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Prace Językoznawcze 12, 77-87

2010

Artykuł został opracowany do udostępnienia w internecie przez Muzeum Historii Polski w ramach prac podejmowanych na rzecz zapewnienia otwartego, powszechnego i trwałego dostępu do polskiego dorobku naukowego i kulturalnego. Artykuł jest umieszczony w kolekcji cyfrowej bazhum.muzhp.pl, gromadzącej zawartość polskich czasopism humanistycznych i społecznych.

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Metaphors of time and Darwin's Scenario of Evolution

Metafory czasu i scenariusz ewolucji Darwina

The paper presents a linguistic analysis of Darwin's text *On the Origin of Species*. The analysis is conducted within the framework of cognitive semantics and investigates the metaphors underlying Darwin's Scenario of Evolution, in particular his conceptualization of the concept of time.

Słowa kluczowe: metafora, analiza tekstu, Darwin

Key words: metaphor, text, analysis, Darwin

1. Introduction

The objective of this paper is an analysis of conceptual metaphors employed by Charles Darwin in his formulation of the theory of evolution. As we have demonstrated in earlier studies, Darwin's theory as presented in his book *On the Origin of Species* draws on a number of metaphors. We have demonstrated the importance of ontological metaphors for the framing of the whole theory (Drogosz 2008) and the role of metaphors of family, tree and struggle in providing coherence (Drogosz 2009). In this study we want to investigate how the concept of time and change inherent in Darwin's theory are conceptualized, because we believe that his way of looking at these phenomena allowed for almost universal application of this theory, including phenomena unrelated in any way to biological evolution.

Our analysis is conducted in the conceptual metaphor theory as formulated by Lakoff and Johnson (1980, 1999) and Kövecses (2002) as well as the blending theory proposed by Fauconnier and Turner (2002). We believe that this theoretical framework offers tools for an insightful analysis of Darwin's text. The study is based on the first and second edition of Darwin's seminal work

On the Origin of Species first published in 1859. The figures in brackets after each quotation refer to the 1996 Oxford edition of the text.

2. The Scenario of Evolution

It has been widely acknowledged that Darwin's text and, consequently, his theory are based on a large number of metaphors (cf. Beer 1983; Young 1985). It must be emphasized here that Darwin himself was fully aware that many of his statements were metaphorical and he made explicit remarks on the matter several times in *The Origin*. It must be also emphasized that no scientific theory is free of metaphorical linguistic expressions and this is so "because abstract thought is mostly metaphorical [and] answers to philosophical questions have always been (and will be) mostly metaphorical" (Lakoff and Johnson 1999: 17). The metaphors that are most often associated with Darwin's theory comprise: personification of nature and natural selection, LIVING ORGANISMS ARE FAMILY MEMBERS, RELATIONSHIPS AMONG ORGANISMS IN TIME ARE A (GENEALOGICAL) TREE, AND RELATIONSHIPS AMONG ORGANISMS AT A GIVEN MOMENT OF TIME ARE STRUGGLE. They all draw from the stock of conventional metaphors available in the English language contemporary to Darwin but remain active today as well. Here we want to investigate Darwin's concept of time and change which jointly contribute to his scenario of evolution. Although in this case too Darwin was making use of existing metaphors, both he and his readers were less aware of the fact. This is because metaphors of time, which we discuss below, though almost universal in languages of the world, are infrequently recognized by their users.

Let us consider the following excerpt from *The Origin*:

1. And I look at varieties which are in any degree more distinct and permanent, as steps leading to more strongly marked and more permanent varieties; and at these latter, as leading to sub-species, and to species. The passage from one stage of difference to another and higher stage may be, in some cases, due merely to the long-continued action of different physical conditions in two different regions; but I have not much faith in this view; and I attribute the passage of a variety, from a state in which it differs very slightly from its parent to one in which it differs more, to the action of natural selection in accumulating (as will hereafter be more fully explained) differences of structure in certain definite directions. [44]

In this fragment of the text Darwin in a nutshell presents his views on how new species could emerge in the state of nature without divine intervention. To describe his vision he employed a number of metaphors which converge into what we refer to as the Scenario of Evolution. These metaphors, all present in

the example above, include: the objectification of the concept of change, the time metaphors, and the Event-Structure metaphor. In what follows we shall discuss them and show how they cooperate to produce a powerful conceptual integration network of evolution, which is often further elaborated as the EVOLUTION IS JOURNEY METAPHOR.

2.1. Objectification of change

The ontological metaphor of objectification in the sense of Szwedek (2000) by virtue of which abstract concepts or events can be conceptualized as physical and concrete objects plays an immense role in Darwin's theory. Perhaps the most fundamental use of objectification is in the way Darwin conceptualizes the concept of change. While objectification of change is by no means unique to Darwin, its combination with other metaphors was part of Darwin's originality.

In the first place we have to realise that variations or changes are not in themselves physical objects (although we talk and think of them in this way). They involve identifying and remembering differences between at least two states at different moments of time. Once this is done, the change can be given the ontological status of a physical object. Such a process of ontological metaphorization is perhaps the most frequent type of metaphorization in language (and at the same time the least noticeable).¹

Objectification allowed Darwin to project all the experiential knowledge concerning physical objects onto the notion of change, which is clearly visible in the way he writes about change (i.e. variation or modification). Thus, variations/modifications can be profitable (2, 7) or useful (3), they can be preserved (3, 9), transmitted (4) and inherited (5, 9), but above all they can be accumulated (6–9):

- (2) ...that slight modifications of instinct might be profitable to a species... [171]
- (3) I have called this principle, by which each slight variation, if useful, is preserved, by the term of Natural Selection, in order to mark its relation to mans power of selection [52]
- (4) ...so that it could never have transmitted successively acquired modifications of structure or instinct to its progeny [193]

¹ Following Kövecses (2002: 35), emotions, such as fear, are typically objectified (as in *my fear* or *your fear* when the emotion of fear is conceptualized as a possession), and so are events (e.g. *going to the race*: EVENT IS A PHYSICAL OBJECT), actions (e.g. *giving someone a call*: ACTION IS PASTA PHYSICAL OBJECT), or any non-physical entities (e.g. *I'm in two minds*: A NON-PHYSICAL ENTITY IS A PHYSICAL OBJECT).

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- (5) ...inherited variations of instinct in a state of nature... [173]
- (6) (refuse) to sum up in their minds slight differences accumulated during many successive generations [26]
- (7) No complex instinct can possibly be produced through natural selection, except by the slow and gradual accumulation of numerous, slight, yet profitable variations. [171]
- (8) Nothing at first can appear more difficult to believe than that the more complex organs and instincts should have been perfected, not by means superior to, though analogous with, human reason, but by the accumulation of innumerable slight variations, each good for the individual possessor. [371]
- (9) ...why should we doubt that variations in any way useful to beings, under their excessively complex relations of life, would be preserved, accumulated, and inherited? [379]

Thanks to such objectification of change Darwin could solve the most fundamental problem of his theory: how species change (i.e. evolve) in time. In his theory, little, objectified modifications accumulate over long periods of time, grow “in size”, altering morphology and behaviour of an organism. If they are “large” enough, then we can talk about emergence of a new species. Yet, in order to fully express his views on the origin of species, Darwin needed more dynamic metaphors than just objectification of change. In the example in (1) we can see evolution depicted as a directed movement, manifested in expressions such as *the passage from one stage of difference to another and higher stage*. Only when the objectified change became combined with the metaphors of time and event, explaining evolution of organisms became possible. We claim that this combination is a result of a complex integration network. Because of its complexity, we first discuss the metaphors of time and event, and later turn to show how they are blended to create a coherent scenario.

2.2. The Time metaphors

Lakoff and Johnson (1999, Ch.10) and Evans (2005) provide an extensive study of how the notion of time is metaphorically conceptualized. We provide only a brief account focusing on those aspects which we find relevant in our analysis.

As Lakoff and Johnson (1999: 137) point out, time is not conceptualized in its own terms but rather via spatial metaphors. Interestingly, this understanding

of time in relation to what we know about motion in space is universal (Kövecses 2005: 47). The most basic metaphor, as Lakoff and Johnson (1999: 140–167) claim, involves an observer located at the present who is facing toward the future, with the past behind him. They call this metaphor the Time Orientation metaphor. The concept of horizontal motion combined with this metaphor underlies our understanding of the passage of time. This metaphor applies to a schema in which a stationary observer faces a long sequence of objects moving past him. The observer is located in the present, which is his reference point, and he faces the future, which is in front of him. The moving objects, the times, approach him from the future and they move past him on their way to the past, that is the space behind the observer. The mappings are listed below:

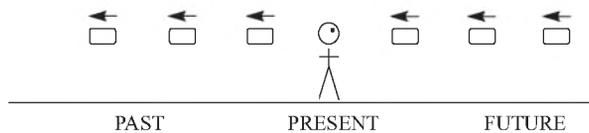
Table 1

Mappings in the Moving Time metaphor

Source domain (Space)	Target domain (Time)
the location of the observer	the present
the space in front of the observer	the future
the space behind the observer	the past
moving objects	times
the motion of objects past the observer	the 'passage' of time

The Moving Time metaphor is manifested in numerous linguistic expressions, such as *That's all behind us now. We're looking ahead to the future. The time has gone when you could mail a letter for three cents.* The scenario evoked by this metaphor can be graphically represented as in Fig. 1. below:

Fig. 1. A graphic representation of the Moving Time metaphor



Another major metaphor for time discussed by Lakoff and Johnson is the Moving Observer metaphor (or Time's Landscape metaphor). Here we also have an observer, this time moving from the space behind him (the past) to the space in front of him (the future). The location he occupies now corresponds to the present. In this metaphor, time is conceptualised as a landscape along which the observer moves. The complete list of mappings is presented below:

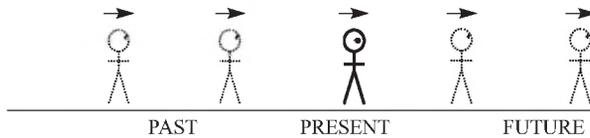
Table 2

Mappings in the Moving Observer metaphor

Source domain (Space)	Target domain (Time)
the location of the observer	the present
the space in front of the observer	the future
the space behind the observer	the past
locations on the observer's path of motion	times
the motion of the observer	the 'passage' of time
the distance moved by the observer	the amount of time 'passed'

The Moving Observer metaphor can be illustrated by linguistic expressions such as: *We passed the deadline. We're halfway through September. We've reached June already.* We can present it graphically as in Fig. 2.:

Fig. 2. A graphic representation of the Moving Observer metaphor



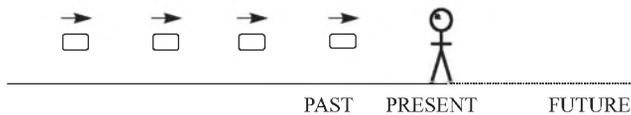
However, in order to account for a dynamic development of species, Darwin needed a modification of the conventional metaphors of time. We believe that Darwin's theory relies on a conceptual integration of the two metaphors of time discussed above. The Moving Time metaphor provides the motionless observer located in the present and objects moving towards him, and the Moving Observer metaphor provides the direction of the movement from the past and the motionless landscape of time. However, there is a crucial difference which, we believe, is the essence of Darwin's theory. The thing is that instead of facing the future the observer faces the past, so he metaphorically turns back to watch objects approaching him from the past. Further, the moving objects are not times, but forms of organisms undergoing changes. The mappings of this metaphor, which we shall provisionally call the Moving Species metaphor, are provided below:

Table 3

Mappings in the Moving Species metaphor

Source domain (Space)	Target domain (Time)
the location of the observer	the present
the space in front of the observer	the past
the space behind the observer	the future
the moving objects	forms of organisms
the motion of objects	the change of organisms

Fig. 3. A graphic representation of the Moving Species metaphor



Notice that in this schematic representation the future is depicted as a dotted line, because in Darwin's scenario of evolution the present, that is the location of the observer, is the end-point of the conceptualized movement of organic forms. While the future evolution of organisms is inherent in the theory, it is beyond the focus of *The Origin*.

This modified Moving Time metaphor contributes the location and orientation of the observer as well as the conceptualized movement of entities (i.e.) organisms. Other elements of the scenario of evolution were provided by the Event-Structure metaphor.

2.3. The Event-Structure metaphor

The Event-Structure metaphor deriving from the way we structure movement of our bodies provides our understanding of all events, concrete and abstract (Lakoff and Johnson 1999: 176). Various aspects are understood metaphorically in terms of such physical concepts as location, force, and motion. The full list of mappings is long and is extensively discussed by Lakoff and Johnson (1999: Ch. 11), but Darwin's theory of evolution incorporates only some of them: states are locations, changes are movements, and long-term purposeful activities are journeys. We believe that the combination of the Moving Species metaphor, the Event-Structure metaphor, and Darwin's observations and generalisations concerning the world of nature can be explained by means of conceptual integration in the sense of Fauconnier and Turner (2002). The Scenario of

Evolution emerging from Darwin's work is then a blend resulting from partial correspondences between three input spaces.

The first input space consists of the observation that organisms from the past, as known from fossils, are different from the present-day forms, as well as the belief that existing organisms descend from them. It also contains the observation that by carefully selecting desired features, people can produce new, improved breeds of domesticated plants and animals. The second input is the Moving Species metaphor discussed earlier and the third input is the Event-Structure metaphor. The inputs and the blend are presented in a simplified form below:

Table 4

The conceptual integration network of evolution

Input 1 Changes of forms of organisms in the world of nature	Input 2 The Moving Species metaphor	Input 3 The Event-Structure metaphor	The blended space The Scenario of Evolution
<ul style="list-style-type: none"> • forms of organisms from the past known from fossils are different from present forms • people produce new varieties of domestic plants and animals by selecting and accumulating desired feature 	<ul style="list-style-type: none"> • motionless observer • turned towards the past • moving elements/ species • movement from the past 	<ul style="list-style-type: none"> • STATES ARE LOCATIONS • CHANGES ARE MOVEMENTS • LONG-TERM, PURPOSEFUL ACTIVITIES ARE JOURNEYS 	<ul style="list-style-type: none"> • a form of an organism at a given moment of time is a location • a form earlier in time (a parent form) is a starting point of movement/journey • a change from one form to another is a movement/journey from one location to another • the present form of an organism is the end-point of movement/ change

The Scenario of Evolution receives the richest elaboration when modifications of organisms are conceptualized as a journey. Countless examples illustrate systematic mappings between the source domain of journey and the target domain of change in time. Thus, an organ of an organism (or an organism itself) is within this metaphor conceptualised as a moving (or travelling) entity (10), the stages in modification (i.e. varieties) correspond to stages of a journey(11), and small differences and changes that organisms may display are conceptualised as steps (12).

- (10) ...that any organ or instinct, or any whole being, could not have arrived at its present state by many graduated steps. [371]

- (11) By comparing the accounts given in old pigeon books treatises of carriers and tumblers with these breeds as now existing in Britain, India, and Persia, we can, I think, clearly trace the stages through which they have insensibly passed, and came to differ so greatly from the rock pigeon [31]
- (12) ... individual differences are the first step towards slight varieties, such as steps leading to more permanent varieties, these as leading to species and ... [44]

Inherent in the metaphor of journey is the movement from the source of movement to some destination, that is directionality. The starting point of the journey corresponds to the parent form and the goal to a new, improved species. This is represented in examples (13) and (14), in which metaphorical movement is the movement forward and natural selection has a direction.

- (13) ... individual differences are the first step towards slight varieties, such as steps leading to more permanent varieties, these as leading to species and ... [44]
- (14) I attribute the passage of a variety from a state in which it differs very slightly from a parent to one in which it differs more, to the action of natural selection in accumulating differences of structure in certain definite direction [44]

Following Darwin's line of thought, if modification is a journey forward, then showing features of ancestors is reversion (5, 16), and if a modification is a journey to some destination, then showing undesirable features is a diversion or a deviation from the right direction (17, 18):

- (15) ...our domestic varieties, then run wild, gradually but certainly revert in character to their original stocks [14]
- (16) ...our varieties do occasionally revert (...) to ancestral forms [14]
- (17) As natural selection acts by life and death—by the preservation of individuals with any favourable variation, and by the destruction of those with any unfavourable deviation of structure [159]
- (18) ...and any actually injurious deviations in their structure will always have been checked by natural selection [159]

Table 5

The mappings in the metaphor EVOLUTION IS A JORNEY

The source domain (JOURNEY)	The target domain (MODIFICATION/ CHANGES)
step	change from one form to another, showing differences
stage in a journey	stage in variation/modification
moving entity	organ, from of an organism
source (starting point)	parent-form
destination	a new, improved form
reversion	showing features of a parent-form
deviation/diversion	showing undesirable features

3. Conclusion

The Scenario of Evolution is obviously only a part of Darwin's theory. Together with such constructs as natural selection, struggle for existence/life, survival of the fittest, missing link, and the tree of life, the theory has become established in public awareness and used as a source domain in so diverse areas of human knowledge and experience as social sciences, philosophy, linguistics or engineering.

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Streszczenie

Artykuł prezentuje językoznawczą analizę konceptualizacji zmian ewolucyjnych organizmów żywych przedstawionych przez Karola Darwina w dziele *O powstawaniu gatunków*. U toku badań ustalono, że „scenariusz ewolucji” zaproponowany przez Darwina w celu wyjaśnienia zagadnienia powstawania nowych gatunków opiera się na metaforach konceptualnych czasu oraz na metaforze struktury zdarzenia. Ustalono również, że scenariusz ewolucji uzyskuje największe uszczegółowienie jako metafora ewolucja to podróż. Należy przyjąć, że osadzenie scenariusza ewolucji w konwencjonalnych metaforach czasu warunkuje liczne późniejsze aplikacje pojęcia ewolucji do dziedzin niezwiązanych z biologią.