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PALAEOLITHIC COGNITIVE INHERITANCE IN AESTHETIC BEHAVIOR OF THE JARAWAS OF THE ANDAMAN ISLANDS

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ABSTRACT

This article considers the limited etic and emic information available on the art-like productions of the Jarawas, Andaman Islands, India, who have only in recent years permitted adequate contact with other societies to facilitate initial studies. Their known history, culture, and art are reviewed, with some reference to nearby other tribes, one of which remains entirely unresearched. It is noted that the known art of the Jarawas consists entirely of nonfigurative or geometric elements, and yet there is evidence that the Jarawas have no difficulty creating highly naturalistic figurative images. The correspondence between the range of their graphic art and the equally limited known repertoire of Final Pleistocene to very Early Holocene South and East Asian art is highlighted. It leads to the consideration of the possibility that the Jarawas' artistic inheritance may be derived directly from a Late Palaeolithic population separated from mainlanders by the rise of the sea level at the end of the Pleistocene. *[India, Andaman Islands, Jarawas, ethnography, material culture, geometric art, Palaeolithic art].*

Scholars have been trying to define art and separate it from non-art through various models and devices. Attempts abound to navigate into how, when, and why the human mind became capable of expressing and recognizing art, and how creative processes actually work (Davis 1986; Hodgson 2000, 2003). The study of palaeoart is actively involved in this quest. The origin of art has been traced mainly through

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archaeological means, which have generally focused on "Palaeolithic" cultures. Embedded in all enquiries on this front is a predisposition to see Stone Age culture as an entity of the distant past, which can be recapitulated through archaeological evidence. The construct of early palaeo-art is thus evidently based on archaeological finds. These consist of a vast number of art-like manifestations, such as nonfigurative engravings, pendants and beads, cupules and linear petroglyphs, proto-figurines, etc., that have been identified as be-ing of Lower and Middle Palaeolithic provenience (Bednarik 1992a, 2003a). This massive amount of evidence underlines that the human capacity to create non-utilitarian products dates back hundreds of millennia.

The present study, however, does not focus on this archaeological record, rather it taps into "living evidence" in order to examine the scope of an alternative source for enriching the discussion on the beginnings of art. In that sense it is hoped that a consideration of the art of the Jarawas of the An-daman Islands can contribute to the discussion of cognitive anthropology.

While the available ethnographic database on art traditions of indigenous groups by and large invokes a great variety of figurative as well as non-figurative (non-iconic, geometric) art, the hunter-gatherer groups of the Andamans exist with a geo-metric tradition lacking any figurative component. This evidence may have considerable significance to understanding the proposed "cultural revolution" models claiming that modern human behavior arose suddenly throughout the Old World around 40,000 years ago, 91 and that behavioral modernity first appeared in Africa where anatomically modern humans are said to have evolved exclusively. 210 It needs to be clarified from the outset that, contrary to the evolutionary model that perceives figurative palaeo-art as conceptually superior to nonfigurative or "geometric" art, the opposite is true. Whereas in figurative or iconic symbolism, the connection between referent and referrer is purely via iconicity – a relatively simple cognitive factor building on visual ambiguity (Bednarik, 2003b) – the symbolism of non-iconic art is only navigable by possessing the relevant cultural "software."

There are numerous cultures that either restrict their art completely to non-iconic forms, or use them for specific purposes, such as highly sacred imagery. For instance, one of the most sophisticated megacultures in history that of Muslim peoples employs principally non-iconic art forms, yet this does not mean that Muslims cannot perceive or create iconicity. The same seems to be true for all other cultural conventions lacking iconic art, such as specific Amazonian tribes or Tasmanians: they have no difficulty detecting iconic meaning in pictures or producing them when prompted. This also applies to the Jarawas. Moreover, numerous nonhuman animal species can perform the task of recognizing and correctly interpreting iconicity in imagery, therefore, it can be assumed that the cognitive faculties required for this task are less complex than those involved in interpreting non-iconic art. Only humans familiar with the relevant cultural convention can detect meaning in such nonfigurative art, therefore, of the two versions, figurative imagery should be seen as the cognitively more primitive.

However, Bednarik (1993a, 1994a) has pointed out that almost all graphic palaeo-art safely attributable to the Pleistocene period is non-iconic. Apart from the Franco-Cantabrian corpus of the Upper Palaeolithic, principally of Western Europe, there are almost no two-dimensional iconic depictions from this period. For instance, iconic sculpture is well represented in the Upper Palaeolithic of Russia and Siberia, but graphic art is limited almost entirely to nonfigurative compositions, notably the sometimes incredibly complex engravings found on ivory and bone plaques. These clearly had symbolic meanings; they often resemble maps but might well be mnemonic devices for telling stories. Their meaning is totally inaccessible to us. Or to cite another relevant example: all credibly Pleistocene and Early Holocene rock art of Australia seems entirely non-iconic, but can be shown to refer to very complex, if unexplained cultural practices. On the basis of all available credible evidence, iconic art appears in Australia only during the Holocene, possibly together with the dingo, an introduced species, and the small stone tool traditions. What renders this particularly relevant is that Australia was initially colonized by Middle Palaeolithic sea-farers from southern Asia, and their massive corpus of Middle Palaeolithic rock art is many times greater than the body of Upper Palaeolithic rock art of Europe. In other words, there is more surviving Middle Palaeolithic palaeo-art in the world than Upper Palaeolithic, and with one single possible exception (Bednarik, 2006), all of the known Middle (and Lower) Palaeolithic graphic "art" appears to be non-iconic, and of a quite narrow range of motif elements.

It is therefore reasonable to rationalize that, on current evidence, graphic palaeo-art traditions commenced with a limited repertoire of non-iconic elements several hundred thousand years ago, and most of the world's Pleistocene palaeo-art continued in much the same form (although the motif repertoire was extended with time). The Upper Palaeolithic graphic traditions of western Europe, still mostly comprised of nonfigurative material, feature also figurative imagery, which in a global perspective is a local aberration that appears to be near-endemic to parts of Europe.

The structure of the discourses on the origins of art is layered with the origins of symbolism, human language, "modern" human culture, and cognition. The discussion on art beginnings has been entirely dominated by discourses on "prehistoric" art, and most specifically on palaeo-art of the earliest phases of human culture. However, the kind of art qualifying to be regarded as prehistoric (i.e., prior to a period an elitist minority defines as History, on the basis of an irrelevant variable, writing) in this context, and the extent to which ethnographic art traditions need to be considered, remains a matter of debate. The prehistoric periods are traditionally and Euro-centrically divided into Stone, Bronze, and Iron Ages. The Stone Age is represented by the so-called Palaeolithic, Mesolithic, and Neolithic periods. The Palaeolithic and Mesolithic periods (food procuring stage) refer to a hunting-gathering and nomadic way of life while the Neolithic period is manifested in a sedentary, food-producing way of life. However, the ethnography of many world regions reveals systematic fallacies in this simplistic taxonomy, which itself

dates from a period of enquiry significantly predating current understanding of the past; it thus needs to be revised (Bednarik 2002). It also involves the assumption that the mode of survival of the represented groups in these periods necessarily reflects their visual art, which is not borne out by the evidence.

A review of all graphic art forms of humanity based on the variable of iconicity, therefore, reveals two streams. One comprises nonfigurative traditions; the other combines these with figurative ones. In an evolutionary perspective, it has been shown that nonfigurative marks characterize human history until the Holocene, in southwest-ern Europe until 32,000 years ago. During the last 8,000 years, the latter stream becomes dominant, although purely nonfigurative traditions do occur up to the present. There is a reasonable possibility that some of these latter cultures might be remnant survivals of the broad Pleistocene spectrum of non-iconicity, most especially in remote geographical enclaves or among remnant aboriginal populations. The early evidence from the Pleistocene features groupings of lines, geometric shapes, and pat-terns, and there is a universal semblance apparent in these archaic traditions (Bednarik, 2003a). Parallel lines, sets of convergent lines, lattices, and dot patterns occur very early and can in some cases be traced back at least 250,000 to 350,000 years B.P. (Mania and Mania, 1988; Bednarik, 1995a). Later they are supplemented by radial motifs, zigzags or meanders, and circles. More recent examples include the Blombos Cave (South Africa) evidence of geometric patterns, perhaps 77,000 years old (Henshilwood *et al.*, 2002). The wide distribution in the Old World of such simple non-iconic forms suggests cognitive universality among the archaic *Homo sapiens* groups involved (Bednarik, 1986, 1990b).

Preliminary studies of rock art and portable art from Asia11 as well as other continents undoubtedly exposed the Pleistocene base of aesthetic production. The palaeo-art of India has been recognized as an important strand of the prehistoric aesthetic tradition of humanity (Chakravarty and Bednarik, 1997). Indian palaeo-art studies have convincingly established the Lower Palaeolithic human workmanship of non-utilitarian products, first at Bhimbetka (Bednarik, 1993b), then at Daraki-Chattan.12 Thirty cupules and four engraved grooves from these two quartzite sites are either of an Acheulian (Misra, 1985) or preceding chopping tool industry, as conclusively shown by stratigraphy. Other early evidence occurs in the form of an ostrich eggshell piece engraved with crosshatched designs from Patne (Sali, 1989) and 25,000 years old (Bednarik, 1994a). Although rock paintings in central India have been suggested to be Upper Palaeolithic (Wakankar, 1983), Misra (1977, 2001) describes them as Mesolithic. Tyagi (1988) also disputes Wakankar's claims for an pper Palaeolithic antiquity of rock paintings in India. However, nearly all known Asian (as well as eastern European) graphic art of the Pleistocene is nonfigurative (Bednarik, 1993a, 1994a). The intricate patterns observed from central Indian rock shelters by Tyagi (1988) are entirely geometric and non-iconic. The Patne eggshell fragment as well as the Mesolithic core from Chandravati (Sonavane, 1991) also bear distinctive geo-metric decoration. Traditionally models of art origins have been guided by deference to the west-ern European paradigm

with its overemphasized zoomorphic depictions. This has led to a false expectation that Pleistocene art would be found to consist of naturalistic imageries, particularly of zoomorphs.

However, evidence of the type archaeology can provide because it has survived incredible time spans should not be considered as the initial manifestation of palaeo-art, since it has been engraved exclusively on hard surfaces. Taphonomy sees to it that most relevant evidence is unavailable, and none of it if it involves perishable materials (Bednarik, 1994b, 1995b). Still today, most art production would not survive as archaeological finds. Because of the temporal nature of most art, very little evidence of early practices can be expected to be available to us. Therefore, the chronological interpretation of the extremely scanty evidence of such early practices is entirely contingent upon its severe taphonomy. Ethnographic art, by contrast, offers a vastly more secure sample, and one that is some-times accompanied by credible emic interpretation. Therefore, we propose that the study of the creativity of the few remaining traditional peoples of the world should be of considerable value in informing palaeo-art studies. In this sense, the few remaining hunter-forager-fisher groups of the Andamans are of particular interest. Especially the Jarawas can provide data on verifiable patterns of aesthetic behavior, evidence that is testable and scientifically falsifiable. In this quest we are not simplistically suggesting that the Jarawas are a "Palaeolithic tribe," but rather seek to present observations we consider relevant to the issue.

The Jarawas of the Andaman Islands are regarded as one of the surviving remnants of the Negritoid substratum of southern Asia. In the con-text of available archaic geometric graphic evidence, the graphic patterns characterizing their art can be considered a remnant of earlier traditions. It would be interesting to establish whether the lack of figurative representation in Jarawa art is attributable to a lack of such creative ability or to other rea-sons. Along with this question, some basic concepts about the functions of the human cognitive sys-tem are already emerging. Further, the world trends in the choice of visual expression lead to another aspect, that is, cultural transmission beyond space and time. The universality of geometric graphic art is not due to proximity; rather it derives from a cognitive context in which creative expressions of humans evolved. To assess the underlying causes that motivated humans to favor geometric markings, we propose that an evaluation of the art of the Jarawas may open the way to a fresh understanding of elementary associative processes.

The Pleistocene archaeological evidence has figured prominently in palaeo-art studies, which some-times attributed false age to the evidence (Bednarik 1996) and is always limited by its inherent weak-nesses in assessing the cognitive faculties of populations to which any emic access is impossible. This article contrasts with palaeo-art approaches and the difference is found not in aims but in method. The limitation of having to reconstruct past cultures and correlating them with "cognition" and "symbolism" of modern humans renders a great deal of speculation inevitable. Whilst it remains essential to build on the empirical basis of the

archaeological evidence, the complexity of the evolution of the concept-mediating role of symbolisms demands an eclectic approach involving both neuro-science and ethnography. Our study represents no radical paradigm shift; rather it advocates a collaborative approach that reconciles the past with the present. This, in turn, opens up not only a dialogue between the cognitive sphere across cultural time but also presents an aspect of cultural conservation transcending time. In order to accentuate the dialogue on cultural conservation back to "Palaeolithic" time, we propose that the graphic culture of the Jarawas has to be understood, and the technological status of the Andaman Islanders needs to be assessed.

THE AREA AND THE PEOPLE

The Andaman and Nicobar Archipelagos are situated in the Bay of Bengal between 6° and 14° northern latitude and 92° and 94° eastern longitude (Map). The archipelago consists of 556 small and large islands. The Andaman and Nicobar islands are separated by Ten Degree Channel, which is about 144 km wide and 400 fathoms deep. The Andaman group of islands extends about 350 km north-south, while the Nicobars cover approximately 262 km along that axis.

The indigenous population of the Nicobars consists of Mongoloid tribes, that of the Andamans of Negritos. The latter are divided into the Great Andamanese and Little Andamanese groups. Most of the ten territorial language groups of the originally most numerous Great Andamanese have per-ished in the 19th and early 20th centuries due to the impact of British colonization. Comprising of the Bea, Balawa, Puchikwar (Bojigyab), Juwai, Kol, Bo (Tabo), Cari (Cariar), Kede, Yereva/ Jeru, and Kora (Radcliffe-Brown, 1948; Man, 1932 [1885]), they now number only 53 individuals occupying 3 km2. Their decimation was hastened with epi-demics of pneumonia in 1868, measles in 1877, and influenza in 1896, and subsequent "assimilation." The Little Andamanese language group consists of the Onges, Sentinelese, and Jarawas. The Onges have been similarly marginalized and now number only 94 members, although occupying 700 km2. The Sentinelese occupies and vigorously defends North Sentinel Island, permitting practically no entry by outsiders. They are believed to number about 100. Even in recent years, they repelled any attempt to land on their island. For instance, in the wake of the 2004 tsunami it was endeavored to land with a helicopter to check how the Sentinelese had fared. A hail of arrows and spears greeted the aircraft and the landing had to be abandoned.

The Jarawas, the remaining of the four Negrito remnants of the Andaman Islands, inhabit at present the western region and coastal belt of South and Middle Andaman Islands. Their current population size is thought to be around 300 and they have led a fully traditional hunter-forager-fisher existence until the end of the 20th century.13 Through their reputation as fierce warriors and uncompromising defenders of their territory they have been able to maintain their way of life despite encroachment on their forests since the British established a penal colony in the 19th century, and later through Japanese occupation. In

July 1996, a Jarawa boy named Enmay, who had fractured his leg after get-ting caught in an animal trap, was taken to a Port Blair hospital. After his recovery and return, the hitherto hostile Jarawas began making friendly contact since October 1997 with the mainstream population, Bengali and Tamil immigrants from the Indian mainland. In September 1999, a measles epidemic affecting 48% of the then 350 Jarawas decimated the tribe (Das *et al.*, 2005). In 2001, an outbreak of febrile illness among the Jarawas, who had apparently never experienced malaria, led to a malariological survey that detected *Plasmodium falciparum* in the blood smears of 30 of the 179 tribes' people examined. It appears that malarial par-asites are recent arrivals for these people, a result of the current fading of their long social and geo-graphical isolation.

Andamanese linguistic groups seem to have evolved from a single language group, but their respective timescales differ. For instance, among the Great Andamanese, there were two distinct major groups. One was recognized as the Bojingiji group (Bea, Balawa, Bojigyab [Puchik-war], Kol, and Juwai) and the group was named after their closeness of language; the other was the Yerewa group (Cariar, Kora, Bo, Jeru, and Kede) who shared a common kind of canoe (*yere*). Each of the communities had further been socially recognized either as *eremtagas* (jungle dwellers) or as *aryotas* (coastal dwellers). Despite differences in environmental niche and ecology, *eremtagas* and *aryotas* of each ethnic community maintained the same language identity. That is to say, intra-community differentiation has not caused linguistic splits while intercommunity differentiation is reflected in language differences. However, apart from their individual linguistic identities, both major Great Andaman groups – Bojingiji and Yerewa – were linguistically closer. But they were not as close with the Onge group. This suggests that the split between the Great and Little Andaman languages occurred much earlier than the split between the Bojingiji and Yerewa groups. The fission between the subgroups followed later again.

The Little Andaman group had also split into the Onges, the Jarawas, and the Sentinelese. Each of these groups maintains separate linguistic identities, but they are cognates. The Little Andamanese languages survived mainly because of the greater isolation, and perhaps the extreme hostility to out-siders of their respective speakers, still maintained by the Sentinelese today. The nonlinguistic cultural database supports the linguistic divisions, for in-stance, the canoes, bows, spears, cooking pots, and baskets of the South and Middle Andaman types were different from those of the other groups. The typological comparison of all Andamanese languages undoubtedly reiterates their common ancestry; although the languages of the Andaman Islands have been studied since the 19th century (Roepstorff, 1987, 1875), they remain inadequately understood. Linguistic enquiries on prehistoric connectivity of the Andamanese languages are scarce, yet there are some observations that, based on the account of mutual unintelligibility and homology, there are no known affiliations either with main-land language families or other linguistic families worldwide. Gray (2005) has suggested that languages through

history change 20% of their basic lexicon every 1,000 years. In that sense, the possibility of cognate words between diverged languages may be of 1% or less after 10,000 years and the mutual unintelligibility may be of 100%. This may be the reason why no external cognates have been detected so far for the Andamanese languages, 14 as the existing comparative methods will not allow detecting homologies beyond 8,000 years. However, Pagel (2000) has proposed long-lived cognate words of 20,000 years age. Further, Dunn *et al.'s* (2005) study suggests that linguistic structural features do indeed contain historical links reaching back at least 4,000 years. But such level of studies has yet to be applied to yield constructive results from Andaman contexts.

Based on Nichols (1992), a preliminary analysis of Jarawa language has been conducted (Sreenathan, 2003). It turned out that the language shows no apparent genetic affinity to other existing languages of Southeast Asia or, indeed, the rest of the world, and there is no evidence of outside influence in the form of borrowing or precolonial linguistic colonization. In an effort to determine the global space for the Jarawa language, selected typological comparison was attempted, which shows that only one feature, inclusive/exclusive opposition directly connects the Jarawas to an Old World pattern and exhibits more typological closeness with the recognized patterns of the Pacific and the New World. The absence of other traits in Jarawa language may be of great significance that seems to indicate an evolutionary depth connecting to a Pleistocene sub-stratum in India.

The aboriginal populations of the Andaman Is-lands along with the Semangs of Malaysia, the Ae-tas of the Philippines, and a few population groups of Papua New Guinea, are considered as remnants of the Negrito populations of Southeast Asia. How-ever, with the sole exception of the Andamanese, these Negrito groups have lost their original languages. The original Negrito languages of the Semangs and the Aetas are unknown. The Malaysian Negritos speak languages of the Asian branch of the Austro-Asian family, a family that dominated the area until two thousand years ago, but has since been replaced on the peninsula, except for isolated pockets by Malay and other Austronesian languages. Traces of extinct Negrito languages found so far show no obvious relationship with Andamanese, and proposals of a connection with the Indo-Pacific family or a linguistic isolate like the Kusunda of Nepal remain unsubstantiated. However, the genetic study by Barik *et al.,* (2008) identifies "a rare polymorphism shared between M31 and M32 lineages [which] suggests that they actually belong to a single haplogroup." It seeks to link this with the hypothetical dispersal of anatomically modern humans and proposes that the "enhanced resolution of M31a suggests a back migration from South-East Asia 20 – 30 kya, into an area that now contains most of the Austro-Asiatic speakers of India." The antiquity of the Andaman Negritoid groups needs to be considered in view of the recent isolation of the mtDNA lineages M31 and M32. Their genetic and linguistic isolation suggests an origin in Late Pleistocene populations of anatomically modern humans that may have reached the archipelago when it was connected to the Asian mainland.

THE CULTURE OF THE JARAWAS

Although their demise as a viable traditional population may be imminent, the Jarawas remain a nomadic tribe engaged in hunting, gathering, and fishing (Sreenathan, 2001). They hunt an endemic wild pig, a monitor lizard, and other quarry with bows and arrows. Unlike the Onges and Andamanese, the Jarawas kept no dogs to help in hunting, although this, too, is now changing. Maritime food sources are of importance, men fishing with bows and arrows in the shallow water while women catch fish with baskets. Mollusks, dugongs, turtles, and so forth constitute a major part of their diet, and they collect fruits, tubers, and honey from the forest. In the latter, they use a plant extract to pacify the bees, and their expertise in the medicinal use of plants is of considerable interest. Digging sticks, wooden buckets (*uuhu*), and baskets (*taaiku*) are used in food gathering, and handmade nets (*pootho*) in fishing (Sreenathan, 2005a). Coastal groups were heavily dependent upon shellfish (Cipriani 1966). In general, the diet, modes of foraging, and of food processing (roasting, baking, boiling) and consumption are broadly shared among all Andaman-ese groups. The temporary camps of the Jarawas consist of huts made of bamboo and palm fronds and they use crude rafts to cross streams. Other Andamanese have used outrigger canoes, which the Jarawas lack. The *thuuya*, which is a leaf stem of the *thuuya* plant, was traditionally used as a float for swimming. Pieces of polystyrene wafting ashore are also used these days.

The archaeological evidence (Dutta, 1978; Cooper, 2002) demonstrates that the Andaman Islanders possessed stone tool technology. Besides lithics, bones and animal teeth were also used as tools, which have been dated back to about 2,000 years. The stone tools found in kitchen midden excavations invite comparisons with stone tool technology elsewhere, and they may suggest that the peopling of the islands may have occurred relatively recently. However, such a hypothesis cannot be tested due to limitations or lack of relevant evidence, or a preference for naturally shaped materials. More-over, archaeological remains of the Pleistocene are likely to have been submerged beneath the rising sea (Curray, 2005). Thus the available and limited evidence may not suffice to gauge the time of the peopling of the islands. Colebrook (1795) observed that "their arrows are headed with fish bones or tusks of wild hogs; sometimes merely with a sharp bit of wood, hardened in the fire, but these are sufficiently destructive." The fibula of the pig was also used for the same purpose (Man, 1932). The 1901 census of India states:

Stone Implements – The only stone cutting implement known to the Andamanese is the quartz flake chipped off, never worked and held between the fingers for shaving and tattooing, and shells and fish bones are used for the small blades of the peculiar adze of this people, and for arrow points scraping and cutting. A cyrena valve is the ordinary knife and scraper. Hammers, anvils, bones and oven stones are made of natural stones. They have never made celts . . . the ends of glass bottles for some years and iron from wrecks for a long time past have been substituted for the indigenous implements, when and where procurable. The object of the long series of murderous raids made by the inland Jarawas on the outlying parts of the

penal settlement proved to have been made in search for iron implements which on the whole are coarsely and roughly made (Temple 1903).

The historical record conveys that Andaman autochthons used improvised iron implements during the days of the British occupation, which began in 1853. Their arrows may nowadays be made of iron derived from shipwrecks and driftwood. Indeed, the metal was known to them well before the advent of the British as shown by its presence in all levels of the Chauldari kitchen midden (Cooper, 2002). This pattern of adapting a stone tool technology to newly available materials can be found widely elsewhere. For instance, the indigenes of Australia first became acquainted with steel through the con-tact with Macassans shortly before the arrival of the Europeans. After contact with the latter, Aborigines began flaking telegraph insulators, bottle glass, and other introduced materials, and they cold hammered horseshoes into huge "shovel-nosed" spear points.

The rapid acquisition of such new materials challenges the traditional Eurocentric definitions of eras characterized by the materials used. The opportunistic use of metal or glass does not change the underlying ecology of a people, because they continue to lack the technology of manufacturing these materials. Over the last few years, the Jarawas have come into contact with many new materials, such as plastic, textiles, and paper, but so far their ecological and economic basis essentially remains as it has been in the past. Most importantly for our present purpose, their metaphysical world, their ontology or their aesthetic concepts have most probably not changed to any significant degree since the time they relied purely on materials supplied by their immediate natural environment. Their language and their art may both be subjected to major changes now, but so far they have probably retained their traditional format. The emerging issue is not to define the Andamanese groups as Palaeolithic remnant populations, on the basis of their under-lying technology, but to recognize that traditional European categorizations are irrelevant to the issue we wish to address here – the status of Jarawa art.

The material culture of the Jarawas shows a gender-based organization of crafts, of which there are broadly two kinds. The primary type is related to their sustenance pattern and the secondary one to the making of ornaments. The absence of specialized craftsmen/craftswomen obviously marks the Jarawas as individually self-sufficient. Ornamentation of material culture related to subsistence was an obligatory practice among the Great Andaman-ese while for others it was optional. Jarawa ornaments are generally simple and community specific. Except cloth and wool nowadays, all other ornament materials are indigenous and there are no ornaments made of metal. Ornaments are commonly fashioned from selected shells, leaves, flowers, and fruits. Permanent ornaments are made of shells (*lelele*), *epochiimi* leaves, pandanus, bark, and cloth or wool.

The temporary or permanent huts of the Jarawas are generally thatched with leaves. Temporary huts have thatched roofs but their sides are open. Dwelling patterns reflect the minimum requirements of individual families or a group of families

(communal huts) and the close-knit nature of the society. Small huts are arranged in rows facing the sea or the inland, arranged contiguous or keeping a distance, or the arrangement may be irregular. It may be L-shaped or in a straight line, or with huts face-to-face.

The architecture of the Jarawas reminds us of the nonhierarchical social structure. No animals live in their dwellings. The parents and their dependent infants constitute the family. The adults of both sexes may or may not sleep with parents in the same *chadda* (hut). Unmarried boys and girls are allowed to stay in separate *chaddas*. Within the *chadda* any space other than the oven space is a sleeping space, which anybody within the family can occupy, and there is no rigid direction or pattern of sleeping practiced. If anybody sleeps outside, that space is marked with two sticks. Normally widows and widowers sleep in the open.

The people refer to themselves as e*ng* (human; Sreenathan, 2001); the word Jarawa is the name given to them by outsiders (Sreenathan, 1996). The lowest structural unit in the social organization among them is the elementary family. Jarawa society comprises different hunting units (Sreenathan, 2001), each of which is composed of intra- and inter-generational kinfolk. It contains consanguineous, collateral, affinial, and descendant relatives. They possess an Inuit-type kinship system (Sreenathan, 2005b) with nuclear families, monogamy, and a deme community organization. Both patrilineal and matrilineal rulers and exogamy are absent. There are no forms of medical practitioners or shamans, and until recently medical care was entirely by traditional means (Sreenathan, 2001).

There is an almost complete absence of musical instruments in the entire Andamans. The only exception is a sounding board shaped like a shield the Great Andamanese formerly used, well ornamented with white clay and used for marking time in song or dance. However, the Jarawas and the Onges use no musical instrument. Their songs are community-specific in nature and all members participate in the singing. No gender differences are observed. Songs are mainly isorhythmic in structure, a single rhythm being repeated. The syllables are grouped into sequences as in words and are of-ten repeated. Phonological deviations of the shape of the words from that of their normal form can be detected. Such changes are yet to be recognized as anaptyxis, metathesis, dissimilation, procope, apocope, synocope, prothesis, vowel harmony, epithesis, and epenthesis. The lack of sufficient data prevents determination of whether the Jarawa language has developed into a poetic dialect. Songs have words and music and may be functional too. Breathing techniques were unknown to the Jarawas, hence they pause any time during singing and then continue. However, what they mean through these songs semantically and symbolically are yet to be established.

The Jarawas have their own performing tradition. Their intricate and rhythmic dance movements are often monotonous. In a common dance form they stand in a row holding each other closely, jumping one step forward and then backward in a rhythmic manner. The dancers themselves sing the accompanying song. Formal

dancing is generally performed as part of important social ceremonies. Men and women do not dance together. Children, married and unmarried folk dance separately. In-formal dance, however, is a spontaneous expression of joy. It is performed as part of gift receiving, in connection with the reunion of hunting groups or to mark the success of a good hunt. Remarkably, only women and children participate in this spontaneous expression by clapping their hands on their thighs. Songs are performed with or without clapped rhythm. These occasional but spontaneous outbursts of singing are common. However, representation of supernatural beings through dance has not been observed among the Jarawas (Sreenathan, 2000).

The Jarawas possess no system of writing. A set of wavy lines can be observed in some of their designs. It is understood that such lines symbolize the sea, in which case the motif could be defined as a pictograph. Another design recalls the bone of fish or a creeper. Besides these, there are no analogized patterns observed or recognizable. Even in these cases, the Jarawas are not in a position to explain the iconic relevance because they are merely following a conventional style and pattern. The use of such graphics does not indicate that they have a non-phonological system expressed in pictographs, nor do the Jarawas use ideographs.

One of the greatest threats to their continuing viability derives from the Andaman Trunk Road, which passes through today's Jarawa Reserve, an area of 765 km2 of thick forests. In May 2002, the Supreme Court of India ordered that the road be closed to general traffic, but so far the order has not been executed. There is considerable trespass occurring in the Reserve through poaching, logging, and the illegal removal of forest produce, such as honey. The Jarawas resent this continuing encroachment and altercations still occur, though no fatalities have been reported in recent years. Unless there is political will to protect these people effectively, it is likely that they will experience the fate of two other Negritoid tribes of the Andamans as reported above.

ART OF THE JARAWAS

The most important aspect of art in the context of all Andaman hunter-foragers-fishers is that they never promulgated iconographic art. No animal, plant, or human figure features in their graphic tradition. The Jarawas practice art only in the form of geometrical patterns and these are mainly found as body makeup or as painted designs on the bow, chest guard, band of the chest guard, wooden bucket, and on the headband (*mahwa*). Generally, these graphic expressions are arrangements of vertical or horizontal lines, at times crisscrossing lattices, zigzag, or wavy patterns. The characteristic feature of their graphic expression, rhythm and symmetry, establishes and celebrates a balance be-tween the Jarawas and their environment.

All community members recognize these designs and they are community specific in nature. Both elementary patterns and combinations of patterns occur. With a limited scope of creative in-novation at the individual level, patterns are chosen on

the criteria of attractiveness. The females contribute most of the design work. Whitish-gray clay, red ochre, and the juice of a creeper called *bailatta* (Sreenathan, 2001) are commonly in use for the purpose. Whitish-gray clay is mixed with water and used for ornamental painting of the body. The red ochre is applied to the person for ornamentation during ceremonial events.

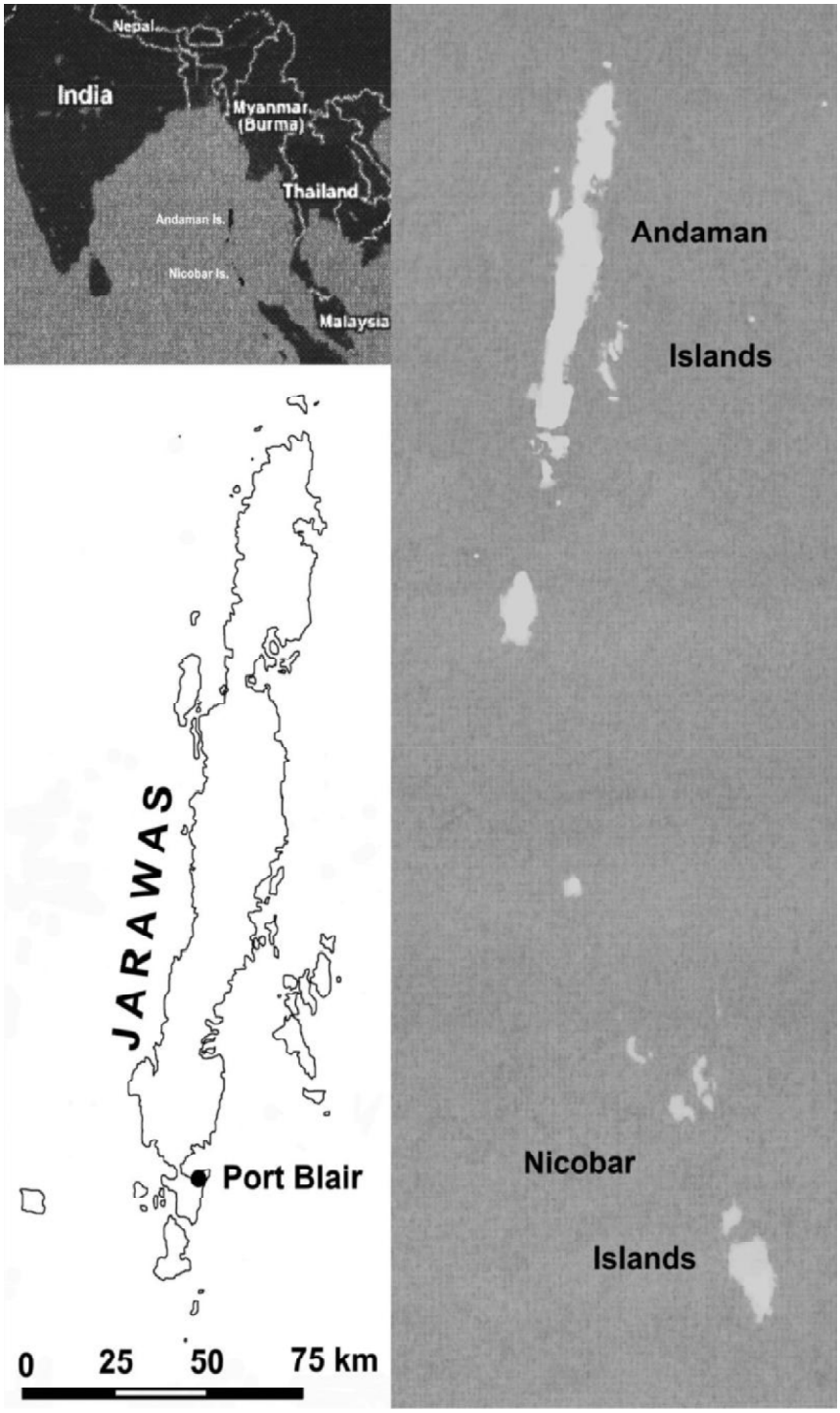
It needs to be fundamentally appreciated that the Jarawas do possess the creative potential to produce iconic motifs. The Jarawa boy named Enmay could create animated figures from memory (Fig. 1). It is therefore cultural practice rather than ability that determined the strict adherence to geometric art forms. Cognitive capacity and form of artistic convention need not coincide, as we have seen from other cultures. The same could well have been valid for many Pleistocene traditions.

BODY DESIGNS

Unlike the body paintings of the Onges, Jarawas have only elementary patterns (Figs. 2 and 3). Among all Andamanese groups the Onges produce the most elaborate body painting (see Appendix). Several linear designs are found on the bodies of the Jarawas. Wavy designs (*aawaav*) are most com-mon on the face. *Aaweed* is the crisscross lattice pattern drawn on breast, chest, and stomach. The *ikkaath* or *heyaaya* parallel lines design is found on the hands and occasionally on stomach and chest. Horizontal and vertical lines are found on any part of the body and are called *oppo*. Body designs are generally made by smearing the body with clay and then scraping out the designs with fingernails or with a small scraping instrument made of a stick or pith, or by directly drawing with the finger. Mostly one paints oneself but the more elaborate work is accomplished with the help of others, especially wives painting their husbands. Designs are applied irrespective of sex and age. No tattooing is ob-served (Sreenathan 2000, 2001) and corpses are not decorated.

CRAFT DESIGNS

A natural dye of brick red color, extracted from the creeper *bailatta*, is used. The surface is always smeared with beeswax before the dye is applied. Ornamenting crafts with clay paint is not practiced. Not all crafts are embellished with such ornamentation. The bow shaft, wooden bucket, and chest guard are the important items on which designs are commonly found (Figs. 4 to 6). Also to be noted is that no cultural material object is painted a second time; whatever designs once made on it will be allowed to fade. These designs provide no distinctive-ness to one's possessions as they are community designs, which all members may practice. Some individuals produce simple designs while others take pains to make the designs more attractive. The occurrence of both decorated and undecorated crafts suggest that the decoration is aesthetic rather than endowed with any spiritual values. Typical motif forms found on craft items are zigzag lines and small circles (e.g., *onebialile* and *bethubethuoppo* designs on chest guards, see Fig. 7), herringbone, ladder, and loop patterns (Fig. 8).



Map: Location of the area

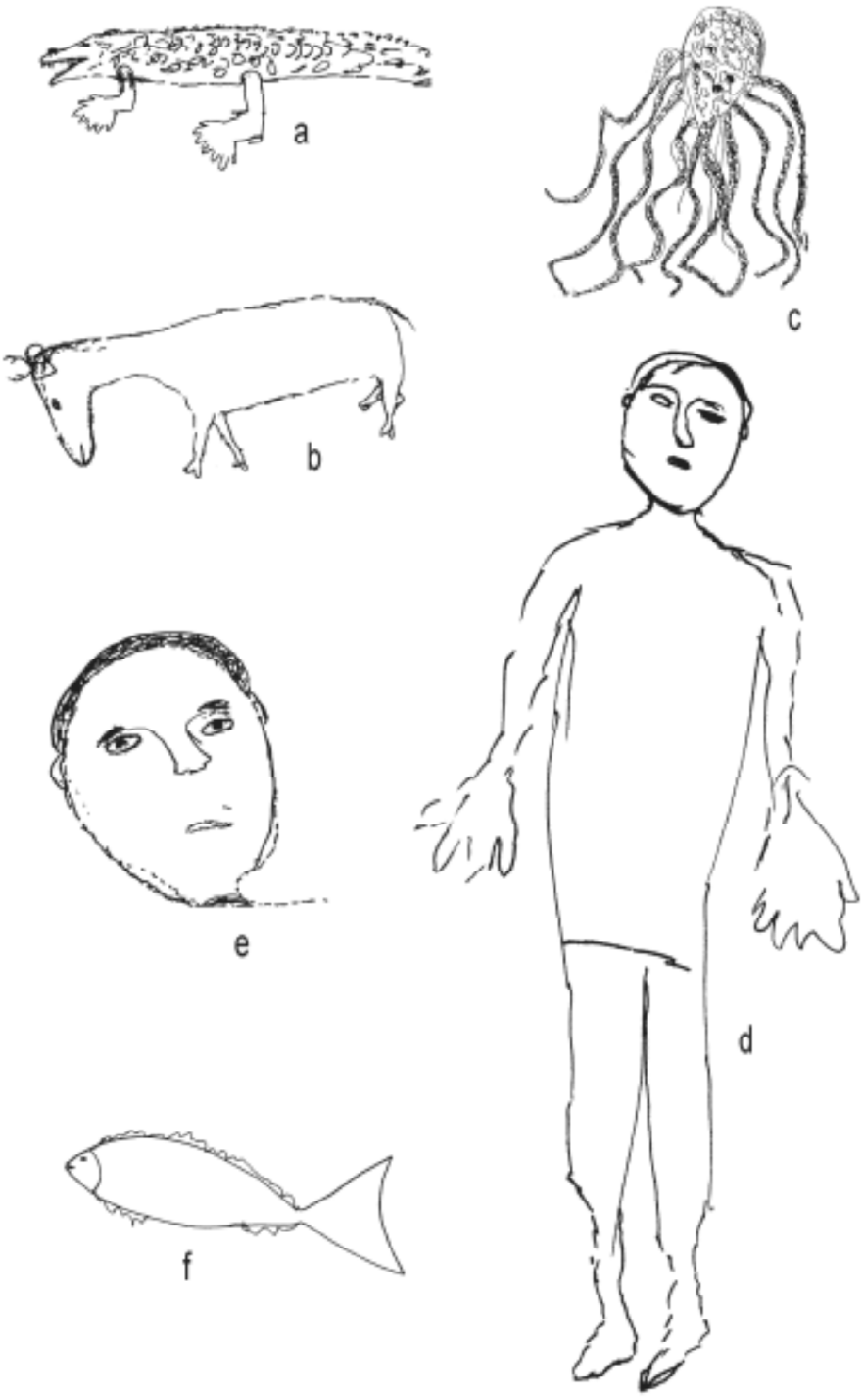


Figure 1: Iconographic drawing ability of the Jarawa boy Enmay

Figure 2: Jarawa body painting

Figure 3: Jarawa boy with body painting

Figure 4: Decorated chest guard worn by Jarawa man

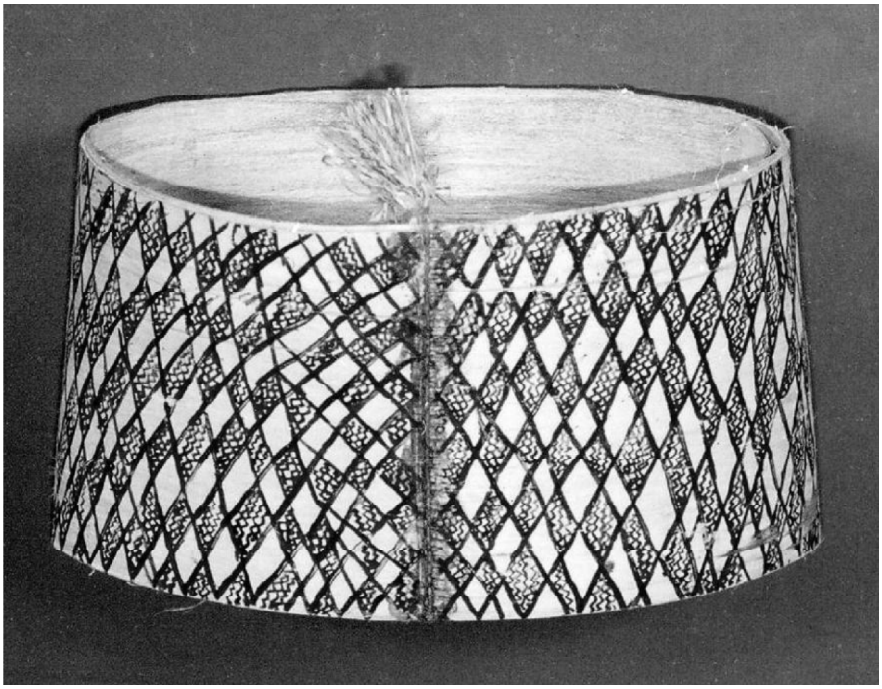


Figure 5: Jarawa chest guard painted red on white

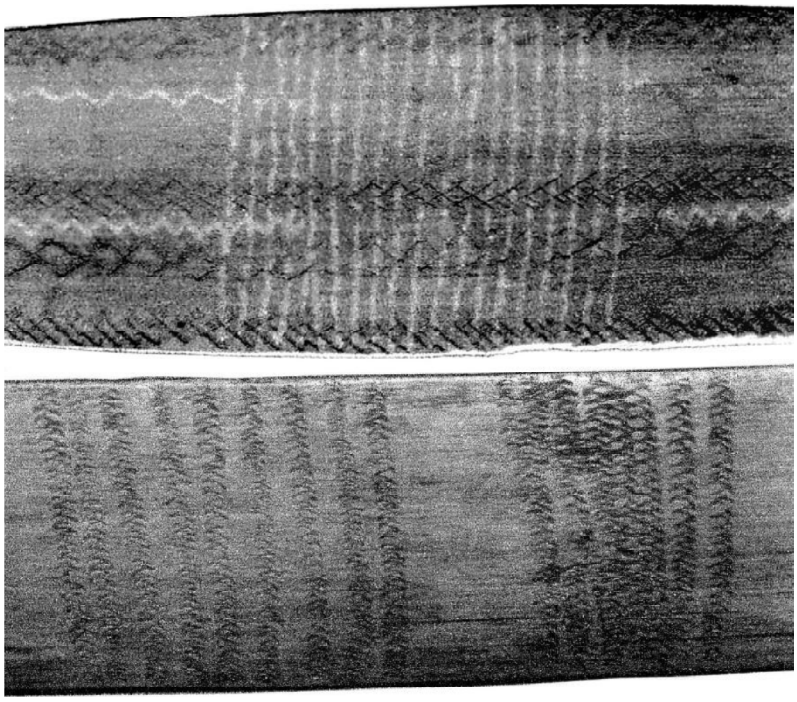


Figure 6: Two Jarawa bow shaft designs

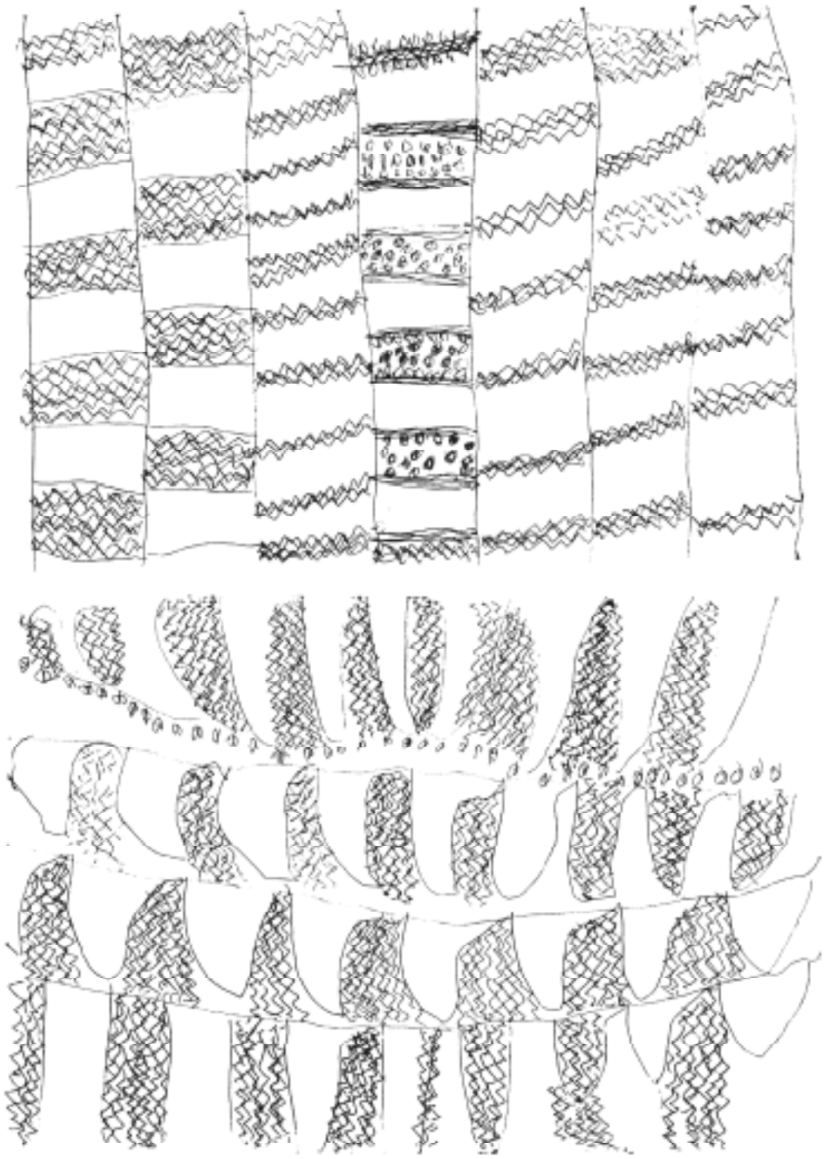


Figure 7: *Onebialile* design (top) and *bethubethuoppo* design (bottom) on chest guards

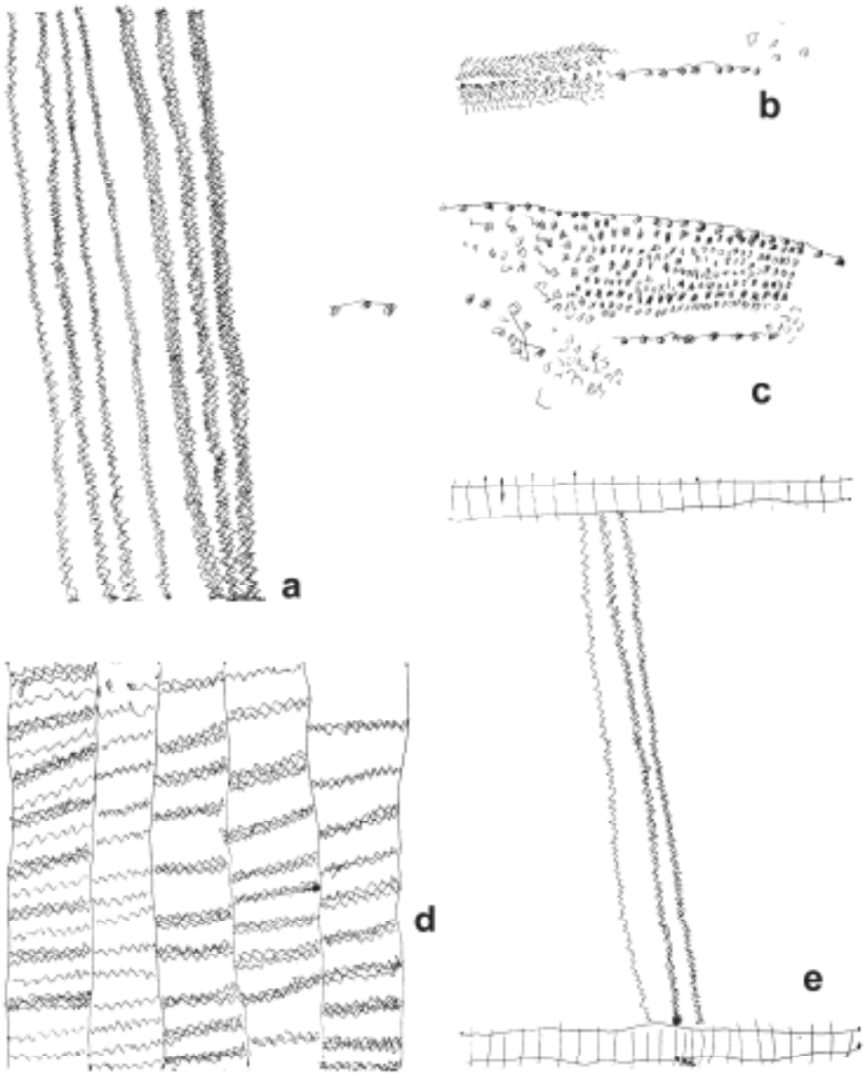


Figure 8: Typical Jarawa designs: (a) *oppo* design on bow shaft, wooden container, and body; (b) *oppohaaneev* design and (c) *thothaaleev* design, both found on bow shaft and wooden con-tainer; (d) *oppodewevelvel* design found on bow shaft, chest guard, and wooden container; (e) *beethobetholev* design on wooden container

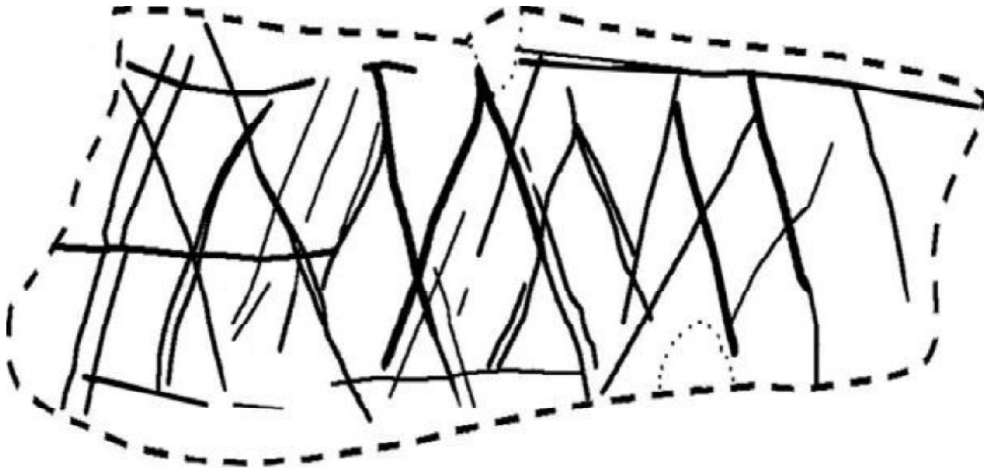


Figure 9: Engraved pattern on hematite, Blombos Cave, Middle StoneAge

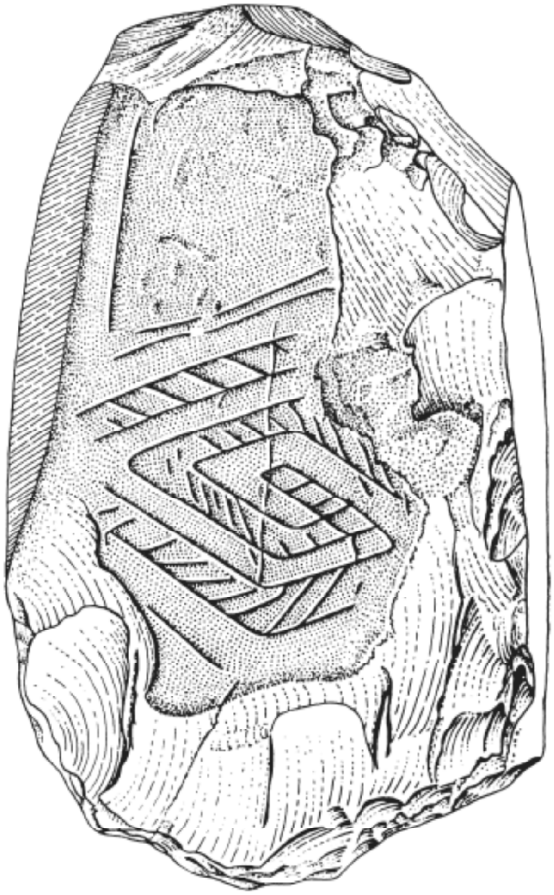


Figure 10: Engraved pattern on chert core, Chandravati, India, perhaps Early Mesolithic

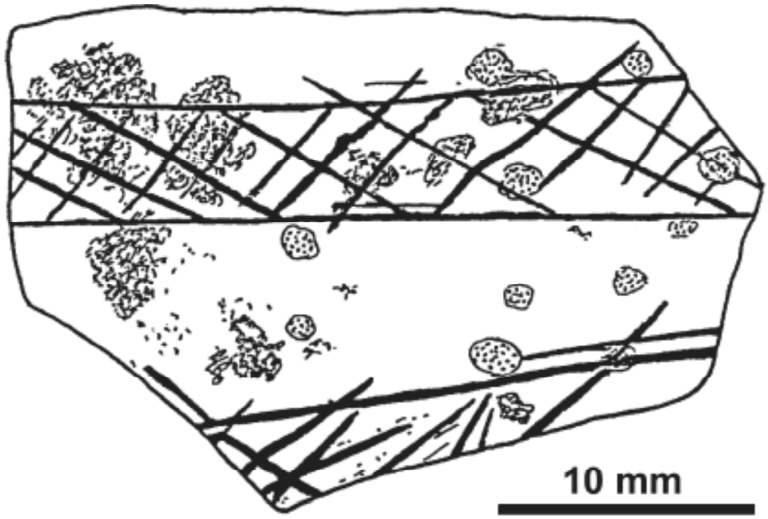


Figure 11: Engraved pattern on ostrich eggshell fragment, Patne, India, Upper Palaeolithic

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Pottery is not very developed among any of the Andaman hunters, and the Jarawas have only small pots with a conical base like those of the North An-daman groups. Decorated ceramics are not found among the Jarawas and the Onges, and the limited Jarawa pottery is comparatively crudely made. The Onges had large pots which they used as cook-ing vessels (Basu 1990). Archaeological fragments of Great Andamanese ornamented pottery suggest aesthetic concerns. Horizontal and vertical linear grooving as well as wavy patterns are found on that pottery. Man (1932) does not state the purpose of the decoration.

CONTEXTUALIZING JARAWA ART

It seems worthwhile to consider the intricate de-signs found among the Jarawas in the context of the non-iconic geometrical genres of palaeo-art. Placing them within the palaeo-art discussions opens a new vista of understanding the beginnings of art, and it projects the value of anthropological information of traditional societies in the discussion of early aesthetics of humanity. The presence of intricate geometric designs and the absence of figurative imagery found among the Jarawas bring to mind the non-iconic nature of Asian Palaeolithic and probably also Indian Mesolithic art. But the problem in such comparisons is that the two art forms, besides being separated by many millennia, are only known from very different media. Ancient palaeo-art offers geometric engravings only on hard and deterioration-resistant surfaces that re-main as archaeological residues, while the evidence presented here consists of anthropological observations. Only the pottery designs observed among the erstwhile Great Andamanese (Man, 1932) would qualify as "archaeological data".

Of particular relevance is the apparent analogy of graphic morphology between the archaic and living evidence. The inherent promise of palaeo-art studies is to illuminate the beginnings of art, and we propose that the prospects of that quest can be enhanced by testing its findings in an anthropological setting.

The early geometric marks have been explained from different angles focusing on certain fundamental questions pertaining to the "origins of art." Such discussions can be defined as being about the initial "motivation," morphology of form, and the mechanisms, kinetics and techniques responsible for the creations, and the early symbolic or indexical value of non-iconic markings. The presence in the Lower and Middle Palaeolithic periods rendered these geometric marks not only relevant in the discussion of the beginnings of art but also added an expectation that a common innate cognitive mechanism, valid over huge distances in both time and space, was responsible for their creation. These deductions made concerning archaic graphic markings have been gathered only from most durable surfaces (Bednarik, 1994b, 1995b). It is not logical, however, to believe that early hominins abruptly started to create engravings on hard surfaces. Rather, we need to see the earliest avail-able record as being highly untypical, as being a taphonomic residue that has been so severely truncated by preservation bias that any simplistic interpretation of it would be doomed to failure. Indeed, we must assume that nothing at all should have survived until art-like production became capable of creating extremely deterioration-resistant forms that had a remote chance of surviving hundreds of millennia. It is only from this perspective of taphonomic logic that the empirical evidence can be expected to be useful at all; without it, it will inherently be misinterpreted (Bednarik, 1994b).

To understand how, when, and why humans became capable of expressing and recognizing palaeo-art, and how the relevant cognitive processes actually work, we need to consult a biological model. Human adaptations described as modern appeared gradually, and along with their universal presence (Bednarik, 2003a), chimpanzees drawing (Tanaka *et al.*, 2003), and the universality of graphic primitives in the expressions of children15 indicate innate behavioral features. The development of palaeo-art is crucial to understanding human cerebral evolution (Langer, 1967; Bednarik, 1990b, 2003a). Donald (1991) presents the view that with encephalization (brain enlargement) humans acquired the capacity for a "self-triggered re-call and rehearsal loop," which basically amounts to the recursive capacity (Chomsky, 1968, 1988, 1994, 1997). Psychologists sometimes refer to this process as "representational redescription" (Karmiloff-Smith 1992). The language faculty also has been recognized as innate by Chomsky and he further suggests that human language might have resulted from the integration of a "conceptual capacity" with a "computational capacity" that could deal with "discrete infinities through recursive rules" (Huybregts and van Riemsdijk, 1982). The questions framed in the domain of the biological evolution of language (Jenkins, 2000; Plotkin, 2003) clearly indicate the fundamental problems that what constitutes knowledge of art and how it is acquired and how it evolves are not only significant in

understanding language but also in other cognitive domains. The model proposed by Donald (1991) in order to understand the human evolution through three stages, viz. mimetic symbol use without symbol creation, construction of conceptual space using language, and the deposition of symbolic properties in material culture, capable of intervening in social behavior or in communicating meaning, may not provide convincing answers in all respects, but his concept of the external storage of symbolism has great validity in illuminating the role of palaeo-art.

Production and comprehension of art involves several neuropsychological and neuroanatomical steps. These include the ability to transduce through externalization perception from one neurological, physiological, cerebral system to another, governed by crossmodal connectivity in the brain. On this view the production of art is a process of crossmodal transfer. Hodgson's (2006) "neurovisual resonance theory" is based upon how the visual cortex and visuo-spatial areas of the brain function, and how different regions of the visual pathways resonate or respond disproportionately according to the nature of the stimulus. According to the biological origins theory, certain images elicit reactions that are built into our visual system.

Body ornamentation no doubt reflects the anthropocentric self-awareness of humans. Among the Jarawas, wearing certain kinds of ornaments made of shells, bones, flowers, fruits, leaves, and threads, painting the body with clay and with *allam* (a mixture of red ochre and pig fat), and wearing the jawbone, skull, or other bone of a deceased person are the elements of ornamentation found. A context-sensitive understanding and cultural deduction disseminates the semantics of the Jarawa ornamentation as a means of establishing humanness (realization, happiness and victory, emblemic indicator, respect for the deceased, saving from evil spirits). All these point towards the symbolization of self-awareness.

Perhaps the surface on which humans started making marks was their own body. Daubing the human body could have been initiated to protect it from the sun, from cold, insects or other parasites, leading to decorative signification. Ochre use by hominins can be traced back to the Early Acheulian in India (Bednarik, 1990a) and south ern Africa (Bednarik, 1992a, 2003a; cf. Beaumont, 1973). Initially lines may have appeared as a by-product of smearing the body with clay or ochre (as did the Tasmanians, for instance). This may have introduced the possibility of intentionally etching lines with fingertips. A similar practice can be observed on the walls of limestone caves in Europe and Australia, where soft cave deposits of "moonmilk" (a carbonate precipitate) have been extensively marked with fingertips in the Pleistocene (Bednarik, 1986). Line markings unintentionally produced by fingers may have prompted visual arousal because they reverberated with the visual system due to the arrangement of neural receptors.16 The reciprocal interaction between cognitive mechanisms and regularities of the world (Shepard 1984; Tooby and Cosmides, 1992) may have resonated and prompted repetition and symmetry in geometrical expressions derived from the very structure of the neuro-visual system (Pinker 1997).

The graphic expression of the Jarawas seems to reflect lines floating in a flat space with a conspicuous absence of any suggestive orientation. Do they perceive space as flat, without comprehension of depth? Do they experience the material world without images, as a connected geometry of lines and curves floating in a flat space devoid of time? Indeed, the aerial view is central to the Jarawa view of space. The designs are created from the very sense of their social perception of space, perhaps dominated by mobility and closeness, and that may be the reason to draw clusters of lines and curves. Everything in their space appears to be connected and no space remains discontinuous to them as long as it is in their possession. At the same time island space is bounded and their socialization is, there-fore, restricted. In their sociology, also, the family is the basic unit and their ensemble is an extension of it. Casting the family within the space of a continuum is manifested in their dwelling patterns. Mobility and closeness are correlated in order to allow the Jarawas to maintain their social structure. Linear patterns are similarly restricted and do not extend beyond the boundaries fixed in the designs. The pictorial space is circumscribed and filled with lines and curves apparently in movement. Every unit in the designs lives within the identical yet flexible boundary, as that of family huts. No physical center is fixed in the design space, as the people do not maintain such a center in their social life. The organic collectivity of their life appears to be the rhythm reflected in the graphic expressions found in their material culture.

We regard the non-iconic tradition of the Jarawas as a part of the non-iconic ensemble of the rest of the world. A core understanding of geometry has recently been recorded in an Amazonian tribe (Dehaene *et al.*, 2006), reinforcing the notion of innateness of geometrical canons. Most importantly, we find several of the features of Jarawa art duplicated in known non-iconic Pleistocene and Early Holocene traditions, despite the significant differences in the media used and the very sporadic nature of the archaeological record. Having mentioned above that nearly all graphic art of the Pleistocene outside of southwestern Europe is non-iconic, we note that there are few exceptions, which nevertheless imply that the ability and potential of producing iconic imagery existed across Eurasia (as, we have noted, it does among the Jarawas). If one excludes the few examples that are more appropriately considered as bas reliefs (such as the anthropomorphs from Molodova V, Ukraine, and Kostenki I, Russia; Abramova, 1962) or that are doubtful (such as the rabbit-like engraving from the latter site, or the iconic elements Marshack (1989) mistakenly discerns in the markings on the mammoth tusk tip from Kirillovskaya, Ukraine), the confirmed iconic figures in the "Palaeolithic" graphic art of eastern Europe and Asia are limited to the undated paintings in Kapova Cave (Bo-riskovski 1984: 226) and Ignatiev Cave (but note that Steelman et al., (2002) have dated a "Palaeolithic" "mammoth" figure in that cave to 7370 50 B.P.) and two portable mammoth engravings, one each from Mal'ta and Berelekh, Siberia, and perhaps one figure from Hayonim Cave, Israel. Instead of iconic (to most contemporary humans figurative) elements, graphic Pleistocene art seems to have consisted almost entirely of "geometric" arrangements. In about 97% of the total area of Eurasia, and in North America, graphic Pleistocene art, wherever it

does occur, is almost entirely re-stricted to geometric or non-iconic marks. Of particular interest are the numerous "geometric signs" on portable objects from Russia (Marshack, 1976), Ukraine, Siberia, and India (Bednarik 1994a). They are best exemplified at Eliseevichi, Mezin, Kir-illovskaya, and Mezherich (but also occurring, less pronounced or in smaller numbers, at Patne, Mal'ta, Afontova, Kavkaz, Balinkosh, Klinets, Timonovka, Suponevo, Novgorod-Severskaya, Avdeevo, and Gagarino), in the first Palaeolithic art discovered in China, in several engraved objects from the Levant (especially the Urkan e-Rub II plaque and an Upper Besor 6 ostrich eggshell fragment), and in the 134 engraved plaques from the Gault site, Texas. The same pattern is earlier found in south-ern Africa, at Blombos Cave (Henshilwood *et al.*, 2002; D'Errico *et al.*, 2001), and may later have extended to North America, where it occurs in the Clovis tradition.17 These palaeo-art traditions begin in the Lower Palaeolithic at Bilzingsleben, Wyhlen Sainte Anne I, Auditorium Cave, Daraki-Chattan, and perhaps East London in South Africa (see Bednarik 2003a for details) and Sai Island (Van Peer *et al.* 2003). They continue through the Mid-dle Stone Age (e.g., Blombos, Fig. 9), Mousterian (e.g., La Ferrassie), and Micoquian (e.g., Oldisle-ben) and extend right through to the end of the Pleistocene, often occurring as reticulate patterns, sometimes of extraordinary complexity (Bednarik, 1992a, 2003a). This body of evidence remains largely ignored by mainstream archaeology with its fascination with zoomorphs.

Of particular interest in the present context are those archaeological engravings that feature lin-ear and geometrical markings. Those of the Lower Palaeolithic are generally very basic, but in the Middle Palaeolithic specific graphic elements appear, such as the zigzag pattern from Bacho Kiro (Bulgaria), the lattices from Blombos Cave, or in the complex geometric comprehension evident in the Tata nummulite (Hungary) (Bednarik, 2003a). These motif types continue through the Upper Palaeolithic and Mesolithic (consider, for instance, the few engraved bones Wakankar (1975) reports from Bhimbetka) or the engraved Chandravati core (Fig. 10). The "intricate geometric patterns" in Indian painted rock art, tentatively attributed to the Early Mesolithic period, are also suggestive of a tradition resembling the art of the Jarawas.

DISCUSSION

Of the greatest relevance here are the patterns that, like those dominating Jarawa art, are contained within fixed spatial boundaries. These appear first in the Asian Upper Palaeolithic and continue through the Mesolithic, forming a distinctive feature of early Asian art systems. Indeed, their similarity with Jarawa art is so conspicuous that it deserves closer attention. Typical examples are the engraved decoration on the Patne ostrich eggshell fragment, dated to 25,000 years B.P. (Fig. 11), or the three separate patterns on the only Pleistocene art object so far reported from China (Bednarik, 1992b). However, this convention can perhaps be traced back to the Middle Stone Age in Africa (at Blombos Cave). Irrespective of this, it can fairly be described as a dominant factor in the graphic art of Asia from roughly

25,000 to 7,000 years ago *as it is known today*. To find this very same and highly distinctive characteristic so well represented in Jarawa art raises an immediate question: to what extent could extant Andaman cultures be related to the Late Palaeolithic or Mesolithic of Asia?

This is not a matter of naively placing Jarawa culture in these technological pigeonholes; rather, we wish to consider the derivation of their graphic arts. There is only two realistic possibilities concerning the colonization of the Andamans by Negritos: they arrived either on foot or by water-craft. In the former case, this can have taken place only at times of lower sea level, i.e., in the Pleistocene. In the latter case, we need to ask why ocean-going seafaring technology is now absent in the islands. This does not necessarily negate the possibility of maritime colonization, because we know from the Australian example that this continent was clearly settled by seagoing Middle Palaeolithic people (Bednarik, 1999), yet they lacked developed maritime capability in more recent times. However, in Australia this is probably attributable to the local lack of large bamboo species, which rendered it impossible to build the kind of vessel Indonesian bamboos had made possible. It would be unlikely that the region to the south of the Irrawaddy Delta, including the present Andaman Islands, had not been occupied by humans in the Pleistocene. Almost certainly it was, although most of the formerly populated areas may now be under the sea. It is then inescapable that there must have been descendants of marooned Final Pleistocene populations. One empirical counterargument is that there is pottery on the islands, but there are caveats here also. First, decorated pottery of the Pleistocene occurs elsewhere in Asia (at least in Japan, of the Incipient Jomon culture), but more relevantly, the very simple conical base pots of the Jarawas immediately bring to mind the Mesolithic pottery of northern Europe. The decorations one finds on Maglemosian art objects also resemble the art of the Jarawas.

In trying to determine the appropriate pigeon-hole of the material culture of the Jarawas in terms of the sequence dominating mainstream archaeology we need to strip away material evidence opportunistically acquired in recent centuries, such as the utilization of steel parts from shipwrecks. The underlying indigenous material culture seems to resemble a version of what is traditionally regarded as an Early Mesolithic technology, or alternatively a Late Palaeolithic economy with some few subsequently introduced features, notably incipient pottery (conversely, ceramics of the Upper Palaeolithic are well known from Europe, so it is false to cite this as a discriminating variable). Either way, the graphic art production strongly con-firms a correlation with cultures traditionally de-fined as Upper Palaeolithic or Mesolithic on the nearby mainland.

However, here it needs to be appreciated that the constructs of these two cultural entities are themselves problematic. We have no idea whatsoever, anywhere, what the cultures or technologies were of all the coastal people of the world during the entire Pleistocene. All the information we have gleaned comes from mobile inland populations, yet it is possible that the coastal people were far more sedentary (due to reliable permanent food sources), perhaps culturally and even genetically

different. Therefore, what we simplistically read as the Mesolithic "revolution" in Europe may simply mark the emerging of the coastal zones and their populations, brought about by rising sea level. Or in other words, the perceived differences between the very Final Palaeolithic and the Early Mesolithic may be attributable more to taphonomy than to culture.

In comparing Jarawa art with Asian mainland art we particularly draw attention to the three highly sophisticated patterns engraved on the antler fragment from Longgu Cave in China, a little over 13,000 years old (Bednarik, 1992b). Their correspondence with graphic elements in Jarawa art, such as the use of sophisticated guilloche patterning, is outstanding and should not be brushed aside as coincidental. While there may be some merit in the argument that iconic art is limited in its graphic repertoire (generally anthropomorphs and the range of animal species of the artists' ecosystem), the range of possible non-iconic constructions is al-most limitless. Yet here we have art traditions, separated by a short stretch of sea and less than 10,000 years, which feature such astonishing structural similarities. By the same token we need to concede that the palaeo-art of all of southern Asia and China remains inadequately explored.

The Eurocentric obsession with zoomorphs, when addressing the issue of graphic production of the Pleistocene and Early Holocene, has been very detrimental to the development of a balanced study of early art systems. It almost seems that mainstream archaeologists simply do not wish to know how art traditions evolved and developed, unless they feature pretty animal pictures. Globally, around 99% of all Pleistocene art motifs are non-iconic, therefore, this European infatuation with zoomorphs has retarded palaeoart research for about a century. Similarly, the restriction of palaeoart discussions to archaeological specimens has been just as counterproductive, because it has engendered the exclusion of ethnographic information (unless it was relegated to confirming simplistic etic interpretations). This separation is the result not only of disciplinary specialization but also of a conscious determination to reify the chronological construct of the perceived phases of what Eurocentric commentators have simplistically called "prehistory." Here we have sought to contribute, in a small way, to a correction of this profound imbalance.

APPENDIX

Cognate Graphic Patterns

The eleven patterns (both carved and painted) identified by E. H. Man (1932) and R. C. Temple (1903) from the Great Andamanese are chevrons, cross lines (close crosshatch), cross lines (wide crosshatch), parallel lines, parallel lines and zigzag (parallels and chevron combined), lozenges, plait or guilloche, fishbone (herringbone), cross incisions (cross cuts), loops, and Vandykes with scalloped bands and cross lines. It is interesting to see how many patterns the Jarawas share with them. R. C. Temple observed that every manufactured article has its

own customary conventional line ornament in one or more of three colors and in one or more of eleven patterns approximated. The colors are red, white, and brown, derived from natural earths. For E. H. Man these colors were whitish-gray, burned yellow/brown (ochre) and brick red (ochre). The following analysis shows how each pattern is related to the Andamanese (erstwhile) and the Jarawas.

Patterns

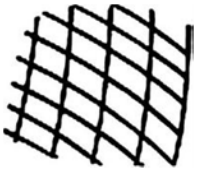
Zigzag

Tribe	*Pattern Name*	*Used on Craft*	*Found on Body*	*Materials Used*
Great Andamanese	*jobo-tartanga*	Canoe, paddle, bucket, etc	Body	Ochre and white Clay
Jarawas	*Aawaav*	Bow, chest guard, bucket	Forehead/chest	Creeper's juice in crafts, white clay on Body

Crosshatching, narrowly spaced

Tribe	*Pattern Name*	*Used on Craft*	*Found on Body*	*Materials Used*
Great Andamanese	*ig-yitinga*	Sounding board, waist belt, chaplet	Body	Carved with a shell, painted with white Clay
Jarawas	*Aaweed*	Wooden bucket, chest guard, bow Shaft	Breast and chest	

Crosshatching, widely spaced

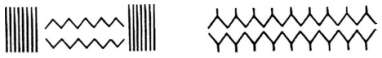


Tribe	*Pattern Name*	*Used on Craft*	*Found on Body*	*Materials Used*
Great Andamanese	*ig-bar-nga*	Outer surface of basket	Body	Vertical lines withbrick red andoblique line withwhite clay
Jarawas	*Aaweed*	Wooden bucket, chest guard, bow	Breast and chest	Creeper's juice incraft, clay on body

Parallel lines

Tribe	*Pattern Name*	*Used on Craft*	*Found on Body*	*Materials Used*
Great Andamanese	*ig-oi-inga*	Across handle paddle	Body	Ochre and white
Jarawas	*Ikkaath/hechaya*	Bow, wooden bucket, chest guard	Face, stomach/hand	Creeper's juice in craft, white clay on body

Parallel lines and zigzag

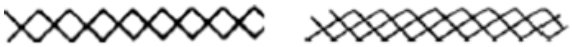


1. 2.

Tribe	*Pattern Name*	*Used on Craft*	*Found on Body*	*Materials Used*
Great Andamanese	1. *jobo tartanga* 2. *to'nanga*	1. Waist belt; 2. Head dress	Not common	White clay
Jarawas	1st pattern *onebialile*		Face, body	Clay

Lozenge patterns

1. 2.

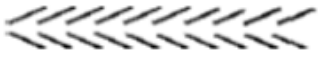


Tribe	*Pattern Name*	*Used on Craft*	*Found on Body*	*Materials Used*
Great Andamanese	1. *jobota'ranga* 2. *ige'unga*	Waist belt, head dress, nautilus shell, wooden food tray		White clay
Jarawas	*onebialile*	Craft	Face	Clay

Guilloche

Tribe	*Pattern Name*	*Used on Craft*	*Found on Body*	*Materials Used*
Great Andamanese	*polior-nga*	Bows and eating trays	Body	White clay
Jarawas	*oppodiveel*	Bow shaft	Body	Creeper's juice, clay on body

Fish bone



Tribe	*Pattern Name*	*Used on Craft*	*Found on Body*	*Materials Used*
GreatAndamanese	*bar'nga*	Sling or belt	Body	White clay
Jarawas	*oppohaaneev*	Bow/wooden bucket	Not found	Creeper's juice

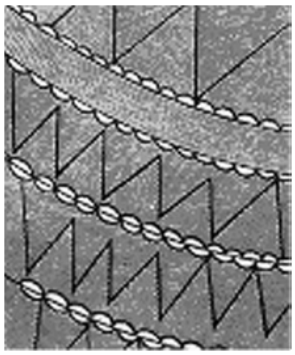
Cross incisions

Tribe	*Pattern Name*	*Used on Craft*	*Found on Body*	*Materials Used*
Great Andamanese	*ige-unga*	Bows and the handles of adzes	Not common	Cut by shell
Jarawas	*bethu oppo*	Bow shaft	Not found	Cut by arrow head / knife (earlier byshell)

Loop

Tribe	*Pattern Name*	*Used on Craft*	*Found on Body*	*Materials Used*
Great Andamanese	*ote'nga*	Sea shell used as food tray	Not common	White clay
Jarawas	*Bethubethuoppo*	Chest guard	Not found	Creeper's juice

Vandykes with scalloped bands and cross lines



Painted in nautilus shell. This is not found among the Jarawas.

The above survey reveals that the Jarawas share most of the designs used by the Great Andamanese, with the exception of tattooing and engraving practice. As far as body painting is concerned, the Onges and the Great Andamanese practiced it more intensively than the Jarawas. Instead of having commonness there are some

patterns remain-ing exclusive to the particular group concerned. The following table shows the cognate pattern of graphic culture

Group	*Body/Craft*	*Materials used*	*Instrument used*	*Application*	*Purpose*
Erstwhile Andamanese	Body	Whitish grey (*o'g*) mixed with water	Palms of Hand	Smeared thickly over the entire body/	To denote mourning
	Body	Whitish grey (*o'g*) mixed with water	Palms of Hand	Thinly smearingover the body	To protect from spirits/heat
	Body (cheeks, body, limbs) Crafts	White clay (*ta'la-o'g*) mixed with water	Nail of the forefinger	Designs are draw non body and implements	Ornamentally
	Body(zigzags and Strips designs)	Burned yellow ochre (*ko'ib*) mixed with animal fat	Fingertips	All over the body	1. Decorating living and dead 2. Medicinal use 3. Protect from Insects
Onges	Body	Red ochre, red ochre with animal fat (pig/turtle)		Smearing	Mourning
	Body	White clay (*alame*) mixed with water	Fingernails/ scraper (pith)	Smearing and scraping all over thebody/ mouth/ face	1. Ornamentation 2. Celebrating victory 3. Protect from spirits 4. Medicinal 5. Insect repellent
Jarawas	Body	White clay mixed with water	Fingernails/ fingertips/ scraper	Smearing and scraping or directly drawing the designs over the body/ mouth/face (mostly designs of face, chest, etc. are found different)	1. Ornamentation 2. Celebrating victory 3. Protect from spirits 4. Medicinal 5. Insect repellent
	Body	Red ochre with animal fat	Fingernails/ fingertips/ scraper	Body smearing and scraping or directly drawing to the body	Restrictively applied during ceremonies (death/other, need to be clarified)
	Crafts	Bailatha juice (creeper)	Arrow head	Designs are made after smearing a coating of wax	Decorative

The above illustrates that the Andaman groups have a shared graphic culture. It is reflected both in the absence of figurative production and in shared graphic designs.

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NOTES

1. Davidson and Noble 1989; Noble and Davidson 1996; Mithen 1996; Klein 2000; White 1992.
2. Deacon 1989; Henshilwood and Sealy 1997; Barham 1998, 2002; Henshilwood and Marean 2003; McBrearty and Brooks 2000.
3. Wakankar 1983; Bednarik 1992a, 1993b, 1994a; Bednarik *et al.* 1991; Bednarik and You 1991; Bednarik and Devlet 1993; Gai Shanlin 1986; Li Fushun 1992; Kumar 1996; Misra 1977; Tyagi 1988; Neumayer 1983, 1993; Hannah *et al.* 2005.
4. Kumar 1996; Bednarik *et al.* 2005; cf. also D'Errico *et al.* 1989.
5. Man 1932; Radcliffe-Brown 1948; Sarkar 1990; Sreenathan 2001.
6. Radcliffe-Brown 1948; Manoharan 1989; Sreenathan 2001.
7. Cox 2005; Kellogg 1959; Kellogg *et al.* 1965; Van Sommers 1984.
8. Barlow 1972; Marr 1976; Hubel and Wiesel 1979; Hamil-ton-Smith 1986; Felleman and Van Essen 1991; Zeki 1992, 1993, 1999; Tootell *et al.* 1998.
9. Collins 2002; Collins *et al.* 1991, 1992; Robertson 1999.

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