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FROM OBJECTIFICATION TO PERSONIFICATION. DARWIN'S CONCEPT OF (NATURAL) SELECTION

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Introduction

The objective of this paper is to investigate the way Charles Darwin describes the concept of selection, both artificial and natural [cf. Darwin 1998]. We believe that this analysis can explain why Darwin conceptualized essentially the same phenomenon (i.e. selection) in different ways. We also believe that it can provide an insight into the process of metaphorization in general. The study is couched in the approach to metaphor proposed by the Conceptual Metaphor theory [cf. Johnson 1980, Kövecses 2002].

The paper focuses on conceptualization of natural selection because of a number of reasons. In the first place, natural selection was Darwin's original idea so he could decide on how to express it in language. Secondly, although artificial selection and natural selection are claimed by Darwin to be the same kind of process (or principle), he uses different metaphors to describe them. Thirdly, it offers a unique opportunity to investigate how the process of metaphorization operates.

The paper is structured as follows: first we show the relevance of objectification and personification for framing Darwin's theory, in particular his concept of natural selection, then we discuss the degree of personification and its motivation in Darwin's work and theory. Finally, we investigate the implications of Darwin's metaphors for the theory of metaphor.

1. Objectification and personification in *The Origin of Species*

As Gillan Beer [2000] convincingly argues, when Darwin was formulating his theory he faced a situation in which he was attempting to frame in language, in a clear form, a theory that he had in mind. To achieve it, he used many conceptual metaphors available to him in English culture and language, such as the metaphor of family, struggle, tree or journey [cf. Drogosz 2008, 2009]. He used them consciously and both his readers and later commentators were fully aware of their impact [cf. Beer 2000, Young 1985, Ruse 1999]. Darwin's main objective was to demonstrate that species of organisms are not immutable, that they change in time, and that new species emerge as a result of these changes without appeal to miraculous intervention but subject to principles operating in nature. He proposed that the natural selection is such a principle or mechanism and he made it the foundation of his theory. However, in order to describe the natural selection, the process of selection itself had to be metaphorically conceptualized as an object (i.e. objectified), though in that case neither Darwin nor his readers were aware of this metaphor.

The special status of objectification (ontologization) was first recognized by Aleksander Szwedek [2000]. As a way of amending the conceptual metaphor theory, he argues that objectification is a first and necessary step in the process of metaphorization, that is an abstract entity or relation is given an ontological status of an object before further aspects can be elaborated [Szwedek 2000:147]. An analysis of the way Darwin writes about selection confirms primacy of objectification over more elaborated metaphors, such as personification.

Anna Drogosz [2008 and 2010] demonstrates the role of objectification for the issues fundamental in Darwin's theory of evolution: objectified modification of an organism could be conceptualized as accumulating over time and thus leading to greater modification (and finally to new species); objectified species, though in reality a collection of individuals, could be conceptualized as an entity having a particular form at a given moment of time, which could in turn be further elaborated via the metaphor of tree and family [cf. Drogosz 2009]. In this paper we limit our attention to objectification and personification of the concept of selection.

1.1. Artificial selection

In the first chapter of his work, Darwin describes how domesticated plants and animals are modified by efforts of breeders who select those specimens which display desired features. Because breeders allow these specimens to have progeny, the desired features are maintained and strengthened in successive generations. The description of artificial selection is long and meticulous, supported by many examples, preparing the reader for the concept of natural selection, because

Darwin claimed that analogous processes of modification take place in nature, and are responsible for the emergence of new species without divine intervention.

The concept of selection in the breeding context is in fact rather diffuse. Essentially, selection is the act of identifying features favoured by breeders, choosing animals or plants displaying these features, and allowing them to produce offspring. More importantly, selection is not only an activity performed by a human agent, but also a sum of these activities as realized over time. It is in this sense that Darwin writes about selection most often and it is this sense which, we believe, is objectified by virtue of the metaphor *ACTIVITIES ARE OBJECTS*¹. Objectification of selection allows Darwin to focus on its different aspects: in (1–3) he emphasizes its duration, in (4–6) he refers to selection as a principle² thus highlighting partial predictability of its results, in (7) he depicts selection as a kind of instrument in the hands of a breeder:

- (1) Certainly, a breed intermediate between two very distinct breeds could not be got without extreme care and **long-continued selection**; nor can I find a single case on record of a permanent race having been thus formed³.
- (2) The laws of correlation of growth, the importance of which should never be overlooked, will ensure some differences; but, as a general rule, I cannot doubt that the **continued selection** of slight variations, either in the leaves, the flowers, or the fruit, **will produce races** differing from each other chiefly in these characters.
- (3) It is not that these countries, so rich in species, do not by a strange chance possess the aboriginal stocks of any useful plants, but that the native plants **have not been improved** by **continued selection** up to a standard of perfection comparable with that given to the plants in countries anciently civilised.
- (4) In Saxony the importance of **the principle of selection** in regard to merino sheep is so fully recognised, that men follow it as a trade: the sheep are placed on a table and are studied, like a picture by a connoisseur...
- (5) It may be objected that **the principle of selection** has been reduced to methodical practice for scarcely more than three-quarters of a century; it has certainly been more attended to of late years, and many treatises have been published on the subject; and the result, I may add, has been, in a corresponding degree, rapid and important.
- (6) **The principle of selection** I find distinctly given in an ancient Chinese encyclopaedia.
- (7) When in any country several domestic breeds have once been established, their occasional intercrossing, with **the aid of selection**, has, no doubt, largely aided in the formation of new sub-breeds; but the importance of the crossing of varieties has,

¹ Obviously Darwin was not the first to objectify selection but was in a long line of breeders who spoke and wrote about selection in this way.

² Ruse [1999] convincingly argues for the importance of presenting natural selection as a principle. By describing it in the way that bore resemblance to principles of Newtonian physics, Darwin was trying to meet the requirements for good science put forward by Herschel. He demonstrates the importance of treating selection as a principle for methodological and philosophical reasons.

³ All the examples come from the 1997 Oxford edition of Darwin's work; all emphasis added in the quotations – A. D.

I believe, been greatly exaggerated, both in regard to animals and to those plants which are propagated by seed.

In the context of breeding the role of the agent is clearly performed by the human breeder who actually does the selection. However, in the examples (2) and (3) selection, said to produce races and improve plants, is itself promoted to the role of the agent. While conceptualization of artificial selection as an agent is marginal, it is the main way of describing natural selection. What is more, while in the case of artificial selection examples such as (2) and (3) may be considered as stylistic variants, conceptualizing natural selection as an agent was motivated by philosophical and methodological reasons.

1.2. Natural selection

Just like artificial selection, natural selection is understood as a principle and a process (8–10):

- (8) And in two countries very differently circumstanced, individuals of the same species, having slightly different constitutions or structure, would often succeed better in the one country than in the other, and thus by **a process of “natural selection”**, as will hereafter be more fully explained, two sub-breeds might be formed.
- (9) Isolation, also, is an important element in **the process of natural selection**.
- (10) Now let us see how this principle of great benefit being derived from divergence of character, combined with **the principles of natural selection** and of extinction, will tend to act.

However, although defined as the “preservation of favourable variations and the rejection of injurious variations”, natural selection is consistently conceptualized as an agent bringing about modifications and giving rise to new species. We can find this agentivity expressed by Darwin in a general way (11, 12), but more frequently he uses specific verbs to describe “actions” of natural selection. Thus, natural selection modifies and improves a species (13), accumulates these modifications (14), destroys and preserves some of them (15) and leads to differentiation and extinction (16).

- (11) Although natural selection **can act** only through and for the good of each being, yet characters and structures, which we are apt to consider as of very trifling importance, may thus be acted on.
- (12) That **natural selection will always act** with extreme slowness, I fully admit. Its action depends on there being places in the polity of nature, which can be better occupied by some of the inhabitants of the country undergoing modification of some kind.
- (13) But if the area be large, its several districts will almost certainly present different conditions of life; and then if **natural selection be modifying and improving**

a species in the several districts, there will be intercrossing with the other individuals of the same species on the confines of each.

- (14) It is, however, far more necessary to bear in mind that there are many unknown laws of correlation of growth, which, when one part of the organisation is modified through variation, and **the modifications are accumulated by natural selection** for the good of the being, will cause other modifications, often of the most unexpected nature.
- (15) If there exist organic beings which never intercross, uniformity of character can be retained amongst them, as long as their conditions of life remain the same, only through the principle of inheritance, and through **natural selection destroying** any which depart from the proper type; but if their conditions of life change and they undergo modification, uniformity of character can be given to their modified offspring, solely by **natural selection preserving** the same favourable variations.
- (16) **Natural selection**, as has just been remarked, **leads to** divergence of character and to much extinction of the less improved and intermediate forms of life.

We propose that the examples (11–16) represent the metaphor of “agentification” rather than personification, because the only human quality that is mapped onto the abstract concept of natural selection is agentivity. It becomes apparent when we compare them with quotations from the text illustrating fully-fledged personification:

- (17) When, by renewed elevation, the islands shall be re-converted into a continental area, there will again be severe competition: the most favoured or improved varieties will be enabled to spread: there will be much extinction of the less improved forms, and the relative proportional numbers of the various inhabitants of the renewed continent will again be changed; and again there will be a fair field for **natural selection** to improve still further the inhabitants, and thus **produce** new species.
- (18) It may be said that natural selection is daily and hourly scrutinising, throughout the world, every variation, even the slightest; rejecting that which is bad, preserving and adding up all that is good; silently and insensibly working, whenever and wherever opportunity offers, at the improvement of each organic being in relation to its organic and inorganic conditions of life.
- (19) it would be **easy** for natural selection to **fit** an animal, by some modification of its structure, for its changed habits, or exclusively for one of its several different habits.
- (20) and natural selection will **pick out with unerring skill** each improvement.
- (21) Thus, as I believe, the most wonderful of all known instincts, that of the hive-bee, can be explained by **natural selection having taken advantage** of numerous, successive, slight modifications of simpler instincts; natural **selection having by slow degrees, more and more perfectly, led the bees** to sweep equal spheres at a given distance from each other in a double layer, and to build up and excavate the wax along the planes of intersection.
- (22) I should have never anticipated that natural selection could have **been efficient in so high a degree**, had not the case of these neuter insects convinced me of the fact.

In these examples natural selection is conceptualized with much more detail and attributed qualities of a human being in general and a breeder in particular. Thus natural selection can purposefully improve and produce new species (17), it is sentient: makes choices and takes advantage (18, 21), and its actions lead to improvement (18, 20). What is more, modifying an animal is easy for natural selection (19) because of its skills (20) and efficiency (22). On the basis of these examples we believe that it is justified to distinguish between agentification (in which only agentivity is projected onto non-human concepts) and personification (in which human qualities such as sentience, free will, intentionality or morality are mapped onto non-human targets). While agentification would be only a minor elaboration of objectification, personification is much richer in detail.

Agentification is the dominating conceptualization of natural selection in Darwin's *The Origin of Species*. It appears far more frequently than personification. What is more, not only natural selection is agentified but so are climate, change, conditions of life, disuse, habit, or process of extermination to name but a few examples⁴. However, it is personification that determines the way the reader perceives the concept of natural selection. This is confirmed by the critical reaction to Darwin's anthropomorphic language. In the words of Michael Ruse, a contemporary philosopher of biology:

Darwin wanted to claim that natural selection has nothing to do with conscious selective decisions. But there was a pervasive feeling that selection of any kind implies consciousness. At the very least, critics thought, Darwin's language was unduly anthropomorphic. Alternatively, those who were keen to find design in nature, felt that through talk of 'selection' even Darwin had to give God some explicit place in evolution [Ruse 1999: 208].

What is more, Darwin frequently expressed his annoyance at the misinterpretation of his intentions. He emphasized that what he meant was a metaphor, necessary for brevity, and that no one accused Isaac Newton of personifying the force of gravity [cf. Beer 2000: 63]. In later additions of *The Origin of Species* Darwin tried to minimise the impact of personification, sometimes explicitly writing that this is a metaphor, sometimes using Spencerian concept of the "survival of the fittest", but he never managed to remove personification from his theory. The questions that naturally arise in this context are: Why did he use personification at all? Was it possible to remove it from the book and the theory? What does it tell us about

⁴ These are selected examples of other agentifications in Darwin's *Origin of Species*:

- (1) "climate acts in main part indirectly by favouring other species";
- (2) "that the change in the conditions of life, by specially acting on the reproductive system, causes or increases variability";
- (3) "Such facts show how indirectly the conditions of life must act";
- (4) "Disuse by itself seems to have done its work";
- (5) "in other cases compulsory habit has done nothing [...] but in most cases, probably, habit and selection have acted together";
- (6) "as this process of extermination has acted on an enormous scale, so must the number of intermediate varieties, which have formerly existed on the earth, be truly enormous".

the process of metaphorization? In the subsequent sections we shall try to address these issues.

2. The motivation for personification

The extensive use of agentification and personification in the way Darwin conceptualizes natural selection is motivated by various factors. We believe that the analogy that Darwin draws between domestication and nature is the prime motivating factor. While the scenario of domestication features a human breeder as the agent, as the one who does the breeding, the scenario of evolution lacks this explicit agent but somehow inherits the slot for the agent that has to be filled. Darwin could not fill it with God (because then it would not be a theory he wanted to propose not mentioning the fact that it would not be new in any way), he could not fill it with personified Nature either (because it would not be much of an alternative to personified God, although Darwin uses this option on some occasions). What only remained was conceptualizing natural selection as an agent. The analogy with artificial selection also explains why he did not stop at agentification but metaphorically elaborated natural selection by mapping the characteristics of the human breeder onto it. Other factors that led to agentification and personification include: the scenario of creation, with God acting as an agent; the concept of evolutionary change which, being embedded in our experiential model of change, implies an external cause; and English syntax which demands an overt sentential subject which, in turn, is conceptually associated with the semantic role of the agent⁵.

As we can see, agentification and personification of natural selection are an inherent part of the theory and Darwin's line of argument assumed in *The Origin of Species*. Removing them from the text would jeopardise its coherence: the analogy with artificial selection would be less clear (and if Darwin decided to exchange it with the term "survival of the fittest" it would become simply impossible). Also, abandoning agentification and personification would demand major stylistic alternations by introducing impersonal sentences and passive voice, which would be devastating for the aesthetic value of the book. Thus we are convinced that Darwin could not give up agentification and personification, no matter how much criticism he faced. This feeling seems to be shared by contemporary evolutionists who, though fully aware of its impact, decide to follow Darwin's strategy and freely personify natural selection⁶.

⁵ The factors motivating Darwin's agentification and personification of natural selection are discussed in detail in Drogosz *On Inevitability of Personification in Darwin's Origin of Species* (forthcoming).

⁶ The examples of personification of natural selection can be found in all contemporary texts on the theory of evolution. To give just a few examples:

(1) "Natural selection could **cause** variation within species" [Ruse 1999: 205];

3. Darwin's selection and the theory of metaphor

The analysis of the way Darwin conceptualizes selection is revealing not only from the point of view of the theory of evolution but from the point of view of the process of metaphorization as well. As we have demonstrated, Darwin precedes the introduction of the notion of natural selection by a discussion on artificial selection, thus agentification and personification are preceded by objectification. Bearing in mind that Darwin had the freedom to choose his metaphors for the notions he was introducing, we believe that the arrangement: objectification – agentification – personification was not coincidental. If we follow Szwedek's proposal of treating objectification as a first and necessary step in metaphorization, then Darwin's ordering makes perfect sense: before Darwin could present a detailed description of natural selection, the process of selection itself, as known from animal husbandry and agriculture, had to be objectified.

Darwin's metaphorization of selection confirms Szwedek's views in one more way. In *The Ultimate Source Domain* Szwedek suggests that the development of metaphorization accompanying the development of abstract thinking covered the following stages: the metonymy-based (feature-to-feature) metaphorization, objectification (concrete-to-concrete metaphorization), and structural metaphors (concrete-to-abstract metaphorization). Thus, metaphors that enabled thinking and talking about abstract concepts as if they were concrete objects would be phylogenetically earlier than metaphors which allowed for a transfer of structure and knowledge of one domain onto another. We believe that Darwin's metaphors of selection recapitulate in a way this "evolution". It appears that when confronted with a new concept (i.e. natural selection) that demanded metaphorization, Darwin chose the metaphor that is phylogenetically earlier as the first stage of his conceptualization. Only after selection had been objectified, more complex (and phylogenetically later) metaphors could follow.

(2) "natural selection [...] **changes** one species into another" [Ruse 1999: 206];

(3) "Does natural selection **choose** between species?" [Dawkins 2006: viii];

(4) "which level in the hierarchy of life will turn out to be the inevitably 'selfish' level, at which natural selection **acts**?" [Dawkins 2006: viii];

(5) "Natural selection therefore **sees to it** that gangs of mutually compatible – which is almost to say cooperating – genes are favoured in the presence of each other" [Dawkins 2006: x];

(6) "As we saw in the case of the butterflies, natural selection **may unconsciously 'edit'** a gene complex by means of inversions" [Dawkins 2006: 39].

Incidentally, in comparison with Richard Dawkins, Charles Darwin was very parsimonious in his use of personification.

Conclusions

In this paper we presented an analysis of conceptual metaphors used by Darwin to write about artificial and natural selection. We have established that artificial selection is mainly objectified while the dominating conceptualization of natural selection is achieved through agentification and personification. We believe that this different treatment of the same process derives from its appearance in two different scenarios: artificial selection is objectified because in the context of domestication the human breeder performs the role of the agent; natural selection is agentified and personified because the slot for the agent remains invitingly open. We also proposed that the way the process of selection is conceptualized reveals the significance of objectification as a first stage of metaphorization and recapitulates the phylogenetic development of metaphorization in the human species. At the same time we can see the importance of conceptual metaphors for Darwin's theory: without objectification further metaphorical elaborations of selection would not be possible, without agentification personification would not obtain, without personification the theory would be impossible, or at least it would be a different theory.

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Summary**From Objectification to Personification. Darwin's Concept of (Natural) Selection**

The article presents an analysis of conceptual metaphors used by Darwin to describe artificial and natural selection. It is established that three kinds of metaphorization are employed: objectification to conceptualize artificial selection, and agentification and personification to conceptualize natural selection. It is argued that the evidence of Darwin's text justifies identifying agentification as a special type of metaphorization. Further it is claimed that the ordering of metaphors: objectification – agentification – personification demonstrates the primacy of objectification with respect to more elaborate metaphors and recapitulates the phylogenetic development of the process of metaphorization. The article also addresses the motivation for Darwin's anthropocentric language.