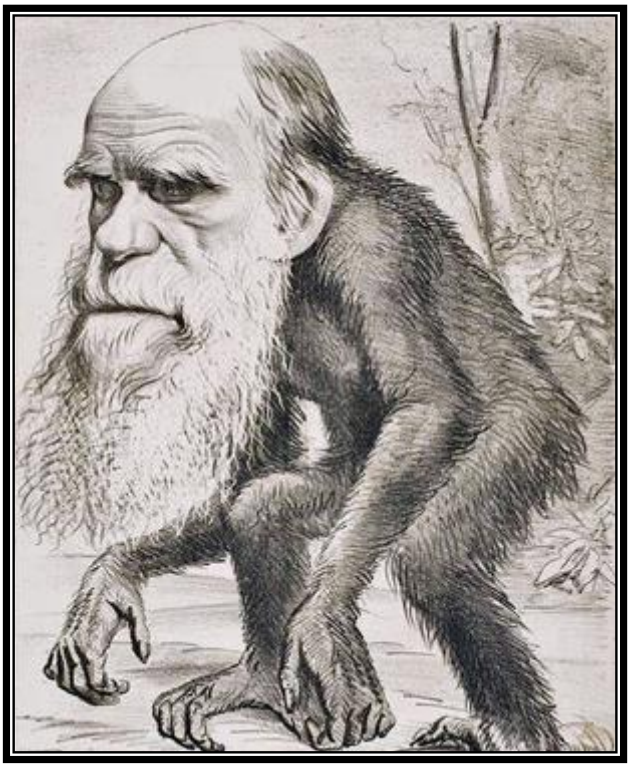
Biopoetics

An evolutionary approach to Art, Literature, Music, and Religion



UCM Course HUM3042
April-May 2018

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INTRODUCTION

1. Beyond the two cultures?

ESSAY ON SCIENCE AND SOCIETY:
Of Two Minds and One Nature

(*Science* 5 November 1999: Vol. 286. no. 5442, pp. 1093 - 1094)

Rhonda Roland Shearer and Stephen Jay Gould

Our propensity for thinking in dichotomies may lie deeply within human nature itself. In his *Lives and Opinions of Eminent Philosophers* (written circa A.D. 200), Diogenes Laertius quotes a much older maxim of Protagoras: "there are two sides to every question, exactly opposite to each other." But we can also utilize another basic trait of our common humanity - our mental flexibility, and our consequent potential for overcoming such innate limitations by education.

Our tendency to parse complex nature into pairings of "us versus them" should not only be judged as false in our universe of shadings and continua, but also (and often) harmful, given another human propensity for judgment - so that "us versus them" easily becomes "good versus bad," or even, when zealotry fans our xenophobic flames, "chosen for martyrdom versus ripe for burning."

The contingent and largely arbitrary nature of disciplinary boundaries has unfortunately been reinforced, and even made to seem "natural," by our drive to construct dichotomies - with science versus art as perhaps the most widely accepted of all. Moreover, given our tendencies to clannishness and parochiality, this false division becomes magnified as the two, largely noncommunicating, sides then develop dis-

tinct cultural traditions that evoke mutual stereotyping and even ridicule. (Scientists, who nearly always speak extemporaneously in public presentations, note that humanists almost always read papers at professional meetings, and rarely show slides - except for art historians, who always use two screens simultaneously - even for the most visual subjects. Why, "we" ask, do "they" not realize that written and spoken English are different languages, and that very few people can read well in public - a particular irony since humanists supposedly hold language as their primary tool of professional competence. But "they," on the other hand, rightly ridicule "our" tendencies to darken a lecture room even before we reach the podium and to rely almost entirely upon a string of pictures thereafter. A stale joke proclaims that if Galileo had first presented the revolutionary results of *Siderius Nuncius* as a modern scientific talk, his opening line could only have been: "first slide please.")

The worst and deepest stereotypes drive a particularly strong wedge between art (viewed as an ineffably "creative" activity, based on personal idiosyncrasy and subject only to hermeneutical interpretation) and science (viewed as a universal and rational enterprise, based on factual affirmation and analytical coherence). We do not, of course, deny the differences in subject matters and criteria (empirical versus aesthetic judgment) in these two realms of human achievement, but we do believe that the common ground of methods for mental creativity and innovation, and the pedagogic virtues of unified nurturing for all varieties of human creativity, should inspire collaboration for mutual reinforcement.

At least we should recognize, if only for practical reasons, that both fields meet resistance in educational lobbies of primary and secondary public schooling - with art classes viewed as superfluous icing on a cake already stripped to a bare minimum of supposedly essential nutrients, and science classes regarded as "too hard" for most students, and too expensive for most constituencies. (How can we forget the infamous words that Teen Barbie once spoke - "math class is tough" - before a public outcry led her makers to eliminate this philistine aspersion upon half of America's students?) If art and science could join forces by stressing our common methods in critical thinking, our common search for innovation, and our common respect for historical achievement - rather than emphasizing our disparate substrates and trying to profit from the differences in playing a zero-sum game at the other's expense - then we might, in Benjamin Franklin's remarkably relevant pun, truly hang together rather than hang separately.

Rather than indulging in such general, and tendentious, preaching, we can best illustrate the potential junction of art and science in the work of creative people whose innovations cannot be neatly slotted into either camp but can only be understood as a reinforcing unification of goals usually parsed between the two realms under Kipling's motto "never the twain shall meet."

The standard examples of Leonardo and other Renaissance figures have been well and justly referenced. But our best cases should not be sought in an earlier age that did not recognize our modern disciplinary boundaries and did not even possess a word for the enterprise now called "science." If we look instead to 20th-century figures who suffered the penalties of mistrust and misunderstanding for working in both domains simultaneously, we can make our major point in more immediate terms.

Marcel Duchamp (1887–1968) may even surpass Picasso in his influence upon the history of 20th-century art - especially in his conventional image as the ultimate Dada jokester, the enfant terrible who festooned the Mona Lisa with a beard, a moustache and a salacious caption, and then called the product art under his own signature; the man who submitted an ordinary urinal as his own sculpture, entitled "Fountain," to a major art show. But Duchamp, as a disciple of Henri Poincaré, also understood the mathematics of non-Euclidean geometry and higher dimensionality in a far more serious and technical way than any other artist of his time. He maintained a passionate interest in science throughout his life, and he made several innovations, in optics, mathematics and perception, that we have not understood both because Duchamp himself chose to be maddeningly cryptic about his intentions and achievements, and because we have not been open to the possibility that an acknowledged genius, once categorized as an "artist," could also be innovative in science.

Among his many hybrid ventures - experiments in optics and perception, mixed with aesthetic achievements in what he called "nonretinal" art or the beauty of the mind or "gray matter" - Duchamp devoted considerable attention and expense (he even trademarked the name) to developing a series of twelve discs, called "Rotoreliefs," and designed for spinning in circular motion on a record turntable (preferably mounted on a wall, so that an observer can view the spinning discs face on).

Although Italian scientists (unaware of Duchamp's work) found and named this particular form of illusion as "the stereo-kinetic effect" in

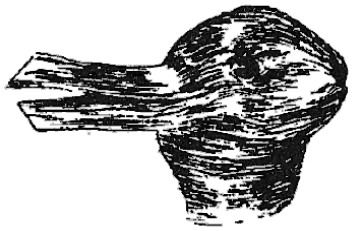
1924, Duchamp apparently discovered this perceptual phenomenon independently in the early 1920s, and completed his first set of discs in 1923. Duchamp recognized that by spinning designs composed as sets of eccentric but concentric circles, a viewer would see the resulting pattern as a three dimensional form even through one eye alone, without the supposedly necessary benefit of stereoscopy! By the 1930s, Duchamp had constructed from his experiments a wonderfully whimsical set of 12 spinning images - from a goldfish in a bowl, to the eclipsed sun seen through a tube, to a cocktail glass, to a light bulb - in order to emphasize his discovery of these three-dimensional effects. (Ironically, as another example of harmful separation between truly unified aspects of art and science, art museums almost invariably exhibit these discs as framed, static objects on a wall - whereas they have no meaning, either artistic or scientific, unless they spin. We are constrained to present a similarly static image in this printed magazine, but readers can observe the discs in their proper motion at https://www.youtube.com/watch?v=G_XDJ0QRgxE; https://www.youtube.com/watch?v=5rzAm2lOnz0; https://www.youtube.com/watch?v=5rgaaYD-hSc; https://www.youtube.com/watch?v=7z1HGnf7oMo; https://www.youtube.com/watch?v=W4t_Z1MaYpQ

Duchamp knew what he had done, and he explicitly regarded the Rotoreliefs as a contribution to science. He wrote to Katherine Dreier in 1935: "I showed it to scientists (optical people) and they say it is a new form, unknown before, of producing the illusion of volume or relief. ... That serious side of the play toy is very interesting." Moreover, Duchamp took great pleasure in the efforts of a professor who wished to use his Rotorelief discs to retrain the three-dimensional insights of soldiers who had lost one eye in the First World War. [At a recent talk, one of us (R.R.S.) demonstrated the rotating discs to a physics professor, blind in one eye for more than a decade, who almost wept for joy at his first sight of three dimensions in so many years]. Duchamp also understood the general basis of his illusion when he wrote in a letter: "I only had to use two circumferences - eccentric - and make them turn on a third center."

We could cite many other examples of innovators, labeled as "artists," who used the tools of their trade to make discoveries that had eluded official "scientists" within their own parochial world. In the 18th century, the Dutch artist Petrus Camper established rules for depicting characteristic differences in the physiognomies of human groups (sexes, ages, and ethnicities) after he noticed that many Renaissance paintings of the Three Kings had depicted Balthazar, the black magus, as a European painted dark, rather than a native of sub-Saharan Africa. (European artists could find few African models at the time.) At

the beginning of our century, the celebrated American artist (and amateur ornithologist) A. H. Thayer discovered the adaptive value of countershading [not for concealment by cryptic coloration, as evolutionary biologists had previously assumed, but rather for making a three-dimensional object fade into invisibility because countershaded organisms appear entirely flat (two dimensional) against their background] - a solution that had eluded scientists but seemed starkly clear to an artist who had spent his life promoting the opposite illusion of making flat paintings look three-dimensional. Abbott's work led to important advances in naval camouflage and saved countless lives in 20th-century warfare.

What could be more precious, or more difficult, than conceptual innovation? We need to access all the tools at our command - even when linguistic and sociological convention parcels out these common mental devices among noncommunicating disciplinary camps - if we wish to triumph in this hardest, yet most rewarding, of all intellectual pursuits. In a key passage from one of the most influential books of our times (*The Structure of Scientific Revolutions*), T. S. Kuhn bridged the disciplinary gap between visual representation and conceptual innovation when he used the famous gestalt illusion of the duck-rabbit as a primary symbol for the meaning and nature of scientific revolution: "It is as elementary prototypes for these transformations of the scientist's world that the familiar demonstrations of a switch in visual gestalt prove so suggestive. What were ducks in the scientist's world before the revolution are rabbits afterwards."



Rhonda Roland Shearer, an associate of the Harvard Department of psychology and a visiting scholar at New York University's physics department, is a New York-based artist who directs the not-for-profit Art Science Research Laboratory.

Stephen Jay Gould (1941-2002) was the Alexander Agassiz Professor of Zoology and Professor of Geology at Harvard and was curator for invertebrate paleontology at the university's Museum of Comparative Zoology.

2. Aims

This course is designed in such a way that students a) get familiarized with the basic concepts of evolutionary theory, and b) will be able to critically assess and evaluate the possibilities of different evolutionary approaches to art, literature, music, and religion. Thus students will get acquainted with debates in the growing field of bio-poetics. The choice of the themes of the course is based on the material available: literature, websites, audio-visual material.

3. Group meetings

Students (in pairs) prepare and chair the group meetings and will give their students the assignments connected to the themes. At every meeting we will focus on one of the themes listed below. It goes without saying that an active participation of every student is expected.

4. Assessment

The final grade will be based on the final essay and a pass on the logbook.

a. Resit. If a student earns a 5.5 or higher for the assessment and meets his or her attendance requirement, he or she passes the course. A student who passes a course (grade ≥ 5.5) will NOT be allowed to take a resit to improve his or her grade. In order to be eligible for a resit exam, a student must have a) met the attendance requirement of the course, or be allowed to make up for it by means of an additional assignment and b) made a fair attempt to fulfil all requirements of the assessment.

b. Additional assignments. To qualify for an additional assignment a student may not have missed more than 30% of the group meetings and must submit a completed request form 'additional assignment because of insufficient attendance' to the Office of Student Affairs, within 10 working days after completion of the course. In the meanwhile, such students will be given a provisional overall grade, but will not receive credits for the course, skills or project until they have successfully completed an additional assignment. The nature and volume of the additional assignment will be proportional to the number of tutorial group meetings missed, and the assignment must be completed and submitted to the coordinator concerned within 20 working days.

5. Co-ordinator & Tutor

Dr. Jan de Roder
Faculty of Arts and Social Sciences
Office B-2.16 | Grote Gracht 90-92 | 6211 SZ Maastricht
j.deroder@maastrichtuniversity.nl

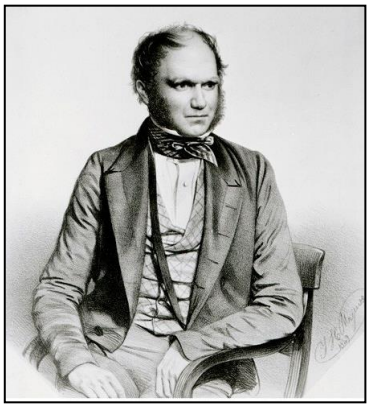
6. Programme

Every week two themes will be discussed (or one, depending on the schedule). The first week we will start with an introduction to the course. The students are expected to develop their individual ideas on their final essay from the start of the course on.

THEMES

1. INTRODUCTION: DARWIN IN A NUTSHELL

The affinities of all the beings of the same class have sometimes been represented by a great tree. I believe this simile largely speaks the truth. The green and budding twigs may represent existing species; and those produced during each former year may represent the long succession of extinct species. At each period of growth all the growing twigs have tried to branch out on all sides, and to overtop and kill the surrounding twigs and branches, in the same manner as species and groups of species have tried to overmaster other species in the great battle for life. The limbs divided into great branches, and these into lesser and lesser branches, were themselves once, when the tree was small, budding twigs; and this connexion of the former and present buds by ramifying branches may well represent the classification of all extinct and living species in groups subordinate to groups. Of the many twigs which flourished when the tree was a mere bush, only two or three, now grown into great branches, yet survive and bear all the other branches; so with the species which lived during long-past geological periods, very few now have living and modified descendants. From the first growth of the tree, many a limb and branch has decayed and dropped off; and these lost branches of various sizes may represent those whole orders, families, and genera which have now no living representatives, and which are known to us only from having been found in a fossil state. As we here and there see a thin straggling branch springing from a fork low down in a tree, and which by some chance has been favoured and is still alive on its summit, so we occasionally see an animal like the Ornithorhynchus or Lepidosiren, which in some small degree connects by its affinities two large branches of life, and which has apparently been saved from fatal competition by having inhabited a protected station. As buds give rise by growth to fresh buds, and these, if vigorous, branch out and overtop on all sides many a feebler branch, so by generation I believe it has been with the great Tree of Life, which fills with its dead and broken branches the crust of the earth, and covers the surface with its ever branching and beautiful ramifications.



(…)

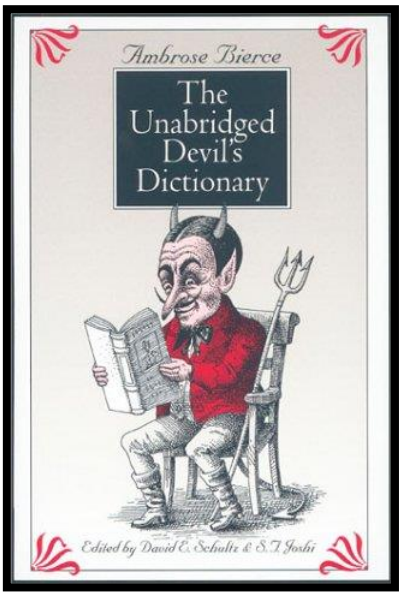
In the distant future I see open fields for far more important researches. Psychology will be based on a new foundation, that of the necessary acquirement of each mental power and capacity by gradation. Light will be thrown on the origin of man and his history.

Charles Darwin (1859): *On the Origin of Species by Means of Natural Selection* (1st ed.), 129-130, 488.

Is is impossible to become a trained evolutionary biologist within a few weeks. Nevertheless we have to try to get familiar with the basics of evolutionary biology. For this we can use some very good introductions like Charlesworth & Charlesworth (2003), Krukonis & Barr (2008), Lawson (2004), and Mills (2004). Dutch students should read Haring (2004) and German students Wuketits (1987). For those students who want to probe deeper into the matter, both Hodge & Radick (2009) and Ruse & Richards (2009) are highly recommended. But we should always start with reading Darwin's own writings. For our purpose the selection in Darwin (2009) is ideal, but have a look at the list of Darwin's main works too (see below).

THE ALPHABET OF EVOLUTION

We will start in a playful way (but don't underestimate the assignment). Complete the list below. Define the concept as clearly as possible. The examples given are of course just for fun (some of you might even think they are silly). They come from Ambrose Bierce's famous *The devils's dictionary* (1911). If you think important concepts are missing, please add them.



adaptation –
altruism –
artificial selection –
bonobo –
culture –
co-evolution –
cognitive science –
creationism –
darwinian aesthetics –
DNA –
domestication –
evolutionary tinkering –
evolution –
evolutionary psychology –
exaptation –
extended phenotype –
female – *An animal usually living in the vicinity of Man, and having a rudimentary susceptibility to domestication. It is credited by many of the elder zoologists with a certain vestigial docility acquired in a former state of seclusion, but naturalists of the postsusananthony period, having no knowledge of the seclusion, deny the virtue and declare that such as creation's dawn beheld, it roareth now. The species is the most widely distributed of all beasts of prey, infesting all habitable parts of the globe, from Greelan's spicy mountains to Indi's moral strand. The popular name (wolfman) is incorrect, for the creature is of the cat kind. The woman is lithe and graceful in its movement, especially the American variety (felis pugnans), is omnivorous and can be taught not to talk.* (Balthasar Pober in Ambrose Bierce's *The devil's dictionary*).
fitness –

functionalism –
gene –
genome –
genotype –
group selection –
human nature –
male - *A member of the unconsidered, or negligible sex. The male of the human race is commonly known (to the female) as Mere Man. The genus has two varieties: good providers and bad providers* (Ambrose Bierce's *The devil's dictionary*).
meme –
mutation -
nature –
natural selection –
phenotype –
primatology -
punctuated equilibrium –
selection pressure –
sexual selection –
social selection –
species –
struggle for life –
survival of the fittest -
variation –

Literature, compulsory:

Charles Darwin,
'Chapter XIV: Recapitulation and conclusion' (=Darwin 2009a*), from *On the origin of species*, in: Charles Darwin, *Evolutionary writings*. Cambridge University Press, Cambridge 2009, 189-211.*

Greg Krukonis & Tracy Barr,
'How Evolution Works' (=Krukonis & Barr 2008a*), in *Evolution for Dummies*. Wiley, Hoboken, NJ 2008, 57-83.*

Kristan Lawson,
'The Idea that Changed the world' (=Lawson 2003a), in *Darwin and evolution for kids. His life and ideas*. Chicago Review Press, Chicago, IL 2003, 91-107.*

Cynthia L. Mills,
'What Darwin Said' (=Mills 2004a*), in *The theory of evolution. What it is, where it came from, and why it works*. Wiley, Hoboken, NJ 2004, 53-67.*

Literature, recommended:

Ambrose Bierce,
The devil's dictionary (1911). Online available: http://richardgingras.com/devilsdictionary/

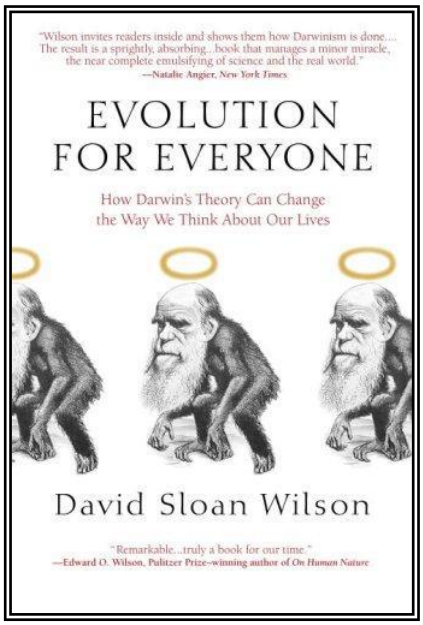
Brian & Deborah Charlesworth,
Evolution. A very short introduction. Oxford University Press, Oxford 2003. [SL + RR]

Keith A. Francis,
Charles Darwin and The Origin of Species. Greenwood Press, Westport, CT 2007.*

Bas Haring,
Kaas en de evolutietheorie. Pandora pockets, Amsterdam 2004. [SL UL]

Johathan Hodge & Gregory Radick (Eds.),
The Cambridge Companion tot Darwin. (2nd Ed.). Cambridge University Press, Cambridge 2009.* [SL UL]

Michael Ruse & Robert J. Richards (Eds.),
The Cambridge Companion to The Origin of Species. Cambridge University Press, Cambridge 2009.* [SL UL]



David Sloan Wilson,
Evolution for everyone. How Darwin's theory can change the way we think about our lives. Delacorte Press, New York 2007.* [RR]

Franz M. Wuketits,
Darwin. Der stille Revolutionär. Piper, München 1987.*

Video:

-*Evolution* (PBS 2001)*
-*What Darwin didn't know* (BBC 2009)*
-*Charles Darwin and the Tree of Life* (BBC 2009)*

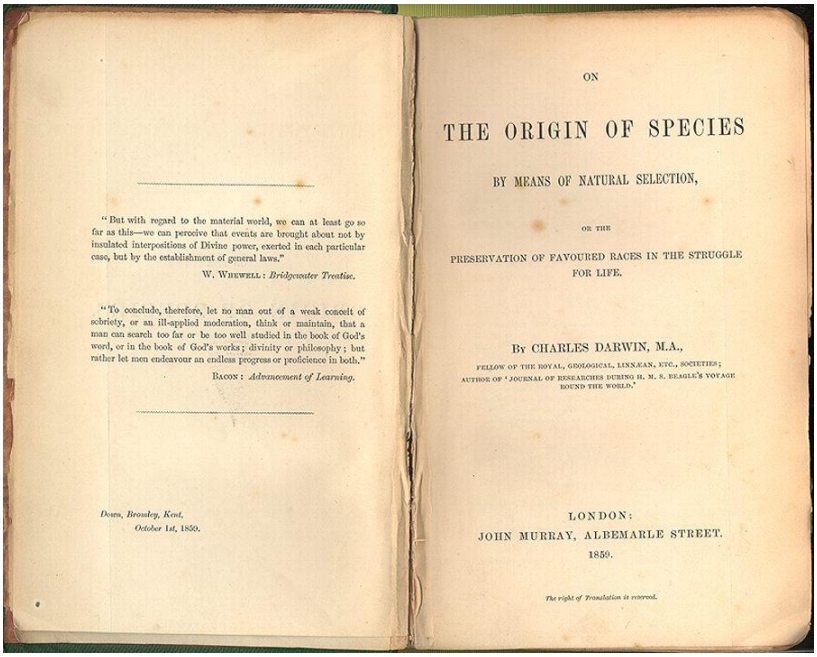
The Writings of Charles Darwin:

Start with the website *The complete works of Charles Darwin Online* (http://darwin-online.org.uk/). Here you will find all of Darwin's works in pdf-, text- or HTML-format. Below other online editions are listed (see also the Porject Gutenberg collection: http://www.gutenberg.org/ebooks/author/485). For Dutch students Dutch translations are listed (some older Dutch editions are available on *The complete works of Charles Darwin Online* too).

Charles Darwin,
Voyage of the Beagle (1845).

-English eBook in pdf*
-English edition online available:
http://www.literature.org/authors/darwin-charles/the-voyage-of-the-beagle/
-Dutch edition (*De reis van de Beagle*, translation Tinke Davids, Atlas, Amsterdam 1993): Centre Ceramique, Public Library

Charles Darwin,
On the origin of species by means of natural selection or, The preservation of favoured races in the struggle for life (1859).


"But with regard to the material world, we can at least go so far as this—we can perceive that events are brought about not by insulated interpositions of Divine power, exerted in each particular case, but by the establishment of general laws."
W. Whewell: *Bridgewater Treatise.*

"To conclude, therefore, let no man out of a weak conceit of sobriety, or an ill-applied moderation, think or maintain, that a man can search too far or be too well studied in the book of God's word, or in the book of God's works; divinity or philosophy; but rather let men endeavour an endless progress or proficience in both."
Bacon: *Advancement of Learning.*

Down, Bromley, Kent,
October 1st, 1859.

ON

THE ORIGIN OF SPECIES

BY MEANS OF NATURAL SELECTION,

OR THE

PRESERVATION OF FAVOURED RACES IN THE STRUGGLE FOR LIFE.

By CHARLES DARWIN, M.A.,

FELLOW OF THE ROYAL, GEOLOGICAL, LINNÆAN, ETC., SOCIETIES;
AUTHOR OF 'JOURNAL OF RESEARCHES DURING H. M. S. BEAGLE'S VOYAGE ROUND THE WORLD.'

LONDON:
JOHN MURRAY, ALBEMARLE STREET.
1859.

The right of Translation is reserved.

-English edition: (Gillian Beer (Ed.). Rev. Ed. Oxford University Press, Oxford 2008)*: SL
-English edition online available: http://www.literature.org/authors/darwin-charles/the-origin-of-species/
-Dutch edition (*Over het ontstaan van soorten door middel van natuurlijke selectie, of het behoud van bevoordeelde rassen in de strijd om het leven*, translation Ludo Hellemans, Nieuwezijds, Amsterdam 2001): UL Randwijck

Charles Darwin,
The descent of man, and selection in relation to sex (1871).

-English edition (With an introduction by John Tyler Bonner & Robert M. May, Princeton University Press, New Jersey 1981)*
-English edition online available:
http://www.literature.org/authors/darwin-charles/the-descent-of-man/

-Dutch edition (*De afstamming van de mens en selectie in relatie tot sekse*, translation Ludo Hellemans. Nieuwezijds, Amsterdam 2002): SL

Charles Darwin,
The expression of emotions in man and animals (1872).

-English edition (Ed. Paul Ekman. Oxford University Press, Oxford 1998): SL
-English edition online available: http://www.gutenberg.org/etext/1227
-Dutch edition: (*Het uitdrukken van emoties bij mens en dier*, translation Fieke Lakmaker. Nieuwezijds, Amsterdam 1999): SL

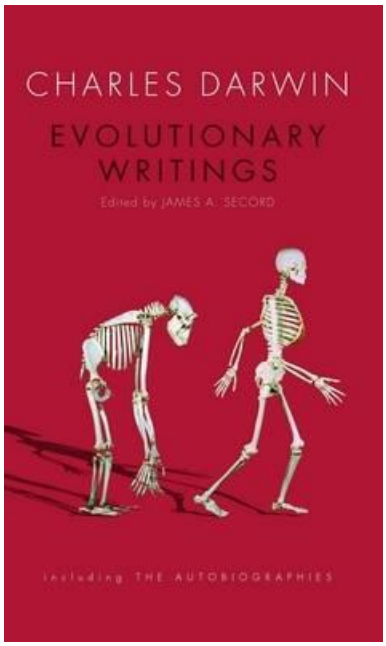
Charles Darwin,
Autobiography (1887).

-English edition: In Darwin, *Evolutionary writings* (2009)*
-English edition online available:
http://www.gutenberg.org/ebooks/2010
-Dutch edition (*Autobiografie 1809-1882*, translation Fieke Lakmaker. Nieuwezijds, Amsterdam 2000): UL

Charles Darwin,
Letters: A Selection 1825-1859. Edited by Frederick Burkhardt, forword by Stephen Jay Gould. Cambridge University Press, Cambridge 1996.*

Charles Darwin,
Evolution. Selected Letters 1860-1870. Edited by Frederick Burkhardt, Alison M. Pearn, & Samantha Evans. Cambridge University Press, Cambridge 2008.*

Charles Darwin,
Evolutionary writings. Including the Autobiography. Edited by James E. Secord. Oxford University Press, Oxford 2009.*



Charles Darwin,
Shorter Publications. Edited by John van Wye. Cambridge University Press, Cambridge 2009.*

2. MEMES

> This concept of cultural replicators—items that are copied over and over—has been given a name by Richard Dawkins (1976), who proposed to call them *memes,* a term that has recently been the focus of controversy. For the moment, I want to make a point that should be uncontroversial: cultural transmission can *sometimes* mimic genetic transmission, permitting competing variants to be copied at different rates, resulting in gradual revisions in features of those cultural items, and *these revisions have no deliberate, foresighted authors.*
>
> (Daniel C. Dennett, *Breaking the spell*, 2006)

Art, music and the lure of religion

"Language makes us unique, but there are many other curious aspects of human nature that require explanation. Unlike other animals we seem to love music and singing, dance and theatre, painting and sculpture. Yet none of these provides an obvious survival advantage. As Pinker explains, "As far as biological cause and effect are concerned, music is useless" (Pinker, 1997, p. 528); and Dennett (1999) says we "cannot avoid the obligation to explain how such an expensive, timeconsuming activity came to flourish in this cruel world." So why and how did they come about? Miller (2000) argues that art has been sexually selected: that the songs, paintings, and other artistic creations are the equivalent of a deer's impressive antlers or the famous peacock's tail, whose functions are to attract mates. He cites evidence that men are more artistic, and that women prefer to mate with creative men. I have suggested that sexual selection plays a part in memetic drive, but the theories are otherwise quite different. According to Miller, artistic creations are aspects of the artist's phenotype and do not necessarily evolve in their own right. By contrast, according to memetics, artistic creations are memes that compete with each other and evolve. Dennett (1999) gives the beginnings of a memetic explanation by imagining how music might have begun – a just-so story about the first infectious sounds.

> *One day one of our distant hominid ancestors sitting on a fallen log happened to start banging on with a stick – boom boom boom. For no good reason at all. This was just idle diddling … mere nervous fidgeting, but the repetitive sounds striking his ears just happened to feel to him like a slight improvement on silence … Now introduce some other ancestors who happen to see and hear this drummer. They might … again for no reason, find their imitator-circuits tickled into action; they might feel an urge to drum along with musical Adam.*

Dennett goes on to describe how drumming was copied and some drummings proved more infectious than others. It didn't matter why; the successful ones might have sounded nicer

or been easier to copy but, whatever the reason, the drumming virus was born. He goes on to imagine that humming memes spread in the meme pool, the competition heated up, and hummings had to get more catchy, easier to hum, or more likely to gain attention, in order to get copied. By this time everyone lived in a music-filled culture. The next step, which Dennett does not consider, is memetic drive. If drumming and humming became popular, and people who were good at them acquired status, then the pressures on hominid genes would change. It would then pay to have a brain that was good at copying drumming and humming, when previously it did not. Any genes that contributed to that ability would be favoured and so, gradually, hominid brains would be redesigned. The co-evolutionary process could continue indefinitely. If this is how music evolved we can easily understand why modern humans have the sort of brains (and ears and hands) that help us enjoy making and listening to music. We are like that, not because music serves any biological function, but because musical memes long ago infected our ancestors and forced their brains to be redesigned. The same argument applies to any kind of art. So, for example, if techniques of cave painting or body decoration or singing evolved in competition with each other, then brains would be driven in the direction of getting better at copying the particular techniques that were successful. In other words, the direction taken by memetic evolution would drive the drection the genes had to take in building our bodies and brains. Another related mystery is why we are so fond of religion and ritual. The answer could be that religious memes were highly successful in the past, putting pressure on people to enjoy religious behaviours and inclining them to believe religious ideas. If this is so it suggests a reason why, in spite of education and rational thought, and in spite of the harm done by religious war and oppression, it seems generally hard for people to live without religion. This is really a general argument about the design of human nature. Whichever direction memetic evolution happened to take in the past, we humans would become better able to copy the memes that were successful – whether those were words, music, paintings, rituals or anything else. Our modern brains therefore carry the traces of all our past memetic evolution."

Susan Blackmore, 'Imitation makes us human'. In *What makes us human*. Edited by C.A. Pasternak. Oneworld, Oxford 2007, p. 10-12.

Literature, compulsory:

Susan Blackmore,

The meme machine. Oxford University Press, Oxford 1999.* [UL Randwijck]

-Chapter 1: Strange creatures, Chapter 2: Universal Darwinism, and Chapter 3: The evolution of Culture.

-Synopsis, online available:
http://www.susanblackmore.co.uk/Books/Meme%20Machine/mmsynop.html

Richard Dawkins,

'Memes: the new replicators', in *The selfish gene*. (30th Anniversary Edition). Oxford University Press, Oxford 2006, 189-201.* [UL Randwyck]

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'The cranes of culture', in *Darwin's dangerous idea. Evolution and the meaning of life*. Penguin Books, London 1995, 335-369.* [SL UL]

Literature, recommended:

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'Language and culture', in *Evolutionary psychology. A beginner's guide*. Oneworld, Oxford 2007, 128-146.* [SL UL]

Susan Blackmore,
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'The Evolution of Meme Machines', in A. Meneghetti (et al), *Ontopsychology and Memetics*. Psicologica Editrice, Rome 2003, 233-240.*

Daniel C. Dennett,
Breaking the spell. Religion as a natural phenomenon. Viking, 2006.* [SL UL]

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From Bacteria to Bach and Back. The Evolution of Minds. Norton, New York 2017.*

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Website:

http://www.susanblackmore.co.uk/ (for lots of free articles and information)

Video:

Susan Blackmore, *Memes and "temes"* (2008). TED Talk:
http://www.ted.com/talks/susan_blackmore_on_memes_and_temes.html

Daniel C. Dennett, *Dangerous Memes* (2002). TED Talk:
https://www.ted.com/talks/dan_dennett_on_dangerous_memes

3. THE MATING MIND

It's extraordinary what's been happening in biology, and so few people in the social sciences know about it. Over a century ago Darwin's idea of sexual selection through mate choice published in his best book, The Descent of Man and Selection in Relation to Sex—that was the full title—the book came out and this wonderful idea of female choice-the idea that female animals of many species choose their mates for all kinds of traits, not just physical appearance, but behavioral traits, songs, and dances, and courtship behaviors. A wonderful scientific theory that Darwin advanced hundreds of pages of evidence for, and it fell like a stone and was widely rejected by Victorian biologists, who refused to believe that this psychological process of female choice could be a causal force in evolution.

All of psychology, anthropology, the humanities, political science, economics in the 20th century, developed without any understanding of how sexual selection could have shaped human behavior. It was just not on the table as an idea. Everything that we are, every aspect of human nature, had to be explained through survival selection—natural selection. And that imposed such serious restrictions on what we could explain—it seemed easy to explain tool making; it seemed hard to explain music. All that's changed now. We've got from biology some powerful new principals about sexual selection that are just ripe for applying to human nature. That's what I'm trying to do; lots of other people are doing it as well, and it's the most exciting area to be working on in psychology at the moment.

Geoffrey Miller in an interview with John Brockman

Sexual Selection. — Inasmuch as peculiarities often appear under domestication in one sex and become hereditarily attached to that sex, the same fact probably occurs under nature, and if so, natural selection will be able to modify one sex in its functional relations to the other sex, or in relation to wholly different habits of life in the two sexes, as is sometimes the case with insects. And this leads me to say a few words on what I call Sexual Selection. This depends, not on a struggle for existence, but on a struggle between the males for possession of the females; the result is not death to the unsuccessful competitor, but few or no offspring. Sexual selection is, therefore, less rigorous than natural selection. Generally, the most vigorous males, those which are best fitted for their places in nature, will leave most progeny. But in many cases, victory will depend not on general vigour, but on having special weapons, confined to the male sex. A hornless stag or spurless cock would have a poor chance of leaving offspring. Sexual selection by always allowing the victor to breed might surely give indomitable courage, length to the spur, and strength to the wing to strike in the spurred leg, as well as the brutal cock-fighter, who knows well that he can improve his breed by careful selection of the best cocks. How low in the scale of nature this law of battle descends, I know not; male alligators have been described as fighting, bellowing, and whirling round, like Indians in a wardance, for the possession of the females; male salmons have been seen fighting all day long; male stag-beetles often bear wounds from the huge mandibles of other males. The war is, perhaps, severest between the males of polygamous animals, and these seem oftenest provided with special weapons. The males of carnivorous animals are already well armed; though to them and to others, special means of defence may be given through means of sexual selection, as the mane to the lion, the shoulder-pad to the boar, and the hooked jaw to the male salmon; for the shield may be as important for victory, as the sword or spear.

Charles Darwin, *On the origin of species* (1859), Chapter IV.

Literature, compulsory:

Geoffrey Miller,

'Central park' [Introduction], in *The mating mind. How sexual choice shaped the evolution of human nature*. Anchor Books, New York 2000a, 1-32.* [SL UL]

+

'Arts of seduction' [On art], in *The mating mind. How sexual choice shaped the evolution of human nature*. Anchor Books, New York 2000b, 258-291.* [SL UL]

or

'Cyrano and Scheherezade', [On language and literature], *The mating mind. How sexual choice shaped the evolution of human nature*. Anchor Books, New York 2000c, 341-391.* [SLUL*]

Literature, recommended:

Margaret A. Boden,

'Mozart, McCartney, and sexual selection' [Review of Miller 2000], in *Nature*, Volume 405 (2000), 512-513.*

Brian Boyd,

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John Brockman,

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Tim Hancock,

'The chemistry of love poetry', in *The Cambridge Quarterly*, Volume 36 (2007), 197-228.*

Daniel J. Kruger, Maryanne Fisher & Ian Jobling,

'Proper and dark heroes as dads and cads. Alternative mating strategies in British romantic literature', in *Human nature*, Volume 14 (2003), 305-317.*

Geoffrey Miller,

'Sexual selection for cultural displays', in Robin Dunbar, Chris Knight & Camilla Power (Eds.). *The Evolution of culture. An interdisciplinary view*. Edinburgh University Press, Edinburgh 1999, 71-91.*

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Steven Pinker,

'The meaning of life' in *How the mind works*. Norton, New York 1997.* [UL]

John D. Wagner,

'Review of Miller (2000)', *Human Nature Review*, Volume (2002), 110-113.*

Edward O. Wilson,

'The arts and their interpretation', in *Consilience. The unity of knowledge*. Vintage, New York 1998, 229-259.* [UL]

Video:

Why sex? (Evolution, part 5) (PBS 2001)*

4. HICKORY DICKORY DOCK

Poetry: The Missing Link?

It seems at least paradoxical that a poetic experience can occur in the absence of a complete or even partial understanding of a poem. This is all the more puzzling in view of the fact that it is especially poetry that is associated with meaningfulness. This paradox has been commented on before, both by critics and by students of literature. Writing about the opaque poetry of Lucebert, who counts among the greatest of Dutch 20th century poets, a critic notes: 'reading this poetry, one has the rare experience to enjoy something without understanding it at all' (Middag 1989). Another critic's judgement sounds similar: 'The poetry of Lucebert is enjoyable without being understandable' (van Deel 1989). In his famous Dante-essay T.S. Eliot summarized this phenomenon as follows: 'Genuine poetry can communicate before it is understood' (Eliot 1951: 238). Eliot does not speak of verbal beauty but claims that words have associations, and that the group of words IN association have associations. Eliot doesn't mention the role of sound and rhythm in this context either. His associations of Dante's Italian words, however, are difficult imagine without taking into account the prosodic layer.

Not long ago I heard a program on a Friesian poet on the radio, one of whose poems was read aloud. A participant of the program said that although he didn't understand one word of it, he enjoyed it very much and wanted to hear some more. This appreciation is not unlike Phil Roberts' remark that 'Shakespeare survives his death not so much because his plays make such marvelous spectacles or because their plots are so fascinating as because his lines SOUND so good - and because, until recently, every reader of Shakespeare would above all LISTEN to him' (Roberts 2000: 14). We should realize that Shakespeare was almost as difficult for past readers as he is for us now. The poetic experience hinted on here is a distinctively physical one; this physical aspect of poetry is validated by the testimony of many poets that a poem is initially conceived in terms of rhythm, or in the words of Seamus Heaney: 'Poetry is bodily activity. I feel the line when I look at it, there's a musculature there. It is a kinetic action, not just an eye movement' (quoted in Williamson 1999)…

From: J.H. de Roder, 'Poetry. The missing link?' First Annual Conference IOT (Inter-facultaire Onderzoeksgroep Taalkunde) (April 2001, UFSIA, Antwerp, Belgium). In Frank Brisard & Tanja Mortelmans (Eds.), *Language and Evolution* (pp. 15-26). Universiteit Antwerpen, Afdeling Linguïstiek, Antwerpen 2002 (*Antwerp Papers in Linguistics*, 101). Online available:
http://webhost.ua.ac.be/apil/apil101/deroder.pdf

Poetry is bodily activity. I feel the line when I look at it, there's a musculature there. It is a kinetic action, not just an eye movement

Seamus Heaney

Poetry can communicate before it is understood

T.S. Eliot

Meaning can look after itself

Dylan Thomas

Freilich ist die Poesie nicht für das Auge bestimmt

Goethe

If I feel physically as if the top of my head were taken off, I know that is poetry

Emily Dickinson

Literature: compulsory

Marco Haverkort & J.H. de Roder,

'Poetry, language, and ritual performance'. Special issue: Ritual language behaviour, in *Journal of Historical Pragmatics*, Volume 4 (2003), 269-286.*

Stephen Jay Gould & Richard C. Lewontin,

'The Spandrels of San Marco and the panglossian paradigm. A Critique of the adaptationist programme', in *Proceedings of the Royal Society of London*, B 205/1161 (1979), 581-598.*

Jan Koster,

'Ritual performance and the politics of identity. On the functions and uses of ritual'. Special issue: Ritual language behaviour, in *Journal of Historical Pragmatics*, Volume 4 (2003), 211-249.*

Literature: recommended

In English:

Andrew Arno,
'How do rituals signify? Aesthetics, intuition, and reference in Fijian ritual communication: Modularity in and out of language', in *American Anthropologist*, Volume 105 (2003), 807-819.*

Noam Chomsky,
'Language and the brain', in: Noam Chomsky, *On nature and language*. Edited by Adriana Belletti & Luigi Rizzi. Cambridge University Press, Cambridge 2002, 61-91.* [UL]

Stephen Jay Gould & Elisabeth S. Vrba,
'Exaptation. A missing term in the science of form', in *Paleobiology*, Volume 8 (1982), 4-15.*

Marjorie Perloff & Craig Dworkin (Eds.),
The sound of poetry, the poetry of sound. University of Chicago Press, Chicago 2009.*

Steven Pinker,
'Why nature & nurture won't go away' in *Daedalus*, Volume 133 (2004), Fall, 5-17.*

Steven Pinker,
'The blank slate' in *The General Psychologist*, Volume 41, No. 1 (2006), Spring, 1-8.*

Frits Staal,
'Mantras and birdsongs', in *Journal of the American Oriental Society*, Volume 105 (1985), 549-558.*

Frits Staal,
'Within ritual, about ritual, and beyond', in *Religion*, Volume 21 (1991), 227-234.*

Frits Staal,
'How a pschoactive substance becomes a ritual. The soma case', in *Social Research. An International Quarterly of the Social Sciences, V*ol. 68 (2001), 745-778.*

In Dutch:

J.H. de Roder,
'Taal, ritueel en poëzie' in *Het onbehagen in de literatuur. Essays*. Vantilt, Nijmegen 2001, 21-98. [SL UL]

Frits Staal,
'Het taaldier' en 'Waarom is ritueel nog geen taal?', in *Drie bergen en zeven rivieren. Essays*. Meulenhoff, Amsterdam 2004, 170-220, 254-277. [SL UL]

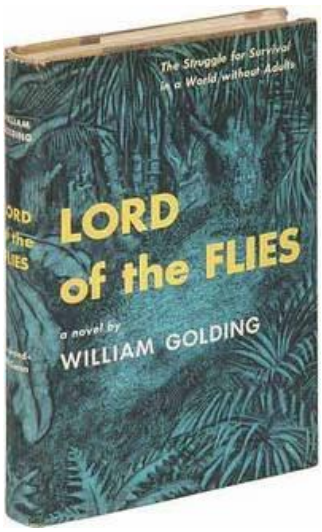
Audio:

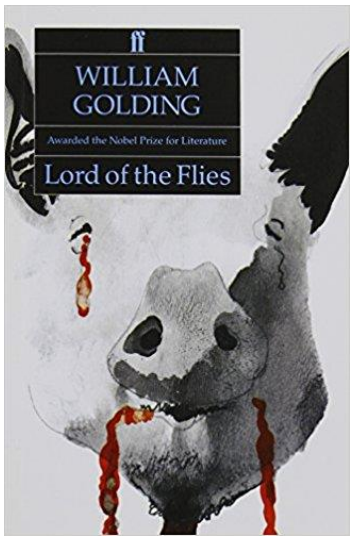
Jerome Rothenberg,
UBUWEB: ETHNOPOETICS, http://www.ubu.com/ethno/

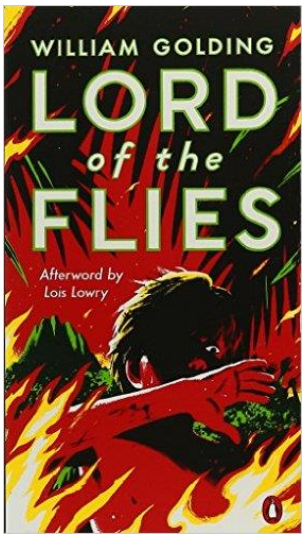
Video:

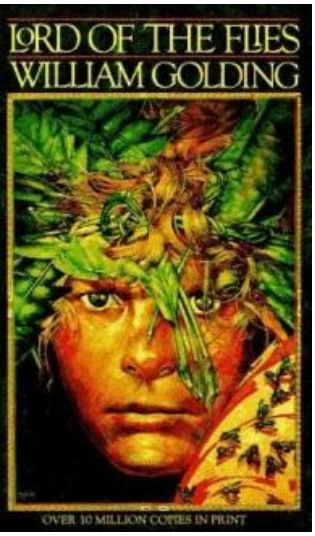
The Story of India, Part 1. Beginnings (BBC 2007)*

5. MORALITY: LORD OF THE FLIES, OR VENEER THEORY AND THE NOVEL







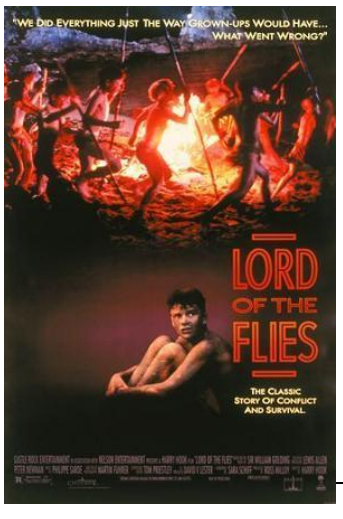


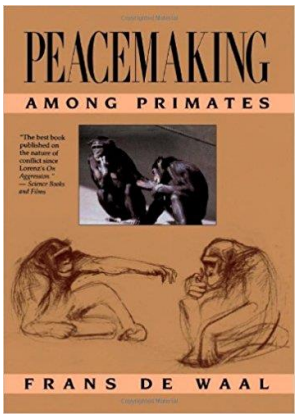
William Golding, *Lord of the Flies*, Faber & Faber, London 1954.

'The whole book is symbolic in nature except the rescue in the end where adult life appears, dignified and capable, but in reality enmeshed in the same evil as the symbolic life of the children on the island. The officer, having interrupted a manhunt, prepares to take the children off the island in a cruiser, which will presently be hunting its enemy in the same implacable way. And who will rescue the adult and his cruiser?' (Golding to Epstein, E.L. Epstein, 'Notes on *Lord of the Flies*', *Lord of the Flies*, New York, Capricorn Books, 1959, pp. 191–92)

Lord of the Flies, Directed by Peter Brook (UK 1963)

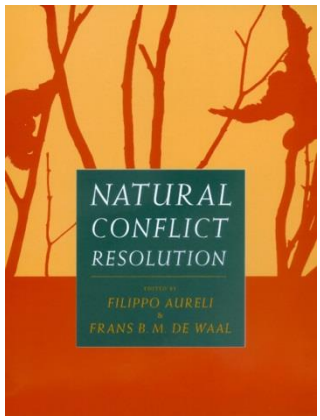
Lord of the Flies, Directed by Harry Hook (USA 1990)





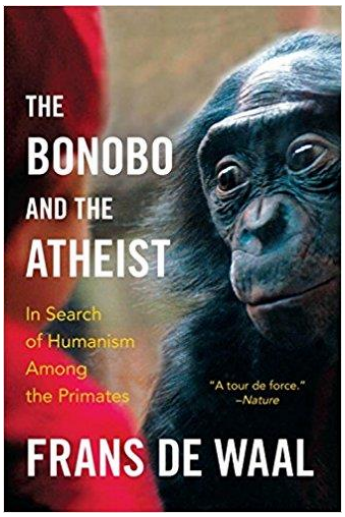
'Although there was no lack of squabbles in the group of young bonobos, they were generally gay and frisky. In no way did they follow the pattern of cruelty and terror so powerfully described for a group of stranded human juveniles in Lord of the Flies. With this 1954 novel, William Golding did in literary fashion what Lorenz and other ethologists later did scientifically. The story called attention to the violent side of human nature. The message, although valid, was grossly exaggerated: the children grew bloodthirstier with every page. Meanness is common, among both human and ape children; but it is not totally unchecked, not even in the absence of adult supervision.'
(De Waal, *Peacemaking among Primates*, p. 192-193)

'How is morality acquired? Is it taught by adults? Or is it constructed out of social interactions? Much research has shown that children acquire morality through a social-cognitive process; children make connections between acts and consequences. Through a gradual process, children develop concepts of justice, fairness, and equality, and they apply these concepts to concrete everyday situations (Killen & Hart 1995). From this view, morality is developed out of social interactions (with peers and with adults) and is not imposed on individuals from outside influences.
This is consistent with an evolutionary view of morality in terms of morality being something that slowly emerges over time. In addition, there are multiple sources of influence on children's acquisition of moral judgment. In this view, morality does not come from parents—nor does it "come from" peers. Rather than being transmitted, morality is constructed through social interactions and social judgments. Yet, in general, children's moral thinking has long been regarded as external, adopted from the adult social environment. According to Freudian and Skinnerian viewpoints, left to their own devices, like the children in Golding's (1954) Lord of the Flies, children would never arrive at anything like morality. Freud's view of the acquisition of morality was that children incorporated parental values to develop a superego, the moral agency of the self. Skinner theorized that adults provide the environmental contingencies necessary to shape a moral being. In the classic theories, morality is a result of adult influence (incorporation of parental values or transmission, for Freud and Skinner, respectively). These views have remained widely influential, in both research and educational arenas. These views, however, are not consistent with an evolutionary approach to morality because they assume a total lack of a moral predisposition in our species.'
(Aureli & De Waal, *Natural Conflict Resolution*, p. 360-361)



'Imagine, we put a few dozen children on an island without adults. What would happen? William Golding thought he knew, giving us savagery and

murder in Lord of the Flies. This may have been a great extrapolation from life at English boarding schools, but there is no shred of evidence that this is what children left to their own devices will do. When four- to five-year-old children are left alone in a room, they tend to egotiate with each other by means of moral terminology such as "That's not fair!" or "Why don't you give her some of your toys?" No one knows what children would do if left alone for a much longer time, but they would definitely form a dominance hierarchy. Young animals, whether goslings or puppies, quickly battle it out to establish a pecking order, and children do the same. I remember the pale faces of psychology students steeped in academic egalitarianism, upset at seeing young children beat up on each other on the first day of preschool. We are a hierarchical primate, and, however much we try to camouflage it, it comes out early in life.' (De Waal, *The Bonobo and the Atheist*, p. 214)



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Lord of the Flies. Faber & Faber, London 1954.*
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'Evolution and ethics' (1893), in *Evolution & Ethics and Other Essays* (= *Collected Essays*, Volume IX), 1-45. Online available: http://aleph0.clarku.edu/huxley/CE9/E-E.html
Frans de Waal,
Morality and the Social Instincts: Continuity with the Other Primates. The Tanner Lectures on Human Values. Delivered at Princeton University, November 19-20, 2003* (Reprinted in De Waal 2006, p. 3-58, see below).

Literature, recommended:

Donald Broom,
The evolution of morality and religion. Cambridge University Press, Cambridge 2003.*
Richard Dawkins,
'Nice guys finish first', in *The selfish gene*. (30th Anniversary Edition). Oxford University Press, Oxford 2006a, 202-233.*
Richard Dawkins,
'The roots of morality: why are we good?', in *The God delusion*. Bantam Press, London 2006b. 209-233.* [SL UL]
Marc D. Hauser,
Moral minds. The nature of right and wrong. Harper Collins, New York 2006.*
Dennis L. Krebs,
The origins of morality. An evolutionary account. Oxford University Press, Oxford 2011.*
Peter Singer,
The Expanding Circle. Ethics, Evolution, and Moral Progress. With a new preface and afterword by the author. Princeton University Press, Princeton 2011. [First published 1981]*
Walter Sinnott-Armstrong (Ed.),
Moral Psychology. Volume 1: The Evolution of Morality: Adaptations and Innateness. A Bradford Book-The MIT Press, Cambridge, Mass. 2008.* [UL Randwyck]
Walter Sinnott-Armstrong (Ed.),
Moral Psychology. Volume 2: The Cognitive Science of Morality: Intuition and Diversity. A Bradford Book-The MIT Press, Cambridge, Mass. 2008.* [UL Randwyck]
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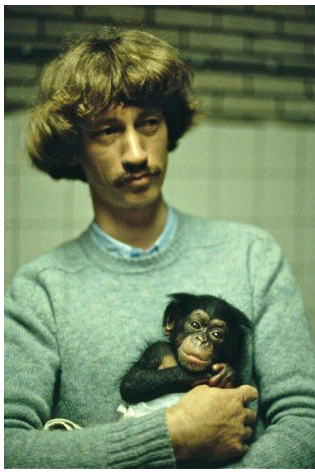
Moral Psychology. Volume 3: The Neuroscience of Morality: Emotion, Brain Disorders, and Development. A Bradford Book-The MIT Press, Cambridge, Mass. 2008.* [UL Randwyck]
G.C. Williams,
'A sociobiological expansion of Evolution and Ethics', in J. Paradis & G.C. Williams (Eds.), *T.H. Huxley, Evolution and ethics. With new essays on its Victorian and sociobiological context*. Princeton Univeristy Press, Princeton, NJ 1989, 179-214.* [UL]
Robert Wright,
The Moral Animal. Why We Are The Way We Are: The New Science of Evolutionary Psychology. Pantheon Books, New York 1994.* [UL]

The main works of Frans de Waal:

Frans de Waal, *Chimpanzee Politics. Power and Sex among Apes*. Johns Hopkins University Press Baltimore 1982 [UL] [Revised Edition 1998*].



Frans de Waal, *Peacemaking among Primates*. Harvard University Press, Cambridge, Mass. 1989.*

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Frans de Waal & Frans Lanting, *Bonobo. The Forgotten Ape*. University of California Press, Berkeley 1998. [UL] [German Edition*]

Filippo Aurelie & Frans de Waal (Eds.), *Natural Conflict Resolution*. University of California Press, Berkeley 2000.*

Frans de Waal, *The Ape and the Sushi Master. Cultural Reflections of a Primatologist*. Perseus Books, New York 2001. [UL]

Frans de Waal (Ed.), *Tree of Origin. What Primate Behaviour Can Tell Us about Human Social Evolution*. Harvard University Press, Cambridge, Mass. 2001.*

Frans de Waal, *My Family Album. Thirty Years of Primate Photography*. University of California Press, Berkeley 2003.

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Frans de Waal, *Primates and philosophers. How morality evolved*. Princeton University Press, Princeton, N.J. 2006.*

Frans de Waal, *The Age of Empathy. Nature's Lessons for a Kinder Society*. Harmony Books, New York 2009.*

Frans de Waal & Pier Francesco Ferrari (Eds.), *The primate mind. Built to connect with other minds*. Harvard University Press, Cambridge, Mass. 2012.*

Frans de Waal, *The Bonobo and the Atheist. In Search of Humanism Among the Primates*. Norton, New York 2013.*

Frans de Waal, Patricia Smith Churchland, Telmo Pievani & Stefano Parmigiani (Eds.), *Evolved Morality. The Biology and Philosophy of Human Conscience*. Brill, Leiden 2014.*

Frans de Waal, *Are We Smart Enough to Know How Smart Animals Are*. Norton, New York 2016.*

Film:

Lord of the Flies, Directed by Peter Brook (UK 1963)
https://www.youtube.com/watch?v=ipA_645fKNc

Lord of the Flies, Directed by Harry Hook (USA 1990)
https://www.youtube.com/watch?v=WIuHyduImtE

Video:

Frans de Waal, *Moral behavior in animals* (2011). TED talk:
https://www.ted.com/talks/frans_de_waal_do_animals_have_morals

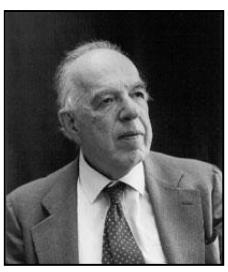
6. TOWARD A NEUROAESTHETICS?

There are hundreds of types of art; Classical Greek art, Tibetan art, Khmer art, Chola bronzes, Renaissance art, impressionism, expressionism, cubism, fauvism, abstract art; the list is endless. But despite this staggering diversity of styles, are there some general principles or "artistic universals" that cut across cultural boundaries? Can we come up with a "science of Art"? Science and art seem like such fundamentally antithetical pursuits; one is a quest for general principles whereas the other is a celebration of human individuality — so that the very notion of a "science of art" seems like an oxymoron. Yet that's what I will suggest in this chapter — that our knowledge of human vision and of the brain is now sophisticated enough that we can speculate intelligently on the neural basis of art and maybe begin to construct a scientific theory of artistic experience. Saying this, as we shall see, does not in any way detract from the originality of the individual artist, for the manner in which she deploys these universal principles is entirely up to her. (After all, knowing the rules of grammar does not diminish our appreciation of Shakespeare's genius!)

V.S. Ramachandran

To the historian of art, it is evident that the two authors' notion of 'art' is of very recent date, and not shared by everybody. They claim: 'The purpose of art, surely, is not merely to depict or represent reality -- for that can be accomplished very easily with a camera -- but to enhance, transcend, or even to distort reality' (Ramachandran and Hirstein, p. 16). They do not explain how one could photograph Paradise or Hell, the Creation of the World, the Passion of Christ, or the escapades of the ancient gods -- all subjects that can be found represented in our museums. Nor is it more legitimate to generalize from certain Indian conventions of representing the female nude than it is for the academic tradition to take the Venus de Medici for the same purpose. Even a fleeting visit to one of the great museums might serve to convince the authors that few of the exhibits conform to the laws of art they postulate.

E.H. Gombrich (1909-2001), one of the most influential art historians of the twentieth century



Literature, compulsory:

V.S. Ramachandran & William Hirstein,
'The Science of art. A neurological theory of aesthetic experience', in Joseph A. Goguen, (Ed.), *Art and the brain*. Special Issue of *Journal of Consciousness Studies*, Volume 6, nr. 6-7 (1999), 15-51.* [e-journal UL] + [UL]
+ *parts of:*
Joseph A. Goguen (Ed.),
A*rt and the brain*. Special issue of *Journal of Consciousness Studies*, Volume 6 (1999), nr. 6/7. [e-journal] + [UL] [see http://www.imprint.co.uk/jcs_6_6-7.html for the content]
and
Joseph A. Goguen & Erik Myin (Eds.),
Art and the brain, Part II. Special issue of *Journal of Consciousness Studies*, Volume 7 (2000), nr. 8/9. [e-journal] [see http://www.imprint.co.uk/jcs_7_8-9.html for the content]
Ellen Dissanayake,
'The core of art: Making special', in *Journal of the Canadian Association for Curriculum Studies*, Volume 1 (2003), 13-38.* (reprint from Dissanayake 1992)

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Artists on science, scientists on art (Nature supplement), in *Nature*, Volume 434 (2005), 293-323.*
Brian Boyd,
'Evolutionary theories of art', in Jonathan Gottschall & David Sloan Wilson (Eds.), *The Literary Animal. Evolution and the nature of narrative*. Northwestern University Press, Evanston IL. 2005, 147-176.*
Ellen Dissanayake,
Homo Aestheticus. Free Press, New York 1992.*
Denis Dutton,
The art instinct. Beauty, pleasure, and human evolution. Bloomsbury Press, New York 2009. [RR]
Anthony Freeman,
'Sharpening up "The science of art". An interview with V.S. Ramachandran', in *Journal of Consciousness Studies* Volume 8, nr. 1 (2001), 9-29.* [e-journal UL]
Joseph A. Goguen & Erik Myin (Eds.),
Art and the brain, Part III. Special issue of *Journal of Consciousness Studies*, Volume 11 (2004), nr. 3/4. [e-journal] [see http://www.imprint.co.uk/jcs_11_3-4.html for the contents]
V.S. Ramachandran,
The emerging mind, BBC Reith Lectures 2003. Profile Books, London 2003. [UL] (see Audio)
V.S. Ramachandran,
'The Artful Brain', in Maureen Devlin (Eds), *The internet and the university. Forum 2004*. EduCause, Washingtoin, DC 2005, 169-198.*
Robert L. Solso,
The psychology of art and the evolution of the conscious brain. The MIT Press, Cambridge, Mass. 2003.*
Tom Stafford,
'The artful brain. An interview with Vilayanur Ramachandran', in *The psychologist*, Volume 17 (2004), 636-637.*

Mark Turner (Ed.),
The artful mind. Cognitive science and the riddle of human creativity. Oxford University Press, Oxford 2006. [RR]
Semir Zeki,
'Art and the brain', in *Journal of Consciousness Studies*, Volume 6 (1999a), nr. 6-7, 76-96.* [e-journal UL]
Semir Zeki,
Inner vision. An exploration of art and the brain. Oxford University Press, Oxford 1999b. [UL Randwijck] [first three chapters*]
Semir Zeki,
'Neural Concept Formation & Art. Dante, Michelangelo, Wagner', in *Journal of Consciousness Studies*, Volume 9 (2002), nr. 3, 53-76.*[e-journal UL]
Semir Zeki,
'The neurology of ambiguity', in: *Consciousness and Cognition*, Volume 13 (2004), 173-196.* [e-journal UL]

Audio:

V.S. Ramachandran, *The emerging mind*, BBC Reith Lectures 2003. Online available: http://www.bbc.co.uk/radio4/reith2003/lecturer.shtml

Website:

Institute of Neuroaesthetics: http://neuroesthetics.org/

Video:

-V.S. Ramachandran, *Neurology and the passion for Art* (UC San Diego 2000)*
-V.S. Ramachandran, *Aesthetic Universals and the Neurology of Hindu Art* (UC San Diego 2008)*
-Matthew Collins, *What is Beauty?* (BBC 2009)*
-*How Art made the world* (BBC 2005)* – 5 Episodes:
1) *More human than human…*
2) *The day pictures were born*
3) *The art of persuasion*
4) *Once upon a time*
5) *To death and back*

TOWARD A NEUROAESTHETICS CONTINUED: SYNAESTHESIA

Literature:

Amy Ione,
'Klee and Kandinsky: Polyphonic Painting, Chromatic Chords and Synaesthesia', in Joseph A. Goguen & Erik Myin (Eds.), *Art and the brain, Part III*. Special issue of *Journal of Consciousness Studies*, Volume 11 (2004), nr. 3/4, 148-158.*

Chrétien van Campen (Ed.),
Leonardo Online Bibliography Synesthesia in Science and Art:
http://www.leonardo.info/isast/spec.projects/synesthesiabib.html

Sean A. Day (Ed.),
Famous Synesthetes. Online available:
http://incorrectpleasures.blogspot.com/2009/01/famous-synaesthetes-or-possible.html

V.S. Ramachandran and E.M. Hubbard,
'Synaesthesia – A window into perception, thought and language', in *Journal of Consciousness Studies*, Volume 8, nr. 12 (2001), 3–34.* [e-journal UL]

V.S. Ramachandran and E.M. Hubbard,
'The phenomenology of synaesthesia', in *Journal of Consciousness Studies*, Volume 10, nr. 8 (2003), 3–34.* [e-journal UL]

Audio:

V.S. Ramachandran, 'Purple Numbers and Sharp Cheese', Lecture 4, *The emerging mind, BBC Reith Lectures 2003*. Online available: http://www.bbc.co.uk/radio4/reith2003/lecturer.shtml

Video:

-V.S. Ramachandran, *Synesthesia* (The Science Network 2007), online available:
http://thesciencenetwork.org/programs/beyond-belief-enlightenment-2-0/v-s-ramachandran

7. VERBAL GROOMING

BBC News Talking point (Wednesday, 29 November, 2000, 11:10 GMT)

Is office gossip good for you?

Bringing back the tea lady and the Friday night office drink will benefit relations in the workplace, according to a new report.

The report by the Industrial Society recommends that employers should give their staff more room to enjoy their work, should see sociability at work as morale boosting and not in opposition to efficiency and productivity.

"Gossip is the cement which holds organisations together," says report author Judith Doyle.

Among primates, the cohesion of groups is maintained by social grooming; the time devoted to social grooming is linearly related to group size among the Old World monkeys and apes. To maintain the stability of the large groups characteristic of humans by grooming alone would place intolerable demands on time budgets.
(…)
Analysis of a sample of human conversations shows that about 60% of time is spent gossiping about relationships and personal experiences.

(Dunbar, 1993, p. 681)

Literature, compulsory:

Robin Dunbar,
'Why gossip is good for you' in *New scientist*, Volume 136 (1992), 28-31.*

Robin Dunbar,
'Talking heads', in *Grooming, gossip and the evolution of Language* (1996.). Harvard University Press, Cambridge Mass. 1996, 1-8. [SL UL]*

Robin Dunbar,
'Of brains and groups and evolution', in Ibidem, 55-79.*

Literature, recommended:

Zubair S. Amir,
'"So delightful a plot": Lies, gossip, and the narration of social advancement in The Eustace Diamonds', in *Victorian literature and culture*, 36 (2008), 187–204.*

Gregory Booth,
'Religion, gossip, narrative conventions and the construction of meaning in Hindi film songs', in *Popular Music,* Volume 19 (2000), 125-145.*

Aafje C. Brandt,
Being talked about: How the source and the message affect person impressions. Doctoral dissertation, Radboud University Nijmegen 2010.*

Keith Devlin,
The math gene. How mathematical thinking evolved and why numbers are like gossip. Basic Books, New York 2000. [UL]

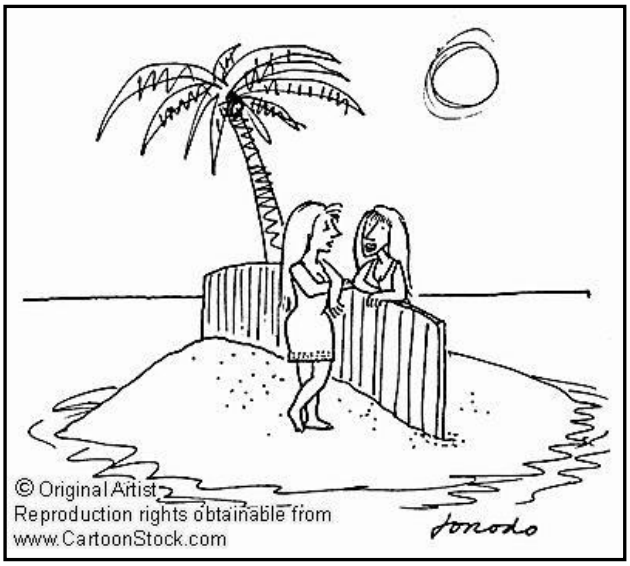
Robin Dunbar,
'Co-evolution of neocortical size, group size and language in humans' in *Behavioral and Brain Sciences*, Volume 16 (1993), 681-735.*

Robin Dunbar,
'The social brain: mind, language and society in evolutionary perspective', in *Annual Review of Anthropology*, Volume 32 (2003), 163-181.*

Robin Dunbar,
'Gossip in evolutionary perspective', in *Review of General Psychology*, Volume 8 (2004): 100-110.*

Pamela M. Fletcher,
'Narrative Painting and Visual Gossip at the Early-Twentieth-Century Royal Academy', in *Oxford Art Journal*, Volume 32 (2009), 243-262.*

Kate Fox,
'Evolution, Alienation and Gossip. The role of mobile telecommunications in the 21st century' (2001), *Social Issues Research Centre*. Online available:
http://www.sirc.org/publik/gossip.shtml



Jan B. Gordon,
'Affiliation as (Dis)semination: Gossip and Family in George Eliot's European Novel', in *Journal of European Studies*, Volume 15 (1985), 155-189.*
R.A. Hill & Robin Dunbar,
'Social network size in humans', in *Human Nature*, Volume 14 (2003), 53-72.*
Jan Gordon,
Review of Patricia Meyer Spacks (1985), in *MLN*, Volume 101 (1986), 1273-1279.*
Lesley Lipson,
'"Las lenguas de las gentes": Gossip as a narrative device in selected works of Cervantes', in *Forum for modern language studies*, Volume 27 (1991), 268-283.*
Rukmini Bhaya Nair,
'Text and Pre-Text: History as Gossip in Rushdie's Novels', in *Economic and Political Weekly*, Volume 24 (1989), 994-1000.*
Patricia Meyer Spacks,
'In Praise of Gossip', in *The Hudson Review*, Volume 35 (1982, 19-38.*
Patricia Meyer Spacks
Gossip. Knopf, New York 1985. [Available through ILL]
Blakey Vermeule,
'Gossip and Literary Narrative', in *Philosophy and Literature*, Volume 30 (2006), 102-117.*

Video:

Robin Dunbar, *Darwin and Friends* (Oxford Abridged Short Talks, september 2010)*
Robin Dunbar, *How it is that humans aren't just great apes? On the social brain theory* (Nobel Conference 2008) (http://www.youtube.com/watch?v=i98XpBFWPrI)

8. MORALITY

The propounders of what are called the "ethics of evolution," when the 'evolution of ethics' would usually better express the object of their speculations, adduce a number of more or less interesting facts and more or less sound arguments in favour of the origin of the moral sentiments, in the same way as other natural phenomena, by a process of evolution. I have little doubt, for my own part, that they are on the right track: but as the immoral sentiments have no less been evolved, there is, so far, as much natural sanction for the one as the other. The thief and the murderer follow nature just as much as the philanthropist. Cosmic evolution may teach us how the good and the evil tendencies of man may have come about; but, in itself, it is incompetent to furnish any better reason why what we call good is preferable to what we call evil than we had before. Some day, I doubt not, we shall arrive at an understanding of the evolution of the æsthetic faculty; but all the understanding in the world will neither increase nor diminish the force of the intuition that this is beautiful and that is ugly.

Huxley, Evolution of Ethics (1893)

Literature, compulsory:

Richard Dawkins,
'Nice guys finish first', in *The selfish gene*. (30th Anniversary Edition). Oxford University Press, Oxford 2006a, 202-233.* [earlier editions: UL Randwyck]

T.H. Huxley,
'Evolution and ethics' (1893), in *Evolution & Ethics and Other Essays* (= *Collected Essays*, Volume IX), 1-45. Online available: http://aleph0.clarku.edu/huxley/CE9/E-E.html

G.C. Williams,
'A sociobiological expansion of Evolution and Ethics', in J. Paradis & G.C. Williams (Eds.), *T.H. Huxley, Evolution and ethics. With new essays on its Victorian and sociobiological context*. Princeton Univeristy Press, Princeton, NJ 1989, 179-214.* [UL]

Literature, recommended:

Donald Broom,
The evolution of morality and religion. Cambridge University Press, Cambridge 2003.*

Richard Dawkins,
'The roots of morality: why are we good?', in *The God delusion*. Bantam Press, London 2006b. 209-233.* [SL UL]

Marc D. Hauser,
Moral minds. The nature of right and wrong. Harper Collins, New York 2006.*

Dennis L. Krebs,
The origins of morality. An evolutionary account. Oxford University Press, Oxford 2011.*

Peter Singer,
The Expanding Circle. Ethics, Evolution, and Moral Progress. With a new preface and afterword by the author. Princeton University Press, Princeton 2011. [First published 1981]*

Walter Sinnott-Armstrong (Ed.),
Moral Psychology. Volume 1: The Evolution of Morality: Adaptations and Innateness. A Bradford Book-The MIT Press, Cambridge, Mass. 2008.* [UL Randwyck]

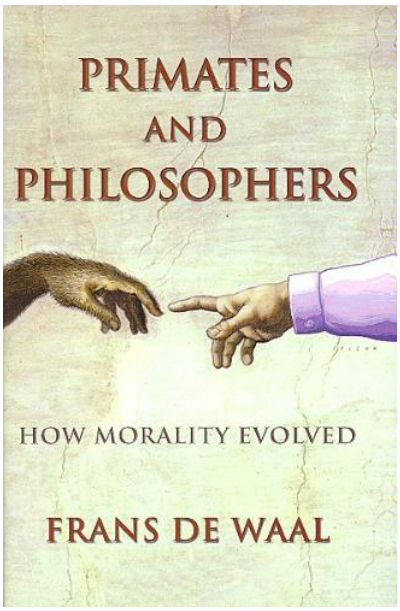
Walter Sinnott-Armstrong (Ed.),
Moral Psychology. Volume 2: The Cognitive Science of Morality: Intuition and Diversity. A Bradford Book-The MIT Press, Cambridge, Mass. 2008.* [UL Randwyck]

Walter Sinnott-Armstrong (Ed.),
Moral Psychology. Volume 3: The Neuroscience of Morality: Emotion, Brain Disorders, and Development. A Bradford Book-The MIT Press, Cambridge, Mass. 2008.* [UL Randwyck]

Frans de Waal,
Good natured. The origins of right and wrong in humans and animals. Harvard University Press, Cambridge, Mass. 1996.* [UL]

Frans de Waal,
Primates and philosophers. How morality evolved. Princeton University Press, Princeton, N.J. 2006.* [UL]

Robert Wright,
The Moral Animal. Why We Are The Way We Are: The New Science of Evolutionary Psychology. Pantheon Books, New York 1994.* [UL]



Video:

Sam Harris, *Science can answer moral questions* (2010). TED Talk: https://www.ted.com/talks/sam_harris_science_can_show_what_s_right

Frans de Waal, *Moral behavior in animals* (2011). TED talk: https://www.ted.com/talks/frans_de_waal_do_animals_have_morals

9. RELIGION

STUDIES OF TWINS SUGGEST THAT FAITH IS INFLUENCED BY GENES

Tim Spector

Popular Science
08.08.2013

I am frequently asked by journalists to recall the most surprising finding of our twin studies. The study of religion and belief in God is the one that always comes to mind, and the results are not easily accepted by many people. Most people can accept diseases or height and even weight being genetically heritable to some extent, but when it comes to our personal beliefs we tend to be more skeptical. For many, the idea that there is a genetic component to our faith--or lack of it--is a stretch too far and damages the concept of self-determination that we hold so dear.

Nevertheless science has shown us clearly that one level of belief in God and overall spirituality is shaped not only by a mix of family environment and upbringing--which is not surprising--but also by our genes. Twin studies conducted around the world in the U.S., the Netherlands and Australia as well as ours in the U.K. show a 40 to 50 percent genetic component to belief in God. (…)

Tim Spector is the author of *Identically Different: Why We Can Change Our Genes* (The Overlook Press, New York 2012).

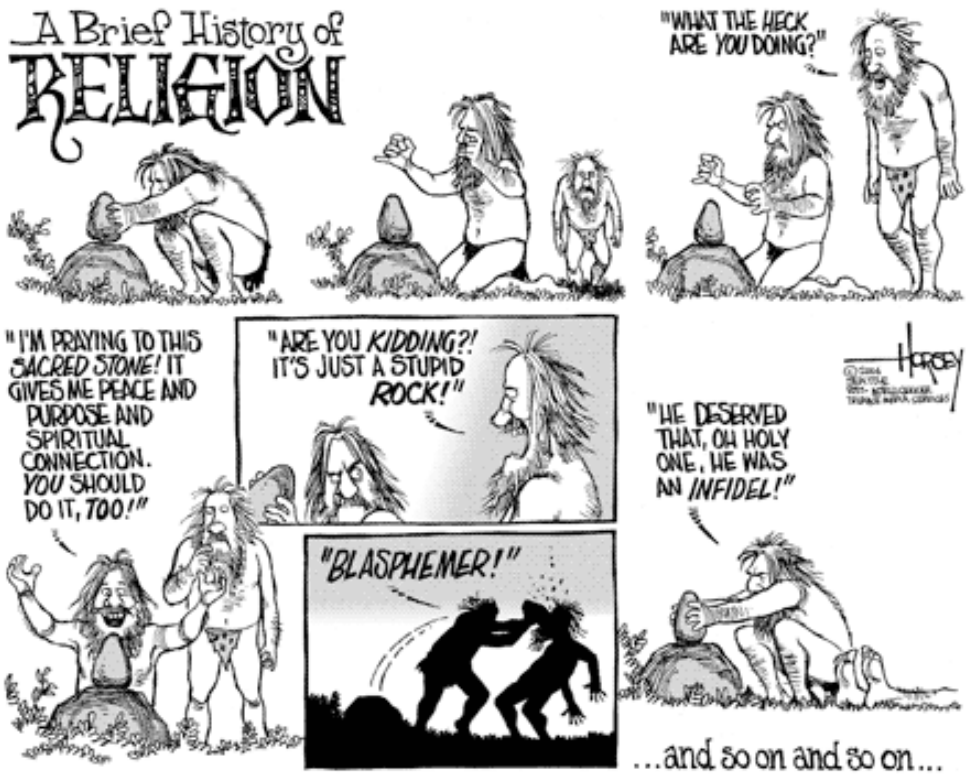
Literature, compulsory:

Thomas Dixon,
'Chapter 1: What are science-religion debates really about', in: *Science and religion. A very short introduction.* Oxford University Press, Oxford 2008, p. 1-17.*

John Ellis,
'Chapter 2: How Science works', in: *How science works: Evolution. A student primer.* Springer, New York 2010, p. 7-26.*

Robert T. Pennock,
'Biology and religion', in David L. Hull & Michael Ruse (Eds.), *The Cambridge companion to the philosophy of biology.* Cambridge University Press, Cambridge 2007, 410-428.* [SL UL]

David Sloan Wilson,
'Introduction: Church as organism' + 'The View from Evolutionary Biology', in: *Darwin's cathedral. Evolution, religion, and the nature of society.* University of Chicago Press, Chicago, Ill. 2002, p. 1-4, 5-46.* [UL]



Literature, recommended:

Matthew Alper,
The 'God' part of the brain. An interpretation of human spirituality and God. Source Books, Naperville, Ill. 2008.*

Alain de Botton,
Religion for atheists. A non-believer's guide to the uses of religion. Random House, New York 2012.*

Peter J. Bowler,
Monkey trials and Gorlla sermons. Evolution and christianity from Darwin to Intelligent Design. Routledge, London 2009.*

Pascal A. Boyer,
Religion explained. The evolutionary origins of religious thought. Basic Books, New York 2001.*

Donald Broom,
The evolution of morality and religion. Cambridge University Press, Cambridge 2003.*

Richard Dawkins,
The God delusion. Bantam Press, London 2006.* [SL UL]

Daniel C. Dennett,
Breaking the spell. Religion as a natural phenomenon. Viking, 2006.* [SL UL]

Willem B. Drees,
Religion and science in context. A guide to the debates. Routledge, London 2009.*

Jay R. Feierman (Ed.),
The biology of religious behaviour. The evolutionary origins of faith and religion. Praeger, Santa Barbara, CA 2009.*

Harris, Sam,
The end of faith: Religion, terror, and the future of reason. Norton, New York 2004.*

Roy A. Rappaport,
Ritual and religion in the making of humanity. Cambridge University Press, Cambridge 1999.*
Michael Ruse,
The evolution-creation struggle. Harvard University Press, Cambridge, Mass. 2006.*

Video:

Karen Armstrong, *My wish: The charter for compassion*. (2008). TED Talk:
https://www.ted.com/talks/karen_armstrong_makes_her_ted_prize_wish_the_charter_for_compassion
Alain de Botton, *Atheism 2.0* (2011). TED Talk:
https://www.ted.com/talks/alain_de_botton_atheism_2_0
Richard Dawkins, *Militant Atheism* (2002). TED Talk:
https://www.ted.com/talks/richard_dawkins_on_militant_atheism
Daniel C. Dennett, *Let's teach religion – all religions – in schools* (2006). TED Talk:
https://www.ted.com/talks/dan_dennett_s_response_to_rick_warren
Jonathan Haidt, *Religion, evolution, and the ecstasy of self-transcendence* (2012). TED Talk:
https://www.ted.com/talks/jonathan_haidt_humanity_s_stairway_to_self_transcendence
God on the brain (BBC Horizon 2003)
What about God (Evolution, part 7) (PBS 2001)

10. MUSIC

Whereas Pinker (1997) thinks that music, art and literature are spandrel-like evolutionary by-products ('cheese cake for the mind'), and Fitch (2005) states that "this issue has been over-emphasized, because a specification of the adaptive function(s) of music is neither necessary nor sufficient for a rich understanding of the biology and evolution of music", there are many others who are convinced that music is as much an adaptation as language is, to the extent that the evolution of language and music are intertwined. Still, we also have the likes of Oliver Sacks: in line with Fitch hardly interested in adaptative and even evolutionary implications, but fascinated by 'tales of music and the brain'. Perhaps there is no wider field in biopoetics than music & evolution.

Music's non-adaptiveness (or the adaptive question is the wrong one):

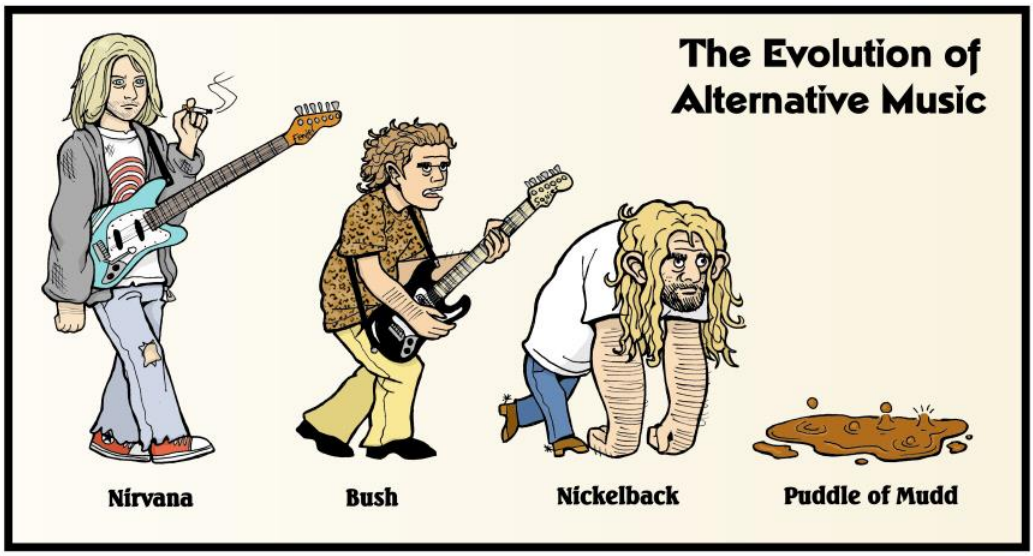
W. Tecumseh Fitch,
'The evolution of music in comparative perspective', in *Annals New York Academy of Sciences*, Volume 1060 (2005), 1-20, 85-88.*

W. Tecumseh Fitch,
'On the biology and evolution of music', in *Music Perception*, 24 (2006), 85-88.*

Marc Hauser & Josh McDermott,
'The evolution of the music faculty: a comparative perspective', in: *Nature Neuroscience*, Volume 6 (2003), 663-668.* [comparable to the position of Hauser, Chomsky, and Fitch in additional theme 4]

Steven Pinker,
'The meaning of life' in *How the mind works*. Norton, New York 1997.* [UL]

Ray Jackendoff & Fred Lerdahl,
'The capacity for music. What is it, and what's special about it?' in *Cognition*, Volume 100 (2006), 33-72.



Adaptive functions of music:

Music and sexual selection:

Geoffrey Miller,
'Evolution of human music through sexual selection', in Wallin, Merker & Brown (2000), 229-360.*

Music as play:

Ian Cross,
'Music, cognition, culture, and evolution', in Peretz & Zatorre (2003), 42-56.*

Music as motherese:

Ellen Dissanayake,
'Antecedents of the temporal arts in early mother-infant interaction', in: Wallin, Merker & Brown (2000), 389-410.*
Ellen Dissanayake & David S. Miall,
'The poetics of baby-talk', in: *Human Nature*, Volume 14 (2003), 337-364.

Music's group function:

Robin Dunbar,
Grooming, gossip and the evolution of Language (1996.). Harvard University Press, Cambridge Mass. 1996, 1-8. [SL UL]

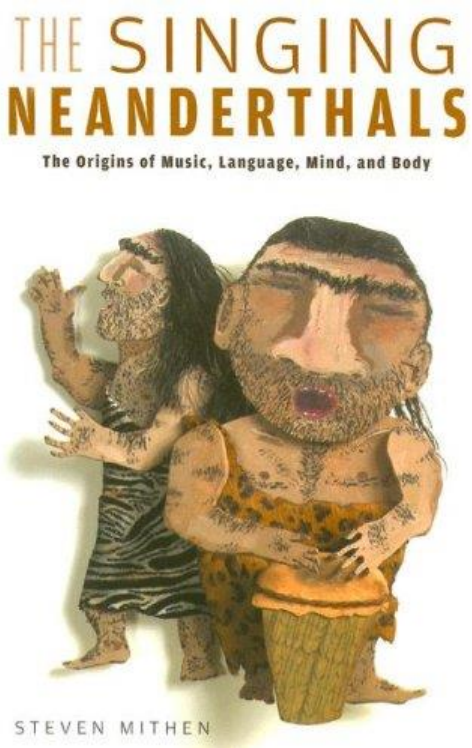
Some interesting volumes of essays and studies that might guide you:

Philip Ball,
The music instinct. How music works and why we can't do without it. Oxford University Press, Oxford 2010.*
Philip Ball et al.,,
Science and music. Nine-part essay-series. in *Nature*, Volumes 453-454 (2008).*
Aniruddh D. Patel,
Music, Language, and the Brain. Oxford University Press, Oxford 2008.* [UL Randwyck]
Reviews:
-Steven Brown, 'Music of language or language of music', in: *Trends in Cognitive Science*, Volume 12 (2008), 246-247.*
-Josh McDermott, 'Exploring music's links to language', in: *Nature Neuroscience*, Volume 11 (2008), 377.*
-David Poeppel & Elika Bergelson, 'How music speaks to us', in *Nature*, Volume 452 (2008), 695-696.*
Isabelle Peretz & Robert J. Zatorre (Eds.),
The cognitive neuroscience of music. Oxford University Press, Oxford 2003.*
Oliver Sacks,
Musicophilia. Tales of music and the brain. (Revised and espanded). Picador, New York 2008.
Nils Wallin, Björn Merker & Steven Brown (Eds.),
The Origins of Music. MIT Press, Cambridge, Mass. 2000. [UL Randwyck]

The special case of Mithen's widely-read and popular *Singing Neanderthals*: a 'holistic' approach:

Steve Mithen,

The singing neanderthals. The origins of music, language, mind, and body. Weidenfeld & Nicolson, London 2005. [UL]



Reviews:

-Daniel K. Avorgbedor, Book Review, in: *Empirical Musicology Review*, Volume 3 (2005), 32-35.*

-Ellen Dissanayake, Book review, in: *Evolutionary Psychology*, Volume 3 (2005), 375-380.*

-W. Tecumseh Fitch, 'Dancing to Darwin's tune', in *Nature*, Volume 438 (2005), 288.*

-Jerry Fodor, 'Give me that juicy bit', *in London review of books*, Volume 27 (2005), nr. 19, 28-29.*

Steve Mithen et al,

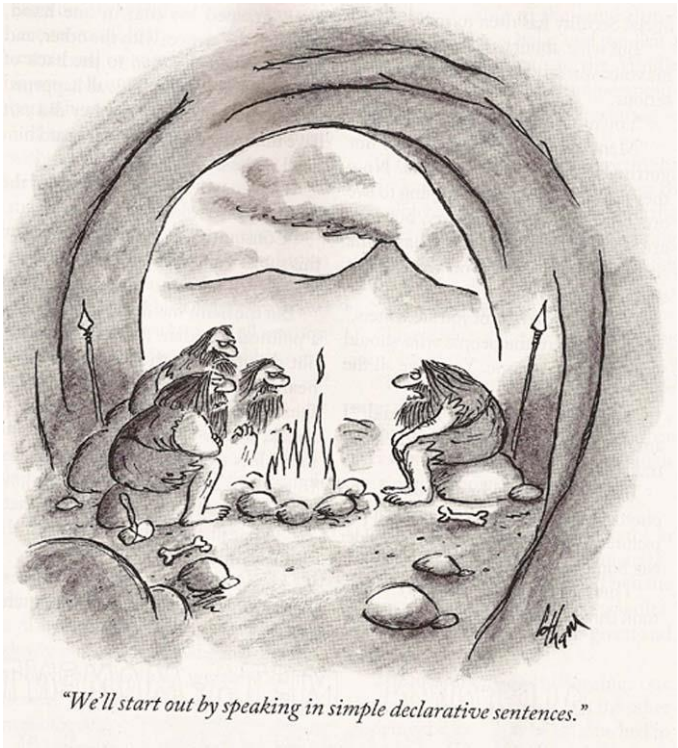
'Review feature: The singing neandethals' [Overview by Steve Mithen + commentary by Iain Morley, Alison Wray, Maggie Tallerman, Clive Gamble + Reply by Mithen], in *Cambridge Archaeological Journal*, Volume 16 (2006), 97–112.*

APPENDIX: LANGUAGE & EVOLUTION

One of the main issues in the field of language & evolution is the question: is language an adaptation (Pinker c.s.) or not (Chomky c.s.). Is language a spandrel?

The Debate:

1) Marc Hauser, Noam Chomsky & W. Tecumseh Fitch,
'The faculty of language. What is it, who has it, and how did it evolve?', in *Science*, Volume 298 (2002), 1569-1579.*
2) Steven Pinker & Ray Jackendoff,
'The faculty of language. What's special about it?' [Reply to Hauser, Chomsky and Fitch], in *Cognition*, 95 (2005), 201-236.*
3) W. Tecumseh Fitch, Marc Hauser & Noam Chomsky,
'The evolution of the language faculty. Calarifications and implication' [A reply to Pinker and Jackendoff], in *Cognition*, 97 (2005), 179-210.*
4) Ray Jackendoff & Steven Pinker,
'The nature of the language faculty and its implications for evolution of language' [Reply to Fitch, Hauser and Chomsky], in *Cognition*, 97 (2005), 211-225.*



Background literature:

Noam Chomsky,
On nature and language. Edited by Adriana Belletti & Luigi Rizzi. Cambridge University Press, Cambridge 2002.* [UL]
W. Tecumseh Fitch,
The evolution of language. Cambridge University Press, Cambridge 2010.*
Marc Hauser,
The evolution of communication. MIT Press, Cambridge, Mass. 1996.*
Ray Jackendoff,
Foundations of language: Brain, meaning, grammar, evolution. Oxford University Press, Oxford 2002.*
Steven Pinker,
The Language instinct. How the mind creates language. Harper Collins, New York 1994.* [UL Randwijck]

What Darwin thought about it:

W. Tecumseh Fitch,
'Musical protolanguage: Darwin's theory of language evolution revisited. On the occasion of Charles Darwin's 200th birthday' (2009). Online:
http://languagelog.ldc.upenn.edu/nll/?p=1136

For those of you who want to 'visit' this conference:

Andrew D.M. Smith, Kenny Smith & Roman Ferrer I Cancho (Eds.),
The evolution of language. Proceedings of the 7th International Conference (EVOLANG7). World Scientific, London 2008.*

Two rather different and original views:

a) Language as the result of the existence of memes:

Susan Blackmore,
The meme machine. Oxford University Press, Oxford 1999. [UL Randwijck]
Chapter 1: Strange creatures, online available:
http://www.susanblackmore.co.uk/Books/Meme%20Machine/Chapter%201.htm
Synopsis, online available:
http://www.susanblackmore.co.uk/Books/Meme%20Machine/mmsynop.html

b) Language as verbal grooming:

Robin Dunbar,
Grooming, gossip and the evolution of Language (1996.). Harvard University Press, Cambridge, Mass. 1996. [SL UL]