

Evolution

by Bart Nooteboom

27. Evolution

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An ancient, fundamental and recurrent theme in thought about humanity and society is that of stability and change. Traditional conservatives are oriented towards the first, progressives to the second, but both are needed. Without stability one gets into a neurotic roundabout that leads to nothing. Without change life is dead. For change some stability is needed. By not surrendering too soon what exists and pursuing it to the hilt one finds out where precisely its limitations lie, and what the needs and opportunities for renewal are.

Evolutionary logic, with its basic processes of the *generation of variety*, *selection* and *transmission* of success in survival, was a brilliant invention for thinking about stability and change. There is stability in that what does not 'fit' in the existing *selection environment*, has no *fitness*, is selected out. But in biology novel combinations of existing genes from a 'pool' by sexual reproduction, and new genes from mutation, together with changes in the selection environment lead to new forms. This is a solution to the logical problem of how something can arise from what already existed and yet be genuinely new.

A second reason why evolutionary logic is a stroke of genius is that it shows how new forms of life can arise without prior *intelligent design*. Earlier, one could not but think that a mechanism (such as a watch) requires a designer (the watchmaker), and that therefore there must be a God. In biology one is now accustomed to evolutionary thought but in policy concerning society, the economy and management not by a far stretch. The old intuition still drives thought into the mode of intelligent design.

Evolutionary logic also lends depth to pragmatic thought, of how ideas can arise neither from pre-established essences that they realize nor as a development towards some perfect, fixed ideal that serves as an end station of perfection. Similarly, it helps to see personal identity not as the manifestation or realization of some fixed 'real self' nor as the movement towards a pre-established goal of perfection. In other words, evolution yields a logic of *imperfection on the move*.

Note that there is no *genetic determinism*. What comes out depends on how genes are *expressed* in interaction with the physical, cultural and social environment in which it takes place. That environment is diverse and hence this yields a diversity of outcomes that is crucial for evolution, and helps as an antidote to universalism, the idea that a form is the same everywhere.

Evolutionary logic may also apply elsewhere, probably with some adaptation or specialization of the logic, in the economy, for example, or in the development of ideas.

Later in this blog I will along that line sketch a theory of invention. I will also consider evolution in society.

28. Realism?

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The question still stands: do we know the world as it is? According to the empiricists we know it through elementary 'sense data'. According to idealists it is all in the mind. I argued that we see and conceptualise the world according to mental categories that we develop in interaction with the world. That effect of the world on our thought yields a form of realism. However, this implies the assumption that the world exists. On what is that based?

We cannot prove that reality exists but we can hardly do other than make the assumption, as a 'natural belief', as the 18th century philosopher Hume already said. The philosopher Heidegger also argued that we cannot do other than think in terms of being, of a world that exists. It would be difficult to make sense of our life and the world without it. If the world does not exist, how could we have developed ideas to survive in it? But this argument is circular, assuming a world to survive in.

To believe in evolution we need to believe in a reality that forms a selection environment. Let us assume that this reality indeed consists of objects in space and time, things, animals and people that act. Especially those are salient for functioning and survival in the world. We would not have survived if we hadn't formed a reasonably adequate mental representation and understanding of them. And that implies that we have an inclination to categorize in such terms of time and place, form, volume, matter, mass, place and movement. Those were of predominant importance to find food, hunt prey, and escape from the sabre-toothed tiger. As Gilbert Ryle indicated in 1949, 'intelligence' does not refer to some psychic object, but to a constellation of capabilities, inclinations and practices. All this does not prove that reality is indeed as postulated, but it does form a coherent argument. That view of reality, plus evolutionary theory, and an explanation of our survival and the consequences for our thought then form a coherent whole. That makes the assumption of external reality a warranted belief, even though we cannot prove it. Admittedly, it is like a house of cards: different elements supporting each other. Not strong perhaps, but still better than a single card.

29. Object bias

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In their book *Metaphors we live by*, Lakoff and Johnson argued, in 1980, that apparently self-evident categories, even in what appears to be direct observation, are in fact metaphors rather than 'literal descriptions'. In fact, literal description does not exist. An apparently literal description is always already a conceptualisation. We grasp our actions in the physical world, in which we have learned to survive, to construct meanings of abstract categories. 'Up', 'upwards' and 'rising' according to Lakoff and Johnson

indicate something good, and 'downwards' and 'falling' something bad because when we are alive and well we stand up while we are prostrate when ill or sick.

The basis for far-reaching metaphorization lies in 'primary metaphors' that build on proprioception (groping, grasping) and bodily survival. Think of our own movement in the world, the speed and direction of the sabre-toothed tiger, the shelter of a roof, a spear and its trajectory, the whereabouts of a lost child, the carrying of a burden. We would not have successfully evolved if we hadn't been reasonably accurate with such categories. This yields a certain basic conceptualisation in our thought and language, in terms of things, including actors, their movement in time and space, distinction between subject and object, and their action, including causal action.

This is reflected in Chomsky's *universal grammar*, where the basic elements of sentences are *noun phrases* and *verb phrases*. The basis for thought lies in things (including living things) that 'do' something. Those 'things' form the paradigmatic nouns and the 'doing something' forms the paradigmatic verb.

The object bias would suggest that we think in terms of distinct, discrete entities that appear in sequence in time, and that it does not come easily to us to see entities connected in a continuum, or in a field of force, or in an integrated process of *duration*, in which moments are not experienced as discrete but as integrated in a flow, as Henri Bergson proposed. We experience it but are unable to conceptualise it.

When we move a word from one sentence to another we are inclined to think that its meaning remains the same, as if we move a chair from one room to another, while in fact the meaning shifts. As if the legs drop off the chair or it changes colour. We think of communication as the transfer of meaning-things across a communication 'channel', while in fact in expression and interpretation meanings are transformed.

In sum, my thesis is that in our conceptualisations we have an *object bias* and an *actor bias*, a difficult to dodge inclination to see everything, including abstract, immaterial things as objects that have a location, move or do something. The grammatical notions of 'subject' and 'object' still carry intuitions of causal action while mostly there is no question of that. How does that conceptualisation do under current conditions, where abstractions, such as happiness, meaning, truth, morality, not to speak of democracy, identity, and so on, may now be crucial for human survival?

30. Evolution in society

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The basic processes of evolution are the *creation of variety*, *selection*, and *transmission* of characteristics if their carriers survive selection. Those processes may also be seen as processes of *self-organization* in economic or political systems and organizations. Herman van Gunsteren noted that in those cases one could add an additional process of *indirect control*. Such control does not aim directly at the content or outcomes of the

processes of variety, selection and transmission, which would obstruct evolution/self-organization, but affects the way in which those processes work, or fail to work.

In the further specification of the basic processes fundamental differences arise between evolution in biology and in society. Van Gunsteren made the useful distinction between the principles and the mechanisms by which they are realised. The principles may be the same but the mechanisms differ radically.

In the capitalist economy and in democracy variety is generated by invention. While there is much trial and error, the creation of variety here is not entirely blind, since unlike biological evolution it is informed by learning and experience obtained from the selection process. In failing one learns what not to do and to look for novel ways. And that may limit variety, preventing attempts that seem insane but might turn out to be strokes of genius.

Selection takes place by means of competition, for markets viz. votes. A question then is to what extent that selection environment can be affected or even created by the carriers (firms, politicians) of the units that are selected (products, political programmes), in what is called *co-evolution*. That happens to some extent also in biology, but here the opportunities for it are much greater. Entrepreneurial firms make markets, and entrepreneurial politicians set the political agenda. Scientists may create their own journal to publish work not accepted by others. That may have a positive effect, when it allows innovators to create an initial niche in which they can survive for the time being, before jumping to a larger market. But when the fabrication of the selection environment becomes stronger or faster than the selection process, evolution fails. The process can then get locked up in a struggle between vested interests.

Third, the transmission of success is based on communication, and there meanings are not duplicated, as genes are, but shifted, supplemented or transformed. That means that transmission is also a source of variety. Conversation and training not only carry over but also create ideas.

In sum, in so far as one can form one's own selection environment, variety is constrained by existing common sense (established ways of solving problems), and transmission is part of variety generation, evolution can fail and the result may be a different process altogether.

For evolution in society we must study cognition and language, which can yield features that are *sui generis* and may no longer correspond with evolutionary logic. Nevertheless evolutionary logic is useful for luring policy makers, in economics and politics, away from their predilection towards *intelligent design*.

My hypothesis is that there is an inclination towards intolerance, xenophobia and discrimination in our genes, and that it goes together with an instinct for altruism only within the group.

In evolution a striving for self-interest favours survival, so that is what evolution leaves in our genes. That egotism is tempered in case of family, since our genes can also be transmitted through them. A step further is that if people resemble us that may be an indication of genetic similarity. People who do not look like us, in appearance and conduct, are suspect.

Damasio reported that revulsion from the foreign is anchored in the brain centre where smell and taste are located. Originally, in evolution, that was a mechanism against ingesting poison. With this, the aversion to the foreign is accompanied not only by emotions of threat but also with feelings of contamination and poisoning.

One might think that loyalty and altruism are good for survival of the group and for that reason could be an outcome of evolution. Charles Darwin thought that. It has long been thought in evolutionary theory that this cannot be so, since potential properties lie in the genes of individuals, and groups have no genes. People with altruistic genes would be vulnerable to an invasion of egotists that prey on them, so that in time the altruists would be pushed out.

However, altruism can survive if in the group deviant, excessively egotistic conduct is identified and punished because a sufficient number of group members commit themselves to it, even if for it they need to bring sacrifices that go beyond their self-interest. Such victory over self-interest requires a strong emotional loading.

That can be derived from religion. From fear of death and human fragility people have an urge towards belief in a myth of immortality. That transcends the limitations of mortal, vulnerable existence, and causes the self to rise above itself. The emotional force of it is strong enough to make sacrifices for a higher cause. If, next, the only true God is that of the own group, then outgroup discrimination is supported by religion, and altruism within the group becomes viable at the price of mistrust of outsiders. There is internal cohesion at the price of external intolerance.

It can be different, with a constitutional state with the rule of law in which misuse of dependence and good faith is punished, and whose cost one is willing to share. Thus divine order can be replaced by the order of law as a source of solidarity.

But even then the instinct towards trust within and distrust outside the group still slumbers, and can be roused when the uncertainty of existence increases due to a crisis or trust in the constitutional state is undermined, with suspicions of failing integrity and abuse of power of police, judiciary or politics. That awakening of the instinct for intolerance and distrust can be fired with an appeal to religion, ideology and nationalism.

82. Evolution in nature and art

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Are nature, or much of it, and art, or some of it, beautiful, or appealing, for the same or for different reasons?

I propose to consider the following idea: they are both the outcome of evolution, but in different ways. Evolution is characterized by more or less random, chaotic generation of trials that are put up to forces of selection. What survives is in harmony with its environment, until it is pushed aside by new novelty. Suppose that it is this harmony that appeals to us. Then we have a common ground for appreciation of nature and art. How would that work?

In nature, of course, novelty arises from genetic mutations, copying errors, and novel combinations of genes in chromosomal cross-over, and the selection environment in terms of food, predators, climate, wars, and illnesses decides survival (If you don't recall this from school biology, never mind).

In art, I propose, it is ideas, or views, images, shapes or musical scores that arise mysteriously, chaotically and next may or may not survive the test of 'making it work', in craftsmanship and the struggle with matter, until what survives is in harmony with the sense of the artist. The harmony of a work of art that is 'just right'.

The artist has to ruthlessly pursue that outcome. And if it is liked by others that is a bonus. Here, I think, artists set an example for the good life. If he/she temporarily or intermittently makes likeable, saleable art in order to survive, that is fine, but if he does not keep his standards there he/she is temporarily not an artist. Rembrandt frequently painted for money, but I am sure that there also he had his standards to keep.

Now why would we appreciate such harmony arising from selection, in nature and art? Because that has contributed to our survival in evolution. If we had not developed such sense we might no longer be here. In order to survive you have to admire what has survived.

But if that is the case, would not the disturbance of order, in novelty that does not fit, or in a shift of selection environment that causes misfits, be distasteful, abhorrent? Yes, and indeed it often is. Novel art forms encounter hostility. Until they have managed to twist the selection environment to their advantage.

161. Play, invention and evolution

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In a recent issue of the Dutch magazine 'De Groene Amsterdammer'¹, the following question was raised. Play is observed universally among people and animals, especially when young. Evolutionary logic tells us that traits can have survived only if they were

¹ Of 7th august 2014.

expedient to survival and reproduction. But play appears to be pointless, rollicking around. Much energy is spent on it, and how could that be afforded if it did not contribute to survival and/or reproduction? Apparently, counter to evolutionary logic, some things, such as play, can have value for themselves.

Play as a value in itself reminds me of existentialist philosophers such as Nietzsche, with his Will to Power, or Heidegger, with his Being in the World. In my philosophical view I would associate play with the will to creation, which I consider to be a basic drive, as discussed earlier in this blog. Playing seems close to the experimentation that leads to creation.

But whatever intrinsic value play may have, value for itself, not as an instrument for survival, the question still remains how it could have survived in evolution.

One answer could be that play also has a socializing function, to find out what one can afford to do to other people, which helps survival.

Apart from that, here I propose that an inherent drive to play, as a joy for itself, can be conducive to survival.

In fact, that is what I have argued with my 'theory of invention', set out in a book in 2000², and in item 31 of this blog. There, I argue that invention arises from experimentation with existing competence (knowledge, skill) in novel contexts, which generates failure, a resulting incentive to adapt, as well as material and directions for experimental change, arising from the novel context.

Soon after I published the book I received a response from a psychologist (in New Zealand), saying that what I described is known as a 'principle of overconfidence' that children display in play: disingenuous, fearless, sometimes reckless expansion into novel contexts of what they can do, think or say.

Entrepreneurs appear to have kept that instinct alive in spite of regimentation in education and employment. Perhaps that is why often entrepreneurs are dropouts, to escape from such regimentation. Innovation requires room and an impulse to play. One of the fundamental problems of much innovation policy is that it does not leave enough room for play.

So, my argument is that while apparently wasteful, an autonomous drive of playful experimentation is conducive to invention, has contributed to survival, and as a result has become embedded as an instinct in the genome.

Intrinsic joy of play and survival in evolution can go together, and perhaps must go together for the instinct for play to survive.

² Bart Nooteboom, 2000, Learning and innovation in organizations and economies, Oxford University Press.

Mathematics is mysterious to most people, including philosophers. The Platonic temptation of seeing knowledge as contemplation of absolute, i.e. universal and timeless truths, is nowhere as strong as there.

The distinction has been made between *synthetic* truth, about the empirical world, and *analytical* truth that follows purely logically from axioms or definitions. The separation between the two has been contested.

For one thing, what was once invented purely by mathematical imagination later turns out to describe, with astonishing accuracy, what we observe in the physical world. How can that be? Surely, there is progression from mutual interaction between theory and observation. Yet the explanatory efficacy of prior mathematical insight remains mysterious. How can that be?

My conjecture, based on an evolutionary argument, is as follows. Survival in evolution selected for ways of cognition that are adequate to a conceptualization of the world that is conducive to survival. In other words, we survived because our thought evolved to reflect reality in some sense.

We survived because we adapted to conceptualize the physical world adequately, inspired by running towards prey and away from predators and enemies, throwing a spear, rolling a wheel, catching fish, building a wall. The claim that we conceptualize the world adequately, in some sense and up to some point, is supported by the fact that we survived. Perhaps this aptitude moves to higher levels of abstraction, inspired by success and failure in predicting nature to invent yet 'higher level' mathematical theories.

From Euclidean geometry in planes to geometry on curved surfaces, onwards to a wider theory of shapes and deformations (topology).

This success of mathematics concerning nature is in stark contrast with our relative inefficacy in developing mathematical insight into how human society works.

In the Enlightenment there was a dream (e.g. Condorcet) that social phenomena could be equally well be accounted for by the mathematics that was so successful in nature. This dream has largely not been realized.

There are mathematical economic theories but they hardly yield an adequate account of society. There are other social theories but not with much effective mathematics in them (except for the statistics behind empirical testing).

Why is that? Along the line of the evolutionary argument the explanation would be that the maths required for adequate understanding of society is of a different order, and our aptitude for it has not been equally nursed by evolution. Adequate social understanding is

only now becoming a condition for survival of our species. Mental evolution may be too slow to catch up in time. Let us hope that in time some mathematics will be found that gives a better grasp of society.

How does mathematics fit in with imperfection on the move, the central theme of this blog? Isn't math the paragon of perfection?

Mathematics is not in fact universal and timeless. With the formulation of basic assumptions, called axioms, a mathematical system shields itself, immunizes itself from imperfection. It rules out all contingencies and subtleties that invalidate it, since it looks only at what follows from the axioms. Perfection is built in. Its imperfection lies in the limits imposed by the axioms, and even mathematics is imperfection on the move, in moving on to other, new axioms, in an ongoing search of abstract patterns, correspondences, (a)symmetries, and transformations.

We need a mathematics of meaning and meaning change, metaphor, identity, freedom, learning, and motivation, to name a few.

205. Parochial altruism

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Empirically, altruism has clearly been shown to exist, in people and animals, especially certain primates. In particular the Bonobo ape, as Frans de Waal has shown.¹ It appears to be present naturally, instinctively.

De Waal makes the point that if altruism were against human nature, had nothing to build on there, the task of morality to impose it would be impossible.

In item 46 of this blog I considered the puzzle of how altruism could have survived evolution as an instinct, i.e. as 'something in our genes', next to an instinct for self-interest and survival. I offered an argument for the hypothesis that it could have survived only when accompanied with some protection of an altruistic group against invasion of opportunistic outsiders that derive advantage from preying on altruists and competing them away in evolutionary selection.

In other words, by hypothesis altruism is accompanied by an instinctive discrimination of outsiders. Perhaps that explains current xenophobia, in Europe, against non-western immigrants. I also suggested that by cultural means altruism concerning members of the group one identifies with may be extended, moulded, to include outsiders. Ethics may then build on a genetic potential for empathy.

I did not offer empirical evidence, and here I proceed to do so.

In a mountain of literature, in psychology and sociology, the proposition is known as *parochial altruism*, and it has been extensively confirmed empirically, but with an

important qualification.ⁱⁱ There is more weight on in-group love and preferential treatment than on out-group hatred. This may make raise some hope against xenophobia.

Not surprisingly, in-group preferential treatment is stronger to the extent that collaboration is more important, reputation effects are stronger, and inter-group competition is stronger. More surprisingly, perhaps, it has also been found to be stronger for more other-oriented or 'pro-social' individuals. One might have expected that they would be more benevolent towards outsiders, but that appears not to be the case. In other words, a stronger other-orientation does not reduce but intensifies out-group discrimination.

Carsten de Dreu et al.ⁱⁱⁱ investigated the effect of the 'love' or 'cuddle' hormone Oxytocin. Here also one might have expected it to reduce out-group discrimination, but the opposite appears to be the case: it intensifies in-group favouritism, between-group rivalry and discrimination.

In his studies of apes, de Waal also found empathy within the group accompanied by distrust of any outsiders.

However, while Chimpanzees are indeed mistrustful and aggressive to outsiders, Bonobos are not. Instead of war they make abundant sexual love with outsiders, as they do within the group, thus avoiding tensions and conflict between in-group and out-group.

De Waal also argues that humans have traits in common with both Chimpanzees and Bonobos, related to our having a common ancestor to them. Perhaps in our stance towards immigrants we should cultivate the Bonobo in us. Perhaps culture could do that.

ⁱ Frans de Waal, *The Bonobo and the Atheist: In search of humanism among the primates*, 2013.

ⁱⁱ See e.g. Carsten K.W. de Dreu, Daniel Balliet & Nir Halevy, Parochial cooperation in humans: Forms and functions of self-sacrifice in intergroup conflict, *Advances in Motivation Science*, 1(2014), p. 1-47.

ⁱⁱⁱ Carsten K.W. de Dreu, Lindred L. Greer, Gerben A. van Kleef, Shaul Shalvi & Michael J.J. Handgraaf, Oxytocin promotes human ethnocentrism, 2011, *Proceedings of the National Academy of Sciences USA*, 108, p. 1262-1266.