The knapped stone assemblages of Vhò and Fiorano sites are also characterized by a general uniformity from a technological and typological point of view. Based on technological studies, it has been argued



that blade blanks were produced by employing indirect percussion with an antler punch and by pressure, though the latter was used only during the latest phase of the debitage process (Del Santo 2019; Santaniello et al. 2020). The microburin technique was systematically employed for segmenting blades and bladelets during the production of rhomboid geometrics. Characteristic tools are burins on a side notch (so-called ‘Ripabianca burins’), long end scrapers with steep front, straight perforators, sickle inserts (Mazzuco et al. 2020), rhomboid geometrics, and bladelets with a semi-abrupt, sinuous retouch (Bagolini, Biagi 1987:431) (Fig. 23).

Both at Vhò-Campo Ceresole and Ostiano-Dugali Alti, burins on a side notch are generally made on thick cortical or semi-cortical blades produced during the first phases of lithic reduction, as was also observed at Lugo di Grezzana (Santaniello et al. 2020). Different typologies of burins are documented even though all of them show a very similar functional pattern. The functional edge is generally the edge created by the burin blow, a step edge suitable for scraping resistant materials such as bone and hard wood, as demonstrated by use-wear analysis (Fig. 24.a-b). The function of rhomboid tools is still debated. Some of these might have been used as cut-

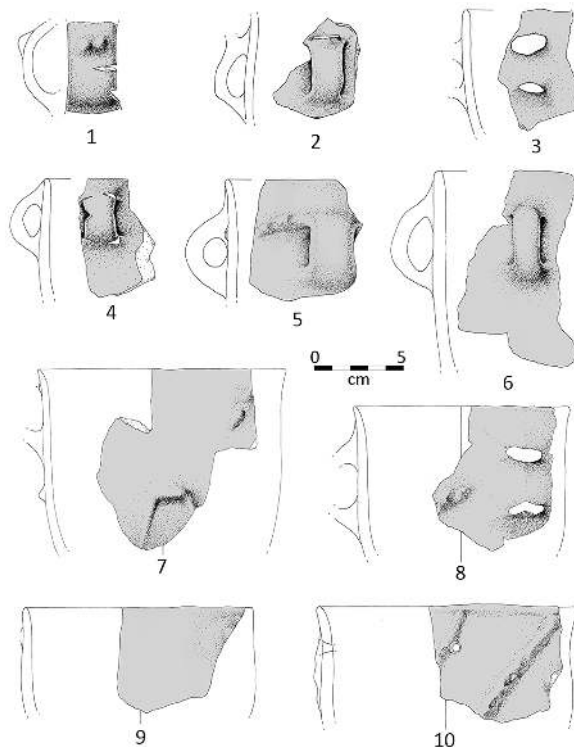


Fig. 17. Vhò-Campo Ceresole. Characteristic hand-held cups from Pit XVIII (1–4, 6–10) and Pit XXXII (5) (drawings by B. Bagolini, P. Biagi, and E. Starnini).

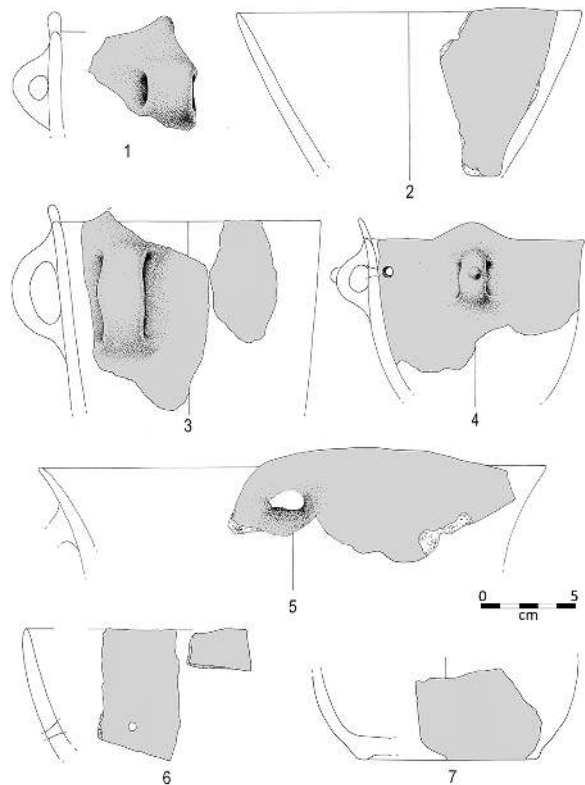
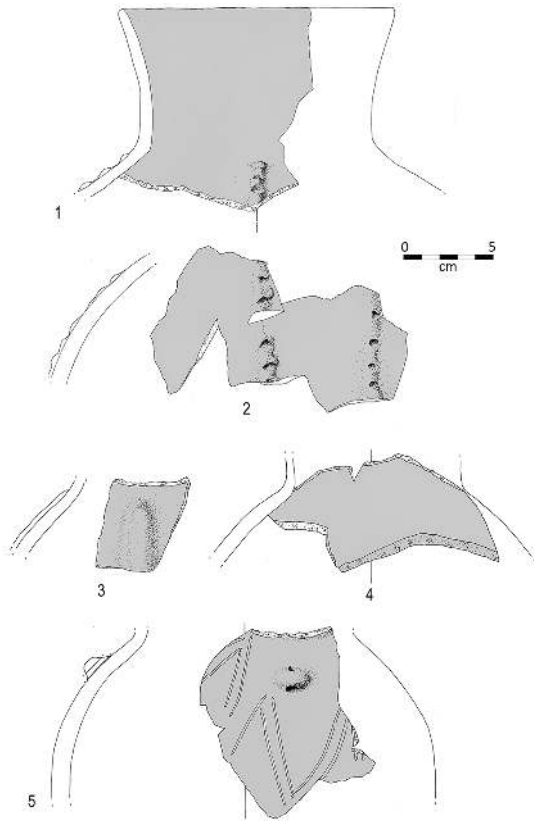


Fig. 18. Vhò-Campo Ceresole. Characteristic ceramic vessels from Pit XVIII (1–6) and Pit XXXII (7) (drawings by B. Bagolini, P. Biagi, and E. Starnini).

ting implements (Voytek 1995), whereas others show characteristic projectile impact fractures, as attested at Sammardenchia in the Friuli Plain (Ziggiotti 2006; 2010). Regarding sickle inserts, the presence of two different types of inserts is remarkable, with either oblique or parallel gloss. Diagonal glossed inserts are typical of the Impressed Ware and Catignano culture assemblages; they were obtained by breaking bladelets or small blades and hafting them obliquely in the sickle handle to form a serrated edge. This type is well attested at Ostiano-Dugali Alti and Vhò-Campo Ceresole (Fig. 24.c).

In contrast, Isorella-Cascina Bocche is characterized by sickle inserts on wider blades, hafted parallel to the sickle handle, so as to form a straight cutting edge (Fig. 24.d). This type of insert was found in other Vhò culture assemblages, such as Brignano Frascati, in a few Fiorano industries (Lugo di Grezzana, Fiorano Modenese), at the sites of the Friuli Plain (Fagnigola, Sammardenchia), and at Danilo culture sites in Middle Dalmatia (Pokrovnik, Danilo-Bitinj, Vrbica, Krivače) (Mazzuco et al. 2018; 2020). Therefore, it is conceivable that the latter type of harvesting tool represents an eastern influence, introduced in the Po Plain from this region of the Balkans not earlier than 6300±25 BP (PSU-5292/UCI-



**Fig. 19.** Vhò-Campo Ceresole. Characteristic globular flasks from Pit XVIII (1–5) (drawings by B. Bagolini, P. Biagi, and E. Starnini).

AMS-116204) and  $6290 \pm 20$  BP (PSU-5615/UCIAMS-127397) (5350–5200 cal BC) (Mazzucco et al. 2018). In conclusion, the knapped stone assemblages from Vhò culture sites show strong similarities with those of Fiorano and, to a lesser extent, with Friuli assemblages, from technological, typological, and functional points of view. This can be understood in the framework of highly-connected Neolithic communities, sharing raw materials, technical behaviours and innovations, as well as stylistic influences.

Regarding the polished stone tools, high-pressure metamorphic rocks from western Alpine sources (Starnini et al. 2004) were employed to produce cutting-edged tools (Fig. 23.51, 53). Other varieties of softer ‘greenstones’ are the raw materials used for the manufacture of arm rings (Fig. 23.52), another shared type of artefact, most probably epitomizing ways of identity construction and/or social differentiation (Micheli 2017; 2019.569–575; Ribero, Starnini 2019).

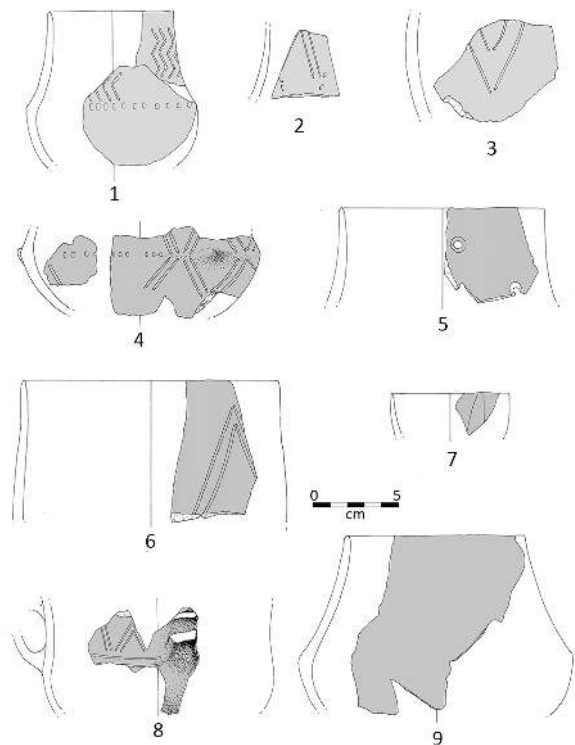
To sum up, comparing the whole material culture package of the two aforementioned cultural aspects, common traits are indeed more numerous than differences. Therefore, this evidence along with a robust

radiocarbon chronology would support the suggested interpretation according to which Vhò culture sites may represent a slightly later spread of the Early Neolithic Fiorano culture towards the western part of the Po Plain.

## Discussion

Owing to the very limited amount of data currently available for the Early Neolithic settlement structures of the Po Plain, new research is necessary to explore wider areas, following strategies similar to those carried out in central Europe in investigating the Linear Pottery Culture settlement organization (Pavlů et al. 2017; Meadows et al. 2019). They should employ systematic surveys, remote sensing, and geophysical prospections to visualize the spatial configuration of the Vhò settlements.

In this respect, the variable geomorphological characteristics of the Po Plain landscapes are to be considered. North of the Po River, archaeological deposits of Early Neolithic sites are exposed to surface erosion caused by terracing and deep ploughing, while south of the river many Neolithic sites are buried by metres of colluvial sediments (Barker et

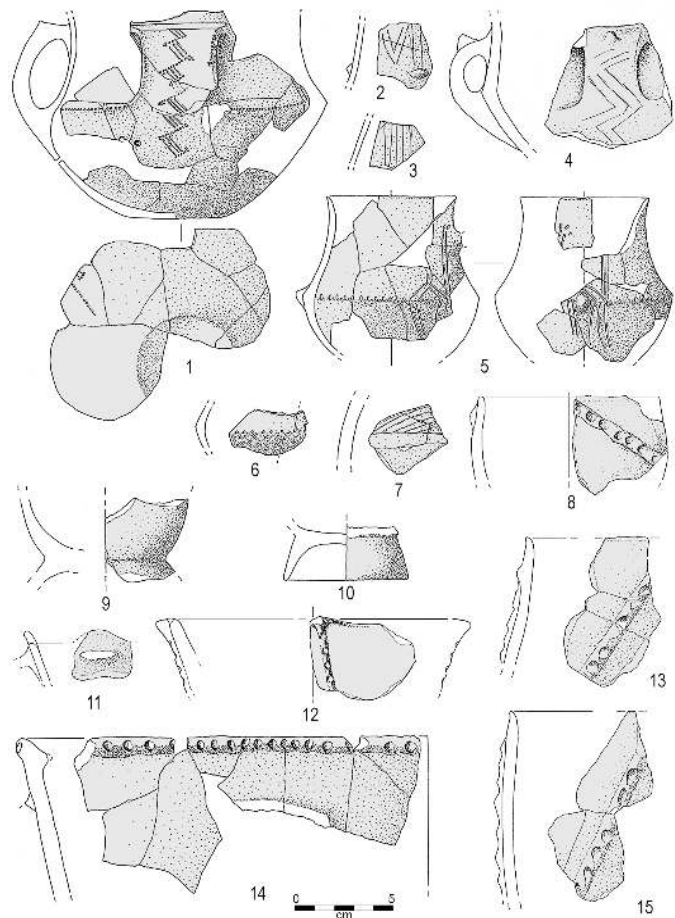


**Fig. 20.** Vhò-Campo Ceresole. Fiorano (2 and 4) and Fiorano-type vessels (1, 3, 6, 8 and 9) and other sherds (5 and 7) from Pit XVIII (2–8) and Pit XXXII (1 and 9) (drawings by B. Bagolini, P. Biagi, and E. Starnini).

al. 1987.110). Typical examples are the sites of Fiorano Modenese (*Malavolti 1953*) and Lugo di Romagna, which were only discovered thanks to the opening of deep clay quarries for brick manufacture (*Steffé, Degasperi 2019*).

The lack of obsidian artefacts at Vhò sites is a proxy for the absence of relationships with the Mediterranean maritime network, despite the modest circulation of marine shells used as personal ornaments. However, some of these shell objects were undoubtedly obtained from fossil specimens retrieved from Tertiary deposits (*Starnini et al. 2000; Micheli 2005*). In contrast, a tight and capillary connective network between Vhò and Fiorano communities was undoubtedly active down the Po River and its tributaries, along which Alpine metamorphic 'greenstones' and pre-Alpine, mainly Lessini flint circulated in two different directions: from west to east in the case of greenstones, and from north-east to south and west in the case of flint material (*Moser 2000*). Proxies of these riverine connections can be seen in close similarities observable in knapped stone assemblages and in pottery production regarding their style, techno-typological characteristics, and raw material choices.

Regarding polished stone tools, the occurrence of cutting-edged implements (axes and adzes) is always scarce. For example, the large shallow pit excavated at Isorella yielded only one fragment of an axe-butt (Fig. 23.51), while the more extensive excavations carried out at Vhò-Campo Ceresole and Ostiano-Dugali Alti returned only a small number of polished greenstone artefacts (*Starnini 1995b; Starnini et al. 2004*). In contrast, it is important to note that a much larger quantity of cutting-edged tools was produced, used, and discarded by the 4<sup>th</sup> millennium cal BC Middle Neolithic Square-Mouthed Pottery culture communities, who settled approximately the same territory previously inhabited by Early Neolithic Vhò and Fiorano culture farmers (*Malone 2003.172*). This quantitative difference reinforces the impression that during the Early Neolithic human impact on the woodland cover was limited, and clearance was applied most probably only to open spaces for building various infrastructural features in villages (*Cremschi 1983*). This interpretation is in accordance with the anthracological data at our disposal (see *Rottoli, Castiglioni 2009*).



**Fig. 21. Isorella-Cascina Bocche. Ceramic vessels from Pit 1, among which are Fiorano types (1, 4, 5 and 6) (drawing by E. Starnini).**

Funerary practices are elusive, and so far Vhò culture sites have not yielded a single burial or graveyard. In contrast, we have records of the possible existence of two crouched burials from the Fiorano culture sites of Calerno (at present lost) and Sant'Ilario d'Enza (at Chierici Reggio Emilia Museum). They were excavated by Chierici in the 1800s (*Chierici 1879c*), though the second is still undated. More recently, remains of a foetus have been retrieved from a posthole of the habitation structure at Lugo di Romagna (*Mazzucchi, Fontana 2019*). Moreover, burnt fragments of a child's skeleton were retrieved from a pit just east of the same house, below its lowermost pavement, though it remains undated (*Degasperi, Steffé 2019.141*), making its chrono-cultural attribution uncertain. In any case, these finds are insufficient to provide a clear picture of the formal burial rituals of the period. In contrast, we have unique expressions of symbolic items from Vhò among which is a clay double-headed human figurine (Fig. 22.6). Fragments of very similar 'mushroom-headed' specimens, and their lower body parts, have been found beside the eponymous site of Vhò,

from other sites of the same culture as far as Piedmont in the west (Fig. 22.3). Another original aspect of the Vhò culture, albeit shared with that of Fiorano, and possibly connected with social status, is the production and use of polished stone disc-shaped arm-rings (Fig. 23.52) (Ribero, Starnini 2019).

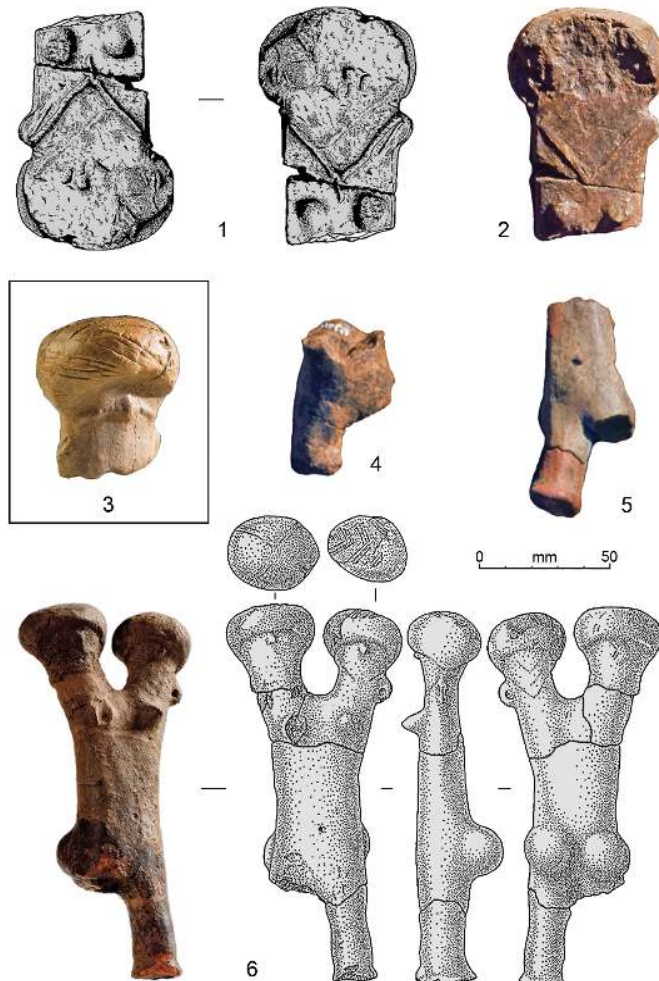
### Conclusion

To interpret the role played by the Po Plain in the Neolithization of Southern Europe, a few points merit discussion, among which is the origin of the Fiorano and Vhò cultural aspects and their importance in this unique microregion, located midway between the Mediterranean and Continental Europe.

In this respect, we have to emphasize the geographic uniqueness of the territory that is bounded by the

Alps in the west and north, and the northern fringes of the Apennines in the south (Barker 1985: 112). The Po River drains an area of about 75 000km<sup>2</sup> and flows in a west-east direction for 652km, receiving water and sediments from 141 tributaries and with a complex palaeogeographic history (Bruno et al. 2017). The Po Plain is open in the east towards three very different geographic entities. These are, from north to south, (1) the Friuli Plain, (2) the Adriatic Sea, and (3) the Italian Peninsula (see Fig. 1).

In particular, the upper Adriatic Sea coastline was affected by dramatic changes from the beginning of the Holocene, with transgressions up to 30km landward of the present shoreline position punctuated by episodes of rapid sea-level rise, separated by periods of sea-level stillstand (Amorosi et al. 2008; Antonioli et al. 2009).

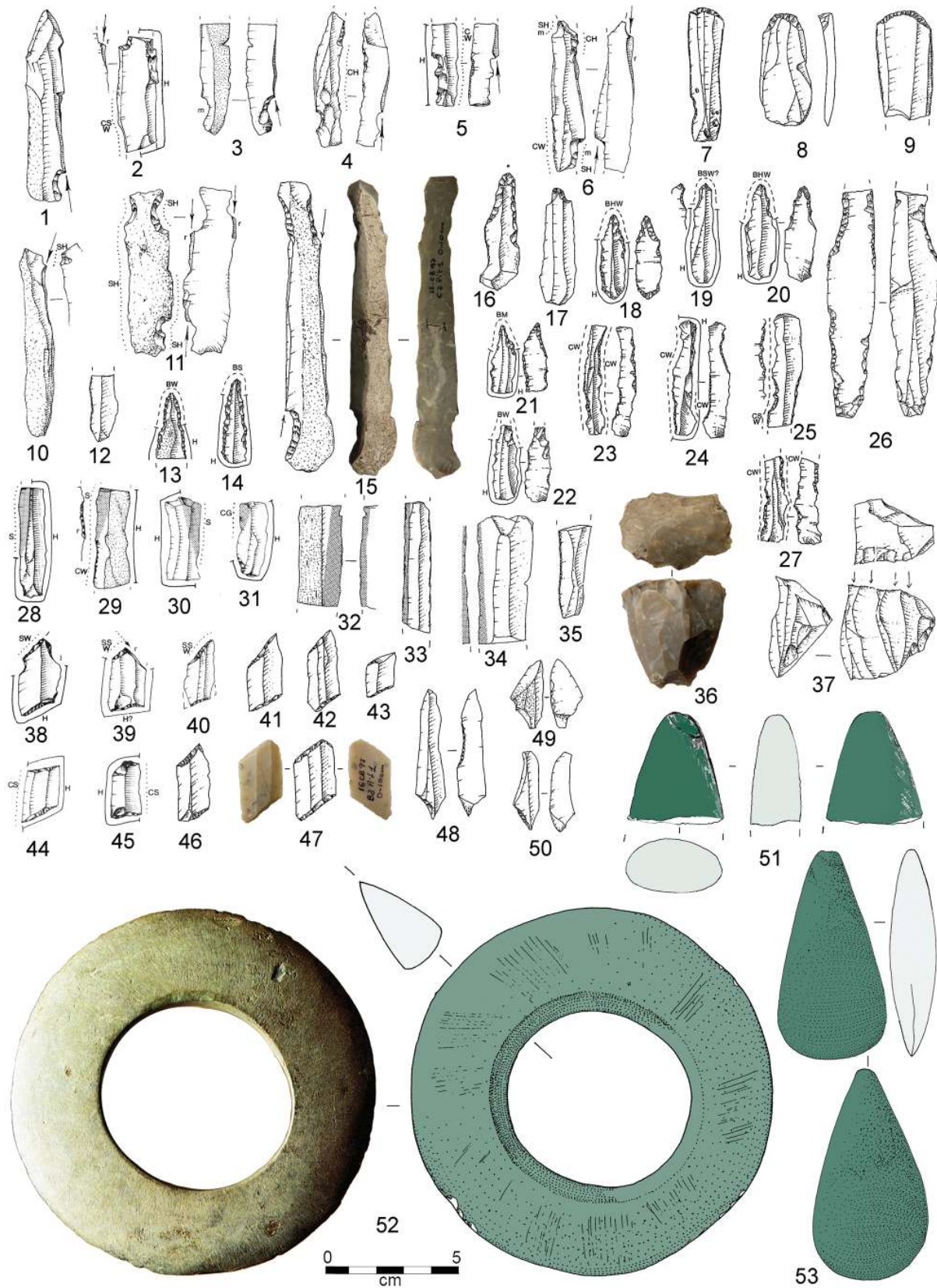


**Fig. 22. Terracotta female figurines with mushroom heads from Vhò-Campo Ceresole Pit VI (6), San Lorenzo Guazzo near Vhò di Piadena as it was first published by A. Mosso (1910.Fig. 149.1) and in its correct position (2) and Alba in Piedmont (3, not to scale) (photographs of the Vhò specimens by P. Biagi).**

We also have to consider that the northernmost edge of both the Adriatic and Tyrrhenian Seas delimits the spread of the Fiorano and Vhò aspects. Moreover, we have to point out that the spread of Neolithization along the coasts of the Adriatic and Tyrrhenian Seas took place in very different ways (Biagi, Starnini 2016; Guilaine 2018).

In both cases our knowledge is limited by the lack of any programmatic research strategies and is conditioned by complex environmental factors. The radiocarbon chronology of the Neolithization process has improved slightly during the last 20 years, with the exception of a few specific areas (Pearce 2013; Binder et al. 2017).

Regarding the alleged components that may have contributed to the origin of the Po Plain Neolithic, at present we know that (1) the northernmost spread of the Dalmatian Danilo culture reached the eastern part of the Friuli Plain but did not enter the Po Plain (Biagi 1996b); (2) the LBK phenomenon did not move southwards across the Alps; in contrast, it stopped roughly around the Vienna basin (Stadler, Kotova 2010); and (3) the Tyrrhenian Impressed Ware culture was probably mainly a maritime coastal phenomenon, with limited and sporadic inland penetration along river valleys, of which we know far too little at least regarding the north-western Tyrrhenian coast and Liguria in particular (Biagi, Starnini 2016; Guilaine et al. 2016).



**Fig. 23.** Lithic tools from Ostiano-Dugali Alti (1-6, 10, 11, 13, 14, 18, 25, 27-31, 38-40, 44, 45) Vhò (52, 53) and Isorella-Cascina Bocche (7-9, 12, 15, 16, 17, 26, 32-37, 41-43, 46-51). Burins on a side notch (1-6, 10, 11, 15), long end scrapers (7-9), straight perforators (13, 14, 16-22), blades with a sinuous edge (23-27), sickles (28-34), retouched bladelets (12, 35), cores (36, 37), rhomboids (38-47), microburins (48-50), polished stone axes/adzes (51 and 53), and polished stone ring (52).

The available data suggest that the aforementioned three components played no role in the origin of the Po Plain Neolithic (see Biagi et al. 1993; Biagi 1996a, 53; 2005). Moreover, we know that the spread of the Impressed Ware Neolithic along the two Adriatic coasts took place with different modalities and speeds (Biagi, Spataro 2002). The distribution of the Adriatic Impressed Ware sites is not limited to the coastline, since settlements of this aspect are known well into the interior of both central Italy (Pessina 2002:118; Pearce 2013, 124–144; Radi, Petrinelli Pannocchia 2018) and Dalmatia (Forenbacher, Miracle 2005; Pearce 2013, 94–106). Moreover, the same cultural aspect did not spread north of the line delimited by the Po River delta to the west, and the southern coast of the Istrian Peninsula to the east. Why? For the moment, we have no explanation, nor any evidence to suggest one, except for a possible role played by subsidence and transgression and alluvial sedimentation affecting the visibility of a large portion of the early-middle Holocene land surface, now buried by metres of sediments (Bruno et al. 2017).

The Po Plain is located in the centre of this complex picture and remains poorly researched. It is crossed by the Po River from west to east and its tributaries flow from north to south and in the opposite direction. Its geomorphology is inhomogeneous and varies according to latitude, longitude and process formations. Moreover, the plain landscape has been greatly affected by human impact since prehistory, including medieval and modern agricultural practices (Cremaschi 1987; Sereni 1989; Starnini et al. 2018:302).

These observations are necessary to interpret the complexity of the phenomenon and the reasons why the three aforementioned cultural entities (Danilo, LBK, and Tyrrhenian Impressed Ware) did not play any role in the Neolithization of the study region. In



**Fig. 24.** Selection of use-wear analyses from the Vhò sites: a-b burins on a side notch from Vhò-Campo Ceresole. Note the presence of the typical bevel-edge polish produced from working bone/antler. c complete sickle insert showing a diagonal gloss from Ostiano-Dugali Alti. Note the diagonal distribution of the gloss (c1), covering the distal fracture (c2). d fragmentary sickle insert showing a parallel gloss from Isorella-Cascina Bocche. Note the presence of the typical cereal polish. The insert has successively been reused from scraping activities (d2) (photographs by N. Mazzucco).

contrast, the available data suggest that its roots are to be sought in central-eastern Italy, most probably in the territory where the Ripoli and Catignano cultural aspects flourished (Tozzi, Zamagni 2003). This can be suggested based on the techno-typological

characteristics of the material culture assemblages, notwithstanding the scarcity of radiocarbon dates (Pearce 2013, Tab. 4.45).

Moreover, it is important to emphasize that the alleged relationships/contacts/influences with the LBK world (see Bagolini 1987:190–191), previously based almost exclusively on generic similarities of pottery ornamentations, are to be excluded in light of the evidence of the respective material cultures. On the other hand, the Early Neolithic of the Po Plain indeed belongs to the second continental wave of the European Neolithic expansion of which also the LBK was part (see Bogucki 2003; Mazurié de Keroulain 2003), otherwise called the ‘Second Temperate Neolithic’ (Gheorghiu 2008).

A recent review of the LBK settlement pattern in the Upper Danube region revealed considerable personal mobility coupled with a very high settlement dynamic that appear to have been integral components of the LBK cultural model (Pechtl 2020). The LBK chronology (c. 5500–4900 cal BC) overlaps that of the Po Valley Early Neolithic cultural aspects under discussion (Starnini et al. 2018, Fig. 2).

Therefore, we can suggest that similar cultural developmental stages were reached in Europe at a global scale at this time, and that the substantial uniformity of the Vhò and Fiorano material culture results from personal and group mobility, or the migra-

tion of households or groups of households throughout the Po Plain, as recently hypothesized to explain the LBK phenomenon in Central Europe (Hofmann 2020). If this hypothesis proves robust and Hofmann’s (2020) model is also applicable in the case of the study region, the Early Neolithic societies of the Po Valley may have practised female exogamy, which would explain the substantial uniformity of pottery production at the macroregional scale, both in terms of style and technology. However, in order to test the model of migration as a constant in the social behaviour in the north Italian Neolithic we need more archaeological and stable isotopic data, and the latter unfortunately remains non-existent in our case study.

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