Archaeology

Cultural Evolutionary Paradigms and Technological Transformations from the Neolithic up to the Indus Urban Period in South Asia

Alessandro Ceccarelli and Cameron A. Petrie

Introduction

Studies of Indus ceramics, especially considerations of raw materials, manufacturing tools and techniques, have tended to argue for a) local technological developments within South Asia and b) linear evolutionary trajectories that played out across thousands of years. The concept of a linear evolution of ceramic technologies in particular has had a significant impact on research at several levels, and in a previous paper we addressed issues concerning the theoretical frameworks adopted for the interpretation of archaeological data in South Asia.[1] We noted that culture historic paradigms remain prevalent, and that there has been a tendency to focus on certain styles and types of artefacts to build seriations and identify archaeological 'cultures', which are often equated to ethnic groups or major phases of socio-political transformation. This paper aims to take the theoretical debate one step further, by looking at studies of technological transmission and transformation and considering the underlying tendency among researchers to adopt *demic* diffusion-based interpretations. The first part of this paper reviews the development of ceramic technologies from the Ceramic Neolithic up to the Indus urban period to understand how certain themes have developed. It will particularly discuss how more 'evolved' technologies are typically seen to have been adopted, homogenously replacing older and less sophisticated manufacturing methods, mostly in view of possible functional or economic gains. The second part will focus on ceramics from northwest India, and will explore evidence for variable regional technologies and resistance to innovation. Our broader aim is to strengthen theoretical mindfulness in this field of research and thus to stimulate dialogue, rather than provide solutions.

Cultural Evolution

Archaeology has the potential to identify the dispersal of cultural materials and technological innovations across space and time, and this is especially true for manufacturing techniques that were used, spread and transformed in proto-historic Pakistan and India. A range of literature has suggested that certain styles and manufacturing techniques were 'discovered' at early stages of social complexity in South Asia, and consistently 'evolved' thorough time, reaching a pinnacle of sophistication during the Indus urban period. This is particularly so for studies focusing on the use and spread of fine clay pastes, wheel-coiling techniques, and more generally the use of rotational devices in ceramic industries.[2] Here we use the concept of a social

evolutionary paradigm to refer to theoretical frameworks used for the interpretation of archaeological materials that seem to follow neo-Darwinian biological models for explaining certain cultural changes.[3] A social evolutionary or neo-Darwinian approach implies that human technological traditions consist of information and ideas (or 'cultural traits') that are stored in human brains and passed on to other individuals through social learning.[4] In such evolutionary models, cultural traits seem to be unaffected by their local conditions and externalisation in material form,[5] and rely on 'the hypothesis that contacts between people are necessary and sufficient for social learning to occur'.[6] Versions of this approach have been adopted to explain certain phenomena of cultural transmissions in the Indus zone, but this is not without problems. The adoption of technologies and styles is not necessarily an even or contemporaneous process, and the potential for resistance to innovations over many centuries also needs to be considered. Aspects of material agency and human choice in the processes of adopting and transmitting technological knowledge,[7] and the social mechanisms behind resistance are often not explored, particularly in relation to observations made about variable regional traditions.

Technological Transmission and Transformations in the Indus Zone

Ceramic Neolithic (5500-4300 BCE)

The origins of ceramic production technologies and their evolutionary trajectories are often seen to lie in the Ceramic Neolithic at Mehrgarh (period IIA), Kachi Plain, Baluchistan (see Fig. 1). The earliest known occupational phases at Mehrgarh, also known as the Aceramic Neolithic Period I, were tentatively placed by Jarrige around 7000 BCE,[8] but the absolute dates from these deposits are problematic and ambiguous due to poor preservation.[9] Petrie has suggested that Period I may have started later, at the beginning of the sixth millennium BCE, and noted that the nature of the transition to Period IIA seems unclear.[10] The generally accepted terminology "Aceramic" and "Ceramic" Neolithic periods has been suggested and largely employed[11] resembling the descriptive lexicon also used in the Near East.[12]

The deposits for Period IIA have reliable dates suggesting a range of c.5470-4700 BCE for the first phase of Mehrgarh Ceramic Neolithic. This phase is also marked by a shift from what appears to be non-permanent, semi-nomadic/seasonal activity, towards less mobility, intensified agricultural activities, and large, extra-household scale storage systems.[13] According to Vandiver,[14] very few fragments of incipient ceramic vessels in the form of early coarse, chaff-tempered pottery were found in the earliest Ceramic phase deposits - previously Period IB, now termed Period IIA.[15] During this period, there is evidence for an increased range of craft activities,[16] and an increase in the number of farming settlements in the greater region.[17] This phase is generally regarded as having the earliest evidence for ceramic production in South Asia, though the early ceramics from Lahuradewa in the central Ganges may be contemporaneous.[18]

Pottery found at Mehrgarh Period IIA is described as being chaff-tempered, handmade, low-fired ceramic, manufactured using the so-called *SSC*, Sequential Slab Construction technique. Vandiver suggested that the physical properties of the organic tempered clay directly affected certain stages of the forming process, leading potters to prefer the use of lumps or slabs of clay rather than 'true' coils (see Fig. 2).[19] She also observed a certain degree of similarity to ceramic industries from Tepe Yahya in Iran, Mesopotamia (Hassuna and Samarra traditions) and Badarian, Tasian and Delta pottery of Egypt.[20] By the end of Mehrgarh Period

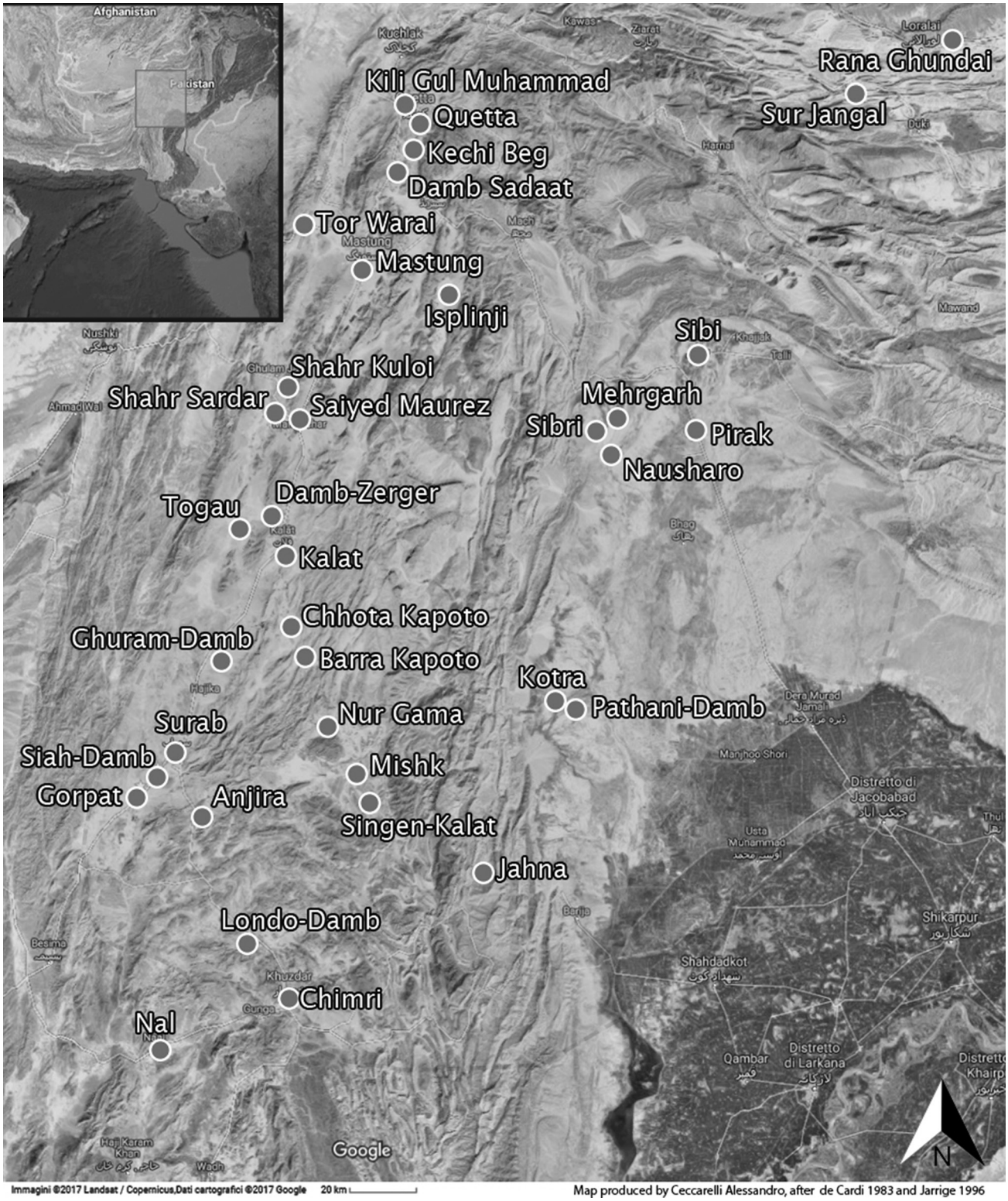

Figure 1: *Map showing archaeological and surveyed sites occupied during the Neolithic and Chalcolithic periods in the Kachi Plain, Baluchistan. Some of these sites provided evidence for current ceramic seriations* (Reference Note: 101).

IIB, the quantity of chaff temper in clay pastes had reduced, potters had started to build walls in strips and bases in less regular slabs, and most wall joins showed characteristic butt-join margins.[21]

Besides *SSC ware*, what is referred to as *Burj Basket-Marked ware* was among the earliest ceramics identified in the archaeological record of South Asia. For this technique, potters used baskets as a mould, and vessels were often coated with a clay slip to hide basket impressions.[22] This combination of techniques also seems to have been quite widespread from the Near East to South Asia, as suggested by evidence from Abu Hureyra (Syria), Ali Kosh and Hajji Firuz Tepe (Iran).[23] Besides obvious inferences regarding diachronic technological developments, comparative studies concerning the distribution of both *SSC* and *BBM* wares opened a debate around the early development of an interaction sphere across the Iranian Plateau and social, cultural and economic mechanisms responsible for the transmission of knowledge and skill between South and West Asia (see Table 1).[24]

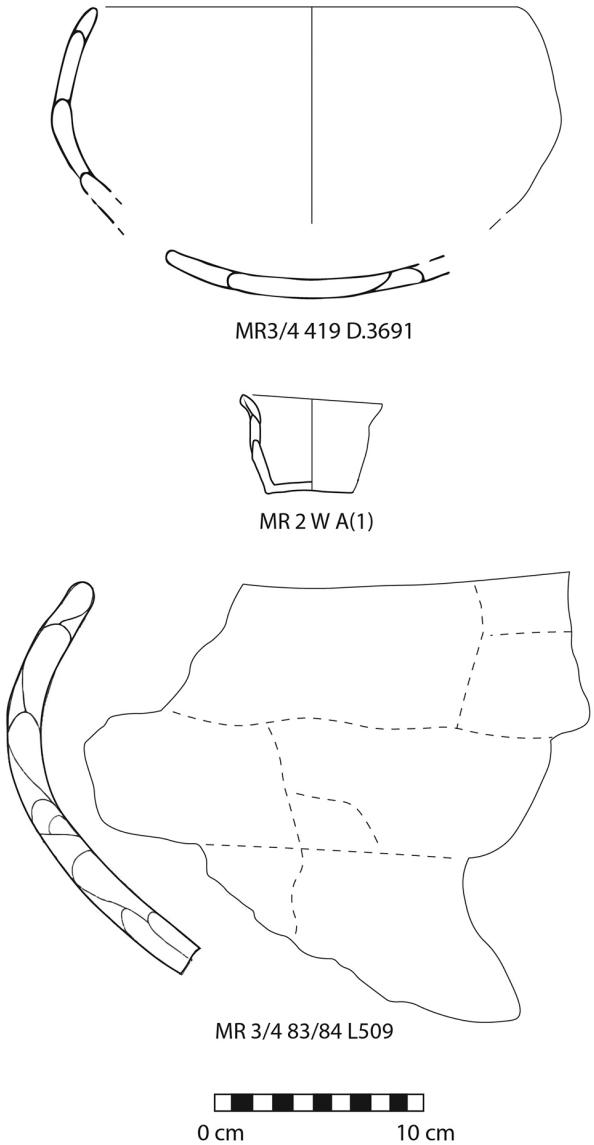

Figure 2: *Chaff-tempered ceramics manufactured using the SSC technique, Neolithic Mehrgarh IIA* (Reference Note: 102).

Early Chalcolithic and Ceramic Neolithic (4300-3800 BCE)

The second half of the fifth millennium BCE witnessed the introduction of a number of technological innovations at Mehrgarh, such as the use of fine clay pastes, rotational devices, pigments, and painted decorative techniques, as well as an exponentially increased variability in manufacturing techniques within rural systems of production. This phenomenon of increased sophistication and intensification of ceramic production was potentially correlated with significant contemporaneous transformations happening at the level of settlement strategies and agricultural activities.[25]

During Mehrgarh Period III, fine-paste red ceramics were developed, often coated with an iron-rich clay slip, and displaying painted decoration. Vessels of this type are variously referred to as *Kili Gul Muhammad* (KGM II-III) and *Togau* wares, and broadly similar to material seen at Periano Ghundai A, Sur Jangal I–II, Surab II, Rana Ghundai Ia–Ib, and Sheri Khan Tarakai. Many of these sites were still in effect Neolithic in terms of technologies (see Table 1).[26] Mehrgarh Period III is marked by the presence of pottery decorated with geometric and fauna motifs, which bears certain comparable features with Iranian ceramic industries, for example *Soghun ware* from Tepe Yahya VI.[27] Traces on the walls of sherds suggest the use of rotation for smoothing the interior surface of vessels, which are marked by the presence of parallel, circumferential

strakes.[28] The distinctive striations have been understood as evidence for the introduction of *tournettes* or turntables, likely employed during the final stages of pottery manufacture. This technique was likely used for thinning and shaping vessels, and also for applying banded decoration, as vessel walls still appear to have been built using slabs, with most joins showing butt-joins markings.[29] The final stages of the manufacturing process also seems to involve trimming by scraping with a multiple-pointed gouge.[30] Wright[31] examined the peculiar sequence of actions necessary to produce the *Togau* pottery, and reaffirmed the incipient use of rotational devices at Mehrgarh Period III. Overall it appears that *Togau* ceramics were produced using a variety of techniques, with some sherds seeming to bear similar concentric lines identified on the later *Faiz Mohammad* ceramics. Wright[32] integrated surface observations with the use of C.A.T. scanning and xero radiography to suggest "production on a fast wheel". However, she emphasised that her interpretations of the results are tentative due to the fact that: (a) other *Togau* vessels do not show such concentric surface striations; (b) analyses were undertaken on a small number of samples; and (c) the analytical techniques employed were quite novel.[33] The observations of Vandivier[34] and Wright[35] thus demonstrate that rotational devices were partially adopted by local potters in some areas, but also that true wheel-throwing techniques were not yet being executed.

Late Chalcolithic and Ceramic Neolithic (3800-3200 BCE)

The development of variable ceramic forming techniques, does not seem to be an isolated phenomenon, and comparable material is found across the Indo-Iranian region (see Table 1 and Fig. 4). In the first half of the fourth millennium BCE, equivalent to Mehrgarh Period III-IV and Kech-Makran Period II, pottery manufactured using coil- and slab- building techniques, as well as the partial use of rotational devices,

Table 1. Some regional ceramic traditions in use during the Ceramic Neolithic, Early Chalcolithic and Late Chalcolithic periods.

Neolithic Traditions	*Early and Late Chalcolithic Traditions*	*Pre-urban Traditions*
SSC Ware[101]	Miri Ware (Kech-Makran II)[102]	Nal Polychrome Ware (Amri-Nal)[103]
Burj Barket-Marked Phase[104]	Zari Ware[105]	Kot-Diji (KD I)[106]
	Anjira Ware[107]	Sothi-Siswal[108]
	Mian Ghundai Dark Rim Fine ware[109]	Damd Sadaat[110]
	Togau Style (Togau A-E)[111]	Hakra Ware[112]
	Kili Gul Muhammad KGM-types[113]	Kalibangan Fabrics A-F[114]
	Sur Jangal Coarse Painted Ware[115]	Ravi[116]
	Loralai Coarse Plain Ware[117]	Anarta[118]
	Sheri Khan Tarakai Wares (SKT A-C)[119]	Early Padri[120]
	Kechi Beg Black-on-Buff Slip[121]	Pre-Prabhas[122]
	Kechi Beg Polychrome[123]	Faiz Muhammad Grey Ware[124]
	Mesolithic Bagor Ware[125]	Wet wares[126]
		Emir Grey[127]
		Quetta Ware (Quetta-Dam Sadaat II)[128]
		Kulli Ware[129]
		Tochi-Gomal phase[130]

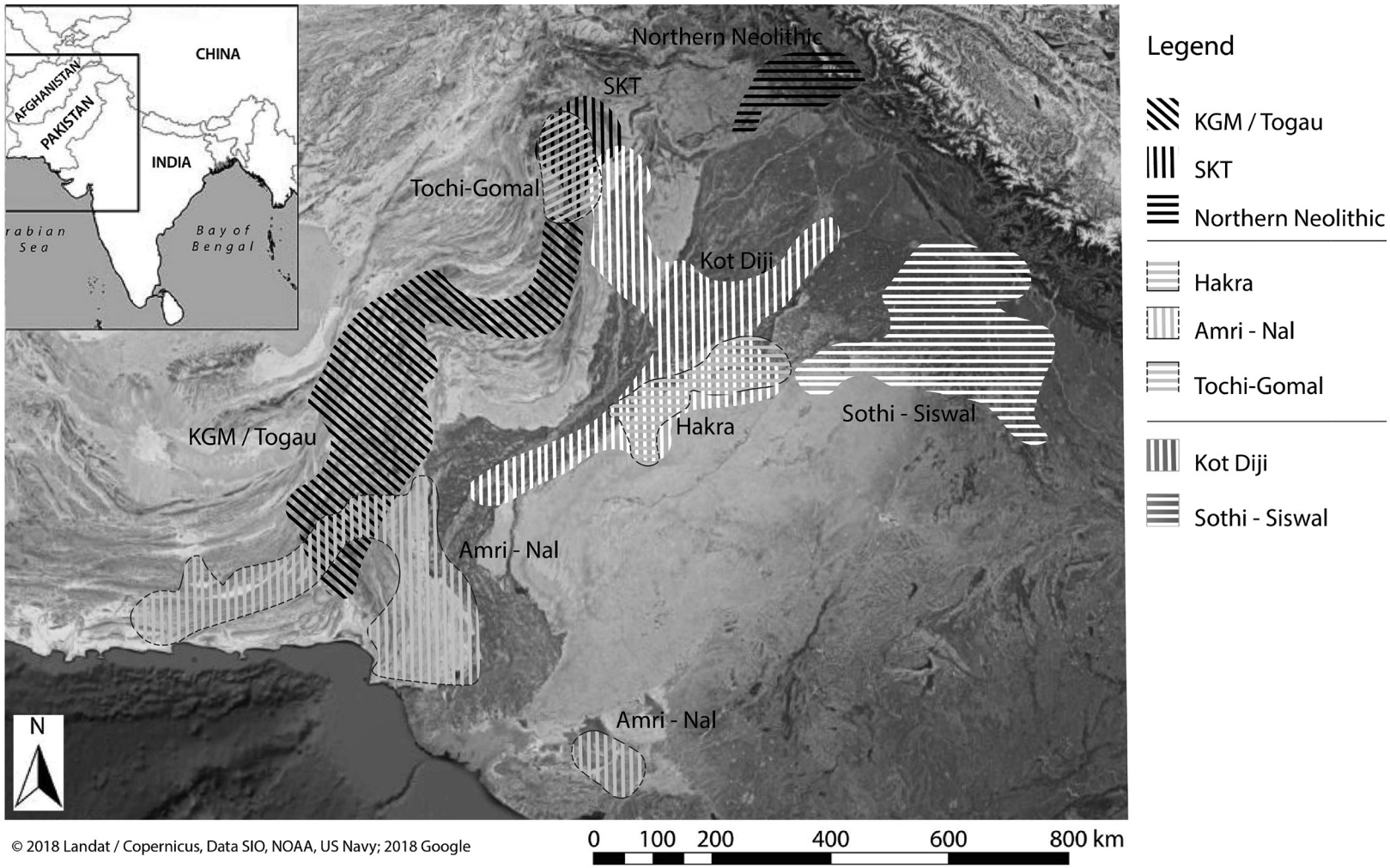

Figure 3: *Map showing areas of distribution of regional ceramic traditions* (Reference Note: 103).

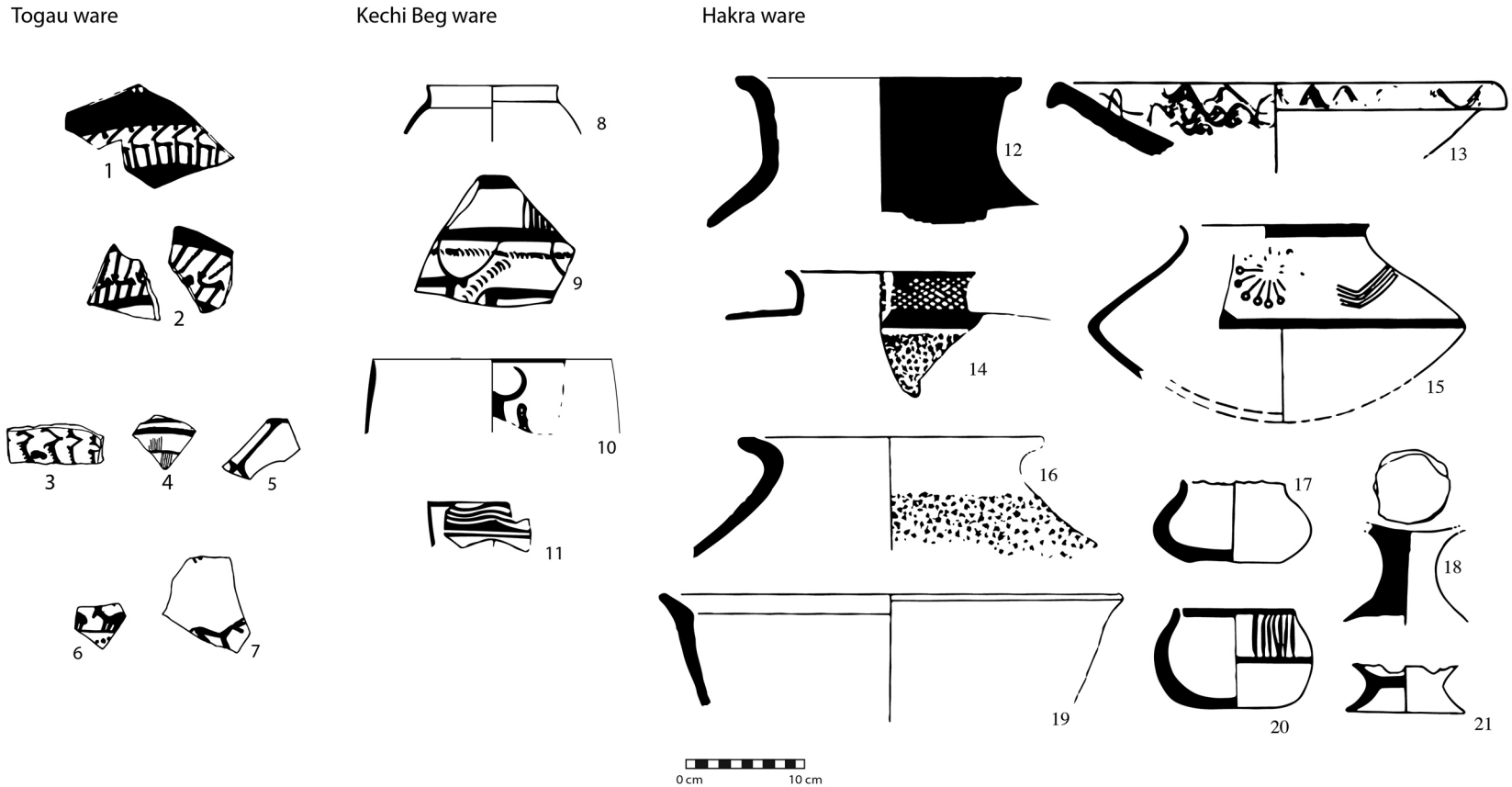

Figure 4: *Togau* (*1-7*), *Kechi Beg* (*8-11*) *and Hakra wares* (*12-21*) (Reference Note: 104).

probably *tournettes*, appeared at Miri Qalat and at Shahi Tump in the Kech Valley.[36] These technological innovations likely correlated to changes in clay processing and recipes, followed by the development of bichrome and polychrome decorations that occurred in various regions during the fourth millennium BCE.

At Mehrgarh, the first known examples of bichrome decoration painted in red and black on a whitish background were documented in the last phase of Period III, around 4000-3800 BCE. The development of painted decorative techniques in Baluchistan, represented by the *Kechi Beg*–type vessels, was often considered to be a phenomenon of external origin, possibly related to influence from Ubaid 5 pottery in Mesopotamia,[37] Namazga II-III pottery and Geoksyur monochrome black-on-red wares from southern Turkmenistan,[38] or even *J ware* from Māhīdašt.[39] Comparable materials were also found at Surab I-II in the Kalat region,[40] Sur Jangal I-II in the Loralai Valley,[41] and in the Kech-Makran Period II (*Miri ware*).[42] However, an indigenous, independent development of painted designs in the Kachi-Bolan Plain has also been suggested, given the nature of pigments used for producing the *Kechi Beg* ware, and long-lasting use of locally available raw materials.[43]

Evidence from many sites indicates not only an increased level of sophistication in ceramic industries during this period, but also the incipient crystallisation of regionalism and regional styles across the Indo-Iranian area. Given the protracted chronology of Mehrgarh Period III, *Kili Ghul Mohammad II, Togau A*, and *Kechi Beg wares* have recurrently been considered as the ancestors of ceramic traditions emerging in Baluchistan during the fourth millennium BCE.[44] As shown, the development of fine-clay fabrics, coil- and slab built vessels, the limited use of rotational devices, surface treatments such as applied slips, and monochrome, bichrome and polychrome painted decorations, including certain recurrent geometric and fauna motifs is significant. However, few studies have investigated the mechanisms behind the synchronic appearance of the various ceramic traditions and styles that developed in the region (Table 1). The available data should perhaps lead to an exploration of spheres of interaction that were in operation across the Iranian Plateau, which appears to have been reinforced in this period.

Conceivably, movement of ideas, technologies, and material culture were also related to certain environmental circumstances. In fact, Jarrige[45] noted that climate, vegetation, and rainfall patterns possibly affected certain settlement strategies in proximity of alluvial basins, which required a degree of resilience through seasonal mobility.[46] Material culture similarities at mentioned sites across the Indo-Iranian region also seem to substantiate this view.

With the identification of *Hakra Ware* in Cholistan and consequently the formalisation of a Hakra Ware phase, the importance of characterising South Asian regional traditions became of central relevance (see Table 1 and Fig. 4).[47] The identification of more than 120 known sites possibly yielding Hakra material revealed a combination of cultural materials, including ceramics, fragments of copper objects, terracotta figurines and bangles, and shellbeads.[48] Ceramics ascribed to Hakra assemblages present a variety of shapes, surface treatments and decoration, which have been used to define sub-types such as *Hakra Mud Appliqué*, *Hakra Black Burnished*, and *Hakra Incised*.[49]

Unfortunately, the characterisation of Hakra Ware suffers from two prominent issues yet to be fully solved: the first being a lack of detailed analysis of the ceramic wares and other cultural materials from stratigraphically secure contexts; and the second being a lack of absolute chronology. Understanding the chronology and technological development of *Hakra Ware* would be particularly interesting given the large variety of tools and techniques currently believed to have been employed in the production of these vessels, ranging from hand-made to wheel-fashioned pottery. Most of the material collected by Mughal[50] that has been used for defining these traditions came from un-excavated sites, typically surveyed areas.[51] Early occupations identified in stratigraphic excavations at Harappa and Jalipur are helpful in this respect, since

they appeared to yield *Hakra*-like pottery, though with less diversity in terms of technology.[52] Additional site reports and ceramics catalogued from these sites will likely contribute to tackling these issues.

The Hakra industries show some technological and stylistic similarities with materials from sites identified in Baluchistan and Cholistan. For instance, ceramic wares recovered at Sheri Khan Tarakai, especially SKT 'B' and 'C' wares,[53] and comparable material from the Ravi phase at Jalipur and Harappa Mound AB and E[54] suggest that there was some degree of sharing of technological knowledge across regional ceramic traditions. These indications of knowledge sharing imply the existence of a form of craft network during the fourth and third millennia BCE, which enabled the transmission of ideas and innovations between Balochistan, the Bannu and Gomal regions, and Cholistan and Punjab. Some of the mechanisms responsible for the intra-regional dynamics of subsistence practices, interaction and ideologies in these areas have been discussed elsewhere.[55]

Although the chronology, distribution, and nature of the Hakra tradition has not yet been entirely clarified, several scholars have proposed an eastern spread, seemingly reaching Haryana in northwest India. What have been named as Hakra sherds have been identified at sites such as Kunal, Bhirrana, Girawad, Kalibangan and Farmana.[56] The identification of Hakra occupational phases at sites in Haryana is typically based on observations on ceramics, e.g. sherds showing *mud appliqué* surface treatment. This evidence suggests a particularly 'early' chronology for pre-Indus and Indus pre-urban sites in Haryana, placing them on the easternmost periphery of the Hakra horizon.[57] However, it is worth mentioning that the application of a rustication - a thin or thick slurry - on the surface of vessels is found not only on Hakra ceramics, but also in Sothi-Siswal, Ravi, Kot Diji, Tochi-Gomal and Harappan pottery assemblages,[58] which makes it an unreliable chronological marker.

A number of sub-phases or regional manifestations of the Hakra tradition, including the *Ravi aspect of the Hakra phase*, show most of the distinctive features of *Hakra ware*, including manufacturing techniques, surface treatments and certain shapes.[59] For instance, Ravi ceramics from Harappa mound AB period 1A were largely hand-built vessels, bearing traces of possible slab or coil construction, with the majority of forms being shallow bowls, deep bowls, carinated vessels, or thick-walled pots covered with a coarse clay slurry mixed with lime-*kankar* or calcrete (calcium carbonate) nodules and fragment of pebbles.[60] Some vessels bear polychrome decoration, using whitish, red-brown or purple-brown pigments, typically portraying geometric and floral motifs, and the bird and net motifs in this period are comparable to decorative elements found at Sheri Khan Tarakai[61] and Rehman Dheri Periods 1 and 2.[62] Comparable material is also found in assemblages from Kot Diji,[63] Jalipur I and II.[64]

Ceramic Landscapes: Transition to the Pre-urban Period (3200-2600 BCE)

There appears to have been relatively minimal to no major technological changes during the transition into the Early Harappan period. Possehl[65] stated that the paradigm already established in the Chalcolithic phases further "expanded rather than modified" into synchronic regional traditions. However, it has also been suggested that during the pre-urban period, e.g. the Kot-Diji phase, significant innovations, such as the use of a "true" fast-wheel for pottery production, were adopted for the first time in certain areas of modern Pakistan.[66] It is also possible that this development did not take place until the Indus urban period, and the extent to which such rotational devices were used in different ways across the diverse regions of the Indus zone is yet to be fully understood.

Following the *Togau, Sheri Khan Tarakai, Hakra* and *Ravi* manifestations, four main regional phases are identified: *Amri-Nal* (Baluchistan, Makran, southwest Sindh, Kohistan and Northen Gujarath), *Kot-*

Diji (Northen Sindh), *Sothi-Siswal* (Punjab and Haryana, India), and *Damb Sadaat* (Quetta Valley, central Baluchistan), with the latter including the *Faiz Mohammad* and *Emir Grey* wares.[67] The Tochi-Gomal cultural assemblage was only found at sites in the Bannu Basin and the Gomal Plain, and is characterised by polychrome pottery akin to Nal ware.[68] Each of these regional traditions encapsulates a specific area of distribution of certain types of material culture, mostly ceramics (see Table 1; Fig. 3). Here, we shall consider the earliest ceramics from northwest India with a view to discussing regional manifestations of ceramic variability.

In northwest India, the *Sothi-Siswal* tradition, which bears some similarities with aspects of *Hakra ware* and emerged in the eastern fringe of the Indus zone, is possibly one of the most significant among the early ceramic industries. Similar material was originally collected at the type-sites Sothi[69] and Siswal.[70] Over the past three decades this material has gradually been contextualized[71] following discoveries at Kalibangan,[72] Rakhigari,[73] Mitathal,[74] Girawad,[75] Farmana,[76] Masudpur VII,[77] and Burj[78] and apparently Nawanbans (Saharanpur, Uttar Pradesh). The classification of Sothi-Siswal ceramics has been organised in many ways, ranging from fabric groups to colours, shapes to manufacturing techniques. This has led to the use of multiple terminologies for this regional phenomenon, which are to an extent often understood as synonyms for aspects of the same tradition, including: Kalibangan Fabrics A to F,[79] Eastern Harappan[80] or Haryana Harappa.[81] Studies by Uesugi[82] and Garge[83] have provided the most comprehensive analysis of these ceramics to date, and have underlined differences with other regional traditions.

Pottery from Kalibangan (KLB) has been used to provide a classification of pre-urban and urban phase ceramic wares and forms, including manufacturing techniques and surface treatments. B.K. Thapar,[84] J.S. Nigam,[85] M. Bala,[86] B.N. Tandon, and V. Roux[87] have all undertaken analyses of ceramics from Kalibangan adopting a variety of methods and have reached a diverse range of conclusions. The initial analyses saw the identification of six classes of ceramics produced during the Indus pre-urban period (*KLB I*), termed Fabrics A to F. Although the term 'fabric' was used for this scheme, the classification method was mostly based on observations of surface treatments rather than composition or clay pastes.[88] Given this ambiguity, ceramics from KLB I have been rearranged several times[89] – using colour of fabrics as the new determining factor to identify Red, Buff and Grey Wares. As a result, on one hand the novel classification scheme brought the KLB I ceramics to be directly associated with and equated to Sothi-Siswal ceramic traditions (*Sothi A*), which were organised in a similar manner.[90] On another hand, the various fabrics, wares and traditions have generated a degree of confusion in the assessment of early ceramics from sites in Rajasthan and Haryana. Given the limited and somehow blurred nature of available data, questions regarding diversity among regional ceramic traditions and systems of production of the pre-urban period could only be addressed in a limited fashion. Consequently, until the distinctive features of each tradition are fully demarcated, direct comparative studies of synchronic and diachronic ceramic traditions – as we know them today in this area – could lead to misrepresentative results.

Similarly, later pottery from the KLB II period has been re-organised into broad classes, namely Buff Ware, Red Ware and Grey Ware.[91] There is, however, a lack of clear delineation of differences, such as separation of surface treatments into 'true' slips and self-slips, light or deep red in colour. In terms of tools and techniques, authors do not necessarily agree on the sequences of actions necessary for producing the pottery found at Kalibangan, suggesting the non- (e.g. Kalibangan Fabric A and D) or limited (e.g. Fabric B and C) use of rotational devices. For instance, it was first suggested that the use of a potter's wheel similar to the modern foot wheel of Punjab – began in the third millennium to produce wheel-thrown vessels.[92] However, Roux and Courty[93] have proposed that coiling was extensively used in both periods, and that rotational devices were used to finish the vessel and effectively remove traces of previous phases of the production sequence.

Neither of the above hypotheses has benefitted from a robust consensus, and have not been developed further to explore social mechanisms responsible for the introduction of new technologies, as well as for the synchronic use of a variety of manufacturing techniques in local ceramic industries.

Discussion and Conclusions

We have discussed the tendency to follow two paradigms for the interpretations of ceramic assemblages and technologies in the Indus zone. The first being the identification of archaeological phases which rely on ceramic seriations and chronologies based on stylistic and typological observations, mostly following a cultural-historic approach.[94] The second encapsulates a linear evolutionary trajectory of technological developments. The overview of technological innovations from the Neolithic up to the Indus urban period has served to demonstrate how scholars have attempted to present the picture of more sophisticated technologies homogenously taking over older, less advanced techniques – mostly in view of possible functional or economic gains within systems of production. The general assumption is that these consistent phenomena happened according to principles of *demic diffusion*,[95] where new approaches were more or less "suddenly" adopted by most communities and spread simultaneously throughout the Indus zone.

The critique to this approach is mostly oriented towards two points. First, such cultural evolutionary interpretations leave little room for exploring the role of the material environment as an active participant in the constitution and transmission of cultural knowledge. Secondly, there are many recorded archaeological and ethnographic instances in which communities may 'learn' about or get in 'contact' with a new trait or technique but choose not to adopt it.[96] Consideration of these two factors will allow for the reassessment of traditions, technological choices and economic aspects of prehistoric ceramic production, including issues of standardisation of pottery within a complex and urbanised society.[97]

This review has served not only to examine technological transformations, but also to assess the extent to which ceramic diffusion and learning mechanisms have been studied so far. Incipient forms of intra-regional interaction spheres in the Indo-Iranian area have been observed since the Chalcolithic phases. The nature of and mechanisms behind these interactions are still not entirely clear; nevertheless, the role of semi-nomad populations and seasonal mobility through changing environments have been addressed.[98] There has been very limited consideration of ceramic variability within regions and between rural communities during the pre-urban and urban periods of the Indus civilisation (see Table 2).[99] However, detailed studies on interaction networks that show Indus medium- and large-scale sites at their intersecting nodes are available. So far, our current knowledge of Indus material culture is mostly based on observations from assemblages recovered at medium to large-scale sites, and the dynamics operating in Indus villages still remain underexplored.[100] This is particularly the case when it comes to understanding ceramic technologies and the nuanced dynamics of social interaction that took place between rural potters, and between potters and the populations making use of their products.

There is much to be learnt from the adoption of a comprehensive, integrated and systematic method for the study of rural ceramics that incorporates a range of quantitative and qualitative data. A combined approach (i.e. a holistic strategy), gives the opportunity to understand social dynamics within community dimensions and at a regional level. This requires the integrated use of various techniques, including the technological and morphological study of vessels, scientific archaeometric analyses, data from multiple sites, an understanding of the paleo-landscape, and comparative experimental and ethno-archaeological studies. Such a bottom-up approach will offer an empirically grounded opportunity to explore questions

Table 2. Simplified summary of ceramic technologies before the advent of urbanisation in the Indus zone. Four stages are identified. SSC: Sequential Slab- built ceramics; BBM: Burj Basket Marked; KGM / T-A: Kili Gul Muhammad and Togau A; SKT: Sheri Khan Tarakai; HW: Hakra Ware; RW: Ravi Ware; SS: Sothi-Siswal; KLB: Kalibangan fabrics (see references in Table 1).

Stages	*Ceramic Tradition*	*Organic Temper*	*Fine Paste*	*Slab*	*Coil*	*Mould*	*Wheel-Fashioning*	*Wheel-Throwning*	*Applied Rustication*	*Monochrome or Bichrome Paintings*	*Polychrome Painting*
Stage 1:	SSC	x		x							
	BBM	x				x					
Stage 2:	KGM/T-A	x	x	x	x	x	x			x	
	SKT	x	x		x	x	x		x	x	
Stage 3:	HW	x	x	x	x	x	x		x	x	x
	RW	x	x	x	x	x	x		x	x	x
Stage 4:	SS	x	x		x	x	x	?	x	x	
	KLB	x	x		x	x	x	?	x	x	

about transmission, transformation, and resilience. When accompanied by an interpretative shift away from cultural evolutionary paradigms towards nuanced theoretical frameworks, it will be possible to better define the nature of traditions in order to characterise *ceramic landscapes,* which may have 'overlapped' with, rather than replaced each other in both a synchronic and diachronic perspective.

Notes

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