

Chapter 4

Joining Forces: Neuroaesthetics, Contemporary Visual art and Archaeological Interpretation of the Past

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1 Introduction

2 Archaeological research has brought to our attention two strands in the interpretation
3 of the past. The first is linked with processes and patterns that transcend time, human
4 communities and the material culture that people used to express the world that they
5 were part of. The second focuses on individual expression via material culture as a
6 reflection of being part of a wider community, while at the same time negotiating
7 one's own place in that community. By combining those approaches, I propose a
8 new understanding of human visual expression as a timeless form of communication
9 where neuroaesthetics creates a platform that cross-cuts time and space, and where the
10 cultural and historical integrity of the creative context in which the visual metaphor
11 is executed is a guide for how to look at material culture. In particular, I concentrate
12 on the idea of the corporality of the human body and visual art. Examples presented
13 include some of the earliest cases known as well as contemporary art. These are,
14 however, not to be understood in terms of one being more complex than the other,
15 but rather as expressions of the same neurophysiological capacities of being human,
16 in particular the social, ritual and symbolic contexts of the cultures of which the artists
17 were part. Such an approach allows us to go beyond the constraints of the nineteenth
18 and twentieth century evolutionary schema where ethnographic analogies provided
19 the basis for comparing the visual expression of small scale societies in the past and
20 which supported the notion of the idea of an evolution from simple to complex.

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21 Neuroaesthetics

22 One of the pioneering works in the field of neuroaesthetics is Zeki's (1999b) *Inner*
 23 *Vision: an exploration of art and the brain*. Zeki (1999a, 1999b) explains which
 24 parts of our brain are responsible for making sense of what we see and how this
 25 influences our visual priorities. Zeki illustrated this by showing works of art ranging
 26 from traditional paintings to kinetic art by making the reader aware of how the
 27 workings of the brain influence our implicit appreciation/understanding of visual
 28 arts, which in turn, he argues, allows artists to create the art objects we appreciate the
 29 most. In subsequent years, this approach has been explored by a number of scholars
 30 in response to growing advances in neuroscience and continuing interest in visual
 31 arts. Although some attempts have been made to address this (e.g. Zeki 2008) the
 32 major missing element is the failure 'to explain complex concepts such as ideals
 33 and beauty' (Minissale 2012, p. 43), which for me is one of the most interesting
 34 aspects of art. Looking for the cultural contexts in which our neurophysiological
 35 abilities have been moderated and explored by both past and contemporary artists.
 36 As archaeologist, we have the advantage of overview of 100,000 years worth of art.
 37 While acknowledging the conceit of universalism, but adopting a critically reflective
 38 stance, we can begin to understand how archaeological study of art can contribute
 39 to our view of the diverse spectrum of what constitutes being human. To illustrate
 40 this approach, examples drawn from different archaeological periods as well as
 41 contemporary visual art in the UK will be included. These comprise images found in
 42 Blombos Cave in South Africa, dated to over 100,000 years ago, Upper Palaeolithic
 43 figurines from the Russian Plain dated to over 30,000 years ago, and contemporary
 44 sculptures by Antony Gormley and Jim Bond dated to the late twentieth and early
 45 twenty-first centuries.

46 In discussing the corporality of the human body used by artists in their creation of
 47 visual metaphors for conveying specific meanings on the one hand, and what we as
 48 viewers use in understanding the art on the other, two concepts from neurophysiology
 49 are useful: one is the recognition of self and the other; the second is the conceptual
 50 perception of art as a function of the brain. These concepts can be illustrated through
 51 the description of the J. de Bellange painting, *Lamentation upon the Dead Christ*
 52 by Nalbantian and Changeux, which emphasises the cognitive and neural process
 53 involved in art, including re-creation, recognition and reasoning, as well as the sym-
 54 bolic and affective aspects of art. They also make point that what they term 'the mental
 55 synthesis' stimulated by the art in the viewer is an interaction between 'long-term
 56 cultural memory' and 'inherited memes'. All of this is brought together in the neural
 57 processes of the frontal cortex of the brain, assembling all of the various points of
 58 reference, resulting in a 'mental reconstructions' (1994, p. 38; 2008, pp. 359–360).

59 Elsewhere, I have presented an understanding of prehistoric imagery of the rock
 60 art of the White Sea in similar terms, which took into account the perception of
 61 vision, the experience of the carver and the cultural meaning of the depicted hunt as
 62 (Janik et al. 2007). Metaphor is central to art: and through the use of metaphor art can
 63 often enhance our experience of the world through encounters with the unexpected.
 64 Furthermore, if we look at the meaning of Christian iconography in the visual arts,
 65 those of us brought up in the Christian tradition rely on our implicit understanding

66 of meaning rather than the picture per se (Janik 2012). This in turn points to cultural
67 preferences structuring the meaning of what is understood and in what way. Making
68 relations between visual clues relies on already stored memories, what they could
69 be and what they can be associated with, and this is due to the process of knowledge
70 acquisition (Palmer 1999; Ratey 2002). This knowledge is acquired through being
71 part of the world in general, and also as being part of a particular culture or community
72 at a specific time, and is being mediated the viewers' own experiences, emotions and
73 personal histories. Further, the existence of neural links between the aesthetic and
74 the emotional values given by particular cultures to specific images and subjective
75 emotional experiences while creating and observing, provides images with emotional
76 influence over both the maker and the viewer (Cinzia and Vittorio 2009). The images
77 that have been considered congenial and that evoke within us the physiological
78 reaction of pleasure, e.g. an increase of endorphins in our body, opening the pathways
79 of neurological connections in our brain related to pleasure, fulfilment and positive
80 feeling, do not need to be the same through time and space. Looking at images of
81 women we can see that the sense of 'beauty' or 'desirability' has changed: pictures
82 by Rubens are now considered ugly, creating the opposite feelings and physiological
83 reactions to those they induced in the early seventeenth century viewer. Further the
84 appreciation of visual art cannot be extracted from the emotional involvement of the
85 viewer and the creator (Nalbantian and Changeux 2008), and so the visual stimulation
86 as understood through neuroaesthetics and the cultural categorisation of meaning.

87 **The Body as a Visual Art Object**

88 The earliest visual expression is linked to the human body and its decoration, which
89 allows archaeologists to reach into the deep past within the understanding of con-
90 temporary art. From a neuroaesthetics perspective, while the body is conceptualised
91 it is at first referenced to the corporality of self (Arzy et al. 2006a; Ruby and
92 Decety 2001). It has been argued that the areas of the brain responsible for visu-
93 alising the body are located primarily at 'the right inferior parietal lobe and the
94 precuneus, the temporoparietal junction' (Ruby and Decety 2001, p. 548). I suggest
95 that this neuroaesthetic property of our brain allows artists to explore the body in a
96 way we explicitly relate to, and creates positive or negative affinity towards it.

97 Postmodernism has shaped contemporary art (Harrison and Wood 2003; Fineberg
98 2010) and the constraints on what is a work of art and the aesthetic status quo have
99 become very flexible. There is no preferred aesthetic: all approaches are equally valid,
100 from 'old-fashioned' paintings, to crumpled pieces of paper and an artist's head made
101 from frozen blood. Furthermore, Conceptual Art, where a particular idea is presented
102 via the use of objects, texts, photographs and so forth, breaks the straightforward
103 relational link between the image, the material it is made from and meaning per se.
104 I suggest that the postmodern sense of aesthetic is more embracing, allowing us to
105 search for the past visual expression without constraining what is and what is not
106 art in the traditional sense based on the Renaissance understanding of visual arts.
107 Although there are other precursors to the use of the body in to create visual impact,

108 it was in such environment, that what is known as Body Art developed, where the
109 body of the artist was used and recorded in particular performance or static contexts
110 (Lucie-Smith 1995; Smith 2003, p. 257). This is also known as Living Sculpture
111 (Lucie-Smith 1984, p. 32). The body is additionally understood in terms of a 'canvas'
112 to be painted, pierced or modified.

113 *Then*

114 The idea of modifying the body in creating visual impact is seen in the earliest
115 examples of visual art. These come from Blombos Cave in South Africa, where 41
116 intentionally pierced beads of *Nassarius kraussianus* shell were found, 39 dated over
117 70,000 years ago and two to over 100,000 years ago (d'Errico 2005; Henshilwood
118 et al. 2004). The presence of numerous pieces of ochre, a few of which were deco-
119 rated, has been established. The analysis of use wear patterns on the shells suggests
120 that they were strung and used as beads (d'Errico 2005). Further, the presence of ochre
121 indicates the use of pigment possibly to alter the colouring of the body's appearance
122 or body modification, including clothing or jewellery. Other examples indicating the
123 use of visually noticeable body modification come from northern Africa (Bouzoug-
124 gar et al. 2007; d'Errico et al. 2009). The examples from Blombos Cave, however,
125 remain the oldest. The use of pigment and beads was also used by our ancient cousins
126 *Homo neanderthalensis*, whose mitochondrial DNA we share (Hublin 2009; Zilhao
127 et al. 2010). Around 50,000 years ago in Cueva Antón, Spain, the perforated shell
128 *Pecten maximus* shell was found in the context of a Neanderthal habitation. Inside
129 was intentionally coloured by a mixture of orange/yellowish material obtained from
130 ogoethite and hematite, while the outside surface was left in its natural red condition.
131 Another example is the oldest-known 'powder box', from Cueva de los Aviones in
132 southern Spain. This was made from *Spondylus gaederopus* shell stained with the
133 residue of an orange/yellowish pigment. Thus, the use of the body as a 'canvas' is
134 not only linked with the oldest evidence of the visual arts, but also that it was not
135 restricted to *Homo sapiens*.

[AQ3]₁₃₆ The use of colour itself relates to neuroaesthetics. According to Zeki (1999), it is
137 linked with three stages: first where the V1 area of the brain is prioritised; secondly
138 with the assessment of the light spectrum wavelength located in area V4 and the last
139 phase correlated to 'making sense', relating to a variety of areas of the brain with a
140 focus on the inferior temporal cortex, the hippocampus and the frontal cortex. Colour
141 in turn is an additional stimulus that carries visual information where the body itself
142 becomes the object that evokes not only an aesthetic impression but also emotional
143 responses to how it looks like. Modifying the body can be seen in the process of
144 performativity as proposed by Butler (1988) where social identities are constructed
145 via visual appearance and particular ways of acting upon those identities. So the use
146 of particular visual stimuli can lead to the creation of visually recognised metaphors
147 that are specific to, or even transcend, particular communities. In such a way, the
148 body itself becomes a medium, a canvas of artistic transformation of the body into
149 social and artistic entity.

Fig. 4.1 Autogenous sculpture, *Reflection* by Antony Gormley at 350 Euston Road, London. (Photograph by Mark Sapwell)



150 *Now*

151 The human body is not only modified or used in the context of performance, but it
152 can also be used in the autogenous sculptures as done by Antony Gormley (Fig. 4.1).
153 He translates the neurophysiological capacities of being human into the autogenous
154 representation of self that is a vehicle for him to ascribe the human condition in the
155 world. He uses casts of his own body, 'body-surrogates' as a metaphor for commu-
156 nicating issues and concerns of the time and space he occupies in the world he lives
157 in. These include the place of gendered role models, the need to move beyond ap-
158 pearance of things, exposure, vulnerability, what it means to be human, our vertical
159 (bipedal) nature, the dark side of the human nature: all of these for Gormley justify
160 the expense of making artworks that investigate the collectivity and singularity of
161 human experience (Powell 2011).

162 How can this help us in trying to interpret prehistoric visual art? First, we need
163 to clarify what we mean by visual art. I regard visual art as the engagement of
164 metaphor based on the creative aspects of being human, metaphors which modify
165 and transform material culture in the act of nonverbal communication. Two different
166 but interrelated categories of visual art can be defined. The first is visual expression,

167 part of the physiological capacities of the human body. The second is a culturally
168 moderated understanding of the world around us that allows us to make sense of and
169 give meaning to the material culture we create and see, through visual expression.

170 By being an inspiration to think outside the box, and look for the past artists' concerns
171 and ideas they were capturing in the visual art they produced. Then by moving
172 from the scale of the individual into the cultural, social and symbolic trajectories they
173 embody in the sculptures they created, so the body of the self becomes a metaphor
174 of concerns/ideas that were part of the world they lived in, just as Gormley describes
175 in his interview with Powell (2011).

176 *Now and Then*

177 Gormley's idea of 'Resistant to time but in dialogue with time' sums up very well
178 the autogenous sculptures that are gendered in contemporary understanding of the
179 concept of human female and male. Gormley follows the notion of the creation of
180 gender as a construct rather than a given, in a similar way to Butler (1988). For
181 him, nakedness is of importance but, as I will show later, nakedness and the lack of
182 displaying the most recognisable part of our body to the other, the face, also has a
183 neurophysiological basis. The materiality of the substance of which the sculptures are
184 made plays an important role for Gormley, which is also the case for the prehistoric
185 art discussed here. I go further in the interpretation of Palaeolithic sculptures than
186 previously (Janik 2012; see also Jones this volume), looking at different aspects of
187 figurines as well as in the way I engage with the voice of the contemporary artist
188 whose sculptures conceptualises the concerns and ideas we share today in the UK
189 and beyond.

190 The artwork can be interpreted as a representation of the time and space in which
191 it was created, influencing the community of which it is a part. This representation
192 changes: for instance in the twentieth century so-called Venues figurines were used
193 to represent the evolutionary development of human societies, where women were
194 fertility symbols, life-giving beings and objects of male desire (Régnauld 1912; White
195 2006). In the late twentieth century, they became objects that allowed us to question
196 those assumptions and reinterpret the place of women in the past, which can be
197 best illustrated in the focus of the way they are written about, where 'autonomous
198 figurines' replaces the vocabulary of 'Venus figurines' (Janik 2012; McDermott 1996;
199 Morriss-Kay 2012). However, in the past they were probably active instruments in
200 the constitution and reconstitution of the social and symbolic realities of Upper
201 Palaeolithic Eurasia. The processes of how they were made, what they were made
202 from and how were they treated is essential in our understanding of the past as an
203 independent historical and cultural identity very different to ours (Janik 2011, 2012).

204 Prehistoric female figurines with exaggerated attributes of the female body due to
205 the deposition of fat tissue and generally known as 'Venus' statuettes has been reinter-
206 preted by McDermott (1996) as self-representations made by the women themselves,
207 so-called autogenous sculptures. The foreshortening projection creates for the viewer

Fig. 4.2 Willendorf figurine, original 11 cm, limestone. (Photograph of a cast by author)



208 a distorted image since it has been created by the women herself: if she looked down
209 on her breasts and carved what she saw—they looked different and bigger than if
210 someone else looked at the woman and carved her body. McDermott proposed ‘at
211 least five or six primary vistas: (1) head and face, (2) superior anterior or upper
212 frontal surface of body, (3) inferior anterior or lower frontal surface of body, (4) in-
213 ferior lateral or lower side surface of body and (5) inferior posterior surface of body,
214 including (a) under-the-arm views and (b) an over-the-shoulder view (McDermott
215 1996, p. 237). So the figurines once argued as reflecting very overweight women
216 were reinterpreted as portraying pregnant females of medium size, in the case of the
217 Willendorf statuette, akin to a 6-month-pregnant Caucasian women with the breast
218 size of 34, cup C (Fig. 4.2; McDermott 1996, p. 240).

219 What is interesting here is the lack of a face, which in the neuroaesthetic context
220 creates an important distinction between being recognised in visual communication
221 via facial expression and recognition of a generic body (Haxby et al. 2000). It is inter-
222 esting that Gormley makes a similar point: by not showing his face he moves beyond
223 his own place in the world by being not recognised by the other, and transcends a
224 self moving from egocentric to the allocentric perspective (Sudo et al. 2012). This
225 is linked with the higher-cognitive functions of the brain, where the 'use of the term
226 embodiment to refer to the capacity to understand or re-represent the states of others
227 by linking them to states related to one's own body, either at the embodiment level
228 directly, or via a representation of one's own body at the embodiment level' (Candidi
229 et al. 2012, p. 110). Although of course when these figurines were produced, there
230 may not have been the skills to work the materials to create faces that would have been
231 readily identified as specific individuals: rather they would have been generalised
232 or abstracted. This means that we cannot be certain about their intent. Gormley on
233 the other hand, has access and training in working many materials and could create
234 veristic faces, so the conceptual importance of his decision not to rely on a critical
235 engagement with the technical abilities of art making as *tekhnē*, honed over many
236 years and generations.

237 *Then Once More*

238 Autogenous figurines have been recovered from several areas of Europe not covered
239 by glaciers (Fig. 4.3) and are dated to between 30,000 and 20,000 years ago.

240 A contextual approach looks at the relationships between who made the objects,
241 what they were made from, and processes of manipulation and deposition. These give
242 us a small window on to the past and the role of material culture in bringing different
243 strands of being together. I focus here on finds from central Russia, a location which
244 has some of the best known Upper Palaeolithic sites in Eurasia: Kostenki 1, layer
245 1, complex 1 (Abramova 1962), dated between over 24,000 and 19,000 years ago
246 (Svezhentsev 1993, p. 28); Avdeev (Gvozdover 1995), dated between over 22,000
247 and 15,000 years ago (Svezhentsev 1993, p. 27) and Gagarino (Tarasov 1979), dated
248 between 30,000 and 18,000 years ago (Svezhentsev 1993, p. 27). Being part of
249 the Pavlovian–Kostenki–Gravettian archaeological culture, despite the diversity of
250 figurines, there is an underlying relationship between them in terms of the materiality
251 of the substance of which they were made, and the visual communication via the
252 presence of the face.

253 **Material Culture**

254 What we can see here is the relationships between the material the figurines are made
255 of and what they represent. This is at the centre of understanding the materiality of the
256 substances selected by prehistoric artists for their representations. As an example,
257 from the data summarised in Table 4.1, we can contrast the material chosen for
258 autogenous figurines and depictions of mammoth, used for objects which will be

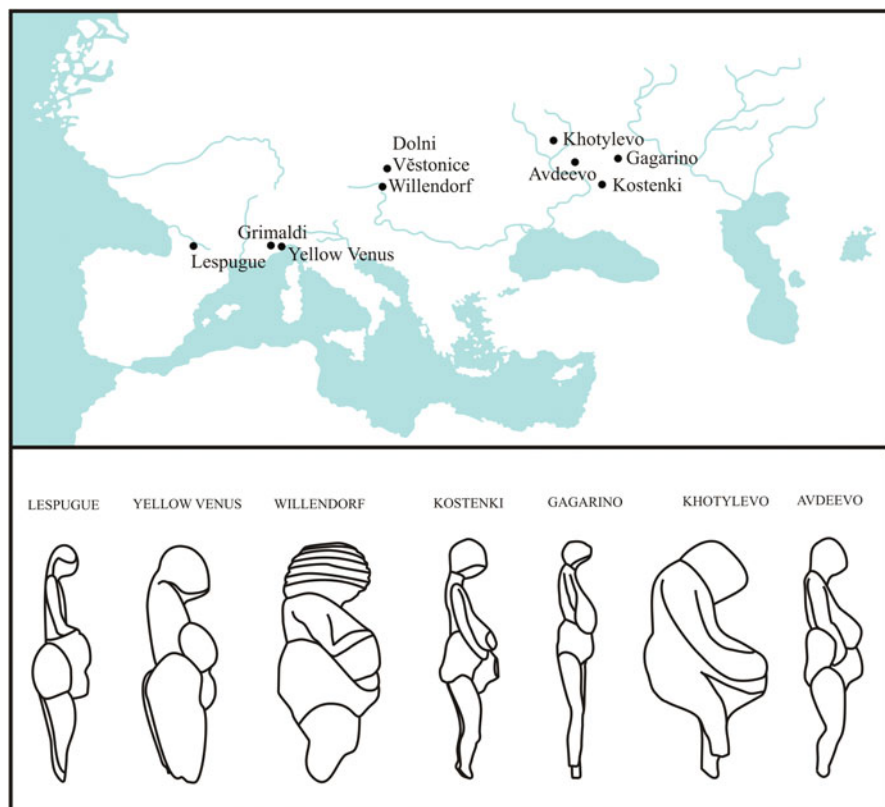


Fig. 4.3 Location of autogenous figurines in Upper Palaeolithic Europe. (Redrawn and adjusted after Mussi Margherita and Peirre 2000)

259 broken and for those which are left complete. The autogenous figurines made of
 260 mammoth tusk and are almost always not broken (though they could easily be) and
 261 the representations of mammoth are made of marl (a very easily broken material),
 262 but again are always complete. Representations in marl of other animals are always
 263 broken, as are the autogenous figurines when made of marl rather than mammoth tusk.
 264 Examining these material metaphorical associations requires further interpretation
 265 which is beyond the scope of this paper. Here, I would just like to suggest that the
 266 role of the mammoth in past societies was probably versatile depending with whom
 267 it was associated, and in which contexts the relationship took place, for example in
 268 social relations between different beings it could take the form of a particular shape,
 269 while in symbolic terms it could be visible via substance (Table 4.1).

270 What is interesting, however, is that at Kostenki 1/1/1/ and Avdeevo shape was not
 271 broken but material was (Table 4.2) as if the visual representation of mammoth had to
 272 be intact, while at Gagarino the presence of mammoth is only visible via the material
 273 of female figurines. Mammoth as material is only preserved in one representation of
 274 a human female and in one case of a horse figure.

Table 4.1 Relationship between materiality of the substance used and unbroken sculptures from main Upper Palaeolithic sites in Central Russia (Kostenki 1/1/1, Avdeevo and Gagarino)

Material	Kostenki 1/1/1	Avdeevo	Gagarino
Mammoth tusk	4 human female	10 human female 1 horse	11 human female 9 finished or in preparation 2 (being carved from one piece)
Marl/sandstone	10 mammoth 2 rhino 3 mammoth/rhino	2 mammoth	

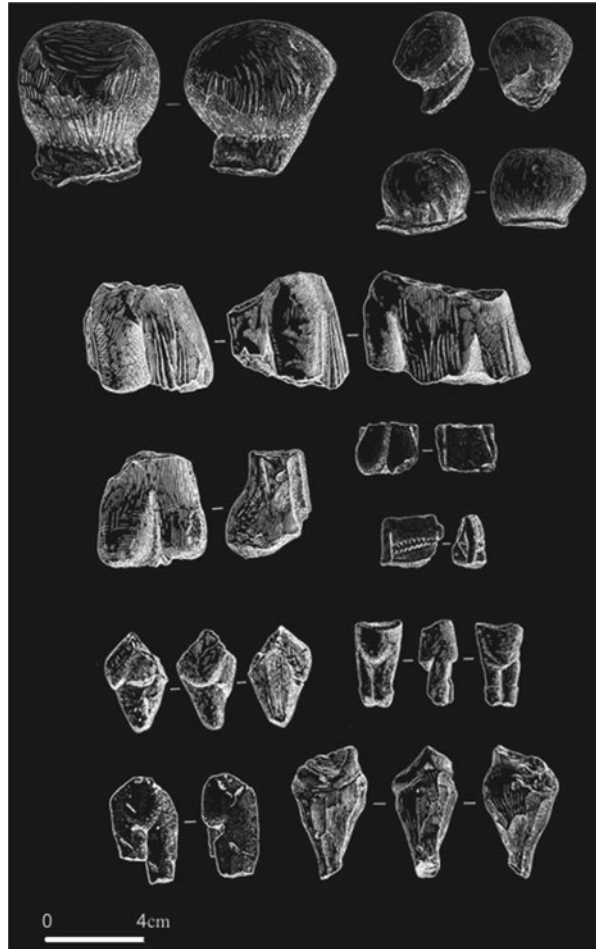
Table 4.2 Relationship between materiality of the substance used and broken sculptures from main Upper Palaeolithic sites in Central Russia (Kostenki 1/1/1, Avdeevo and Gagarino)

Material	Kostenki 1/1/1	Avdeevo	Gagarino
Marl/sandstone	7 cave lion 1 rhino/horse 2 horse 6 bear 1 wolf 14 bird 68 human female	15 human female	
Mammoth tusk	0	1 human female	4 anthropomorphic most probably female
Mammoth joint or vertebra	0	1 human female	

275 On the other hand, the material from which mammoth representations are carved is
 276 shared with all other representations: cave lion, rhino, horse, bear, wolf, bird and hu-
 277 man females (Fig. 4.4). I suggest that this relational link is a unique feature/category
 278 that allows us to distinguish between the female artists expressing their place in the
 279 world via autonomous sculpture and any other depictions. Unfragmented female
 280 figurines were created by female artists while the broken fragments come also from
 281 the statuettes that are made to look like self-portraiture. This in turn has important
 282 implications, since they could be made by others than the 'self' who can be defined
 283 in contemporary terms as other female or male artists. Therefore participation via
 284 the substance of marl/sandstone was open to other members of the community as
 285 well as pregnant sculptors.

286 Looking from the neuroaesthetic perspective the process of fragmentation has
 287 been exploited by Jim Bond, whose kinetic sculptures break the body up and bring it
 288 together in the process of embodiment and fragmentation (Fig. 4.5). This artistic un-
 289 dertaking of fragmentation can be referenced to neuroaesthetics and the extrastriate
 290 area of the brain (Astafiev et al. 2004; Arzy et al. 2006b). What is very interesting
 291 about this point when discussing the visualisation of self and the other is the transfor-
 292 mation from an egocentric perspective to an allocentric one as is seen in Gormley's

Fig. 4.4 Number of fragmented figurines from Kostenki 1/1/1. (Redrawn and adjusted after Abramova 1970)



293 sculptures, in which one sees oneself embodying ideas or concerns shared by a num-
 294 ber of individuals, helping to create a collective identity. Further, the agency of self
 295 and other in the context of the sensorimotor system was studied revealing that through
 296 the motor capacities of body parts, the self/other body distinction is constructed (Ferri
 297 et al. 2012). This process can be traced/recognised in the interview with Gormley:
 298 it can also indicate the way to understand autogenous and nonautogenous figurines
 299 and their fragments (Table 4.1).

300 Lastly, I suggest that through the process of fragmentation the women themselves,
 301 or other members of the prehistoric communities, go through the emotionally charged
 302 act of breaking that reinforces the neuroaesthetic properties of the figurines. In the
 303 end, in the process of nonverbal communication based on the properties of our bodies'
 304 neurophysiology, the application of colour into some of the autogenous figurines,
 305 creates one more element that implicitly focuses attention on the objects themselves,

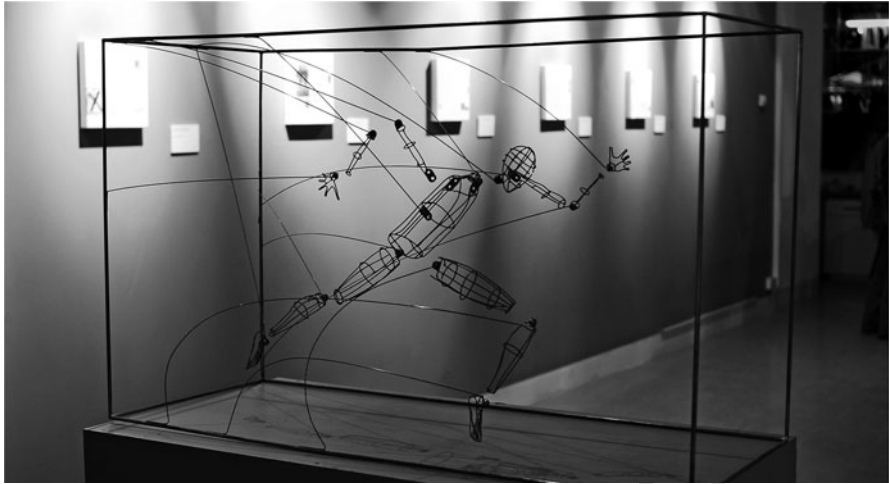


Fig. 4.5 Kinetic sculpture, *Giant Leap* by Jim Bond. (Photograph by John Coombes)

306 and by breaking them the surface colour of red or black becomes white, reinforcing
 307 the act of breaking through creating a new visual quality. The significance of colour in
 308 these figurines merits further research, as has been done in other areas of archaeology
 309 (cf. Jones and McGregor 2002).

310 Discussion

311 Returning to the topic of the relationship between contemporary and prehistoric
 312 visual art, at the first glance we might not see the connection, but if we look at the
 313 form in which the artists engage their bodies in their artistic practice, and how these
 314 bodies are used in social or symbolic contexts, we begin to see the conceptual links.
 315 Further, the materiality of the substance or material from which the figurines are
 316 made is as important to Gormley as to the artists of the Upper Palaeolithic. What
 317 is constant is the relationship between substance or material and representation:
 318 whereas for autogenous figurines mammoth is the most significant, in the case of
 319 Gormley's self-sculptures it is iron.

320 What also unities different times is the use of human body beyond the self reaching
 321 from an egocentric to an allocentric perspective in neuroaesthetic terms, creating a
 322 visual vocabulary based on being human, in which meaning can be shared across
 323 a particular time and space, and can be shared again between us and our distant
 324 ancestors via our neurophysiology.

325 Subsequently, the images themselves become active agents in the symbolic and
 326 social life of the communities who create and appropriate them. Even if they lose their
 327 original meaning through their visual presence/the way they look either reinforces or
 328 challenges our own status quo: both in the Palaeolithic and today, people are simply
 329 moved on the emotional level, where their 'feelings do the talking'.

Summary

This paper is offered as an attempt to deepen our appreciation of the physical faculties of our bodies, in particular our emerging appreciation of the physicality of thought manifested in the brain's structure and chemistry. Although beyond the scope of the current paper, future research will engage with studies of affect and phenomenology, to further develop our understanding of the shared human heritage of engaging the body to create art, as well as the differences in bodily artistic engagement through place and time.

Inspired by the pioneering work in neuroaesthetics, this paper adopts a neuroaesthetic approach to the interpretation of some of the earliest representations inspired by the human form, including the probable body ornaments from Blombos Cave in South Africa and Palaeolithic figurines from Kostenki, Avdevo and Gagarino in the Central Russian Plain. Drawing on current art historical approaches to Renaissance Christian iconography, and moving on to key examples from contemporary art, ranging from the body art of Antony Gormley and the fragmentary art of Jim Bond, the paper argues for a realignment of archaeological interpretation of some of the most ancient art known, a realignment that develops a clearer understanding of the relationship between the artist's choice of materials and what it is they are attempting to represent, whether that be an expression of their own corporality, gendered relationships, or their place in the world, or all of these. The paper proposes a bold new approach to ancient visual art, an approach that is effectively informed by current thinking about how the brain processes visual information, and the significance of that for the development of human expression.

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Chapter 4: Author Query

- AQ1.** Following references are cited in the text but are not given in the reference list: Zeki 2008; Nalbantian and Changeux 1994, 2008; Janik 2012; Cinzia and Vittorio 2009; Ruby and Decety 2001; d'Errico 2005; Henshilwood et al. 2004; Bouzouggar et al. 2007; d'Errico et al. 2009; Zekki 1999; and Abramova 1970. Please provide full references or delete the citations.
- AQ2.** Should it be "goethite" here in place of "ogoethite"? Please suggest.
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