

JANE CLARK

SENIOR RESEARCH CURATOR, MONA

ART AS AN EXTENSION OF OURSELVES

Art is part of the human extended phenotype; that is, an integral aspect of our humanness. As both action and expressively made object—something humans do, a programmed behaviour as well as the material result of that behaviour—art is as much part of our human nature as our physiology. As you may remember from high-school biology, an organism's genotype is its inherited genetic DNA makeup. A phenotype is 'the set of observable characteristics of an individual resulting from the interaction of its genotype with the environment'.¹

The extent to which a phenotype can reach beyond an organism's own body was brilliantly argued in 1982 by Richard Dawkins in his book *The Extended Phenotype*. Since the 1980s molecular geneticists have mapped the human and numerous other genomes (ours is apparently almost 99% identical to the chimpanzee's). Just this year, *Nature* published a study showing that specific genes can be responsible for animal architecture: that American deer mice (*Peromyscus maniculatus*) always dig simple, short, shallow tunnels, while closely related but genetically distinct oldfield mice (*P. polionotus*) construct long deep burrows with a canny escape detour; and that there are three gene loci determining tunnel length in *P. polionotus* and just one for their escape route.² Dawkins's ultra-Darwinian, 'triumphantly genetic' view of evolution has been challenged and remains debated by scientists, philosophers, anthropologists and linguists (I categorically exclude creationists from this discussion). Dawkins and Stephen Jay Gould, for example, feuded publicly until the latter's death in 2002; Gould insisting that natural selection worked not just on individual genes but on multiple levels extending to populations and indeed species and ecosystems as a whole. Of course nobody claims that there is a gene 'for' art. The production of proteins encoded by genes is only one element in a web of interactions between molecules, tissues, organisms and their surroundings, with evolved variation also arguably dependent upon factors ranging from epigenetic, to behavioural, to symbol-based inheritance. As Dawkins himself points out, 'replicators do not have to be made of DNA in order for the logic of Darwinism to work'.³ If you've already read David's and Elizabeth's essays—and you should have—you'll realise that 'our evolved tendencies are locked in intimate embrace with our learned ones' (Elizabeth) and that we 'suspect multiple culprits in the crime of our capacity for creativity' (David).

I declare from the outset that I am a curator and an art historian, not a scientist; and I willingly concede that I am extending Dawkins's conception of an extended phenotype further and

much less rigorously than he would approve. Nevertheless, art historical research persuades me that ancient Egyptian funerary objects, silver coins, Australian indigenous paintings and contemporary installations are to the human organism what bowerbirds' bowers are to bowerbirds, termite mounds to termites and caddisfly houses to caddisflies. I don't mean that every evolved human being could (and still can) paint a *Mona Lisa* or compose a *Für Elise* but that, as a species, we all have an instinct for art that has manifested over time in extraordinarily various ways. Both making art and consuming art are arguably hard-wired and uniquely evolved human behaviours, like our inborn capacity to learn language, or—to borrow again from Dawkins—a beaver's capacity for dam building. Painting and sculptures are not adaptations in themselves. Rather, humans have for millennia exploited more general adaptations—the capacity to learn and to pass on learning, the genetic makeup that gave us opposable thumbs, voiceboxes and so on—to develop the skills needed to exploit art making and art consumption in an adaptive manner.⁴ Individual-level processes have population-level outcomes.⁵ Of course we've done similar things with agriculture and technology, warfare, gastronomy and sport. All are clearly time-consuming activities that have had enough long-term utility not only to persist but also to allow we humans—now so numerous and so connected—to make almost the entire planet our 'niche' (biologically speaking, niche creation is engineering the environment in ways adaptive for the organism doing the engineering). However, because Mona is a museum of *art*, old and new, this exhibition continues Mona's non-didactic, sometimes intuitive, often discursive and rarely conclusive exploration of the hows and whys we human beings have exploited and continue to exploit our complex ability to use our imaginations. Which came first, the chicken or the egg? Art or cognition? At Mona, I live by the wise conclusion of that master of cautionary tales, Hilaire Belloc:

*Oh! let us never, never doubt
What nobody is sure about!*
'The Microbe', 1897

Evolution may be a 'Red Queen race' without any finish line, but human individuals and societies do have goals—and a purposeful sense of future that seems unique to our species. The exhibition, although spread across much of the museum and with no set route or narrative, is loosely divided into sections—'chapters' if you will—intended to suggest both motives and consequences in the art-making feedback loop: art feeds bio-cultural evolution and bio-cultural evolution feeds art. So questions are posed, about the role of play in creativity, for example, not just in childhood but throughout life; and about the evolutionary purpose of fiction (questions expertly addressed in Brian Boyd's masterful *On the Origin of Stories*⁶). We explore our instinct for pattern and our instinct for breaking it (thinking outside

the square, experimenting); how we learn things by doing them, with imitation a pre-requisite for innovation (anthropologists call this cultural ratcheting); art's relationship to sexual selection, for winning mates through status and display; and art as both an expression of and a bolster for belief. There is no division between ancient and modern—all the art at Mona was once contemporary; and no differentiation between local and imported (all of our ancestors travelled out of Africa).

As Elizabeth has already discussed, the arts clearly have had a longstanding role, in demonstrating fitness, focusing attention, building intellect, transferring knowledge from the past to the future through many generations, preserving cultural memory, and challenging the status quo. I am fascinated by the idea that the emergence of human civilization not only provided a new milieu in which entirely different non-DNA kinds of replicator selection could proceed, but also that the concomitant evolution of culture has so dramatically accelerated the rate of change in the extended human phenotype. Archaeologists tell us that symmetrical stone handaxes were first crafted by our hominin ancestor *Homo erectus* about 1.5 million years ago but that their design, throughout Africa, Europe and Asia, scarcely changed for another million years. Then things really began to move. From the caves of Lascaux, painted by Paleolithic people anatomically very like us, it was only 15,000 years to the beautiful individualised portraits on Mona's coins from ancient Afghanistan; from there to Leonardo, a mere 1500; and just decades from Henry Darger's obsessive watercolours to Kutluğ Ataman's televised story-telling, Toby Ziegler's inter-museum broadband live video-feed and Chris Townend's soundscape of 'perpetual funeral choirs'. (That other niche-changing human activities have also exponentially increased in pace and may well have less benign outcomes is a whole other subject).

Geoffrey Miller, who argues that sexual selection predated cognition, believes that even such apparently pragmatic tools as those handaxes evolved in part through sexual selection as displays of manual skill—essentially for showing off. Steven Pinker believes that art began as an exaptation—an accidental by-product—of sexual selection. Art-making, making utilitarian things 'special', as Ellen Dissanayake puts it, is intrinsic to human social learning and reflects our ability to understand, or at least to probe and influence, the minds of others.⁷ Certainly early human cutting tools are easily distinguishable from the found tools employed by chimpanzees, sea otters and various birds, just as proto-artistic human behaviour can be distinguished from ritualised behaviour in animals; but just *when* these differentiations emerged remains controversial.⁸ Even after *Homo sapiens* discovered that nature could be further improved upon by knapping flints for elegant shape and colour, patterning and aerodynamics, the evidence we have for context is highly restricted: stone axes and arrow

heads, despite demonstrating artistry, have probably only been classed as 'art' since the invention of museums and art history. And they have survived because they are stone, not necessarily because they were the most interesting things their makers were creating at the time. Presumably those makers were also busy decorating their bodies, singing, dancing; and telling their children stories in order to focus their attention, develop their brains and teach them lessons about life.

The ancient Egyptian stone projectile points at Mona are comparatively recent: Late Neolithic, so only about six or seven thousand years old (that's still before Bishop Ussher and his adherents believe the world began). It seems that these expertly knapped objects were tradable, i.e. desirable, having been discovered by archaeologists in places far away from the great flint mines of the Eastern Desert and alongside decorated pottery and jewellery.⁹ Survivals from ancient Egypt are, of course, a rich source of information about early human creativity and its purposes. The carved stone panel of hieroglyphs from the tomb of a man named Montuhotep is a demonstration of symbolic written language, technology and a complex religious belief system. Marcel Marée, at the British Museum, translates the man's name as 'Montu [god of war] is content'; and the bee and rope signify that he was among the king's highest officials. About six centuries later, the pharaoh Amenhotep III's large carved and glazed scarabs seem to have been made as propaganda or at least as news bulletins, when Egypt was a superpower in the Eastern Mediterranean region, replicated in the hundreds to be distributed widely at home and further afield. One series commemorates his union with a principal wife named Tiye. Another, even though most Egyptians would not have been able to read the hieroglyphic inscription, declares that Amenhotep single-handedly brought down 102 lions with bow and arrow in a period of ten years: definitely showing off, even if true (David makes an analogy with the North Korean personality cult of Kim Jong-il).

The collection of large silver Bactrian and Indo-Greek coins already mentioned can also be regarded as excess capacity—'peacock feathers' in evolutionary terms; boys' toys in common parlance—produced by numerous rulers of Greek ancestry who, after the death of Alexander the Great, presided over a patchwork of contested territories between Iran and India, now part of Afghanistan, Tajikistan, Uzbekistan, Turkmenistan and Pakistan. These coins are much more elaborate, beautiful and valuable than they needed to be to serve simply as tokens of trade. Rather, they present the men who issued them as handsome (these are among the earliest individualised portraits to survive in art); rich (Roman historian Justin described 'the famed Bactrian Empire of a thousand cities, wallowing in wealth'); powerful (Demetrius wears an elephant-scalp headdress as conqueror of India and successor to Alexander); of excellent dynastic stock; and multicultural. Most depict ancient Greek deities on the reverse—

Zeus, Poseidon, Athena or Heracles—and on several examples the kings themselves are called ‘God’. Agathocles issued a series of ‘pedigree’ coins linking himself with both Alexander the Great and Demetrius to ‘document’ his lineage and thereby legitimate his rule. He was also one of the early Indo-Greek rulers to issue bilingual coinage, with Greek inscriptions on one side and a translation on the reverse in the local native language and Kharoṣṭhi alphabet. Antimachus and Apollodotus wear the traditional Macedonian felt hat or *kausia*, proclaiming their western-ness even at such a distance from the mainstream Greek world; while Antialcidas Nikephoros ‘the Victorious’, mixes metaphors by representing himself in a *kausia* on one side and Zeus with an Indian elephant on the other.

Art can be ideology made visible. It has been an instrument of social cohesion for millennia, not least through the actualisation of mythologies. And of course this is utterly dependent upon the human capacity for mental time travel, our ability to create mental pictures of our past and future, not only for ourselves as individuals but also for our society or even our species. Self awareness is not absent in other animal species but it seems to be uniquely developed in human beings, enabling both episodic memory of specific experiences and working memory—the seemingly basic ability to do things like knowing words while speaking them, remembering a telephone number when dialling it, painting on a canvas while imagining the subject or writing down musical notes while composing.¹⁰ Male satin bowerbirds (*Ptilonorhynchus violaceus*) may build beautiful bowers for their courtship displays, and have even learned to decorate their dance floors with scraps of blue plastic as well as blue and yellow flowers, but it is extremely unlikely that they look at one another’s bowers and imagine inventing a completely different shape (the computer-generated ‘Utah teapot’ shape proposed by Toby Ziegler, for example!) or imagine bequeathing some new kind of non-perishable bower to their chicks. Their intellect has them making a kind of art, but the art has not dramatically transformed their intellect in return.

Human art—as opposed to bird or beaver varieties—has become supremely malleable. The imagery in many Australian Aboriginal paintings, for example, was mainly used for ceremonial body decoration or ephemeral ground paintings made of sand until the concept of collectable, tradable, art was recognised. Traditional designs, a language of pattern, symbol and meaning ‘owned’ by certain individuals or exclusive to their particular social group and passed down through generations for millennia, are now recognised in the international contemporary art world. The Pintupi artist Uta Uta Tjangala, who first met white people in his thirties, became a founding member of Papunya Tula Artists, pushing the boundaries of tradition with his inventive use of colour and imagery. He was apparently a charismatic personality, a leading authority on men’s ritual and dance, and one of the first to accept when

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the schoolteacher at Papunya, Geoffrey Bardon, offered the community acrylic paints in the early 1970s. Uta Uta's *Women's Dreaming* (1972), based on Tingari ceremonial designs, was included last year in an exhibition at the Musée du quai Branly in Paris.¹¹

Two large paintings in 'The Red Queen' by Rover Thomas, both entitled *Rainbow Snake Dreaming (Krill Krill)*, 1983, represent an innovative physical incarnation of ancient oral traditions. Thomas, having worked for years as a cattle stockman in the Kimberley, settled at Warmun community near the township of Turkey Creek not long after the devastation of Darwin by Cyclone Tracey on Christmas Eve of 1974. As art dealers and curators learned when they enquired about the origin of these powerful map-like images, this use of natural rock-art ochres on modern boards evolved as a consequence of Thomas's role as a senior ceremonial leader. Thomas had been the recipient of a 'dreaming' story from the spirit of his classificatory mother, who had died after a car accident during the cyclone, endowing him with songs, dances and imagery for a new ritual performance called the *Krill Krill*. During the *Krill Krill*, dancers carried painted boards across their shoulders, an adaptation of traditional dance totems or *ilma*, at first painted by others under Thomas's direction and generally discarded after the event. Such performances, known as *palga*, were popular public entertainment—'almost like a musical would be for whitefellas'¹²—but Thomas also incorporated serious information into his productions. As curator Wally Caruana explains: 'Against a background of decades of cultural disruption and social change, Aboriginal elders across the Kimberley interpreted the cyclone as a manifestation of the ancestral Rainbow Serpent (*Wungurr* or *Unggud*) who had destroyed Darwin as a warning to all Aborigines, young and old, not to forego their culture and its ceremonies and beliefs: to keep their culture strong'.¹³ In about 1980, as owner of the designs and their narrative content, Rover Thomas began to paint dance boards himself and then to make larger paintings expressly for sale. In 1990 he represented Australia at the Venice Biennale.

The large wheel-shaped 'currency' stone from the Micronesian islands of Yap represents a similar transmutation from traditional elite status symbol to contemporary elite collectible. Before the nineteenth century, rai currency stones were made up to three metres in diameter, half a metre thick and weighing four tonnes, with their value dependent not only on size but also provenance. They were carved from limestone, all of which had to be ferried more than 400 kilometres to Yap from the Palau Islands by sailing canoes or rafts—a clear demonstration of fitness! Used in political, territorial and social transactions, they were placed in front of communal clubhouses or on specific pathways and although the ownership of a particular stone changed, the stone itself was rarely moved. Today, no ancient examples may

be taken from Yap; those carved after the 1870s, when shiploads of stone were imported by entrepreneurs to be mass-made with metal tools, are far less valuable to collectors.

Art is intricately bound up with the human awareness of mortality, or, in the language of modern psychologists, our 'terror management'.¹⁴ Certainly it is plausible that elephants, dolphins, wolves and other mammals understand death. However no species apart from us engages in symbolic behaviour and the making of special objects so as to influence the psychological ramifications of that understanding. Elaborate burials, having an inherent bias for survival, provide some of the earliest evidence of human creativity. Documented Neanderthal burials (*Homo neanderthalensis*) are unsophisticated. Whereas we *Homo sapiens* have complicated the process of laying each other 'to rest' with paraphernalia ranging from canopic jars, mummification and egg-shaped jarrah urns to cathedral crypts, multi-storey mausoleums and posthumous Facebook pages.

Montuhotep's inscription, mentioned earlier, assures us that he went to his afterlife equipped with everything he might require, in the particular care of Osiris, ruler of the underworld, and Anubis, god of embalming and guardian of the dead.¹⁵ The beaded-net mummy-covering at Mona would have been placed over a linen-wrapped body, lying in a coffin for burial about 2,500 years ago. It was made to provide protection for the physical body so that the person's 'Ba', a kind of 'spirit', could leave by day and return by night for eternity. Its coloured faience beads are threaded to represent a bearded Osiris face-mask identifying the deceased as 'an Osiris', that is, a resurrected and perfected being. Further protective motifs include a large decorative collar with falcon-head ends, a symbolic scarab beetle, the winged deity Nut, goddess of the sky, and the Four Sons of Horus to watch over the owner's internal organs.

The large, late Bronze Age, anthropoid (body-shaped) terracotta sarcophagus in 'The Red Queen', one of a number of ancient coffins in Mona's collection, is of a distinctive style found both in Egypt and in other areas around the Mediterranean where Egyptian colonies were well established by the thirteenth century BCE. Similar coffins in this material and 'slipper' shape have been found at the Deir el-Balah cemetery, south of Gaza near the Egyptian border, and were probably used for Egyptian soldiers or administrative officials who died while stationed abroad as well as for locals emulating the ruling elite.¹⁶ You can be sure that any surviving Egyptian mummy contains the wrapped up remains of an elite consumer, because a 'beautiful burial' bestowing glory both on earth and in the next world was very expensive. Visitors to Mona should also look at the Roman-Egyptian coffin, which still contains the mummified body of Pausiris, 'son of Pausiris, grandson of Harpsêmis, 70 years old'. Doubtless this old man's family, organising his stucco plaster portrait in up-to-date

naturalistic style accompanied by ancient symbols, never remotely imagined an afterlife in Tasmania, subject to the latest technologies of CT scanning and thermoluminescence testing and with a whole new function as ‘art object’ in a museum which David has called his own fitness marker.

Both art making and art consumption can become rituals in themselves. In the late-eighteenth and nineteenth centuries, when public art museums first appeared in many parts of the world, they were often built with grand Ancient Greek–style porticos in the supposed image of the *Mouseion*, the temple where the Muses—the nine daughters of Zeus—were worshipped for presiding over the fine arts. Artworks became the resident deities in the Enlightenment’s temples of art. And so they may still be in twenty-first century, no-column models such as Mona. Artists (and curators and private museum owners?) perhaps officiate as priests in a whole new belief system. Queuing for the latest Monet blockbuster is one ritual; wooing sponsors for the next enterprise is another. Japanese artist Sachiko Abe has turned a meditative process of cutting paper meticulously into strips just half a millimetre wide, performing silently except for the rhythmic sound of her scissors for hours and hours on end, from private therapy to public art. If one definition of art is a display that is excess to human needs for physical survival, wasteful and costly in terms of time, energy and resources, surely this is its exemplar!

By coincidence, Chiharu Shiota is also Japanese-born, but was formerly a student of Marina Abramović and now lives in Berlin. Recalling Abramović’s assault on her own hair with a metal comb and brush while repeating the words ‘art must be beautiful ... artist must be beautiful’, Shiota works relentlessly with her body as a performance artist, storyteller and keeper of memories. Her *Red Line* (2013) drawing, with its feathery scarlet [hand-print](#) gash across white paper, evokes blood—as though her own bodily fluids were ‘bleeding’ into the artwork—and the sense of a body present even in its absence: like a spider absent from her web (a spider’s web is unequivocally a phenotypic extension).¹⁷ Rirkrit Tiravanija’s *Tea Ceremony*, created especially for ‘The Red Queen’, is both a ritual and a subversion of ritual. He has co-opted the centuries-old Japanese *chado*, sometimes translated as ‘the Way of Tea’, a precisely disciplined tradition informed by Zen Buddhism for preparing and serving *matcha*, or powdered green tea. The aesthetic of *chado*—which at its most formal lasts many hours—is rigorous simplicity and awareness of the moment. In Tiravanija’s mirror-walled Mona version, ‘a platform for people to interact with the work itself but also with each other’, participants not only take part in the ceremony but also see themselves participating in the ritual of experiencing contemporary art; even the tea mistress, Mai Ueda, wore a mirrored kimono for the opening session. This is what the French theorist–critic Nicolas Bourriaud

called 'relational aesthetics', where the artist is a catalyst, with viewer-participants intrinsic to the work, doing things together as art. Yet while Bourriaud's terminology was novel in the 1990s, the concept is of course ancient.¹⁸ Montuhotep's funeral and Rover Thomas's *Krill Krill* ceremony could be categorised as 'relational' performance art. Recent studies noted by Ellen Dissanayake suggest that the neuropeptide oxytocin, known primarily for its hormonal effects in female reproduction, lactation and mother-infant bonding, also has an important role in communal art making and consumption for the pleasure and social cohesion that it can help encode in our brains.¹⁹

It seems almost banal to point out that one of the main things that make a work of art a work of art is the relationship entailed between maker and consumer. That is why a bowerbird's bower can probably be considered at least a proto art-object. And why James McNeill Whistler was incensed enough to sue when John Ruskin criticised one of his poetic nocturnes as 'flinging a pot of paint in the public's face'.²⁰ I would argue at this point that Henry Darger's art represents a potent unconsummated relationship with his envisaged reader-viewer. In Miller's words, the very claim 'that one's work is art is a claim for sexual and social status'. And the human desire to distinguish oneself from the common run has translated over time into the development of all kinds of 'artfully contrived' art preferences in which intellectual effort, fashion and a sense of humour can contribute to desirability.²¹

Beyond the fundamental randomness with which natural selection originally led us to art, there is also a considerable element of chance in its making, visually encapsulated in Hubert Duprat's coolly elegant dice. (Leonardo probably did not know that his experiments in oil painting technique would lead him to the *Mona Lisa*. Duprat is famous for patenting a process of making caddisflies encrust their houses with precious gems; he knew about caddisflies because he 'hobnobbed with hunters and fishermen' as a boy²²). Contemporary conceptual art's rapid, wide and multifarious spread among human populations owes much to what Miller well explains as sexual selection's 'runaway' process, where 'phenomena evolve in arbitrary directions under their own momentum'.²³ As well as the genes involved in the resultant extended phenotype, there are memes replicating at ever accelerating speed (I use the term coined by Dawkins for non-genetic, cultural replicators with some reservation, because it has taken on a rather superficial yet ubiquitous life of its own in the media).²⁴ Artworks are frequently 'thought experiments', playing with imaginary worlds to advance our understanding of the actual world.²⁵ In times past, they were very often stand-ins for science in our human quest for 'explanation', and often imbued with enormous authority. In the most recent works presented in 'The Red Queen', issues are raised but not resolved; this art suggests and questions, rather than defines. Like Mona itself, much contemporary art makes

no claim whatever to *know*. But it is, I believe, one of the phenotypic tools with which human genes are still leveraging themselves into the future.

FOOTNOTES

1. *Oxford English Dictionary*, online at <http://oxforddictionaries.com/definition/english/phenotype?q=phenotype>
2. Jesse N. Weber, Brant K. Peterson and Hopi E. Hoekstra, 'Discrete genetic modules are responsible for complex burrow evolution in *Peromyscus* mice', *Nature*, vol. 493, 17 January 2013, pp. 402–5, online at <http://www.nature.com/nature/journal/v493/n7432/full/nature11816.html>
3. See Richard Dawkins, *The Extended Phenotype, the Long Reach of the Gene*, Oxford University Press, Oxford, 1982 and rev. ed. 1999. He takes on Gould's *Ever Since Darwin, Reflections in Natural History*, Norton, New York, 1977, and others; more recently, see Dawkins, 'Extended Phenotype—But Not Too Extended. A Reply to Laland, Turner and Jablonka', *Biology and Philosophy*, 19, 2004, pp. 377–96, replying to articles in the same issue by Kevin N. Laland, J. Scott Turner and Eva Jablonka respectively.
4. I have been aided in my understanding and in formulating this statement, by Kevin Laland's concise explanation of why dairy farming and cheese eating are not adaptations in and of themselves, in 'Extending the Extended Phenotype', *Biology and Philosophy*, vol. 19, 2004, pp. 322–3. See also Kevin N. Laland and Gillian Brown, *Sense & Nonsense: Evolutionary Perspectives on Human Behaviour*, Oxford University Press, Oxford, 2002.
5. Peter Richerson and Robert Boyd, *Not By Genes Alone: How Culture Transformed Human Evolution*, University of Chicago Press, Chicago, 2005, p. 7.
6. Brian Boyd, *On the Origin of Stories: Evolution, Cognition, and Fiction*, The Belknap Press of Harvard University Press, Cambridge and London, 2009.
7. Geoffrey Miller, *The Mating Mind: How Sexual Choice Shaped the Evolution of Human Nature*, Vintage, London, 2001, p. 267 and see 288–91; Miller addresses the idea of art as extended phenotype as an outcome of Darwinian sexual selection, p. 270ff. See also Steven Pinker, *How the Mind Works*, Allen Lane, Penguin Press, London, 1997; Ellen Dissanayake, *What is Art For?* University of Washington Press, Seattle, 1988 and *Homo Aestheticus: Where Art Comes From and Why*, Free Press, New York, 1992; and Brian Boyd's helpfully concise summary of these and other authors' points of view in 'Evolutionary Theories of Art', Jonathan Gottschall and David Sloan Wilson (eds), *The Literary Animal*, Northwestern University Press, Evanston, 2005, pp. 149–78.
8. Scientists still argue, for example, whether the beads and etched ochre found at Blombos Cave in South Africa (from 100,000–72,000 years ago) and the 90,000-year-old marine shell beads at Qafzeh Cave in Israel were consciously created as symbolic artefacts or simpler markers of social status. See Michael Balter, 'Did Working Memory Spark Creative Culture?', *Science*, vol. 328, 9 April 2010, pp. 160–3; and Heather Pringle, 'The Origins of Creativity', *Scientific American*, March 2013, pp. 23–9. As Miller points out, art making and big breasts must have been in place at least 60,000 years ago when human groups colonised different areas of the world.
9. See Meagan Mangum, 'The Lost Art of Egyptian Lithics', in *Connections: Communication in Ancient Egypt*, University of Birmingham research essays, online at

<http://www.birmingham.ac.uk/research/activity/connections/Essays/MMangum.aspx>

10. For a concise summary of various theories of how working memory may work, see Michael Balter, 'Did Working Memory Spark Creative Culture?', *Science*, vol. 328, 9 April 2010, pp. 160–3. Thomas Suddendorf at the University of Queensland has written well on mental time travel; his new book, *The Gap: The Science of What Separates Us from Other Animals*, Basic Books, New York, will be published in November 2013.
11. Judith Ryan et al., *Tjukurrjtjanu: Origins of Western Desert Art*, National Gallery of Victoria, Melbourne, 2012.
12. Don McLeod, interview in *Rover Thomas. I want to paint*, Holmes à Court Gallery, Perth, 2003, p. 48; the name of the ceremony is variously spelled *Krilkril*, *Kurirr Kurirr* or *Gurirr Gurirr*.
13. Wally Caruana, 'Rover Thomas: "Who's that bugger who paints like me?"' in *World of Dreamings: Traditional and Modern Art of Australia*, National Gallery of Australia, Canberra, 2000, exhibition at the State Hermitage Museum, St Petersburg, online at <http://nga.gov.au/dreaming/Index.cfm?Refnc=Ch5>
14. I am grateful to Brian Boyd for drawing my attention to the literature of Terror Management Theory and especially the work of Professor Mark Landau; see, for example, Mark J. Landau, Daniel Sullivan and Sheldon Solomon, 'On graves and graven images: A terror management analysis of the psychological functions of art', *European Review of Social Psychology*, vol. 21, no. 1, 2010, pp. 114–54.
15. 'One revered with Osiris, Lord of Busiris, and with Anubis, who is in the embalming chamber: the nobleman, mayor, royal sealbearer, and sole companion, of gracious arm, the revered one, Montuhotep'. I am grateful for the translation by Professor Colin Hope, Director of the Centre for Archaeology and Ancient History at Monash University; and Marcel Marée, Assistant Keeper in the Department of Ancient Egypt and Sudan, British Museum, London, who also provided expert advice on its interpretation.
16. Ann E. Killebrew, *Biblical Peoples and Ethnicity: An Archaeological Study of Egyptians, Canaanites, Philistines, and Early Israel 1300–1100 BCE*, Society of Biblical Literature Archaeology and Biblical Studies, no. 9, Brill Academic Publishers, Leiden, 2005, especially p. 65ff. Anthropoid clay coffins in this style were believed by nineteenth-century writers such as Flinders Petrie to have come from 'Philistine' burials; however Killebrew and other modern archaeologists emphasise that this is incorrect. We are grateful for advice from Dr Killebrew, Associate Professor of Archaeology at The Pennsylvania State University, and from Dr Bruce Routledge, School of Archaeology, Classics, and Egyptology, University of Liverpool.
17. See Richard Dawkins, *The Extended Phenotype*, for a discussion on spider webs, pp. 198–9.
18. Bourriaud originally used the term 'relational aesthetics' in his *Relational Aesthetics*, Presses du réel, Paris, 1998 (English 2002), but emphasises that he was writing about a very specific time in contemporary art; see his interview with Bartholomew Ryan in *Art in America*, 17 March 2009, on line at <http://www.artinamericamagazine.com/news-opinion/conversations/2009-03-17/altermodern-a-conversation-with-nicolas-bourriaud/>. On how Rirkrit Tiravanija's oeuvre has become part of the art museum/art market elite, see 'Transactional Aesthetics, Or The Highly Collectable Rirkrit Tiravanija', *greg.org blog*, 30 October 2011 at

http://greg.org/archive/2011/10/30/transactional_aesthetics_or_the_highly_collectable_rirkrit_tiravanija.html

19. Ellen Dissanayake, 'The Deep Structure of the Arts', presented by Mona at the University of Tasmania, 26 March 2013, as part of a lecture tour hosted by the Australian Experimental Art Foundation, Adelaide, and the International Visitors Program of the Visual Arts Board of the Australia Council for the Arts.

20. Ruskin was reviewing Whistler's *Nocturne in Black and Gold: The Falling Rocket* (1874), quoted in Ronald Anderson and Anne Koval, *James McNeill Whistler: Beyond the Myth*, Carroll & Graf, New York, 1994, p. 215. Whistler drew up a writ for libel and won the case, but was awarded only a farthing in damages.

21. Geoffrey Miller, *The Mating Mind*, Chapter 3, 'The Runaway Brain', and see pp. 283–4.

22. Hubert Duprat and Christian Besson, 'The Wonderful Caddis Worm: Sculptural Work Collaboration with Trichoptera', *Leonardo on-line*, <http://www.leonardo.info/isast/articles/duprat/duprat.html>

23. Geoffrey Miller, *The Mating Mind*, Chapter 3, 'The Runaway Brain', and see p. 276ff.

24. Richards Dawkins, *The Selfish Gene*, Oxford University Press, Oxford, 1976; and see *The Extended Phenotype*, p. 109, for his clarification of the difference between a meme (a unit of information residing in a brain) and how it expressed in a 'meme product'. In the digital era, the word is popularly applied to an image, video, etc. passed electronically between internet users.

25. Thanks again to Dawkins for making me realise this; see *The Extended Phenotype*, p. 3. Art is at once dependant upon and favourable to abstract thought.