Replacement of Neanderthals by Modern Humans Series

Yoshihiro Nishiaki
Takeru Akazawa *Editors*

The Middle and Upper Paleolithic Archeology of the Levant and Beyond

Springer

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The planned series of volumes will report the results of a major research project entitled "Replacement of Neanderthals by Modern Humans: Testing Evolutionary Models of Learning", offering new perspectives on the process of replacement and on interactions between Neanderthals and modern humans and hence on the origins of prehistoric modern cultures. The projected volumes will present the diverse achievements of research activities, originally designed to implement the project's strategy, in the fields of archaeology, paleoanthropology, cultural anthropology, population biology, earth sciences, developmental psychology, biomechanics, and neuroscience. Comprehensive research models will be used to integrate the discipline-specific research outcomes from those various perspectives. The series, aimed mainly at providing a set of multidisciplinary perspectives united under the overarching concept of learning strategies, will include monographs and edited collections of papers focusing on specific problems related to the goals of the project, employing a variety of approaches to the analysis of the newly acquired data sets.

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Preface

The aim of the Replacement of Neanderthals by Modern Humans project (RNMH2010–2014) was to make a contribution to one of the most intensely debated issues in paleoanthropology—the question of why replacement occurred between these two populations/species. In this respect, despite a long history of comparable research, the RNMH project is unique because it advocates the "learning hypothesis," the proposal that replacement occurred because of significant differences in adaptive technology due to innate variation in learning ability between Neanderthals and modern humans. Thus, a series of multi-disciplinary investigations were carried out for six years including the year of 2015 for synthesis under the auspices of the RNMH project in an attempt to verify this hypothesis.

Key outputs of the project have been published as individual journal articles as well as monographs in this Series, including conference proceedings. Results presented at the first international conference (RNMH2012) held in November 2012 in Tokyo, were published as Series 1 and Series 2; papers in these series discussed the dynamics of learning in Neanderthals and modern humans from cultural and cognitive perspectives, respectively. The second conference (RNMH2014) was held in December 2014, Hokkaido; in this case, outcomes were compiled according to specific disciplines and were combined with contributions from non-attending participants. In this second round of publication, Series 3, published in 2016, was devoted to developing an understanding of the evolution of learning ability via theoretical modeling, while Series 4, published in early 2017, comprised studies on the learning behavior of modern hunter-gatherers that were conducted by cultural anthropologists. This volume augments these earlier publications and contains a collection of papers that present archaeological evidence for the replacement of Neanderthals with modern humans with emphasis on the Levant and surrounding areas, the region where this transition is thought to have initially occurred in Eurasia.

Sessions at the RNMH2014 conference were held with the support of various individuals and institutions; we would like to extend our deep gratitude to Kenichi Aoki (Meiji University, Japan), Tomoya Aono (Date City Institute of Funkawan Culture, Japan), Ofer Bar-Yosef (Harvard University, USA), Tasuku Kimura (The University of Tokyo, Japan), Naomichi Ogihara (Keio University, Japan), Naoyuki Ohshima (Date City Institute of Funkawan Culture, Japan), Hiroki C. Tanabe (Nagoya University, Japan), Hideaki Terashima (Kobe Gakuin University, Japan), Motomitsu Uchibori (The Open University of Japan, Japan), and Minoru Yoneda (The University of Tokyo, Japan). In particular, we are very grateful to the Education Board of Date City, Hokkaido, and the Date Volunteer Society for Scientific Meetings, who prepared the venue for this international conference. We thank Christopher Bergman (AECOM, USA), Seiji Kadowaki (Nagoya University, Japan), Marcel Otte (University of Liège, Belgium), and Miho Suzuki (The University of Tokyo, Japan) for providing support and comments that were invaluable to the editing of this book.

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12 Neanderthals and Modern Humans in the Indus Valley? The Middle and Late (Upper) Palaeolithic Settlement of Sindh, a Forgotten Region of the Indian Subcontinent

Paolo Biagi and Elisabetta Starnini

Abstract

This paper discusses the Middle and Late (Upper) Palaeolithic sites of Sindh (Pakistan), a region of the Indian Subcontinent of fundamental importance for the study of the spread of both Neanderthals and Anatomically Modern Humans (AMH) in south Asia.

Most of the Middle Palaeolithic assemblages known to date were collected during the geological surveys carried out during the 1970s in Lower Sindh by Professor A.R. Khan, and the short visits paid to Upper Sindh by B. Allchin. More finds were discovered by the Italian Archaeological Mission during the last 30 years mainly at Ongar, near Hyderabad (Lower Sindh), and the Rohri Hills, near Rohri (Upper Sindh).

The presence of characteristic Levallois Mousterian assemblages at Ongar, and other sites west of the Indus River, opens new perspectives to the study of the dispersal of Neanderthal groups, whose south-easternmost spread has systematically been avoided by most authors.

Although the presence of typical Levallois Mousterian assemblages attributed to Neanderthals has been recorded from Iran, Afghanistan, Uzbekistan, and former Soviet Central Asia, the presence of similar complexes in the Indian Subcontinent is very scarce. The occurrence of typical Levallois cores, flakes, blades, points, Mousterian scrapers and one Mousterian point at Ongar is suggested to mark the south-easternmost limit of this cultural aspect. In contrast, the Middle Palaeolithic of the Indian Subcontinent is mainly characterized by unretouched flake assemblages and scrapers. Levallois points and flakes have already been described as a minor component of the so-called "Late Soan" complexes of the Punjab along the same western bank of the Indus in north Pakistan.

Even more complex is the definition of the earliest Late (Upper) Palaeolithic assemblages in the study region. In contrast with what previously suggested, Late (Upper) Palaeolithic sites are quite common in some areas of Lower Sindh, among which are the Mulri Hills (Karachi) and Jhimpir (Thatta). The assemblages from Karachi region sites are characterized by subconical cores with bladelet detachments, curved, backed points, bladelets, lunates of different shape and size, and, in a few cases, a high percentage of burins. The situation in Upper Sindh is absolutely different. The Rohri Hills yielded evidence of an impressive number of Late (Upper) Palaeolithic flint workshops, characterized by subconical

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bladelet and bladelet-like flakelet cores, and impressive amounts of debitage products. A similar situation has been recorded also from Ongar (Milestone 101), where modern limestone quarrying still underway has destroyed all the archaeological sites.

To conclude: Sindh is a very important region for the study of the Palaeolithic of the Indian Subcontinent and its related territories. It is unfortunate that our knowledge of this important territory is very scarce, and its archaeological heritage is under systematic destruction.

Keywords
Indus Valley • Thar Desert • Levallois Mousterian • Blade and Burin Assemblages • Neanderthal and Modern Human Dispersal

12.1 Introduction

The scope of this paper is to overview and discuss the Middle and Late (Upper) Palaeolithic assemblages of Sindh (Pakistan), and to frame them into the wider picture of the archaeology of the same periods in Eurasia.

The Indus Valley, Sindh in particular, is a territory of fundamental importance for the study of the relationships between west and east from prehistory to the present (Holdich 1910; Panhwar 1983; Baloch 2002; Boivin 2008). This is due to the unique geographic and morphologic characteristics of the country located, as it is, to separate the uplands of Iran, in the west, from the Great Indian (or Thar) Desert, in the east, midway between the high mountain ranges of the Hindu Kush and Himalayas, in the north, and the Arabian Sea, in the south (Lambrick 1986).

Sindh is the south-easternmost province of present-day Pakistan. Its western territory consists mainly of limestone formations (Blanford 1880; Vredenburg 1909; Bender and Raza 1995; Naseem et al. 1996), some of which are very rich in good-quality flint sources (Biagi 2008a; Biagi and Starnini 2008; Biagi and Nisbet 2010); the central part is represented by the alluvial plain of the Indus River, the course of which varied greatly from prehistory to the present (Flam 1984, 1999, 2006; Wilhelmy 1966, 1968), and its delta, whose fan is continuously widening toward the Arabian Sea (Tremenheere 1867; Prins et al. 2000; Giosan et al. 2006); the eastern part is covered by the Great Indian (or Thar) Desert sand dunes that are dotted with saltwater, perennial basins (Goudie et al. 1973; Bakliwal and Wadhawan 2003).

Given the above premises it is hard to believe that little attention has ever been paid to the Palaeolithic of the Indus Valley, Sindh in particular, apart from the well known contributions provided by B. Allchin and her collaborators in the late 1970s (Allchin 1976, 1979; Allchin et al. 1978). Palaeolithic assemblages have been rarely reported from Pakistan before the mid 1970s, when the first Late (Upper) Palaeolithic sites were discovered in Sindh (see for instance Krishnaswamy 1947; Gordon 1958; Khatri 1962; Coles and Higgs 1975; Fairservis 1975; and also Chakrabarti 1999).

Regarding the Middle Palaeolithic period, the problem of the south-easternmost spread of the Neanderthal sub-groups, from the Near East, has never been considered by most authors until the 2010s, with very few exceptions (see for instance Bar-Yosef 2000, p. 142; 2011, Fig. 11.1; Costa 2013; Finlayson and Carrión 2007, Fig. 1). The problem is still nowadays scarcely taken into consideration by most authors (see Bar-Yosef 2011). In contrast the importance of Sindh as a coastal route across which modern humans moved on their way to the southern regions of the Indian subcontinent has been recently reconsidered (Mellars 2006; Bulbeck 2007; Field et al. 2007; Dennell and Petraglia 2012; Bar-Yosef and Belfer-Cohen 2013; Mellars et al. 2013).

It is well known that east of the Levant *Homo neanderthalensis* fossil remains have been uncovered from several sites, whose distribution covers a wide territory between the Taurus and Zagros Mountains in the west (Solecki and Solecki 1993; Trinkaus and Biglari 2006), and former Soviet Central Asia and Siberia in the east (Okladnikov 1949; Movius 1953a, b; Abramova 1984; Vishnyatsky 1999: 112; Trinkaus et al. 2000; Derevianko 2004; Flas et al. 2010; Glantz 2010; Dobrovolskaya 2014; Mednikova 2014), with a wide gap between the two regions.

In contrast different types of Levallois Mousterian lithic complexes (Clark and Riel-Salvatore 2006) that characterize the Middle Palaeolithic Eurasian chipped stone assemblages (Van Peer 1995; Dibble and Bar-Yosef 1995), are known from the Iberian Peninsula (Giles Pacheco et al. 2000) to Central Asia and beyond (Ranov and Gupta 1979; Derevianko and Pétrine 1995; Derevianko et al. 1998; Derevianko and Markin 1999; Krakhmal 2005; Ranov et al. 2005, Krause et al. 2007; Bar-Yosef and Wang 2012). In a few of the above regions Neanderthals are thought to have survived until the beginning of the Upper Palaeolithic (Szymczak 2000, p. 125; Derevianko et al. 2004; Vishnyatsky and Nehoroshev 2004; Shunkov 2005; Rybin and Kolobova 2009).

Levallois chipped stone assemblages whose characteristics differ from those of Eurasia (Beyin 2006, 2011, p. 7) were manufactured also by Middle Palaeolithic anatomically modern humans in north and northeastern Africa and the Levant (Demidenko and Usik 1993; Bar-Yosef 2000, p. 140; Hublin 2000, p. 163).

The results obtained from a systematic programme of radiometric dating has showed how complex the available data are to interpret, and how further investigation is highly needed (Kadowaki 2013). Many authors suggest that the Initial Upper Palaeolithic (IUP) of the Levant developed from Middle Palaeolithic Levantine Mousterian complexes (Kuhn et al. 2009), which typologically differ from those of northeastern Africa (Beyin 2006, p. 24).

The material culture of *H. neanderthalensis* is characterized by different types of Middle Palaeolithic lithic complexes, often referred as Mousterian with variable percentages of Levallois artefacts, whose debitage technology (Boëda 1994, 1995) shows that different methods can produce identical or different types of artefacts (Meignen 1998).

The available evidence shows that the Middle Palaeolithic human dispersal was much more complex than previously suggested (Forster 2004; Petraglia 2007; Glantz 2010; Scerri et al. 2014; Bolus 2015; López et al. 2015). In most papers concerning the problem, with very few exceptions (Finlayson and Carrión 2007, Fig. 1), a question mark constantly recurs in the north-western part of the Indian Subcontinent distribution maps regarding the spread of *Homo* sp. (Bar-Yosef 2000, Fig. 18; 2011, Fig. 11.1; Henke 2006, Abb. 4; Henke and Hardt 2011, Fig. 3.8). This is due mainly to the virtual absence of human remains (Athreya 2007, 2010; Costa 2013; Rightmire 2015), and our limited knowledge of sites of this period in the entire Subcontinent (Chauhan and Patnaik 2012, Table 1).

One of the most important and unexplored issues regards the south-easternmost spread/distribution of both *H. neanderthalensis* and Levallois assemblages (Finlayson 2004; Bar-Yosef 2000, 2011). At present Levallois Mousterian industries attributed to the Neanderthals are known from the coast of Iranian Makran (Vita-Finzi and Copeland 1980), the Hormuz Strait islands (Dashtizadeh 2010), Iran (Coon 1951; Hole and Flannery 1968; Smith 1986; Roustari et al. 2004; Jaubert et al. 2009; Bazgir et al. 2014), Afghanistan (Dupree et al. 1970; Dupree 1972; Davis 1978), and former Soviet Central Asia (Ranov 1976, p. 102; Movius 1953a; Ranov and Gupta 1979; Ranov et al. 2005). Characteristic Levallois complexes (Baumler 1995, p. 19; Boëda 1995) are very rare in the Indian Subcontinent, with the exception of a few surface assemblages and isolated finds from the Indus Valley, among which are those from Lower Sindh (Biagi 2006; Biagi and Starnini 2014a, b), and perhaps the Indian Thar Desert (Blinkhorn 2014).

Given the above premises, and our little knowledge of the Late (Upper) Palaeolithic in the entire Indian Subcontinent, Pakistan included, it is not surprising that most western authors had paid little or no attention to the region, for instance discussing the problem of the Middle to Late (Upper) Palaeolithic transition in south Asia (Brantingham et al. 2004; Kuhn et al. 2004; Derevianko 2010, 2011a, b; Derevianko et al. 2014).

12.2 The Levallois Mousterian Assemblages of Lower Sindh

Typical Levallois Mousterian assemblages and isolated tools are known from a few sites in Lower Sindh, west of the Indus (Fig. 12.1). At present the most important is Ongar (Biagi 2005), also reported as Milestone 101 by B. Allchin (1976, p. 486), located some 27 km southwest of Hyderabad. During the 1970s surveys, B. Allchin recovered assemblages and workshops of different Palaeolithic periods on the top of the easternmost, horseshoe-shaped, limestone terrace, one of which she attributed to the Middle Palaeolithic (Allchin et al. 1978, Table 8.9b).

Professor A.R. Khan, of the Department of Geography, Karachi University, revisited the area in the late 1970s, when the sites were being destroyed by extensive limestone quarrying (Fig. 12.2). During his fieldwork he noticed "*the presence of theLevalloisian industryin the area beyond any doubt*" (Khan 1979b, p. 80). From Ongar this author rescued hundreds of Levallois artefacts, among which are typical turtle-shaped cores with flake detachments (Fig. 12.3), unretouched and retouched points, flakes, a few wide blades, and different types of side and transversal scrapers with facetted "*chapeau de gendarme*" butts, as well as one typical Mousterian straight point with covering retouch on its dorsal face (Fig. 12.4). It is important to point out that whenever these tools had been collected from a European site they would be referred to Neanderthal activities.

Ongar and the neighbouring limestone terraces of Daphro and Bekhain were systematically surveyed between 2005 and 2008 by one of the authors (PB) (Biagi 2005; Biagi and Franco 2008). During four fieldwork seasons, Levallois artefacts were collected from the upper part of a profile visible along the northern bank of a seasonal stream that flows eastwards down to the village of Ongar (Biagi and Nisbet 2011) (Fig. 12.2). A few more tools, among which are Levallois flake cores, were collected from the surface of one of the mesas.

Other typical, small Levallois Mousterian assemblages and isolated tools, were collected from a few other sites located immediately to the east of Karachi, among which

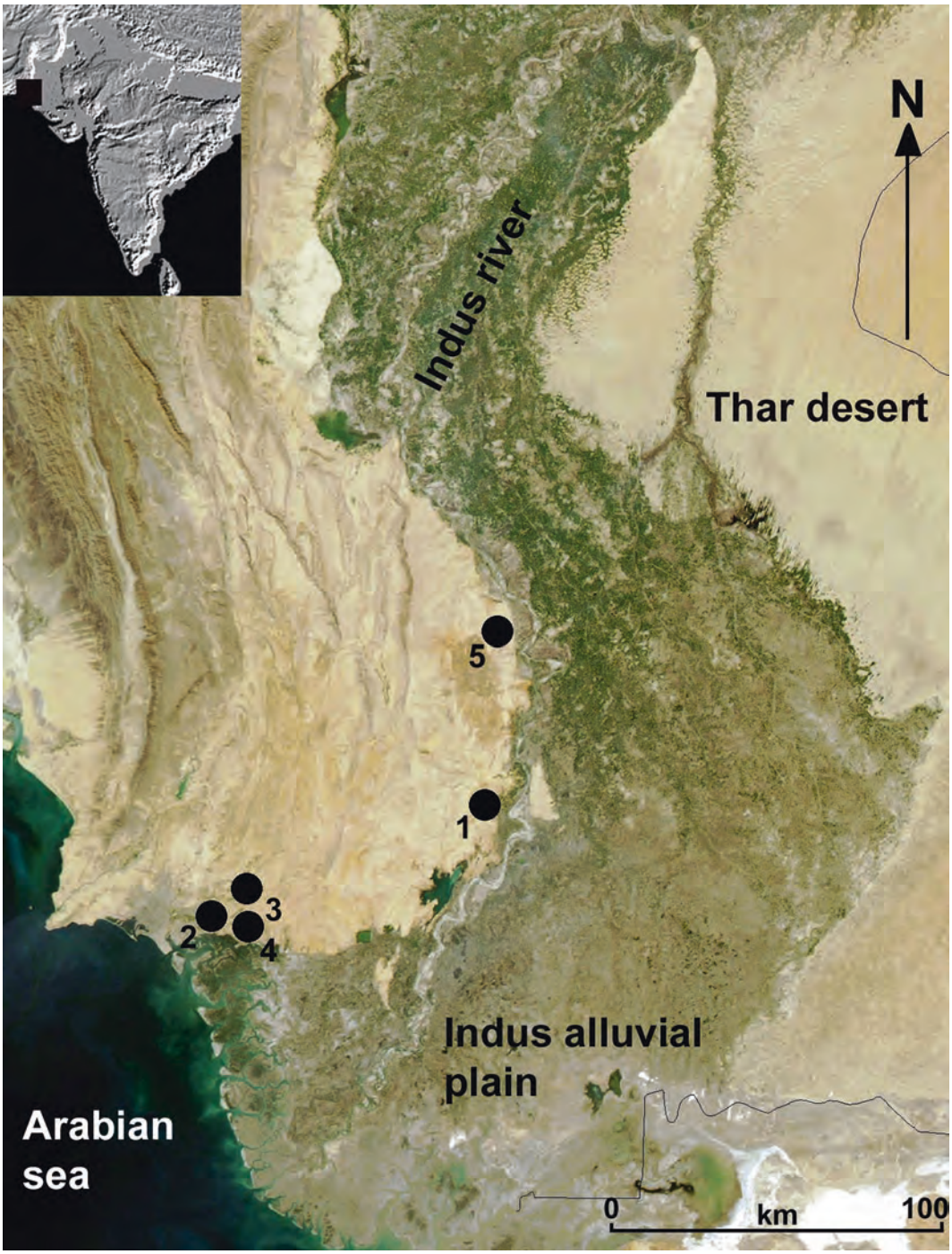

Fig. 12.1 Distribution map of the Levallois Mousterian assemblages and tools of Lower Sindh. *1*: Ongar, *2*: Mulri Hills, Karachi, *3*: Deh Konkar, *4*: Landhi, *5*: Arzi Got (From Biagi and Starnini 2014b: Fig. 1)

are the Mulri Hills, Landhi, Deh Konkar (Khan 1979a, p. 13; Blinkhorn et al. 2015) and the Laki Range (Biagi 2008b). One more characteristic Levallois Mousterian flake with a facetted butt was collected from the surface of a limestone terrace close to the Baloch village of Arzi, east of the national road, some 38 km north of Jamshoro (Biagi 2010, p. 2).

12.3 The Middle Palaeolithic Assemblages of Upper Sindh and the Thar Desert

Middle Palaeolithic chipped stone artefacts have been recovered also from the Rohri Hills in Upper Sindh (Allchin 1976), the central-western terraces of which were systematically surveyed between 1994 and 2002 as one of the activities

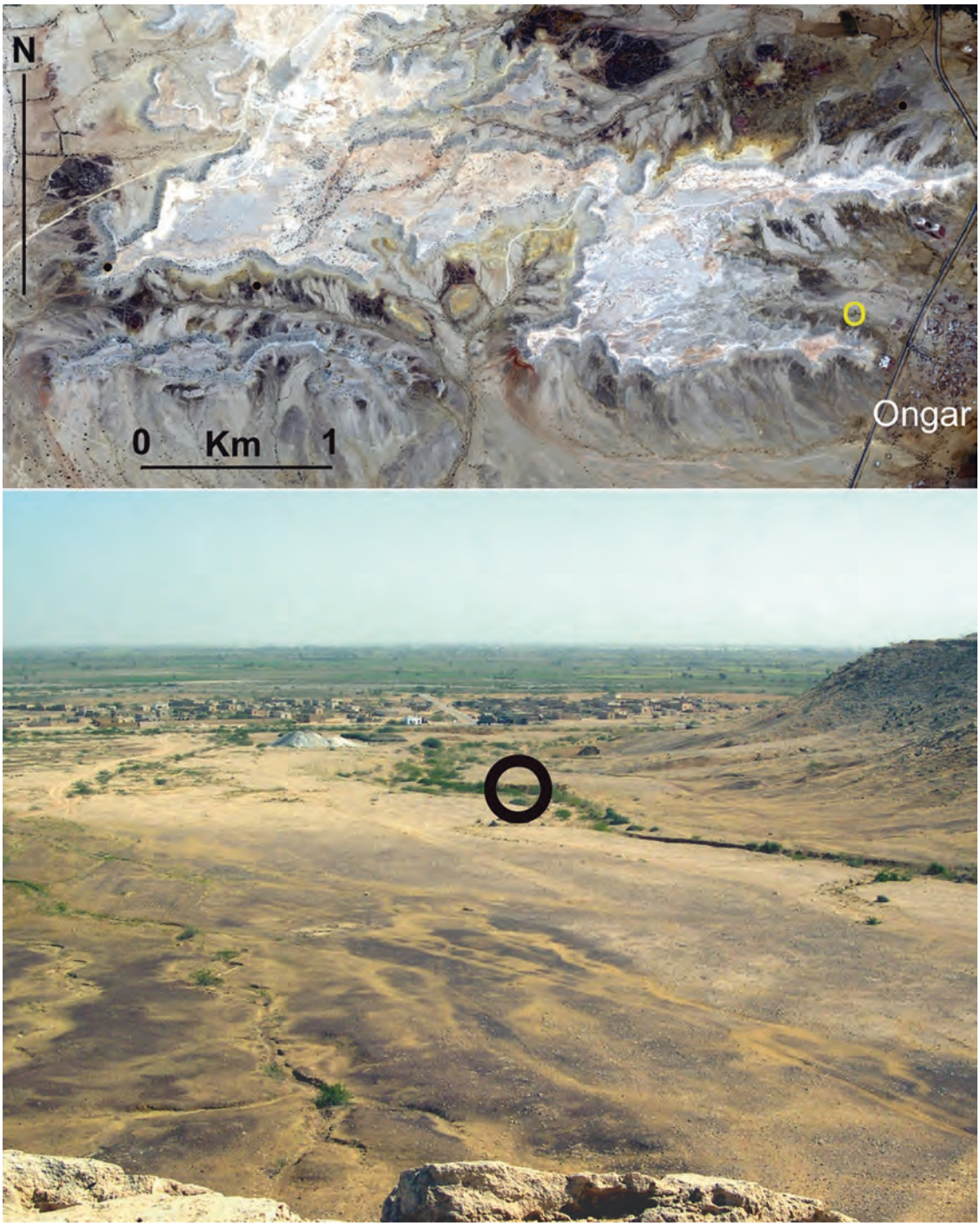

Fig. 12.2 Ongar: Location of the area that yielded Levallois artefact rediscovered in 2006 (*circle*)

of the Joint Rohri Hills Project carried out by Ca′ Foscari University of Venice (I) and Shah Abdul Latif University, Khairpur (PK) (Starnini and Biagi 2011).

The Rohri Hills are limestone formations, whose deposits are rich in excellent quality flint seams (Blanford 1880; De Terra and Paterson 1939, p. 331). The hills elongate in north-south direction east of the course of the Indus. Their landscape has been described as a steppe desert characterized by very low precipitation (Majumdar and Sharma 1964; Seth 1978, Fig. 14.2), with a June maximum temperature of some 46° Celsius (Ahmad 1951). Some of the Rohri Hills terraces are literally covered with archaeological sites. Among these are hundreds of flint knapping workshops of different periods, from Acheulian Palaeolithic hand-axe manufacturing areas to Mature Indus Civilization debitage heaps that consist of thousands of bladelets and bullet cores (Allchin 1976,

Fig. 12.3 Ongar: *turtle-shaped*, Levallois flakelet cores from A.R. Khan's collection (Photographs by P Biagi)

1979; Allchin et al. 1978; Biagi and Cremaschi 1988, 1991; Starnini and Biagi 2011).

A few years ago F. Negrino and M.M. Kazi (1996) proposed a chrono-typological sequence for the Rohri Hills Palaeolithic industries that they subdivided into six main "Series" on the basis of the techno-typological characteristics of the artefacts, their physical condition, degree of weathering, colour and thickness of surface patina. Their Middle Palaeolithic Series 5 includes implements that "*resemble Levallois flakes with the presence of dihedral and facetted platforms*" as well as two cores "*with centripetal removals, very similar to Levallois types*" (Fig. 12.5). A few isolated Levallois-like artefacts, with flat or dihedral platforms, were collected from the surface of Ziārāt pir Shābān, from which many Acheulian workshops were also recovered and partly excavated (Biagi et al. 1996).

Series 6 of their proposed sequence consists mainly of subconical blade and blade-like flake cores, blade-like flakes and blade by-products recovered *in situ* from hundreds of workshops that were attributed to the beginning of the Late (Upper) Palaeolithic (Negrino and Kazi 1996, p. 36; Biagi et al. 1998–2000).

The eastern and southern fringes of the hills are surrounded by the westernmost dunes of the Great Indian Desert (or Thar Desert) from which many Palaeolithic lithic assemblages have been discovered, among which are a few Levallois artefacts with "*preparation of the striking platform"* (Allchin et al. 1978, p. 311). In contrast, typical Levallois cores and tools have never been recovered from any of the Thar Desert sites of Upper Sindh surveyed by the present authors, although they are reported from one of the Rohri Hills sites by Allchin et al. (1978, Table 8.3). These authors do not mention their presence at Nawab Panjabi (Unnar) and Chancha Baluch (Fig. 12.6), in the southwestern part of the Rohri Hills, as well as at Hokra, Gurha and Shambar Lake, and other sites of the Great Indian Desert of Rajastan. Palaeolithic tools, among which are also a few Levallois-like flakes with oblique, flat platform, were collected from "Unnar Hill", some 300 m east of Unnar in the Rohri Hills (Biagi and Cremaschi 1988, p. 429).

Moving north, Levallois cores and flakes are known from Sanghao Cave in the NWF (Allchin 1973; Salim 1986). They are reported also from the "Late Soan B" assemblages of Punjab, in north Pakistan (Movius 1944, p. 28; 1948; Krishnaswamy 1947; De Terra and Paterson 1939, Plate XLII).

12.4 The Late (Upper) Palaeolithic Assemblages

The discovery of Late (Upper) Palaeolithic sites in Sindh derives from the research conducted in the 1970s by B. Allchin and A.R. Khan in two distinct regions. In those years, while B. Allchin noticed that the assemblages of some Rohri Hills flint workshops (Allchin 1976, p. 479) were "*based upon the manufacture of parallel-sided blades from unidirectionalcores*" (Allchin et al. 1978, p. 320), Professor A.R. Khan emphasized the recurrence of a well-defined type of point, "*aknifelike tool, with strongly curved and steeply blunted back and very sharp and more or less straightcutting edge*" that he considered the most characteristic implement of the Late (Upper) Palaeolithic assemblages of the Karachi region (Khan 1979a, p. 13).

The above discoveries were made roughly a decade after the excavation of Sanghao Cave in north-western Pakistan (Dani 1964; Allchin 1973; Ranere 1982); while the excavations at Riwat 55, the suggested oldest Late (Upper) Palaeolithic site of Pakistan, TL-dated around 45,000 BP

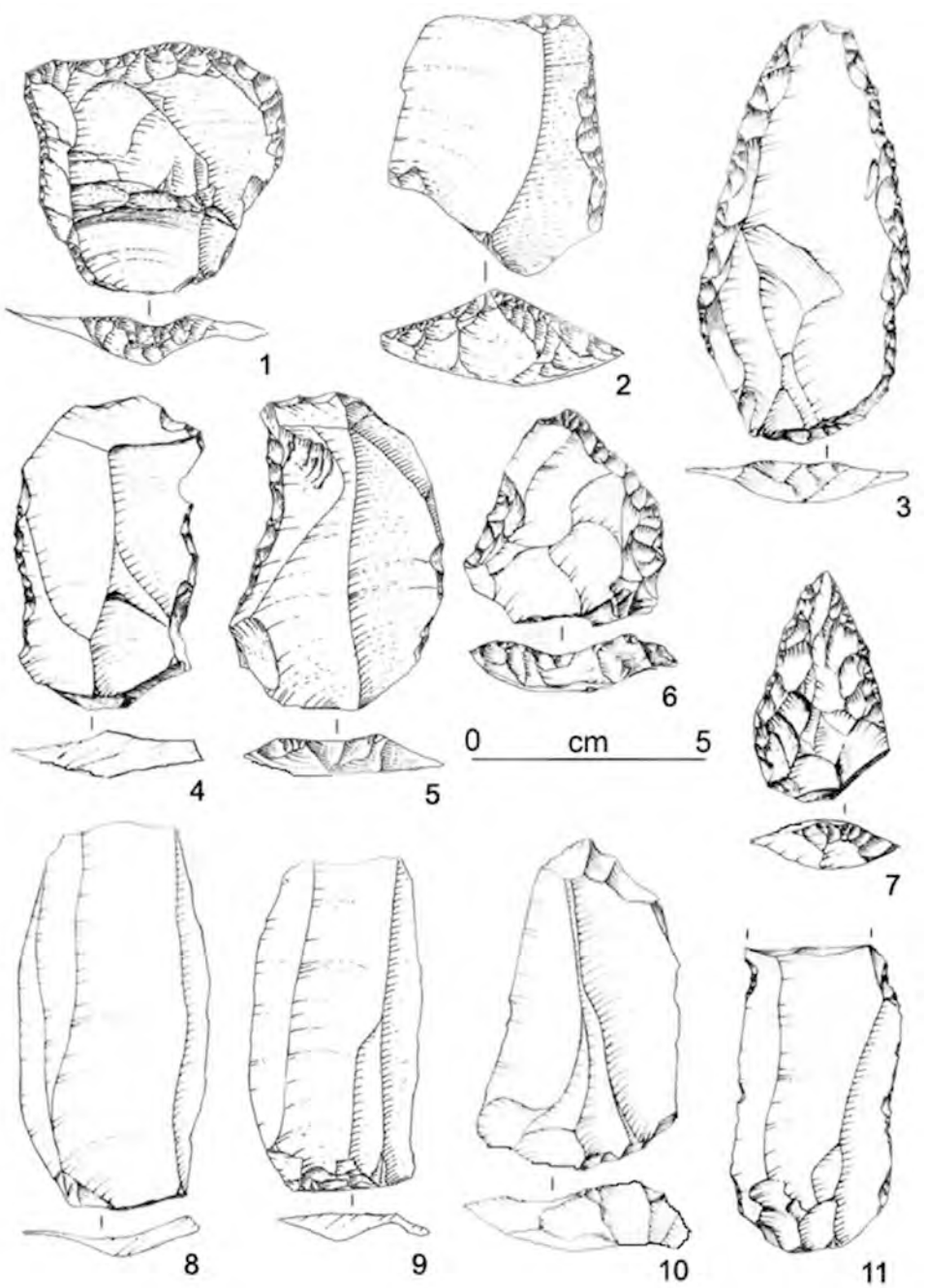

Fig. 12.4 Ongar: Levallois Mousterian tools from A.R. Khan's collection (Drawing by P. Biagi, inking G. Almerigogna)

(Rendell and Dennell 1987), were carried out only in the early 1980s (Rendell et al. 1989).

Recent finds, new excavations and the study of old collections have slowly improved our knowledge of the Late (Upper) Palaeolithic of Sindh. On the basis of the techno-typological characteristics of the chipped stone assemblages five different districts have yielded sites of this period: (1) the territory around Karachi and the Mulri Hills in particular, (2) Jhimpir (Thatta), (3) the Ongar and Daphro Hills (Hyderabad), (4) Ranikot (Jamshoro) and (5) the Rohri Hills (Sukkur/Rohri) (Biagi 2017b) (Fig. 12.7).

12.4.1 Karachi and Its Surroundings

The geomorphology and evolution of Karachi basin have been studied by Professor A.R. Khan (1979b, c). According to this author "*the coastal area near Karachi reveals a series of raised beaches and marine terraces*" (Khan 1979a, p. 19), the highest of which, some 50 m high, capped by wind-blown sand, yielded evidence of Late (Upper) Palaeolithic and Mesolithic occupations.

Other sites of these periods were discovered in the Hab River valley (Mendiari), along the banks of watercourses that

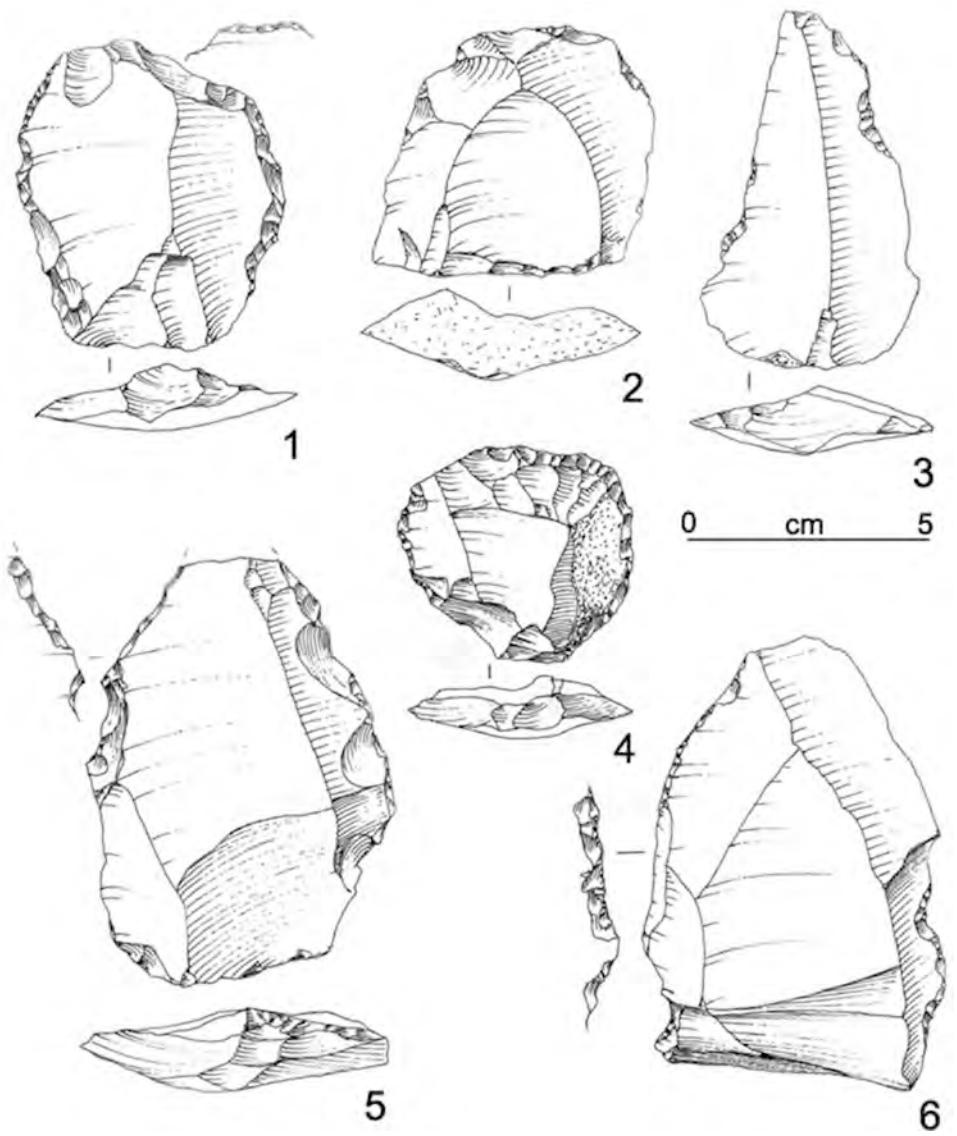

Fig. 12.5 Rohri Hills: Middle Palaeolithic artefacts of Series 5 (Drawing F. Negrino, inking by G. Almerigogna)

flow into the Malir River, at Rehri, facing Khadiro Creek, and the Mulri Hills, at the eastern outskirts of Karachi (Khan 1979a) (Fig. 12.7: 1). The variability of the tool types collected from the above sites, the limited information regarding their recovery, as well as their approximate location, in absence of GPS recording systems, make the precise chrono-cultural attribution of each complex sometimes doubtful.

Very important Late (Upper) Palaeolithic and Mesolithic sites were discovered in the 1970s by Professor A.R. Khan on the Mulri Hills (Fig. 12.8). The hills, some 70 m high, elevate between the courses of the Layari and Malir Rivers, east of Karachi. They consist of variegated beds developed on the sedimentary bedrock of the Miocene Upper Gaj formation (Zaidi et al. 1999).

Prehistoric sites were mainly discovered along the southern upper slopes of the hills, close to two main faults, along which several springs opened (A.R. Khan pers. comm 2002; Biagi 2003–2004). Narrow, seasonal streams originating from the above springs flow southward into the Malir River, which they join some 10 km north of Ghizri Creek.

MH-16 is the only homogeneous Late (Upper) Palaeolithic site discovered on the hills. The assemblage is composed of 425 artefacts obtained from flint pebbles whose source or outcrops are at present unknown. It consists of 90 cores, 147 complete, unretouched artefacts, 103 unretouched fragments, among which are 45 blades and bladelets, 62 tools, 3 burin spalls, 14 crested blades and flakes and 6 microburins (Fig. 12.9: 45–48). The retouched tools are represented by 14 burins (Fig. 12.9: 1–8), 3 end scrapers (Fig. 12.9: 9, 10), 4 truncations (Fig. 12.9: 11), 1 triangle (Fig. 12.9: 33), 19 curved backed points (Fig. 12.9: 12–17, 19–27, 29, 35, 36), 5 curved points on thick, triangular flakes (Fig. 12.9: 28, 30–32), 1 thick backed blade (Fig. 12.9: 18), 5 backed bladelets (Fig. 12.9: 34, 40–44), 2 backed bladelets and truncation

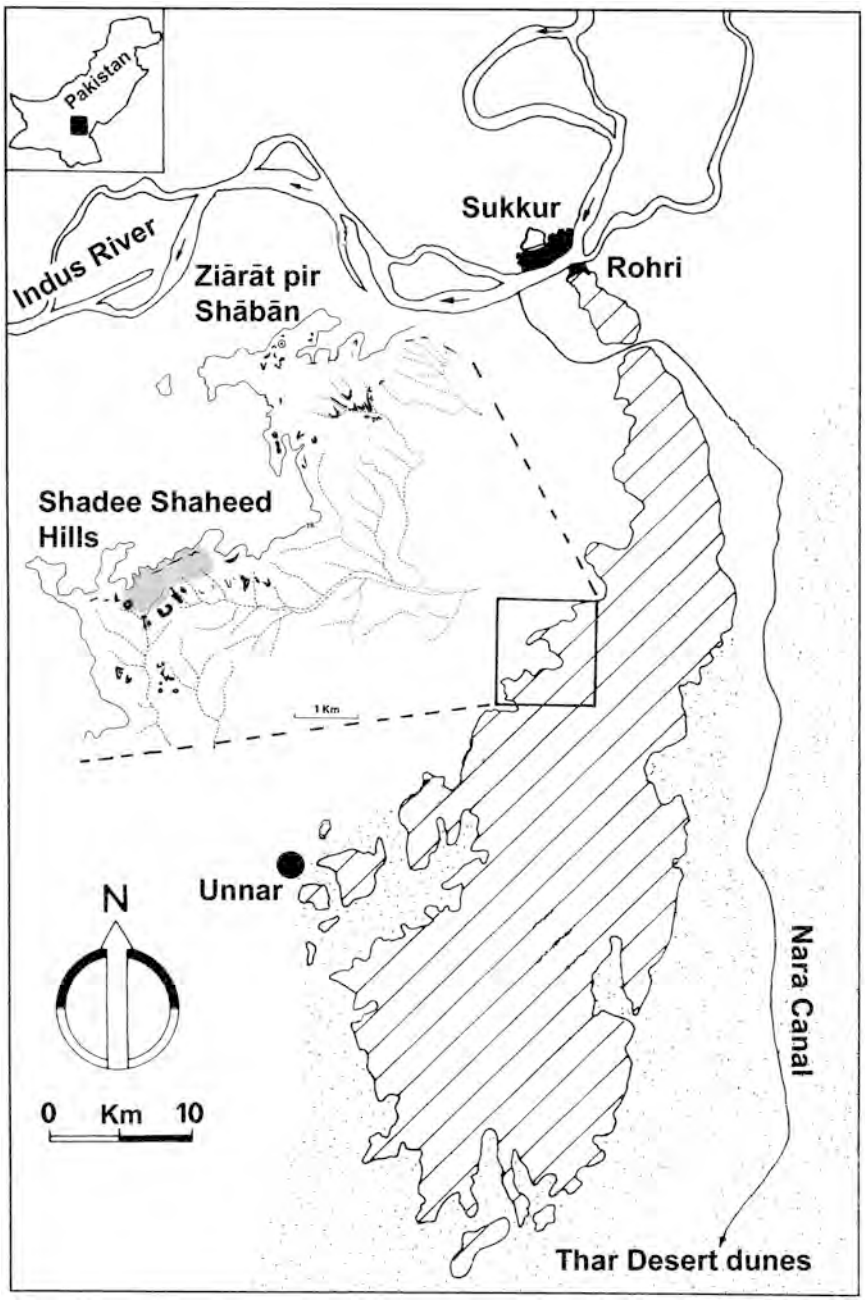

Fig. 12.6 Rohri Hills: distribution map of the areas that yielded Middle Palaeolithic artefacts (Drawing by P. Biagi)

(Fig. 12.9: 39), 2 backed points (Fig. 12.9: 37, 38), 4 side scrapers, and 1 flakelet with abrupt retouch. The tools are mainly obtained from bladelets or bladelet-like flakelets of normolithic size (2.5 to 5 cm long), and also from blades and blade-like flakes (5–10 cm long). Other sites of the Karachi area that yielded Late (Upper) Palaeolithic assemblages are Mendiari (Fig. 12.7: 2), Rehri 4a (Fig. 12.7: 3), Deh Konkar (Fig. 12.7: 4), and Ran Pethani 9 (Fig. 12.7: 5). Characteristic curved backed points, attributable to this period, were collected also from Langeji, Kadeji and Jorando gorges, Kankar Nala, Khar Nai and Bakran.

12.4.2 Jhimpir

The area around Jhimpir (Thatta) was first visited by W.T. Blanford in the late 1880s. From Jhimpir Blanford reported the presence of "cherty and flinty limestones" close to the railway station (Blanford 1880, p. 153). The surveys were resumed by the Italian Archaeological Mission in 2010 along the terraces south and southwest of the village. They led to the discovery of many sites (Fig. 12.7: 6), most of which were attributed to the Late (Upper) Palaeolithic (Biagi 2011).

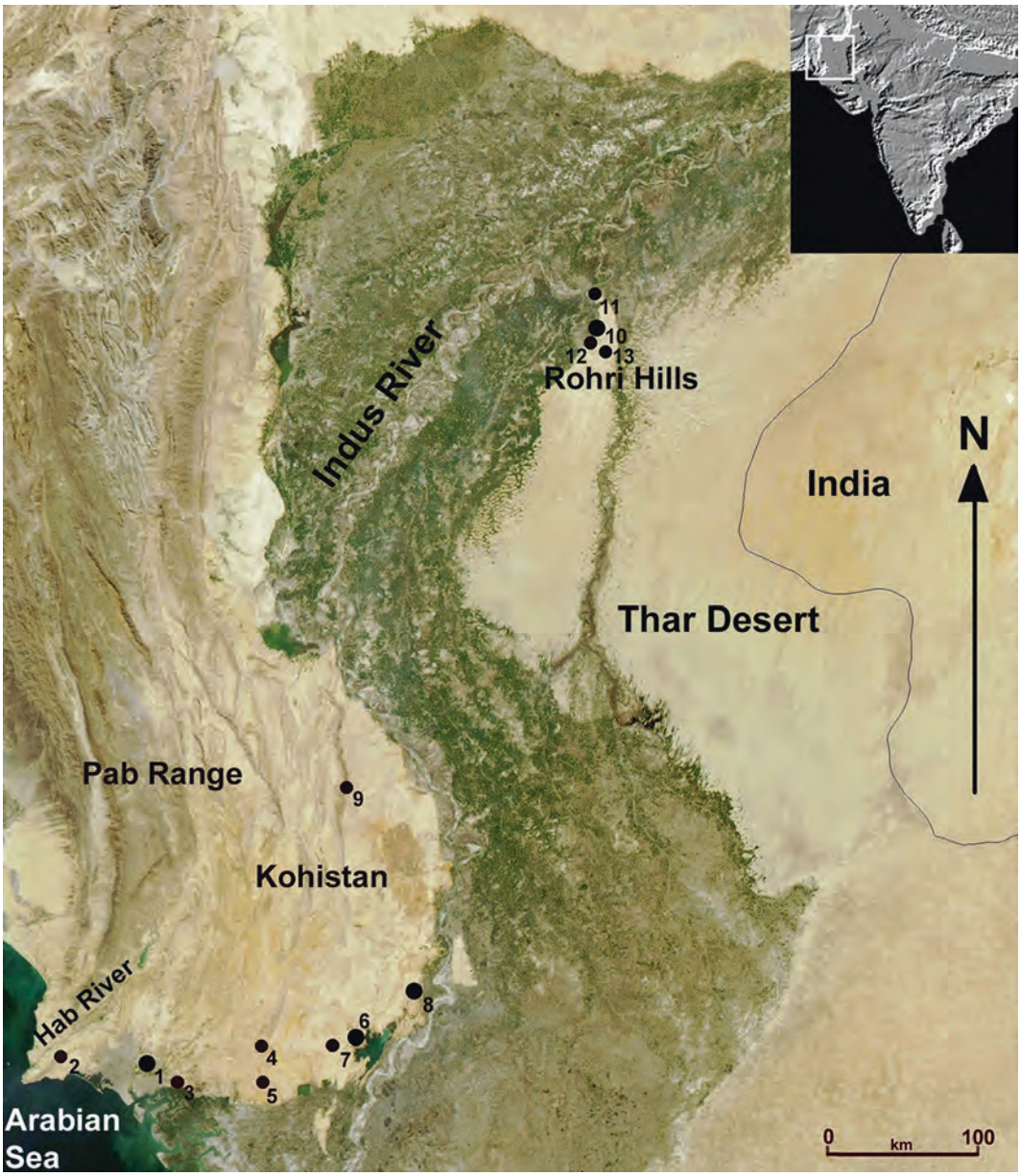

Fig. 12.7 Distribution map of the Late (Upper) Palaeolithic sites mentioned in the text. *1*: Mulri Hills, *2*: Mendiari, *3*: Rehri, *4*: Deh Konkar, *5*: Ran Pethani, *6*: Jhimpir, *7*: Jhimpir W1, *8*: Ongar and Daphro, *9*: Ranikot, *10*: Rohri Hills, Shadee Shaheed, *11*: Sukkur, *12*: Unnar, *13*: Southernmost hills. The *larger dots* show greater complexes (Drawing by P. Biagi)

The Jhimpir sites consist of lithic scatters lying on the eroded surface of Kirthar limestone weathered terraces. Their distribution is delimited by a well known freshwater spring (Blanford 1880, p. 153), in the north, an elongated flint outcrop, in the south, and the artificial Kalri Lake depression, in the east (Fig. 12.10), which was formerly filled with the waters of Sonehri and Kinjhar basins (Khan 1979a, p. 16; see also Tremenheere 1867, map).

At least 15 of the lithic spots recovered from Jhimpir have been attributed to the Late (Upper) Palaeolithic. Sites JHP-1, JHP-7 and JHP-9 yielded also a few microlithic lunates (Biagi 2011, fig. 5–7). The Jhimpir artefacts are chipped from local, light grey nodular flint (2.5Y7/1–7/2: Munsell Soil Color Charts 1992). They are often coated with a thin dark greyish brown (2.5Y3/2) to dark brown (7.5Y3/3) patina due to exposure and weathering.

Two outcrops, labelled JHP-21 and JHP-28 respectively, are known south and southwest of the main cluster of Late (Upper) Palaeolithic sites (Biagi and Nisbet 2010). A short survey conducted in January 2011 led to the

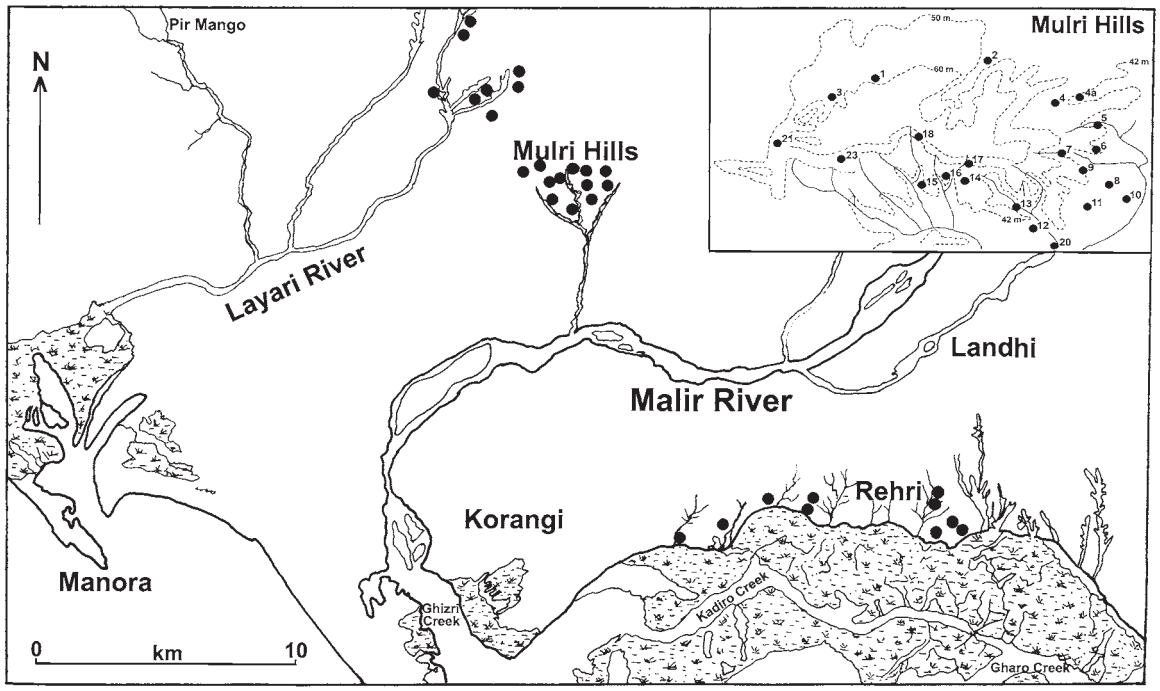

Fig. 12.8 Environmental setting of the Mulri Hills between the Layari and Malir Rivers (Karachi). The detailed distribution of the MH sites, according to A.R. Khan's field map, is in the *upper, right* corner. Other sites along the Layari and at Rehri are also shown (Drawing by P. Biagi)

discovery of another good quality flint source along the southern edge of the limestone terrace (JHP-30), some 5–6 kms west-south west of JHP-21. Another Late (Upper) Palaeolithic spot of lithic artefacts, covering a surface of some 20 sqm, was discovered some 1 km to the west of JHP-30, at 24°58′53.9 N – 67°57′25.0 E (JHP-W1) (Fig. 12.7: 7). One prismatic core with bladelet detachments, 1 abrupt retouched flakelet, and many fragments of laminar blanks and debitage flakelets were recorded on its surface.

12.4.3 Ongar and Daphro Hills

Apart from the Late (Upper) Palaeolithic industries described by B. Allchin et al. (1978, p. 300), and despite the recent limestone mining activities, a few large Late (Upper) Palaeolithic workshops and isolated finds were found still intact in some areas of the hills in 2008 (Fig. 12.7: 8). The Late (Upper) Palaeolithic assemblages from Ongar consist of subconical and prismatic cores with bladelet and bladelet-like flakelet detachment, bifacial picks (Fig. 12.11), and very rare burins. Workshops consisting of thousands of debitage products, coated with a desert brown patina (7.5YR4/6) caused by exposure and weathering, were recorded also from the neighbouring terrace of Daphro (Fig. 12.12).

12.4.4 Ranikot Fort

The Late (Upper) Palaeolithic site of Ranikot Fort (RNK-1: Fig. 12.7: 9) was discovered on the surface of a Kirthar limestone terrace (Blanford 1867, p. 15) at 165 m of altitude, some 720 m northwest of Sann Gate (Biagi 2017b) (Fig. 12.13). The terrace is delimited, in the east, by the deep incision of a seasonal stream that flows southward into the Nai Rann or Sann River (Blanford 1880, p. 135).

The chipped stone assemblage was collected from an eroded surface. The central point of the site, covering a surface of at least 500 sqm, is 25°53′11.190 N – 67°55′29.486 E. No clear concentration of artefacts was noticed, although they were mainly distributed toward the edge of the terrace.

The artefacts are obtained from small pebbles of local flint, which is quite common to the limestone that covers the Ranikot formation (Blanford 1880, p. 135). The chipped stone assemblage is weathered, coated with an olive yellow patina (2.5Y6/6) with small, lighter spots. Some specimens show a few, small *concassage* detachments (i.e. taphonomic retouch or pseudo-retouch: Kolobova et al. 2012), due to either a slight movement from their original position, or trampling. No traces of the original Pleistocene soil were noticed all over the area.

The industry consists of 19 cores (Fig. 12.14: 8–23), 121 unretouched artefacts, 4 burins (Fig. 12.14: 1–4), 1 crested blade, 12 core rejuvenations (Fig. 12.14: 6) and 1 splintered

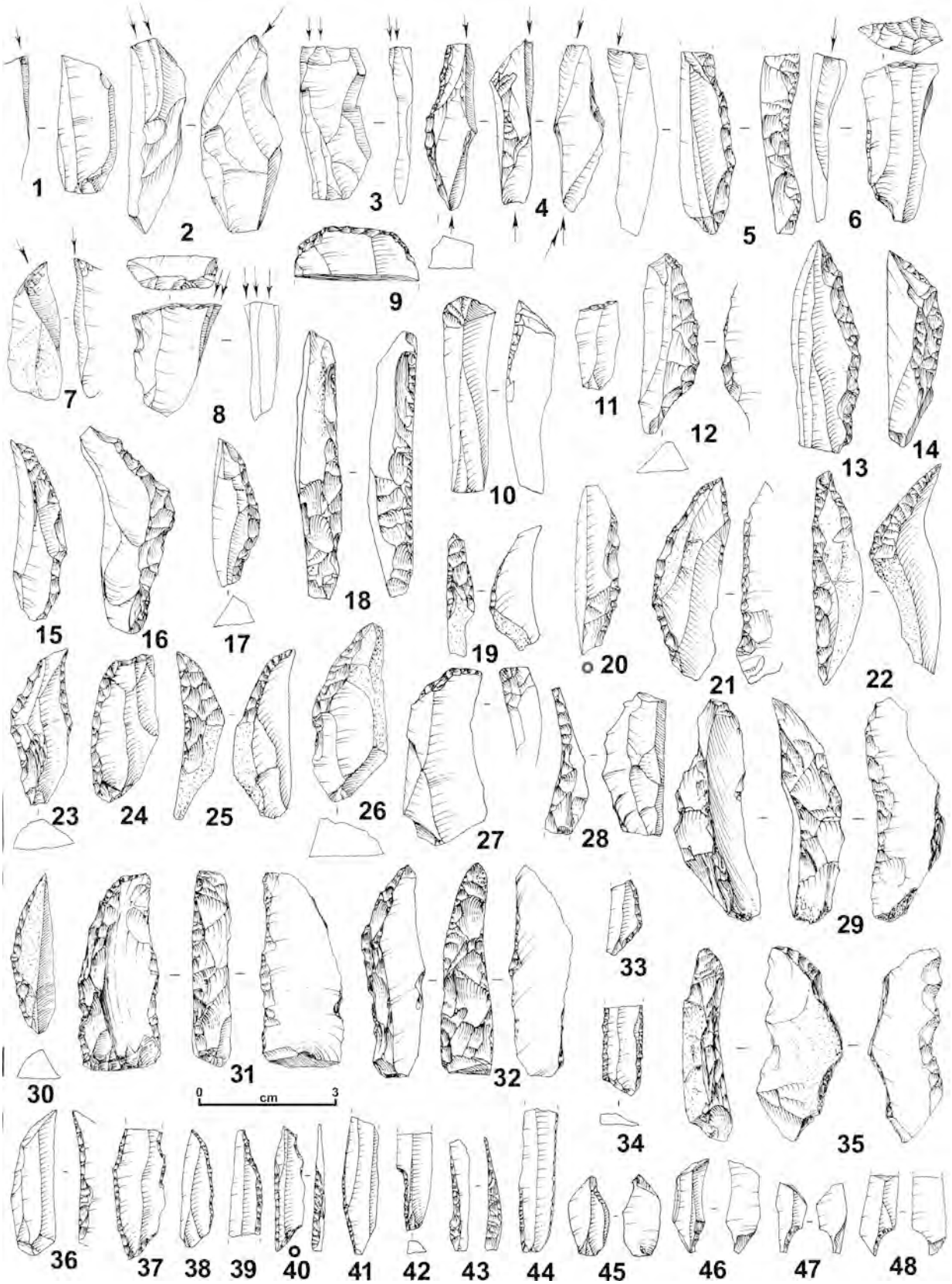

Fig. 12.9 Mulri Hills, site 16 (MH-16). *1–8*: Burins, *9*, *10*: End scrapers, *11*: Truncation, *12–17*, *19–28*, *30*: Curved, backed points, *18*: Thick backed blade, *29*, *31*, *32*, *35*: Thick, curved points, *33*: Triangle, *36–39*: Backed points, *34*, *41–44*: Backed bladelets, *40*: Backed bladelet and truncation, *45–48*: Microburins (Drawings by P. Biagi, inking by G. Almerigogna)

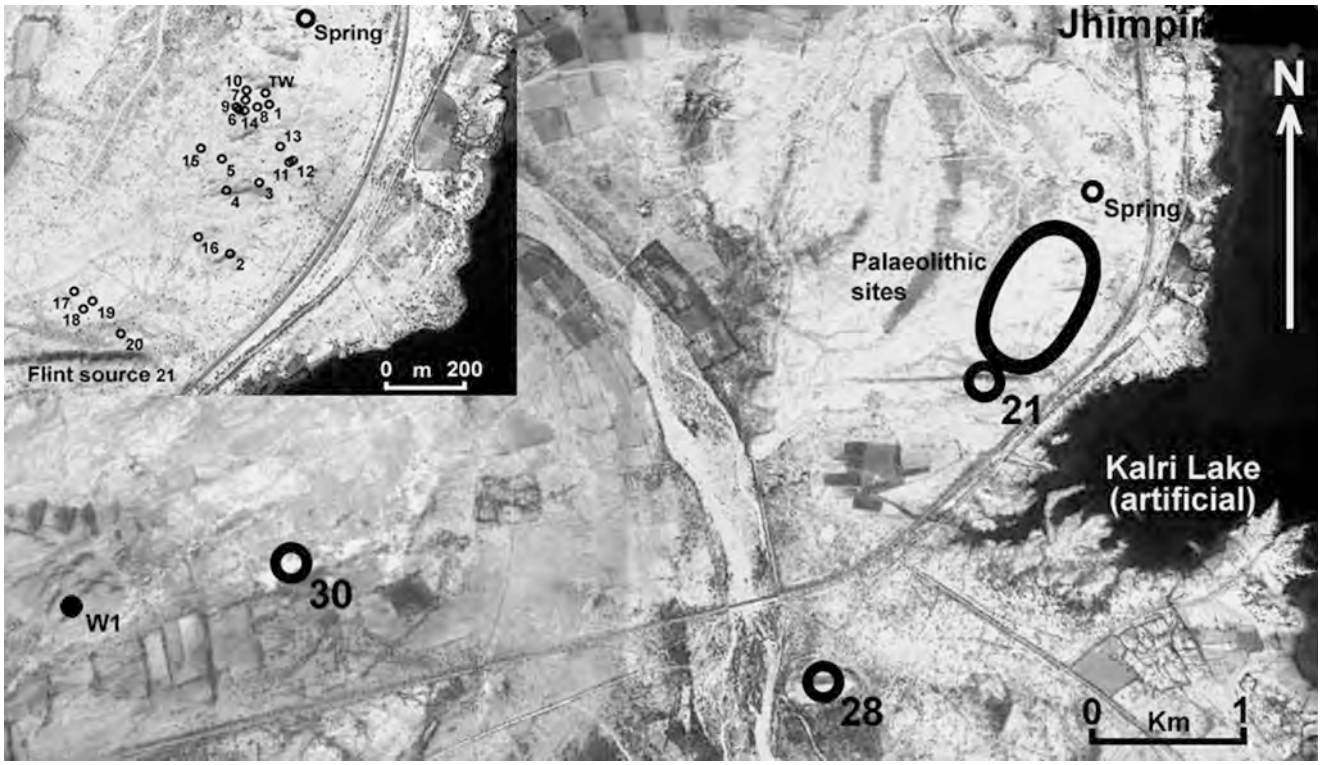

Fig. 12.10 Jhimpir: Distribution map of the Late (Upper) Palaeolithic sites discovered on the limestone terrace facing the artificial Kalri Lake. The precise location of all the JHP sites is shown in the *upper left* corner. The *larger circles* show the location of flint sources JHP-21, JHP-28 and JHP-30. Site JHP-W1 lays some 6.5 kms west south west of the main group (Drawing by P. Biagi)

piece (Fig. 12.14: 5). The cores are small, exhausted, subconical (10) or prismatic (9) with bladelet or bladelet-like flakelet detachments (Fig. 12.14: 8–23) on one surface. The platform is flat or slightly concave, obtained with one or more removals. Some of the cores are thin; others show traces of cortex.

All the burins are obtained from flakelets. One is simple with one lateral blow (Fig. 12.14: 1), 1 simple with two opposed, lateral blows (Fig. 12.14: 2), 1 simple with two transversal blows (Fig. 12.14: 3), 1 on retouch with two parallel, lateral blows (Fig. 12.14: 4). The splintered piece is on a bladelet.

12.4.5 The Rohri Hills

W.T. Blanford was the first to describe the geomorphologic characteristics of the Rohri Hills (Blanford 1880, pp. 101–107) that he attributed to the Brahui limestone formation (Blanford 1877). The same author also reported the first recovery of flint artefacts near Sukkur and Rohri, at the northern edge of the hills, in 1866–1867 (Blanford 1880, p. 20).

Some 70 years later H. De Terra and T.T. Paterson collected a few chipped stone tools from the top of a few small limestone terraces at Sukkur, west of the course of the Indus (De Terra and Paterson 1939, pp. 330–336) (Fig. 12.7: 11). They attributed the finds, among which are a few unretouched artefacts and one subconical bladelet core, coated with a dark brown desert patina, to their lithic Group A. According to their description this assemblage can be attributed to the Late (Upper) Palaeolithic period (De Terra and Paterson 1939, Plate XLV).

B. Allchin revisited the area in the mid 1970s. She discovered a few Late (Upper) Palaeolithic working floors at Chancha Baloch, some 4 km from Kot Diji, and Unnar (incorrectly reported as Nawab Punjabi) (Fig. 12.1: 12) (Allchin 1976, p. 479; Allchin et al. 1978, pp. 278–288).

The Joint Rohri Hills Project resumed the research in the area in the 1980s. Only during the 1990s it became clear that all the terraces of the central-western edge of the hills, east of the shrine of Shadee Shaheed, were spotted with hundreds of Late (Upper) Palaeolithic workshops (Biagi et al. 1995, p. 23).

The chipped stone artefacts were often displaced around the edge of man-made, oval depressions filled with wind-

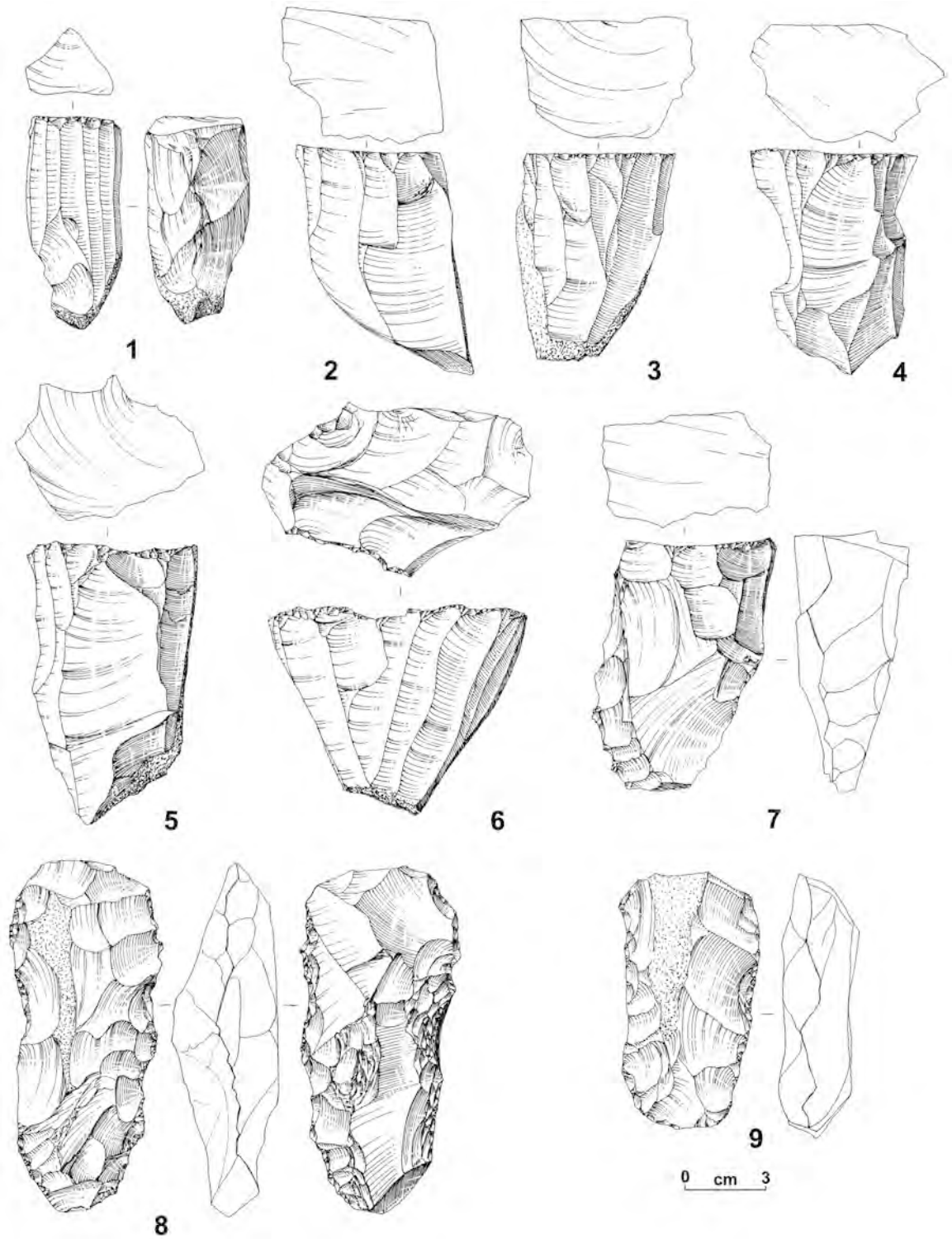

Fig. 12.11 Ongar. 1–7: Late (Upper) Palaeolithic cores, 8, 9: bifacial picks (After Biagi and Franco 2008: Fig. 5)

blown sand, from which the surface covered with limestone pebbles had been removed by prehistoric knappers (Fig. 12.1: 10). The workshops were characterized by scatters of thousands of brown, patinated debitage products (10YR4/3), subconical and prismatic bladelet and bladelet-like flakelet cores, pre-cores, flint hammerstones, crested blades and, in a few cases, bifacial picks (Fig. 12.15) (Biagi et al. 1994, 1998–2000; Biagi 2008a).

Fig. 12.12 Daphro: Late (Upper) Palaeolithic workshop made of thousands debitage flakes and cores (Photograph by P. Biagi)

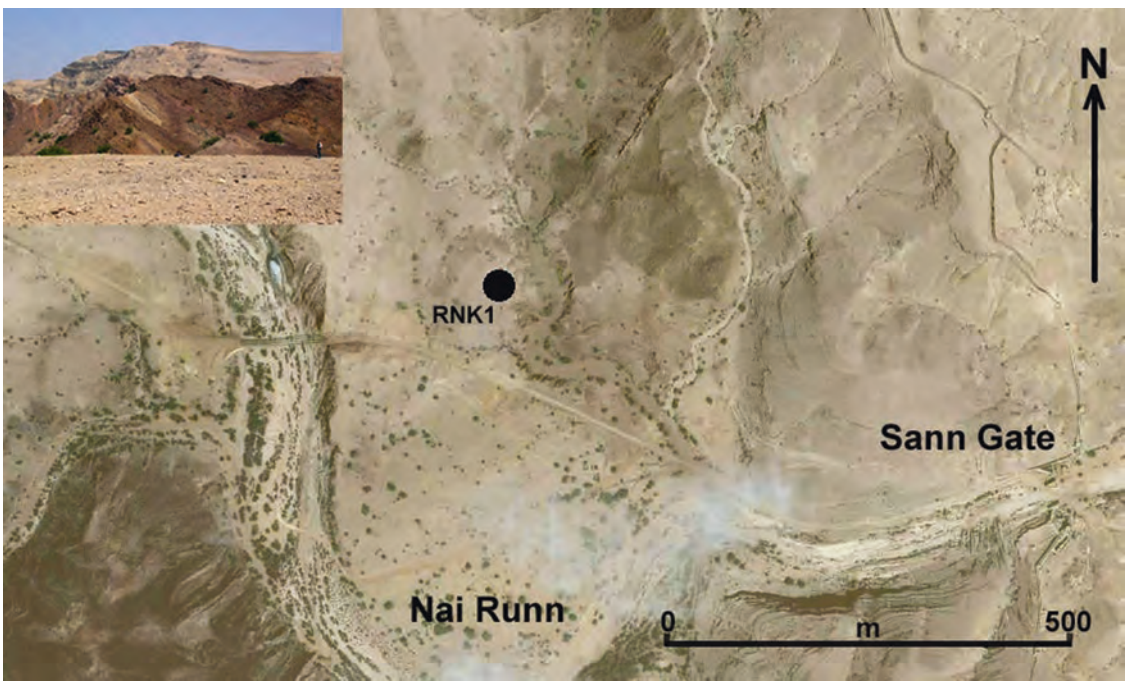

Fig. 12.13 Ranikot Fort: Location of the Late (Upper) Palaeolithic site RNK-1 and characteristics of the same site (*upper left* corner: drawing and photograph by P. Biagi)

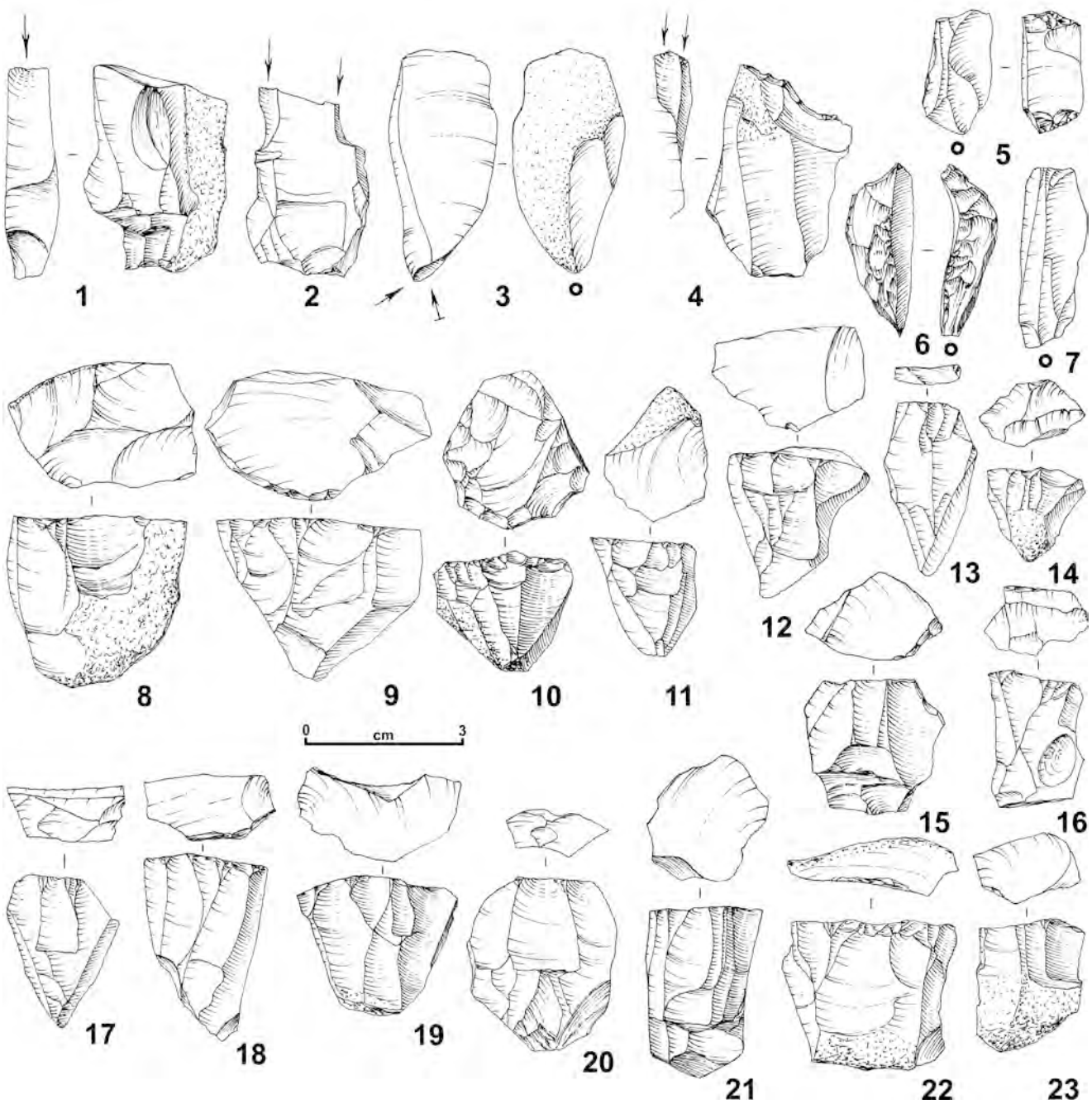

Fig. 12.14 Ranikot Fort: Late (Upper) Palaeolithic assemblage from RNK-1. *1–4*: Burins, *5*: Splintered bladelet, *6*: Core rejuvenation flake, *7*: Bladelet, *8–23*: Subconical and prismatic cores (Drawings by P. Biagi, inking by G. Almerigogna)

The micro-morphologic analysis of the soil of Workshop ZPS-2 (Biagi et al. 1998–2000, p. 116), shows that the Rohri Hills workshops formed during an "*arid climatic phase that characterized the second part of the last glacial*" most probably around the beginning of the Late (Upper) Palaeolithic (Negrino and Kazi 1996, p. 36).

12.5 Discussion

As already suggested by the present authors the Levallois Mousterian assemblages of Lower Sindh might represent the south-easternmost spread of *H. neanderthalensis* (Biagi 2006, 2008a; Biagi and Starnini 2014a, b). The available dis-

Fig. 12.15 Rohri Hills: Surface of a Late (Upper) Palaeolithic workshop with debitage flakes and bladelet cores (Photograph by P. Biagi)

tribution, which is delimited to the east by the course of the Indus, might correspond to a geographic/ecologic barrier, as already proposed for a purely theoretical dispersal route followed by AMH (Stock et al. 2007, Fig. 1). Although we know almost nothing of the Late Pleistocene location and environmental characteristics of the Indus delta (von Rad and Tahir 1997; Prins et al. 2000, p. 346; Inam et al. 2007, p. 336), nevertheless we can argue that during the OIS5-OIS3 the morphology of Lower Sindh was dramatically different from that of both present and Hellenistic periods (Haigh 1894; Wilhelmy 1968; Eggermont 1975; Biagi 2017a).

The Levallois Middle Palaeolithic chipped stone assemblages of Lower Sindh were collected from sites located along the western side of the Lower Indus Valley. This evidence is so far unique for the Indian Subcontinent. It opens an important debate on a few major topics among which are (1) the south-easternmost distribution of the Levallois Mousterian, and its eventual relationships with the Middle Palaeolithic of the Indian Subcontinent, (2) the techno-typological and chronological sequence of the Palaeolithic complexes in Sindh, (3) the easternmost distribution of the Aurignacian/Baradostian and its eventual relationships with the earliest Late (Upper) Palaeolithic industries of the Indian Subcontinent, (4) the definition of the human groups responsible for the production of all the above assemblages (Bolus 2015, p. 2388), (5) the chronology of the events that took place in the area during the Middle and Late (Upper) Palaeolithic, and the problems related with the eventual replacement of Neanderthals by AMH in the entire region (Reich et al. 2011, p. 523).

1. The typical Levallois Mousterian assemblages from Lower Sindh, mainly those from Ongar (Biagi 2008a; Biagi and Starnini 2014a; Blinkhorn et al. 2015), do not find any close parallel with the Middle Palaeolithic chipped stone industries from other regions of the Indian Subcontinent that have been often attributed to the Nevasian (Boriskovskiy 1971, Figs. 40–43). In contrast they can be compared with other assemblages from Iran, in the west, and Central Asia, in the north, where they are thought to have been produced by *H. neanderthalensis*. East of the Indus, flake assemblages, sometimes with a low Levallois-like component, characterize the Middle Palaeolithic (Pant and Jayaswal 2013). As reported above the Middle Palaeolithic industries from the Rohri Hills and the Thar Desert greatly differ from those from Ongar, and Karachi province, in the southwest.
2. Many flint workshops of the Rohri Hills have been attributed to the Late (Upper) Palaeolithic on the basis of distinctive techno-typological traits, and other characteristics of the chipped stone artefacts (Allchin et al., 1978, p. 280; Biagi et al. 1998–2000; Biagi and Starnini 2014a). In contrast almost nothing is known about the Middle Palaeolithic, given the absence of flint workshops attributable to this period in the Shadee Shaheed Hills (central-western terraces of the Rohri Hills), and the Rohri Hills in general. The geographic distribution of the few Acheulian, and the much more numerous Late (Upper) Palaeolithic workshops on the hills is very different. A similar, although not identical situation is known from Ongar in Lower Sindh.
3. The easternmost distribution of the Aurignacian/Baradostian complexes, although this term is currently considered quite generic and controversial (Fedele et al. 2008) covers a territory partly coincident to that of the Levallois Mousterian (Otte 2015). West and north of Sindh, they are known from Iran (Otte and Kozłowski 2007, 2009; Otte et al. 2012; Ghasidian et al. 2017) and Central Asia (Otte and Derevianko 2001; Otte 2004; Otte and Kozłowski 2011, Fig. 8; Kolobova and Krivoshapkin 2014). At present they have never been reported from the Indian

Subcontinent, where the beginning of the Late (Upper) Palaeolithic is perhaps represented by blade assemblages with curved, backed points (Murty 1969, 1970, 1979, 2003; Paddaya 1970; Sharma 1982). These latter assemblages are known from central and south-eastern India as well as Sindh. As far as we know their distribution does not overpass the course of the Hab River that marks the boundary between Sindh and Balochistan, in the west. Also in the case of the Late (Upper) Palaeolithic of the Indian Subcontinent many questions are still unsolved: (1) where did the above assemblages originate from? and from what tradition? When and where did they start to make their appearance? (2) what are their chronological and cultural relationships with the very rich Late (Upper) Palaeolithic workshops of the Rohri Hills from which retouched tools are almost absent? and with the industries characterized by geometric "microliths" in south-central India (Clarkson et al. 2009)?

4. The scarcity of Middle and Late Pleistocene human remains in India makes the general picture even more difficult to interpret (Costa 2013; Rightmire 2015). Therefore, it seems reasonable to suggest that also in the Indian Subcontinent "*without actual, direct fossil association, it is impossible to assign a human type as the maker of most Middle Palaeolithic industries in Eastern Europe and Central Asia*" (Marks and Monigal 2004, p. 78).
5. The Middle and Late (Upper) Palaeolithic chronological sequence of the entire Indian Subcontinent is still too badly known, and supported by few radiometric dates (Chakrabarti 1999, p. 74; Clarkson et al. 2009; see also Singhvi et al. 2010; Mishra et al. 2013). This is one of the main reasons why at present it is difficult not only to frame the Ongar and other Levallois Mousterian assemblages of Lower Sindh into the general picture of the Middle Palaeolithic of the Indian Subcontinent, but also to follow the sequence of the different cultural events that took place during the Late Pleistocene in most of the study areas. This observation can be extended also to the Late (Upper) Palaeolithic sites of the study region.

To sum up, regarding the Middle Palaeolithic, Sindh falls into the complex and fragmentary picture described above of which little is known, and even less is understood (Marks 2012). In contrast with Lower Sindh, from which typical Levallois Mousterian assemblages are known, the chipped stone industries from the Indian Thar Desert, and the Rohri Hills sites, would point to a different origin and development of the Indian Middle Palaeolithic.

The problem of the Late (Upper) Palaeolithic is even more complex, also because of the absence of sites of this period all along the coast of Makran and Las Bela (Balochistan), the suggested dispersal route followed by AMH to spread into the Indian Subcontinent (Blinkhorn and Petraglia 2014, p. 73). At present the south-westernmost sites of this period have been recovered from Mendiari, along the eastern terraces of the lower Hab River course, some 15 kms from the present seashore.

The chronology of the Late (Upper) Palaeolithic sites of Lower Sindh can be tentatively proposed only on the basis of the typological characteristics of the chipped stone tools that are represented by different types of (sometimes thick) curved backed points, obtained from bladelet blanks with direct or bipolar abrupt retouch. These industries are known from a few, although different, distant regions of the Indian Subcontinent (Mishra 2013, Fig. 4.1). They have nothing in common with the so-called Aurignacian/Baradostian complexes whose distribution covers wide territories located in the west and north of the study region. Furthermore they look absolutely different from those of the manufacturing workshops of both the Rohri Hills and Ongar, from which retouched tools are almost absent.

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