

Changes in the so-called non-utilitarian production in human history

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Abstract

Rather than referring to non-utilitarian creations, this presentation addresses the exogrammatic function of certain types of objects in human history. Just as cultures are epidemics of mental representations that are replicated in other brains, the ‘memes’ attached to exograms are reconstructed in conspecifics by metarepresentation. In the most recent human history such phenomena have become so ubiquitous that our illusion of reality is almost entirely constructed by them, but since exograms must have been introduced at some point in that history, the most important role of palaeoart research is to explore when and how they became established and how they developed. This paper presents the empirical information currently available on the origins and growing influence of exograms to the point when they began to determine the direction of the evolution of our species and eventually suspended it. It also explains why it is so hard to extract this information from archaeological data.

Introduction

The purpose of the NeanderART 2018 conference, where this paper was presented, was to address the complex topic of the origins of art-like productions and related behaviours, focusing on the period of hominin evolution preceding what are widely regarded as ‘anatomically modern humans’ (AMHs). This has been rendered necessary by the dogma of the replacement hypothesis that no humans prior to the appearance of AMHs were capable of creating or using palaeoart. In recent years this hypothesis, popularly known as the African Eve hypothesis, has been refuted (Bednarik 2008, 2013a). Not only has its central notion, that AMHs are the result of speciation in an unspecified region of sub-Saharan Africa, been discredited by genetic evidence showing that they are the same species as robust humans before them; a review of the hypothesis and its many claims has long shown that they have no basis in empirical knowledge. Indeed, the African Eve model is based on a hoax and its erroneous reasoning has been protracted by a long series of mistakes and unfamiliarity with the relevant evidence. Indeed, the Eve Hoax can be regarded as archaeology’s greatest blunder of the second half of the 20th century, comparable in its magnitude and effects to the Piltdown Hoax, which delayed the development of palaeoanthropology and Pleistocene for almost four decades.

One of the most important false claims of the Eve advocates was that all hominins preceding Eve were too primitive to produce art and lacked a capacity of symbolic thought, or even of using language. It is this claim that the NeanderART 2018 conference examined in some detail. In its most extreme form, humans before AMHs

were defined as being closer to apes than to humans (Davidson and Noble 1990) (Figure 1). Indeed, in its declining phase the replacement hypothesis is resorting to the fashion of limiting the term ‘humans’ to those it regards as AMHs. In accordance with present-day understanding, the robust humans preceding the extant humans certainly belonged to the same species. That includes, at the most minimal level, the Neanderthals, the Denisovans and any other groups or sub-species contemporary with them. Therefore, the correct scientific name of the Neanderthals has to revert to the one used before the African Eve madness: *Homo sapiens neanderthalensis*. And the pinnacle of evolution, the AMH, is again *Homo sapiens sapiens*, just as it was before this collective psychosis. Many palaeoanthropologists would now argue that *Homo heidelbergensis*, *H. rhodesiensis* and *H. antecessor* are also subspecies of *H. sapiens* — and they may well be right. Indeed, the ‘lumpers’ may in the end prevail over the ‘splitters’, and even *Homo erectus* may end up being welcomed to our species. The simple fact is that such taxonomies need to be decided by inter-fertility, not by perceived robusticity or gracility.



Figure 1. Demonising artistic rendering of a Neanderthal, by an artist not worth mentioning.

At this point it is also advisable to dump the meaningless AMH label. What is it supposed to define (see cogent criticism by Tobias 1995)? First of all, “we have never been modern” (Latour 1993): we may be ‘modern’ now, but what does that mean in cladistic terms? The range of our species into the past can only be determined by genetics, and the limited amount of data currently available makes it clear that our species extends at least a hundred millennia into the past and perhaps much longer. So there are two different issues that have been conflated by the Eve lobby: relative robusticity/gracility and species identification.

The replacement hypothesis has already been replaced a decade ago, by a theory that is far more elegant, more plausible and that offers explanations, a whole avalanche of them rather than a just-so explanation without empirical support. The replacement hypothesis has been replaced by the domestication hypothesis in 2008:

The most comprehensive case for human self-domestication has been proposed for the changes that account for the much later transition from robust humans such as Neanderthals or Denisovans to anatomically modern humans. Occurring between 40,000 and 25,000 years ago, this rapid neotenization has been explained as the result of cultural selection of mating partners (Bednarik 2008) on the basis of variables lacking evolutionary benefits, such as perceived attractiveness, facial symmetry, youth, specific body ratios, skin tone or hair, none of which play any role in any other animal species. This unintentional auto-domestication, coinciding with the introduction of imagery of female sexuality, occurred simultaneously in four continents then occupied by hominins. It led to rapid changes typical for domestication, such as in cranial morphology, skeletal architecture, reduction in brain volume, to playful and exploratory behavior, and the establishment of thousands of deleterious conditions, syndromes, disorders and illnesses presumed absent in robust humans (Bednarik 2011a). This hypothesis effectively replaces the Replacement Hypothesis (known as African Eve theory') and explains the relatively rapid transition as a culturally induced domestication process still continuing today. It also explains the rise of exograms and their role in selecting for competence in the use of external memory traces (Wikipedia, 'Self-domestication').

Where the replacement hypothesis went wrong is that it, correctly, noticed that robust hominins changed rather abruptly into gracile, and it adopted the seemingly only logical explanation: one species must have been replaced by another, be it by genocide, being outcompeted or overwhelmed by new diseases. But the change from robust to gracile *Homo sapiens* was not instantaneous, nor were there any regions in Eurasia that were unoccupied by humans, with the exception of very high altitudes, highly arid zones and glaciated regions. Robust hominins were living in the Arctic zone (Pavlov et al. 2001; Schulz 2002; Schulz et al. 2002; Slimak et al. 2011), so it would be naïve to expect finding wide open, unoccupied spaces. Moreover, the change from robust to gracile occurred at roughly the same time in four continents occupied by 50 ka ago, when it apparently began to take place. The correct explanation has to consider that hominins 10 ka ago were around 10 % more robust than today, 20 ka ago they were 20% more robust, and so on. The development was therefore gradual but in geological (or palaeoanthropological) terms it seems almost instantaneous, and this is what led to the search for an explanation. As we know today, that search yielded the wrong explanation. Evolution is not the only process that can change the genetics of a species, there is a much faster way: domestication, I.e. selective breeding. This is where Mendel trumps Darwin. Domestication can change a genome significantly in a single millennium, and the self-domestication of humans took several tens of millennia. It commenced between 50 to 40 ka ago and it is still in progress, changing our species inexorably, unstoppably.

It may be a sobering thought, but it is perhaps better to have a realistic grasp of these processes, not some naïve narrative about some Eden in southern Africa from whence we all derive, through a process that involved genocide and global extinction, separating our beastly ancestors from those fit to go to heaven. The teleological nature of archaeology and its origins in religion are among the factors preventing that discipline from being scientific: the sciences regard evolution as entirely dysteleological. But

before we can effectively investigate the changes in the utilitarian and non-utilitarian productions in two million years of hominin history we need to dispense with the model that prevents any effective consideration of these productions: the replacement or African Eve hypothesis. We will do this now, before addressing more substantive issues.

The replacement hypothesis

The African Eve theory postulates that a cognitively, intellectually and technologically superior human species arose in sub-Saharan Africa, and after ‘replacing’ all robust humans in Africa it migrated to Asia, where it did the same. It then invented seafaring in South-East Asia and colonised Australia, before marching into Europe and wiping out the resident Neanderthals there. This extraordinarily simplistic and genocidal hypothesis originates from German archaeology professor Reiner Protsch, who since 1973 has provided numerous fake radiocarbon dates from human remains. It took the discipline thirty years to expose him, and in 2003 he was sacked in disgrace (Terberger and Street 2003; Schulz 2004). His legacy, however, lives on and remains the dogma of human evolution, especially throughout Anglo-American archaeology.

The idea that the technocomplex archaeologists call the ‘Upper Palaeolithic’ was first established in sub-Saharan Africa and then introduced from there to Europe has been expressed since the early 20th century. For instance, Dorothy Garrod, noted for her infamous role in the Glouzel affair in 1927 (Bednarik 2013b: 76), subscribed to this notion. But the actual ‘African Eve hoax’, as we shall tactfully call it, derives from the work of Professor Reiner Protsch ‘von Zieten’. His aristocratic title was as bogus as his second doctorate and he was heavily fined by a German court for claiming to have the latter. Presenting a series of false datings of fossil human remains over following years he proposed that modern humans arose in sub-Saharan Africa (Protsch 1973, 1975; Protsch and Glowatzki 1974; Protsch and Semmel 1978; Henke and Protsch 1978). Thirty years later it was shown that all of his datings had been concocted and he was dismissed by the University of Frankfurt (Terberger and Street 2003; Schulz 2004). However, during the intervening decades an entire academic cottage industry had been established around the original idea, spawning numerous variations on the general theme: the ‘Afro-European *sapiens*’ model (Bräuer 1984), the ‘African Eve’ complete replacement scenario (Cann et al. 1987; Stringer and Andrews 1988; Mellars and Stringer 1989; Vigilant et al. 1991; Tattersall 1995; Krings et al. 1997); the Pennisi (1999) model; the ‘wave theory’ (Eswaran 2002); the Templeton (2002) model; and the ‘assimilation theory’ (Smith et al. 2005), among others.

Of these, the mitochondrial Eve model is the most extreme, contending that the purported African invaders were a new species, unable to interbreed with the rest of humanity. They replaced all other humans, either by exterminating or out-competing them (be it economically or epidemiologically). There were significant methodological problems with this ‘African Eve theory’, as the media dubbed it, right from the start. The computer modelling was botched by Cann et al. (1987) and its haplotype trees were irrelevant. Based on 136 extant mitochondrial DNA samples, it arbitrarily selected one of 10^{267} alternative and equally credible haplotype trees (which are very much more than the number of elementary particles of the entire universe, about 10^{70} !). Maddison (1991)

demonstrated that a re-analysis of the Cann et al. model could produce 10,000 haplotype trees that are more parsimonious than the one chosen by these authors. And yet there is no reason to assume that the most parsimonious tree should define what occurred, bearing in mind the entirely dysteleological nature of evolution (Hartl and Clark 1997: 372). Several of Cann et al.'s assumptions were false, such as exclusive maternal transference of mitochondria; the constancy of mutation rates of mtDNA (Rodriguez-Trelles et al. 2001, 2002); and the purported models of human demography or the timing or number of colonisation events which are completely unknown. Another flaw of the replacement model was that Cann et al. had mis-estimated the diversity per nucleotide (single locus on a string of DNA), incorrectly using the method developed by Ewens (1983) and thereby falsely claiming greater genetic diversity of Africans, compared to Asians and Europeans. This oft-repeated claim (e.g. Hellenthal et al. 2008; Campbell and Tishkoff 2010) is inherently false. At 0.0046 for both Africans and Asians, and 0.0044 for Europeans, the genetic diversity coefficients are in fact very similar. Even the premise of the role of genetic diversity is itself false; for instance, it is greater in African farming people than in African hunters-foragers (Watson et al. 1996), yet the latter are not assumed to be ancestral to the former (see e.g. Ward et al. 1991). Similarly, the contention that genetic diversity of extant humans decreases with increasing geographical distance from Africa (e.g. Atkinson 2011) is doubtful.

Gibbons (1998) has noted that by using the modified putative genetic clock, Eve would not have lived 200,000 years ago, as Cann et al. had contended, but only 6000 years ago (which would at least match the prediction of the Old Testament precisely). Indeed, the hypothetical split between Eve's tribe and other humans has been placed at times ranging from 17,000 to 889,000 years ago by various writers, all without credible justification (e.g. Vigilant et al. 1991; Barinaga 1992; Ayala 1996; Brookfield 1997). This applies to the contentions concerning mitochondrial DNA ('African Eve') as much as to those citing Y-chromosomes ('African Adam'; Hammer 1995). The divergence times projected from the diversity found in nuclear DNA, mtDNA and DNA on the non-recombining part of the Y-chromosome differ so much that a time regression of any type is extremely problematic. Contamination of mtDNA with paternal DNA has been demonstrated in extant species (Gyllensten et al. 1991; Awadalla et al. 1999; Morris and Lightowlers 2000; Williams 2002), in one recorded case amounting to 90% (Schwartz and Vissing 2002). The issues of base substitution (Lindhal and Nyberg 1972) and fragmentation of DNA (Golenberg et al. 1996) have long been known (see Gutierrez and Marin 1998). Other problems with interpreting or conducting analyses of palaeogenetic materials are alterations or distortions through the adsorption of DNA by a mineral matrix, its chemical rearrangement, microbial or lysosomal enzymes degradation, and lesions by free radicals and oxidation (Geigl 2002; Carlier et al. 2007).

In its initial forms, the replacement hypothesis derived not from genetics, but from palaeoanthropology in the form of fossil skeletal evidence. Genetics was only enlisted in the late 1980s, and its application was bungled from the beginning (Barinaga 1992; Hedges et al. 1992; Templeton 1992, 1993, 1996, 2002, 2005; Brookfield 1997; Klyosov and Rozhanskii 2012a, 2012b; Klyosov et al. 2012; Klyosov and Tomezzoli 2013). The key claim of the replacement theory, that the 'Neanderthals' were genetically so different from the 'Moderns' that the two were separate species, has been under strain since Gutierrez et al. (2002) demonstrated that the pair-wise genetic distance distributions of the two human groups overlap more than claimed, if the high

substitution rate variation observed in the mitochondrial D-loop region (see Walberg and Clayton 1981; Zischler et al. 1995) and lack of an estimation of the parameters of the nucleotide substitution model are taken into account. The more reliable genetic studies of living humans have shown that both Europeans and Africans have retained significant alleles from multiple populations of Robusts (Hardy et al. 2005; Garrigan et al. 2005; cf. Templeton 2005). After the Neanderthal genome yielded results that seemed to include an excess of Gracile single nucleotide polymorphisms (Green et al. 2006), more recent analyses confirmed that ‘Neanderthal’ genes persist in extant Europeans, Asians and Papuans (Green et al. 2010). ‘Neanderthals’ (Robusts) are said to have interbred with the ancestors of Europeans and Asians, but not with those of Africans (Gibbons 2010; cf. Krings et al. 1997). This falsity continues to prevent the discipline from leaving the falsified premise behind: Robusts and Graciles *did not interbreed*: the latter simply descend from the former.

Sankararaman et al. (2012) report that comparisons of DNA sequences between ‘Neanderthals’ and present-day humans have shown that the former share more genetic variants with non-Africans than with Africans. Further evidence of ‘interbreeding’ (read ‘descent’), from a 40-ka-old *Homo sapiens sapiens* fossil, implies a 10% contribution of ‘Neanderthal’ genes (Viegas 2015). Sankararaman et al. (2014) report finding ‘Neanderthal’ haplotypes in the genomes of 1004 present-day humans. Prüfer et al. (2014) demonstrated several gene flow events among Neanderthals, Denisovans and early modern humans, possibly including gene flow into Denisovans from an *unknown* archaic group. Kuhlwilm et al. (2016) analysed the genomes of a Neanderthal and a Denisovan from the Altai Mountains in Siberia together with the sequences of chromosome 21 of two ‘Neanderthals’ from Spain and Croatia. They believe that a population that diverged early from other Moderns in Africa contributed genetically to the ancestors of Neanderthals from the Altai Mountains roughly 100 ka ago. They did not detect such a genetic contribution in the Denisovan or the two European Neanderthals. Finally, Vernot et al. (2016) report the occurrence of ‘Neanderthal’ and ‘Denisovan’ DNA from present Melanesian genomes. All of this could simply suggest that gracile Europeans and Asians evolved largely from local robust populations, which had long been obvious from previously available evidence (e.g. the close link in tooth enamel cellular traits between Neanderthaloids and present Europeans; Weiss and Mann 1978).

So why was Protsch’s African Hoax re-cycled for several decades? Cavalli-Sforza et al. (1988) already considered that the phylogenetic tree separates Africans from non-Africans, a view reinforced by Klyosov et al. (2012). But whereas the first authors interpreted this as placing the origin of ‘modern humans’ in Africa, Klyosov et al. showed that this separation continued for 160 ± 12 ka since the split of the haplogroups A from haplogroups BT (Cruciani et al. 2002); therefore, Africans and non-Africans evolved essentially separately. As Klyosov et al. most pertinently observe, “a boy is not a descendant of his older brother”. Therefore, contrary to Chiaroni et al. (2009), haplogroup B is neither restricted to Africa, nor is it at 64 ka remotely as old as the haplogroups A are (some of these may be older than 160 ka).

It is interesting to note that the ‘genetic clock’ archaeologists so ardently subscribe to is rejected by them when it is applied to the dog, implying its split from the wolf occurred 135 ka ago. In the second case they disallow it because there is no palaeontological evidence for dogs prior to about 15 ka ago. However, in this they seem

to be mistaken (see e.g. Germonpré et al. 2009). This raises the question why the same restraint in relying on genetic indices has not been exercised in relation to hominins, and why an implausible catastrophist scenario has been so eagerly embraced concerning the human species. After all, we are only one of many species that have managed to colonise a great variety of environments, from the Arctic to the tropics. In all other cases genetic diversity is thought to be the result of introgression and not of conquest by ‘superior’ species. To see whether this discrepancy in approach could be attributable to humanistic fervour (Bednarik 2011a) rather than to science we could review the palaeoanthropological and ‘cultural’ contexts of the African Eve hoax.

Initially, as noted, the African Hoax derived from false age determinations of numerous hominin remains, especially in Europe. These included the four Stetten specimens from Vogelherd, Germany, widely claimed to be about 32 ka old (e.g. Churchill and Smith 2000a, 2000b), when in fact their Neolithic provenience had long been noted (Gieseler 1974; Czarnetzki 1983: 231) and their ages range credibly from 3980 ± 35 to 4995 ± 35 carbon-years (Conard et al. 2004). The Hahnöfersand calvarium, the “northernmost Neanderthal specimen found” and dated to $36,300\pm600$ BP or $35,000\pm2000$ BP (Bräuer 1980) by Protsch, is at 7470 ± 100 BP or 7500 ± 55 BP actually a Mesolithic ‘Neanderthal’ (Terberger and Street 2003). The Paderborn-Sande skull fragment, purportedly $27,400\pm600$ years old (Henke and Protsch 1978), is in reality only 238 ± 39 carbon-years old (Terberger and Street 2003). It is so fresh that when it was drilled for sampling it emitted a putrid smell. The Kelsterbach skull, dated to $31,200\pm1600$ years BP by Protsch (Protsch and Semmel 1978; Henke and Rothe 1994), is probably of the Metal Ages (Terberger and Street 2003) but has mysteriously disappeared from its safe in Protsch’s former institute. The cranial fragment from Binshof, claimed by Protsch to be $21,300\pm20$ years old, turned out to be only 3090 ± 45 years.

Further afield the ‘modern’ Robust specimen from Velika Pećina, Croatia, is now known to be only 5045 ± 40 radiocarbon years old (Smith et al. 1999). Those from Roche-Courbon (Geay 1957) and Combe-Capelle are now thought to be Holocene burials (Perpère 1971; Asmus 1964), as probably also applies to the partial skeleton from Les Cottés (Perpère 1973). The Crô-Magnon specimens, widely regarded as the ‘type fossils’ of anatomically modern humans, are neither of the Aurignacian technocomplex, nor are they anatomically modern; especially cranium 3 is quite Neanderthaloid. Being about 27,760 carbon-years old (Henry-Gambier 2002) they are more likely to be of the Gravettian than of the Aurignacian. A similar pattern of intermediate forms between Robusts and Graciles pertains to the numerous relevant Czech specimens, most of which were lost in the Mikulov Castle fire of 1945. The surviving sample includes the Mladeč specimens, now dated to between 26,330 and 31,500 BP (Wild et al. 2005); the very robust specimens from Pavlov and Předmostí (both between 26 and 27 ka); Podbaba (undated); and the slightly more gracile and more recent population from Dolní Věstonice. The same pattern of ‘intermediate’ forms continues in the specimens from Cioclovina (Romania), Bacho Kiro levels 6/7 (Bulgaria) and Miesslingtal (Austria).

Therefore, there are no ‘anatomically modern’ finds from Europe that have been shown to be more than 28,000 carbon-years old. The earliest *liminal* ‘post-Neanderthal’ finds currently available in Europe, still very robust, are the Peștera cu Oase mandible from Romania (Trinkaus et al. 2003), thought to be in the order of 35 ka old but re-

dated to c. 40 ka (Fu et al. 2015), and the partial cranium subsequently found in another part of the same extensive cave (Rougier et al. 2007). Both lack an archaeological context and are clearly not ‘anatomically modern’. Also intermediate between robust and gracile types are the six human bones from another Romanian cave, Peștera Muierii (c. 30 ¹⁴C ka BP; Soficaru et al. 2006). Looking at Eurasia as a whole, there are hundreds of specimens of the last third of the Late Pleistocene that are intermediate between robust *Homo sapiens* and *H. sapiens sapiens*. Collectively they show that a simplistic division between ‘Moderns’ and ‘Neanderthals’ hinders a comprehension of these finds. They include those from Lagar Velho, Crete, Starosel’*e*, Rozhok, Akhshtyr’, Romankovo, Samara, Sungir’, Podkumok, Khvalynsk, Skhodnya, Denisova and Narmada, as well as several Chinese remains such as those from the Jinniushan and Tianyuan Caves. Incredibly, the numerous intermediate or liminal forms contradicting the belief that robust and gracile populations were separate species were simply ignored by those wishing to preserve this dogma. More importantly, they failed to appreciate that not a single fully gracile specimen in Eurasia can credibly be linked to any of the Early Upper Palaeolithic tool tradition, be it the Aurignacian, Châtelperronian, Uluzzian, Proto-Aurignacian, Olschewian, Bachokirian, Bohunician, Streletsian, Gorodtsovian, Brynzenian, Spitzinian, Telmanian, Szeletian, Eastern Szeletian, Kostenkian, Jankovichian, Altmühlian, Lincombian or Jerzmanovician (Bednarik 2011b). The proposition that these industries were introduced from sub-Saharan Africa is therefore without support, a notion squarely contradicted by the lack of any geographically intermediate Later Stone Age finds from right across northern Africa until more than 20,000 years after the Upper Palaeolithic had been established all over Eurasia. Similarly, the African Eve advocates ignored that at least six Early Upper Palaeolithic sites have yielded human skeletal remains attributed to Neanderthals: the Châtelperronian layers of Saint Césaire (c. 36 ka) and Arcy-sur-Cure (c. 34 ka) in France; the Aurignacian of Trou de l’Abîme in Belgium; the Hungarian Jankovichian of Máriaremete Upper Cave (c. 38 ka; Gábori-Csánk 1993); the Streletsian of Sungir’ in Russia (which yielded a Neanderthaloid tibia from a triple grave of Graciles; Bader 1978); and the Olschewian of Vindija in Croatia (Smith et al. 1999, 2005; Ahern et al. 2004). Like other late specimens the latter are more gracile than most earlier finds — so much so that many consider them as transitional (e.g. Smith and Raynard 1980; Wolpoff et al. 1981; Frayer et al. 1993; Wolpoff 1999; Smith et al. 2005).

The replacement paradigm is not even supported by the palaeoanthropological finds from Africa, which generally mirror the gradual changes in Eurasia through time. It is often claimed that ‘anatomically modern humans’ date from up to 200 ka ago, yet no such specimens have been presented. The skulls from Omo Kibish offer some relatively modern features as well as substantially archaic ones; especially Omo 2 (an undated surface find) is very robust indeed (McDougall et al. 2005). The more complete and better dated Herto skull, BOU-VP-16/1, is outside the range of all gracile humans in several cranial indices (White et al. 2003). The lack of ‘AMHs’ from sub-Saharan Africa prior to the Exodus of Eve’s scions is conspicuous: the Border Cave specimens have no stratigraphic context; Dar es Soltan is undated; the mandibles of Klasies River Mouth lack cranial and post-cranial remains; and the Hofmeyr skull features the same intermediate morphology evident at the same time, 36 ka ago, in Eurasia (Grine et al. 2007, 2010).

As the Levant is on the route the Exodus would have taken, the lack of African fossils of the African Eve ‘species’ prompted the replacement advocates to turn to the that region for support. The Mount Carmel finds from Qafzeh Cave and Skhul Shelter were recruited as ‘Moderns’, yet all of these skulls present prominent tori and receding chins, even Qafzeh 9, claimed to be of the most modern appearance. The distinct prognathism of Skhul 9 matches that of ‘classic Neanderthals’, and the series of teeth from that cave has consistently larger dimensions than Neanderthaloid teeth, an archaic trait. Supposedly much later ‘Neanderthal’ burials in nearby Tabun Cave as well as the Qafzeh and Skhul material are all associated with the same Mousterian tools, and the TL datings of all Mount Carmel sites are far from soundly established, with their many discrepancies and inversions. This population is best seen as transitional between robust and gracile forms, from a time when gracilisation had commenced elsewhere as well. Another nail in Eve’s coffin is presented by the extant Australians, with their average cranial capacity well within the range of *Homo erectus*, who possess molars and other indices of robusticity matching those of Europeans several hundred millennia ago. Their tool traditions were of Mode 3 types (‘Middle Palaeolithic’) until mid-Holocene times, and remained so in Tasmania until British colonisation two centuries ago. Clearly, the guiding principle of the replacement advocates, that Mode 4 technologies were introduced together with ‘modern’ anatomy, is a falsity — in Europe as well as elsewhere. This brings us to the next major contradiction of the Eve model.

One of the chief obstacles the African Eve theory has always faced is that the Early Upper Palaeolithic (EUP) tool traditions of Eurasia, claimed to indicate the arrival of AMHs, all seem to have evolved locally. They first appear fairly simultaneously between 45 ka and 40 ka BP, even earlier, at widely dispersed locations from Spain to Siberia (e.g. Makarovo 4/6, Kara Bom, Denisova Cave, Ust’-Karakol, Tolbaga, Kamenka, Khotyky, Podzvonkaya, Tolbor Dorolge; Bednarik 1994). The earliest radiocarbon date by an EUP site was provided at Senftenberg, Austria, at >54 ka BP (Felgenhauer 1959). In Spain the Aurignacian commenced at least 43 ka ago (Cabrera Valdés and Bischoff 1989; Bischoff et al. 1994). EUP variants such as the Uluzzian (Palma di Cesnola 1976, 1989), the Uluzzo-Aurignacian, and the Proto-Aurignacian (43–33 ka BP) have been reported from southern Italy (Kuhn and Bietti 2000; Kuhn and Stiner 2001). The montane Aurignacoid tradition of central Europe, the Olschewian (42–35 ka BP), clearly developed from the region’s final Mousterian (Bayer 1929; Kyrle 1931; Bächler 1940; Zotz 1951; Brodar 1957; Malez 1959, Vértes 1959; Bednarik 1993a). The Bachokirian of the Pontic region (>43 ka BP), the Bohunician of east-central Europe (44–38 ka BP; Svoboda 1990, 1993), and various traditions of the Russian Plains complete the picture to the east. Some of the latter industries, such as the Streletsian, Gorodtsovian and Brynzenian derived unambiguously from Mousteroid technologies, whereas the Spitzinian or Telmanian are free of Mode 3 bifaces (Anikovitch 2005). The gradual development of Mode 3 industries into Mode 4 traditions can be observed at various sites along the Don River, in the Crimea and northern Caucasus, with no less than seven accepted tool assemblages coexisting there between 36 and 28 ka ago: Mousterian, Micoquian, Spitzinian, Streletsian, Gorodtsovian, Eastern Szeletian and Aurignacian (Krems-Dufour variant). A mosaic of early Mode 4 industries began before 40 ka BP on the Russian Plain and ended only 24–23 ka ago. In the Crimea, moreover, the Middle Palaeolithic is thought to have ended only between 20–18 ka BP, which is about the same time the Middle Stone Age ended

across northern Africa. Elsewhere in the Russian Plain, the first fully developed Upper Palaeolithic tradition, the Kostenkian, appears only about 24 ka ago. All of this shows that there cannot possibly be a correlation between UP technologies and ‘Moderns’. The most recent Mousterian in the far north dates from 28.5 ka ago (Slimak et al. 2011).

The Russian succession of traditions connecting Mode 3 and 4 technocomplexes is repeated in the Szeletian of eastern Europe (43–35 ka BP; Allsworth-Jones 1986), the Jankovician of Hungary; and the Altmühlian (c. 38 ka BP), Lincombian (also c. 38 ka BP) and Jerzmanovician (38–36 ka BP) further northwest. Similarly, the gradual development from the Middle Palaeolithic at 48 ka BP (with ‘Neanderthal’ footprints of small children) to the Upper Palaeolithic is clearly documented in Theopetra Cave, Greece (Kyparissi-Apostolika 2000; Facorellis et al. 2001). Thus there is a complete absence of evidence of an intrusive technology in the postulated eastern or south-eastern entry region of Europe, through which an invading tradition arriving from the Middle East would have had to pass. Nor should this even be expected, considering that in the Levant both Mode 3 and Mode 4 industries were used by robust as well as gracile populations: the replacement advocates’ notion that their ‘Moderns’ introduced Mode 4 in Europe is refuted by all credible archaeological evidence. The Mousteroid traditions of the Levant developed gradually into blade industries, e.g. at El Wad, Emireh, Ksar Akil, Abu Halka and Bileni Caves, and that region’s Ahmariian is a transitional technology. This can be observed elsewhere in south-western Asia, for instance the Aurignacoid Baradostian tradition of Iran clearly develops in situ from Middle Palaeolithic antecedents. The late Mousterian of Europe is universally marked by regionalisation (Kozłowski 1990; Stiner 1994; Kuhn 1995; Riel-Salvatore and Clark 2001), miniaturisation and increasing use of blades, as well as by improved hafting technique. This includes the use of backed or blunted-back retouch on microliths that were set in birch resin in Germany, almost as early as the first use of microlithic implements in the Howieson’s Poort tradition of far southern Africa. Therefore, the notion that a genetically and palaeoanthropologically unproven people with a Mode 4 tool set travelled from sub-Saharan Africa across northern Africa is completely unsupported, while there is unanimous proof that these traditions developed in situ in many Eurasian regions long before they reached northern Africa or the Levant.

Finally, the ‘African Eve’ advocates failed to consider that the record of palaeoart provides precisely the same finding as derived from genetics, physical palaeoanthropology and technological development. Having fallen victim to Protsch’s hoax they relied on the unassailability of their belief that the EUP traditions, especially the Aurignacian, were by Graciles. Among the EUP traditions previously attributed to Moderns, the Châtelperronian was in 1979 discovered to be the work of Neanderthals. The Châtelperronian of Arcy-sur-Cure in France had produced numerous portable palaeoart objects, including beads and pendants (Figure 2). Instead of conceding that they had been wrong, the Eve supporters then argued that the Neanderthals, incapable of symbolising according to their dogma, must have ‘scavenged’ these artefacts (White 1993; Hublin et al. 1996). They failed to explain, however, what such supposedly primitive creatures would do with symbolic objects.

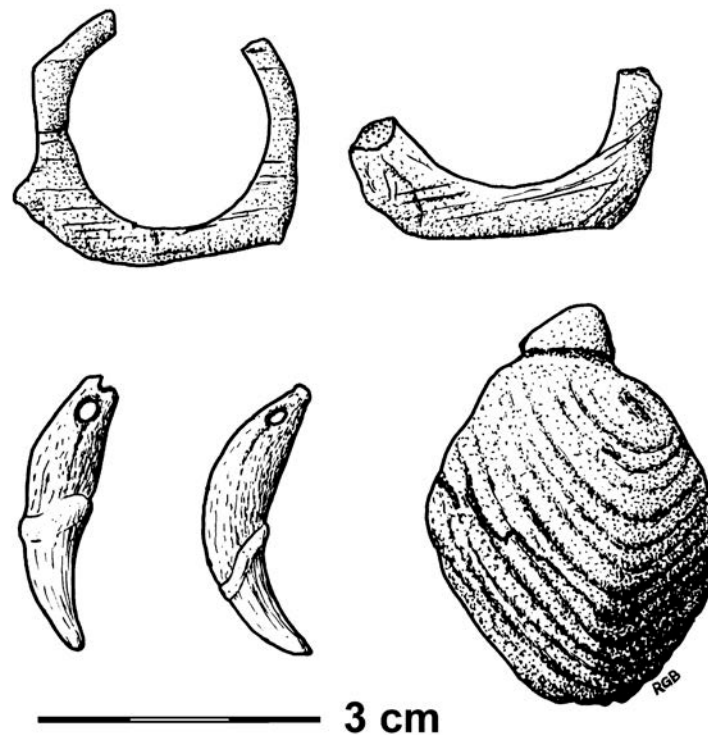


Figure 2. Ivory ring fragments, perforated animal canines and grooved shell fossil, Châtelperronian, Grotte du Renne, France, made by Neanderthals.

This is one of numerous examples of the accommodative reasoning of the replacement advocates. Others are the claims that beads of the Lower Palaeolithic are unrealistic prior to Eve (d’Errico 1995; d’Errico and Villa 1997; Rigaud et al. 2009), or the assertion that Early Pleistocene seafaring colonisers (Bednarik 1997, 1999, 2003a) might have drifted on vegetation (Davidson 2003). After we first observed the lack of evidence linking early Aurignacian finds to the purported Moderns (Bednarik 1995a), we proposed that no such link exists to any EUP industry (Bednarik 2007, 2008a). The contention that the Aurignacian rock art (in Chauvet Cave and several other sites) and portable palaeoart (e.g. in Hohlenstein), arguably the most complex and sophisticated of the entire Upper Palaeolithic, is the work either of ‘Neanderthals’ or of their direct descendants (Bednarik 2007, 2008a, 2011a, 2011b) has removed the last vestiges of support the African Eve hypothesis has ever claimed. The notion that palaeoart was introduced in Eurasia by Graciles now stands refuted, and one can only wonder how such an unlikely and thoroughly incongruous construct could have ever captivated Pleistocene archaeology and palaeoanthropology. The archaeological record shows unambiguously that the Upper Palaeolithic tool traditions of Eurasia developed in situ, that the hominins in question evolved in situ, that the genetic evidence is ambiguous at best, and introgression can account fully for the genetic observations. ‘Modern’ humans derive from archaic *H. sapiens* in four continents and they interbred with them no more than grandchildren breed with their grandparents.

The domestication hypothesis

Over ten years ago the ‘replacement hypothesis’ was replaced by our ‘domestication hypothesis’, which accepts that the change from Robusts to Graciles was gradual, occurring in all four continents then settled (Bednarik 2008b). Culturally guided sexual selection replaced natural selection, first becoming evident in the females (Bednarik 2011a). Hominins lost their robusticity and physical strength, experienced a 13-14% atrophy in brain volume, and their genome deteriorated rapidly, with the introduction of at least 8000 defective mutations, allowing the rise of neurodegenerative illnesses, mental illnesses, Mendelian disorders and numerous other deleterious alleles. Darwin regarded domestication as a deliberate human intervention (Darwin 1868, Vol. 1: 2) and subsequent considerations of domestication of humans (Hahn 1896; Fisher 1914; Schwalbe and Fischer 1923) were either superficial or were marred by racialisation and eugenic sentiments. Bagehot (1905: 51) incorrectly proposed that it was human self-domestication that led to civilisation. The subject became increasingly dominated by the linking of domestication with domesticity (Boas 1938; Eibl-Eibesfeld 1970; Wilson 1988), and in the course of the 20th century the issue of human domestication came to be firmly wedded to the ‘Neolithic revolution’ (Hodder 1990). Leach (2003) continued along the same line of reasoning that human domestication is a development of the Holocene, essentially tied to the Neolithic.

Generically the domestication of animals, plants and fungi is the collective genetic alteration of their physiology, behaviour, appearance or life cycle through selective breeding. Typically, one organism assumes a significant degree of influence over the reproduction and care of another organism in order to secure a more predictable supply of a resource or characteristic of benefit. Many animal species, vertebrate and invertebrate, from mammals to social insects, have domesticated others, for instance to serve as staple food source, to modify foods indigestible by the domesticators, or for their labour. Insect domesticators are well known for their animal and fungi domesticates (Hölldobler and Wilson 1990; Munkacsı et al. 2004; Mueller et al. 2005). In mammalian species, the domestication syndrome involves profound changes in brain form, size and function due to sustained selection for lowered reactivity. The reduction is greatest in those wild progenitor species that possess the greatest brain volume as well as maximal degree of folding (Kruska 1988a, 1988b; Plogmann and Kruska 1990; Trut 1999; Zeder 2012). Brain volume reduction has affected nearly all domesticated animal species and ranges from 6% to as high as 30–40%. Not surprisingly, it tends to be the limbic system, which regulates endocrine functions and thus behaviour, that is the most affected part of the brain.

Although domestication is well understood as a generic phenomenon affecting a large number of organisms, the question of self-domestication was not pursued in any detail, although it has been suggested that cats, wolves and bonobos are self-domesticated (Driscoll et al. 2007; Russell 2012; Hare et al. 2012). The self-domestication of hominins has never been considered in any consequent fashion until we arrived at the subject of recent human evolution from a very different perspective. During the late 1980s, as the replacement hypothesis gained wide acceptance rapidly, we became one of a dwindling number of its opponents. African Eve was marketed very effectively, by the “mastery and shameless willingness to use various online social networking platforms, publishers and all manners of other deafening self-promotion”,

not to mention manipulation of the peer review system, and archaeology and palaeoanthropology began to “resemble poorly managed but well-advertised corporations” (Thompson 2014). The popular science writers, science’s “lumpenproletariat” (Rose 2016), played a key role in this campaign to neutralise opposition to Eve. As the “high priests” (Thompson 2014) of Eve’s crusade gained control over the mainstream journals, dissenting views were spurned and effectively censured.

We responded with counterarguments addressing specific central tenets of African Eve. First we refuted the notion that the advent of palaeoart coincided with the appearance of Graciles towards the end of the Pleistocene, showing that it extends hundreds of thousands of years into the deep past of hominins (Bednarik 1992). Three years later we stunned Eve’s advocates by showing that there was no evidence that the people of the Early Aurignacian tool industries were anatomically modern (Bednarik 1995). Indeed, the hominins of the last half of the Late Pleistocene show a distinctly clinal development of skeletal gracility. At no point did a significantly different kind of people suddenly appear, as the Eve scenario would demand. On the contrary, late Neanderthals tend to be significantly more gracile than their predecessors, and from about 35 ka to 25 ka ago, there is a succession of increasingly gracile humans, and a co-existence of robust and gracile forms can be found in various parts of the world. By 2007 we challenged the most fundamental tenets of the replacement hypothesis, proposing that not only the Aurignacian, but all of the Early Upper Palaeolithic traditions of Europe were the work not of ‘modern’ humans, but of Robusts or their immediate progenies (Bednarik 2007). At the same time we attributed the neotenous changes during that period to sexual selection based on culturally determined somatic features, promising to present the details of our ‘domestication hypothesis’ shortly. Those details were presented the following year, describing the main features of this hypothesis that was offered as an alternative to the replacement hypothesis (Bednarik 2008b).

The veracity of any testable hypothesis is tested by subjecting it to falsification attempts. In the case of our human auto-domestication theory, testing is readily possible by numerous means. The most obvious is by investigating how many genetic markers signalling domestication can be detected in the genome of present-day humans. In 2007, the genetic markers of domestication were unknown, but in recent years a great deal of such data has become available. The new genetic evidence corroborates the auto-domestication hypothesis. But in addition to that obvious source of challenge there have been various other developments since 2007 that either falsify the African Eve theory or verify our alternative. For instance, the formerly ‘brutish’ Neanderthals were suggested to have produced petroglyphs (Rodríguez-Vidal et al. 2014) and to have used parts of raptor birds for body decoration (Finlayson et al. 2012; Morin and Laroulandie 2012). As recently as 2003, most archaeologists had rejected the attribution of seafaring skills to Robusts and sought to explain away the Indonesian evidence concerning *Homo erectus* (Davidson 2003; Rowland 2003; Spriggs 2003). Since then, two separate teams have demonstrated the Lower Palaeolithic presence of hominins in the Mediterranean island of Crete (Mortensen 2008; Strasser et al. 2010, 2011; Simmons 2014) and a Russian team has claimed the presence of people with an Oldowan-like Mode 1 technology on the island of Socotra off the Horn of Africa (Amirkhanov et al. 2009).

Relevant new developments have greatly weakened the replacement hypothesis: the purported speciation event supposedly responsible for the appearance of a new gracile species has never occurred, having been falsified by genetics as described above: all hominins of the last half million years or so appear to have been interfertile; therefore, they are all subspecies of *Homo sapiens*.

The changes in exograms through hominin history

One of the most important factors in the defeat of the African Eve Hoax is the evidence that palaeoart has been produced not since the advent of Graciles or Mode 4 technocomplexes (Upper Palaeolithic or Later Stone Age), but extends back hundreds of thousands of years and was in widespread use during the Modes 1, 2 and 3 tool traditions. Palaeoart is not necessarily ‘art’ in the modern Eurocentric sense of that word; it consists of productions resembling art, but no evidence of it being either art or symbolic has been presented. The term ‘palaeoart’ refers simply to ancient phenomena created by hominins for which no purely utilitarian explanation is available. The most important aspect of this palaeoart is that it constitutes the only major corpus of evidence for exogrammatic production we have from the entire Pleistocene. It is therefore of fundamental importance in establishing how humans acquired the ability of consciously creating reality constructs, which is what distinguishes them from all other creatures on this planet (Bednarik 2014a). Without these frames of reference, human cognition as we know it could not exist. They are central to learning how our ancestors managed to create autopoietic reality from the sensory input the brain receives from the outside world and the proprioceptors (Bednarik 2011a). Moreover, it would be impossible to understand the changes to the human brain in recent evolution without considering the effects of the use of exograms. As externally stored memory traces they connect intimately to the neural terminals in our brains that process them and operate through them.

This should have always been self-evident, but Pleistocene archaeology has relegated these productions to the humanistic banalities of ‘art’ or ‘symbolisms’, readily comprehended simplistic entities. To deal with palaeoart scientifically, its study must be conducted by scientific (falsifiable) disciplines, including the cognitive and neurosciences. The ‘memes’ that are attached to exograms are cultural constructs that need to be reconstructed in each conspecific brain by such mechanisms as metarepresentation and recursion (Suddendorf 1999; Shimamura 2000; Samson et al. 2004). These faculties have been suggested, via homology, to have appeared in human ancestors during the Pliocene (Bednarik 2012, 2015). The introduction of exograms therefore needs to be understood in the context of early hominid cognition.

Another factor of the importance of perceiving palaeoart as exograms rather than art is the important role they play in the domestication hypothesis. One of the very numerous effects of human auto-domestication that is difficult to account for is the atrophy of the human brain during the final Quaternary period, essentially the last 50,000 years BP. It is universally assumed that this period was one of rapidly increasing demands on the human brain. And yet, during the final Pleistocene and the Holocene, the brain volume of humans decreased on average by 13-14%. While brain size loss is a universal feature of mammalian domestication, it is difficult to understand how at a time of newly arising great neural demands, millions of years of encephalisation would

suddenly be reversed. Indeed, the decrease in volume is occurring at a rate 37 times greater than the rate of brain size increase over the previous two million years (Bednarik 2014b). Encephalisation came at a huge evolutionary and social cost to the societies concerned, the magnitude of which is hard to appreciate. We have been conditioned to think that it was the great price humanity paid for its mental and cognitive sophistication, and yet when those demands were apparently greatest, the process suddenly reversed and our rapid brain atrophy replaced it. This seems to severely challenge the notion that brain size increase was related to intelligence or cognition. Which in turn raises the need to explain why hominins would have been saddled with the enormous biological and social handicap of encephalisation in the first place: either the teleological concept of brain evolution is fundamentally flawed, or there is another reason why the human brain could tolerate brain atrophy as prescribed by domestication.

Just as the auto-domestication hypothesis has solved the Keller and Miller (2006) paradox — as well as various other unexplained phenomena in hominin evolution — it also explains the toleration of brain atrophy readily (Bednarik 2011a, 2014a). Just as the memory of a computer can be extended by external storage of some of its functions, the external storage of memory traces in the form of exograms limits the computing power needed by the brain and therefore its size can be reduced without severely adverse effects. Indeed, the size of external storage can be regarded as theoretically unlimited, as the shared memory becomes increasingly stored in exograms. The outcome is that the ability of exploiting and processing exograms gradually became a selective factor, and in that sense humans found themselves on a developmental trajectory that is totally different from that of any other species. Our culture became entirely dominated by our proficiency in the exploitation and deployment of external storage of memory. Hominins became the first organisms on this planet capable of creating self-extracting systems generating self-referential realities. Human cognition as we know it would not be possible without these frames of reference. The autopoietic realities we experience as real exist because our imagined worlds became real (Plotkin 2002).

It follows from this that in exploring the changes in the so-called non-utilitarian production in human history, more constructively defined as exograms, we can lay the foundations for an understanding of how hominins arrived at inventing constructs of reality, and perhaps also what the underlying neural changes/processes were. It goes without saying that nothing could be more profound in improving our understanding of “the undiscovered primate” of Todd Preuss. In short, the most important role of palaeoart is not to serve archaeology in providing attractive covers for books, or in the opportunity of assisting in inventing archaeological narratives of the human past. It is to furnish the sciences with the raw data of how exograms were developed in the course of human history. The vigorous promotion of the replacement hypothesis has hindered that process for decades. A brief summary of the changes in exograms through time is provided here.

The earliest known exogram is the Makapansgat jaspilite cobble from South Africa (Eitzman 1958; Bednarik 1998), carried for a long distance into a dolomite cave and deposited between 2.4 and 2.9 million years ago. The primate who handled it detected its strong pareidolic properties, which presupposes apperceptive capability. It also implies self-awareness and a developed theory of mind. The oldest indication of pigment use, suggestive of similar faculties, comes from southern Africa, from such

sites as Kathu Pan 1 in South Africa (0.8-1.3 Ma years old); Kabwe at Broken Hill, Zambia; and Wonderwerk Cave in South Africa (~1.1 Ma ago; Bednarik 2017). The earliest currently known proto-figurines have been reported from Morocco (Bednarik 2003b) and Israel (Goren-Inbar 1986; Goren-Inbar and Peltz 1995). The object from Tan-Tan, coated in haematite pigment, is of the Moroccan Middle Acheulian (Figure 3); the Berekhat Ram proto-figurine is of the Late Acheulian. A proto-figurine is essentially evidence of a pareidolic reaction to a natural feature resembling another object in shape, as expressed in action emphasising those features. Petroglyphs seem to have arisen first in India, in the form of cupules at sites such as Auditorium Cave, Bhimbetka (Bednarik 1993b) and Daraki-Chattan (Bednarik et al. 2005; Figure 4). They are of people with Mode 1 tool industries but remain essentially undated, and they are followed by the late Mode 2 traditions that created identical petroglyphs in the Kalahari Desert. Found at two sites in the Korannaberg hills, at Nchwaneng and Potholes Hoek, these petroglyphs are attributed to the climatic incursion of 410-400 ka ago (Beaumont and Bednarik 2015). The oldest known portable engraving, somewhat older, was found on a shell from the *Homo erectus* deposit at Trinil, Java (Joordens et al. 2014). Dating by $^{40}\text{Ar}/^{39}\text{Ar}$ and luminescence suggests that it is roughly between 540 and 430 ka old.



Figure 3. Middle Acheulian proto-figurine of quartzite, modified, Tan-Tan, southern Morocco.



Figure 4. Lower Palaeolithic cupules on a wall of Daraki-Chattan Cave, central India.

Other palaeoart finds of the Lower Palaeolithic are the numerous stone beads of the Acheulian from a series of sites in France and England (Bednarik 2005). They are all of perforated *Porosphaera globularis* fossils and have been reported from the Acheulian for well over 150 years (Boucher de Perthes 1846; Prestwich 1859: 52; Smith 1894: 272-276), yet some authors continued to reject them until recently (Rigaud 2006-2007; Rigaud et al. 2009) (Figure 5). Similarly, the same French team (d'Errico and Villa 1997) rejected the significance of the expertly perforated wolf incisor from Repolust Cave in Austria (Mottl 1951). It is from a handaxe-free Lower Palaeolithic tool industry and thought to be roughly 300 ka old (Bednarik 2001). D'Errico had similarly explained away the Mousterian bone flute from Divje babe I, Slovakia (Turk 2018), as having been caused by animal chewing. The age and significance of the several engraved pieces from the Steinrinne near Bilzingsleben in Germany (Mania and Mania 1988; Bednarik 1995; Brühl 2018) are somewhat better established (Steguweit 1999). They are 424-374 ka old (Lisiecki 2005) and were excavated with thousands of stone implements and numerous hominin remains so robust many have described them as *Homo erectus* specimens (Figure 6). A similarly engraved forest elephant vertebra has been found at Stránská skála, Czech Republic (Valoch 1987; Bednarik 1995). More recent is a notched bone fragment from the Late Acheulian of Sainte Anne I, at Polignac, Haute-Loire, France (Raynal and Séguy 1986; cf. Crémades 1996).



Figure 5. Acheulian stone beads from Bedford, England, United Kingdom.



Figure 6. One of several engraved objects from the Lower Palaeolithic of Bilzingsleben, Germany.

The production of petroglyphs by people with Mode 3 technocomplexes (Middle Palaeolithic, Middle Stone Age) has been known for a century, e.g. at La Ferrassie in France (Capitan and Peyrony 1921; Peyrony 1934). Numerous other finds confirming that robust hominins, including *Homo sapiens neanderthalensis*, produced palaeoart are now on record, but their relevance continues to be declined by the cognitive evolution deniers. They accept that Neanderthals had, on average, larger brains than we do, but they insist that they did nothing with those big brains. It has apparently not occurred to African Eve's followers that natural selection would have never tolerated the immense evolutionary encumbrance of encephalisation. We now have Neanderthal petroglyphs from Zarzamora Cave, Spain, Gorham's Cave in Gibraltar (Rodríguez-Vidal et al. 2014) and dozens of other sites around Europe have also yielded Mousterian palaeoart (for details see Bednarik 2017). Even a significant part of exogram production associated with Mode 4 traditions in Europe is the work not of 'moderns', but of the much-

maligned Neanderthals. And this is not surprising, as modern Eurasians are domesticated robust humans, i.e. they developed directly from such people as Denisovans and Neanderthals. Therefore, it is reasonable to expect that the humans who created the extensive palaeoart of all the well over a dozen Early Upper Palaeolithic tool traditions, such as the Aurignacian, were Neanderthaloids or post-Neanderthals (Bednarik 2007, 2011a, et passim). They produced the extraordinary palaeoart of Swabia in Germany, of Chauvet and Baume Latrone (early phase) in France and numerous other sites in Europe. And that is before we consider the thousands of Pleistocene and early Holocene palaeoart examples of Australia, also made by people with Mode 3 technologies. It tends to be overlooked in this context that all of the rock art of Tasmania was created by humans with Mode 3 traditions.

It needs to be appreciated that the task of *reliably* detecting the changes in exograms as a function of human evolution is almost impossible at this stage. This is simply because the discipline has been completely dominated by a false model and an inherently bogus framework, based on Protsch's Hoax. The only protagonists working on alternative ideas have been marginalised, disenfranchised and relegated to the status of heretics: African Eve was not just an idea; it was a dogma, defended very effectively by an army of tens of thousands of supporters. In this climate a comprehensive model of the development of exograms is simply unattainable at present. The entire record of the world's palaeoart is unreliable, incomplete, inchoate and much in need of review, thanks to the Eve Hoax. At present, only one book summarises Pleistocene palaeoart (Bednarik 2017), which illustrates the problem neatly. Nevertheless, we will attempt a brief characterisation of the changes in exograms through hominin evolution, if only to provide a falsifiable model to test.

Until around 500 ka ago, all exograms we have currently are in the forms of manuports, modified manuports, pigment use, beads and pendants. Pareidolia (Bednarik 2016) played a major role in their use, which likely explains the emergence of symbolism, referent and referrer. The only other exograms we have from the earliest period are cupules, but they also exhort us to remember that cupules have the greatest longevity of all petroglyphs; therefore this is a taphonomic determinant. It invites us to consider that other, more fugitive forms of exograms were almost certainly in use at that time.

It is with the late part of the Lower Palaeolithic phase that the initial signs appear of a formal tradition of palaeoart that becomes the longest by far in the history of humans. It lasts roughly from 500 ka to 30 ka ago (and in some parts of the world even beyond that) and the failure of detecting this pronounced tradition is attributable to the Eve Hoax. The consistencies in the engraving conventions spanning from the mid-Middle Pleistocene to the end of the Late Pleistocene are remarkable, and yet they were never noticed because on the discipline's blinkered view. The various geometric patterns of these traditions persist for hundreds of millennia. They comprise lattices of zigzags or lozenges, convergent lines motifs of various types, grids and parallel lines, surrounds and borders, the ubiquitous cupules (the 'signs of all times'), and in regional variants the rise of circles and curvilinear mazes or lattices, and finger flutings in caves. This entirely aniconic tradition occurs in four continents and persists for around a half million years, but it remained undetected by mainstream archaeology because such evidence was 'not allowed' to exist. Besides engravings, other forms of palaeoart continued throughout, including beads, pendants, manuports and pigment use. Two-

dimensional iconicity was most probably introduced by children (Bednarik 2008c), although the time of its inauguration remains unclear. We have one tantalising find from the last interglacial, but common introduction seems to occur only around 40 ka ago. This is despite the recognition of three-dimensional iconicity very significantly earlier.

The phase of linear archaic engravings is by no means static in its forms. It shows development and change, and yet the underlying consistencies connect its various strands almost globally. The meanings of these exograms may not be knowable to us, but if we had a full record of the surviving evidence we might be able to reconstruct the dynamics of these traditions, and define the changes in the so-called non-utilitarian production in human history more precisely. The first task is to rid the discipline of the cancer called African Eve.

Concluding remarks

My grievance is with those who have for several decades retarded the discipline with their absurd idea of a ‘Mother of all Humans’, not because they had any sound ideas for its support, but because they were ignorant of the existing data (most of which was available when they inflicted their notions on the discipline), and most particularly because they controlled the refereeing system of the fashionable journals in the field and *censured opposition to their hypothesis*. When it comes to the origins of human somatic modernity (Bednarik 2011b), which seems to have emerged in a relatively short time, we simply have two options: either there was a mass movement of populations from some other part of the world, or there was a rapid genetic change, i.e. by domestication. The ignorance of the Eve supporters can be illustrated in many ways, but the most obvious is this: rather than conjuring up an African Eve, there would be a much more sensible replacement scenario, and yet they did not even think of it. We have absolutely no idea of the nature, physical characteristics, culture, genetics or any other aspect of that half of the human species that occupied the coasts, the lowlands, the major river valleys and the deltas. We have not one iota of knowledge about them, because all Pliocene and Pleistocene evidence has been lost to sea-level rises. It can reasonably be assumed that they were far more sedentary and developed than the inland tribes that followed the herds, and that would explain their very early seafaring feats as well as the evidence of permanent Acheulian villages of stone huts, among other things. If that were the case, the more realistic version of the replacement hypothesis would have been that the more developed cultures of coastal tribes supplanted the inland ones, as did their genomes. But Eve’s advocates did not even have the cognisance to think of this more realistic alternative; they simply wanted a racially pure Eve that was incapable of viably breeding with any other kin. Not only did they succeed in retarding the discipline for three decades, they crushed or obstructed much good work, destroyed careers to serve their own, and led to public and the popular science writers on a lengthy wild goose chase that will still continue for another decade. It generally takes about 40 years to rid the discipline of its major blunders (e.g. the rejection of Pleistocene humans, of Pleistocene rock art, of Neanderthals, of *Homo erectus*, of australopithecines, of direct rock art dating, or the correction of Piltdown). This is because, as Max Planck observed, we have to wait for the generation in question to die first: they will not admit to having been wrong in their lifetimes.

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