

Maciej Litwin

University of Wrocław

“Language Laws Are Physical Laws.” Comments on Marek Kuźniak’s *Foreign Words and Phrases in English*

Abstract: In his *Foreign Words and Phrases in English* Marek Kuźniak advances a meta-discursive metaphor, *Language Laws are Physical Laws*. His method goes beyond Leonard Talmy’s Force Dynamics project by positing analogy where isomorphism is not to be found. This decision is justified because strict identity, as postulated by analytic philosophers, is impossible according to the cognitive paradigm. Analogies may be problematic but they have explanatory power, as evidenced in Zeno’s paradox, which could ultimately be solved with the development of mathematics. The analogy underlying the central metaphor of Kuźniak’s project is founded on correspondence in a mathematical-logical sense (forces and mass in physics and CRACn value in corpus studies). Both “mass” and “CRACn” value ultimately refer to semantics, and their symbolic renderings under mathematical formulas are ontologically equivalent. There is no fixed substrate for “meaning” nor for “matter” in both respective domains that would not be cognitively motivated. Elaboration of the basic metaphoric mapping shows that the temporal transience which rendered Zeno’s paradox insoluble is also at work in conceptualisation across two domains. Elements corresponding to different time frames (“occurrence,” “individual,” “planet,” “language”) appear together. Such discrepancies may be accounted for under modern physical theories and model-dependent realism with no loss to argument cogency. Different ontological levels are acceptable for a meta-discursive mapping. Kuźniak ultimately uses his metaphor to speculate about language change. His argumentation is valid but the ontology of language change that he proposes might be simplified: it may be derived from the perceptual moment cognitive basis.

1. Introduction

Marek Kuźniak’s *Foreign Words and Phrases in English* (2009) is a highly provocative book. Its main argument is that the language assimilation process is governed by forces analogous to physical attraction and repulsion and that it may be accounted for in line with the meta-cognitive metaphor: *Language Laws are Physical Laws* (Kuźniak 2009).

At first this proposition seems intuitively acceptable: it might well belong to the body of studies on conceptual metaphors. But on second thought — and when we consider the prefix “meta-” — Kuźniak’s proposition refers us directly to the grand epistemological debate with its ancient focal points — mathematicity of nature being perhaps the most obvious one.

Kuźniak goes to some lengths to avoid ambiguity about the status of his propositions, and his work is punctuated with disclaimers where he states what he does *not* mean in his argument. Of his central claim he says: “Certainly, the proposed metaphorical conceptualisation should not be interpreted in terms of formula x is y , but rather x is like y ” (Kuźniak, 185). Such insistence on precision is well-placed and perhaps it is also telling of Kuźniak’s own intellectual journey. Blurred vision and circularities of reason are only too common whenever meaning is dissected.

Choosing his subject matter, Kuźniak does more than refresh somewhat forgotten questions posed by 19th-century continental linguists, with their apparently exotic claims about the uniformity of language and biology. Indeed, in his work Kuźniak toils in the shadow of metaphysics, which the analytic philosophy of Carnap and Quine expunged from philosophy in pursuit of a crystal clear vision of truth. And while his silences respect the dominant trend in science, his linguistic project, indirectly, is a challenge to those who dictate the rules of what is and what is not legitimate epistemology today. Indeed, if we accept Kuźniak’s well-expounded claim that at meta-cognitive level *Language Laws are Physical Laws*, the question commends itself: what exactly is this meta-level where such analogies work?

In the following pages we shall look closer at a central disambiguation node of Kuźniak’s argument. Our purpose is to study in more detail work that contains bold ideas and prompts important questions about language, thought, mathematics and nature.

2. Isomorphism and analogy

In Chapter 6 of his book, in his discussion of Leonard Talmy’s Force Dynamics, Kuźniak highlights an important methodological decision point. Talmy, Kuźniak explains, is sceptical of the Force Dynamics framework’s correspondence with physics based on apparent qualitative gap, “where force interactions constituting the linguistic Force Dynamics are analysed as to their degree of isomorphism with forces which are subject to a scientific investigation in physics” (Kuźniak, 184). Kuźniak explains his stance, saying that “postulated lack of isomorphism between the physical and non-physical forces is substituted for the postulate of search for far reaching analogies between the world of physics and the world of language ...”

(Kuźniak, 185). This is followed by the disambiguation phrase cited above: "x is like y" (Kuźniak, 185).

Kuźniak's proposition is derived from the rebuttal of isomorphism, a decisive step away from Talmy's position (Talmy 2002: 458). In epistemology the gulf between "x is y" and "x is like y" is unbridgeable. In fact, the difference between the two propositions is nothing other than a central ontological problem: that of "identity." Quine said that there is "no entity without identity" (Quine 1969), a statement that effectively determines the boundaries of philosophy springing from a nominalist commitment. Univocality is a loaded ontological question and the case behind it is also pragmatic. Scientific method with its determinism and mathematical rigour is based on unequivocality (univocality), a position which has not been substantially changed even by Gödel's result in mathematics and Heisenberg's uncertainty principle in quantum physics (Feynman's "alternative histories," or "sum over histories," is still a sum).

But the identity claim, which is the corner stone of formal logic systems, really hinges on what amounts to metaphor, or a blended concept. This argument is raised by the critics of the radical analytic approach. In *Women, Fire, and Dangerous Things* Lakoff cited Putnam extensively to demonstrate contradictions of the reference model of truth (Lakoff 1987: 235–237, 249–258). Strict univocality is an impossibility because formalist symbols that are supposed to refer us to a reality pure and simple are really a circular device which builds on the transparent act of interpretation by a human conceptualiser in the first place (Putnam 1981: 481–482). Symbols take meaning by necessity. The rules governing the nominalist realm of logic are subject to the phenomenon that the nominalist enterprise fails to account for: meaning.

But the nominalist domain's boundaries will be pushed from within, too. In his persuasive *Physik und Religion*, Hans-Dietrich Mutschler commented on the metaphysical intrusions in main stream analytic philosophy as well as metaphysical effervescence among physicalist hardliners (Mutschler 2007). Mutschler illustrates this citing the famous equation of Einstein's relativity theory:

$$E=mc^2$$

This equation, Mutschler explains, does not contain an ontological claim. Rather, it is a formula under which the variable denoted as "E" may be substituted by "mc²" *salva veritate* (Mutschler 2007). There are no scientific grounds to justify ontological claims behind meaningless formulas, Mutschler argues (2007), or else the entire nominalist enterprise collapses from within. But since thought without meaning is an impossibility, as argued by cognitive scientists (Lakoff 1987), it is not surprising to see scientific projects imbued with higher order ontology (e.g. Mutschler's discussion of Carl von Weizsaecker) (Mutschler 2007).

Quine's identity claim is, then, problematic on two accounts: (1) a symbol entails meaning even though it may be modelled as reference; a mathematical

function (Lakoff 1987); (2) entities from whatever ontological systems may never be stripped of their grounding in human conceptualisation as long as we use language to discuss them. We find just this intimation at the beginning of formal logic, in the opening lines of Gottlob Frege's *Die Grundlagen der Arithmetik*:

Auf die Frage was die Zahl Eins sei, oder was Zeichen 1 bedeute, wird man meistens die Antwort erhalten: nun, ein Ding. Und wenn man dann darauf aufmerksam macht, dass der Satz „Die Zahl Eins ist ein Ding“ keine Definition ist, weil auf der einen Seite der bestimmte Artikel, auf der andern der unbestimmte steht, dass er nur besagt, die Zahl Eins gehöre zu den Dingen, aber nicht, welches Ding sie sei, so wird man vielleicht aufgefordert, sich irgendein Ding zu wählen, das man Eins nennen wolle. Wenn aber jener das Recht hätte, unter diesem Namen zu verstehen, was er will, so würde derselbe Satz von der Eins für verschiedene Verschiedenes bedeuten, es gäbe keinen gemeinsamen Inhalt solcher Sätze. ... (Frege 1987: 15).

[When asked what the Number One is, or what the sign 1 means, one is likely to answer: a Thing. But when one pays attention to the fact that the statement: “Number One is a Thing” is not a definition, as [in English] it brings together a zero article on one side and an indefinite article on the other, that it only means that the Number One belongs to Things, without specifying which Thing it should be, then one is perhaps called upon to choose some Thing that might be called One. But if everyone had the right to understand under this name whatever he chooses, the same statement about One would mean different things for different people and there would be no common content of such statements.]¹

A literal reading of the formula $a=x$, where the “=” sign has ontological implications, is against the nominalist reflex. Formal logic may mirror ontology, but its business is considering conditions and their satisfaction rather than probing “being.” To do justice to this reflex the formalist approach entails quantification of a and x , which, in its turn, allows isomorphism-based juxtaposition and classification. This is how, on a conceptual level, isomorphism and identity are yoked together in symbol manipulation.

Talmy dismisses the validity of his Force Dynamics *vis à vis* physics because of a lack of isomorphism that would open the way to identity-based claims that are proper to physics and its mathematical-formal instrumentation. Force Dynamics is not quantifiable, or else ontological economy (Ockham's razor) requires that it should be assumed as such.

Meanwhile, for the same reasons (lack of isomorphism), Kuźniak chooses analogy. The reasons for such an approach within the cognitive project are strong: identity conceived of as isomorphism is really a blended concept (Fauconnier and Turner 2002) where an object perceived by a human conceptualiser (source space 1) is integrated with a symbol value (source space 2) so that the two may be meaningfully discussed as being the same (“ a ”). It is via this device, which ascribes uniformity to a feature of the space-time continuum, that a limit and a number are established — “something,” a force, is conceptualised that will be isomorphic with other symbol-referenced entities. Kuźniak takes the opposite route. Free from the

¹ Citations translated into English by Maciej Litwin.

shackles imposed by symbol manipulations, he may derive his solution from a concept of Force Dynamics that is qualitative. On the whole, his options are: (a) posit isomorphism between the quantitative and the qualitative; (b) follow Talmy and end there; (c) reject isomorphism's requirement based on its conceptual rather than physical (or any other) motivation in favour of analogy. He chooses the third option.

As long as Kuźniak builds on the cognitive project, this choice is justified. Analogy (non-identity) is not only a justified option; it is the only option available to a human conceptualiser (Turner 1996; Fauconnier and Turner 2002). For human conceptualisers identity is a symbol or a metaphor of whatever univocality should be, but it is *not* an entity that is identical with itself. Kuźniak's decision holds ground.

3. Objects and events

Kuźniak's method departs from Talmy's position over the lack of isomorphism between Force Dynamics and mechanics. Caution is well-founded when naïve concepts are elaborated to propose determinist laws governing the cosmos. The history of science knows examples of such contentious applications, with Zeno's famous paradoxes being a staple example.

Michał Heller discusses steps in which mathematical concepts were elaborated that led to the emergence of calculus and furnished a coherent explanation of Zeno's paradoxes (Heller 2010). The process took roughly two thousand years, and culminated in a model that enabled us to frame motion within mathematical formulas. This definition is crucial: a model is not a description, but a conventional device under which we “assume that a mathematical structure represents an aspect of the world's structure” (Heller 2010: 66). In light of what has been said before, we would add: it is a metaphoric device.

If the growth of mathematics overturned Zeno's paradox, we might well assume that what was at stake was merely spurious reasoning or a problem ahead of its time. Yet the paradox, which presents motion as an impossibility, is non-trivial and cannot simply be written off as an offshoot of imperfect mathematics: the fact that a number of eminent scholars in the 20th century (e.g. Russel) seriously discussed the riddle invented in the 5th century B.C. by the student of Parmenides points to a deeper motivation (Heller 2010: 62–65). Heller explains: “Logical antinomies only appear when we bring together the mathematical hypothesis of continuum and the notion of temporal transience” (Heller 2010: 64). Or putting it in a simpler fashion: “Zeno's paradox concerns the amount of time it takes to make the journey, not the distance covered ... [The] time ... is proportional to the distance covered ..., and so since the total distance is finite, as is the total time ... motion is possible after all” (Mlodinow 2009: 94).

So Zeno's paradox is a consequence of blending temporal transience with the concept of the mathematical continuum. Because this blend is just too natural to human conceptualisers, the paradox is a favourite and topical puzzle of amateur philosophers even today. It is also a vivid reminder of the transcendent cognitive experience of temporality. Indeed, temporality is hardwired into the human conceptual system based on the phenomenon of perceptual moment (Evans 2004). Space and time, motion and stasis are inextricably blended in conceptual mappings that draw on the pulsating reality of embodied time: small portions of sensory input conceptualised by humans second by second, even as we sleep. This basic cognitive process engulfs and permeates human thought in various ways. Below, we will see it manifest in two approaches to a single problem that lies at the heart of Kuźniak's metaphor: the objectivity of matter.

If we consider Kuźniak's overarching metaphor, we are likely to point out that time and space are what is apparently lacking in the concept of "Language Laws." This is true, of course, only in specific interpretations of "laws." If laws are conceived of as predictive rules that apply to objectively existing reality, as was the case in Newtonian physics with its notion of objectively existing time, then a compound phrase that blends "language" and "laws" becomes problematic.

By what device, then, may a connection be established to bring together two separate realms under the explanatory meta-cognitive metaphor *Language Laws are Physical Laws*? Kuźniak bases his metaphor on the correspondence between mass and CRACn value, i.e. Cumulative Relative Accumulative Count, "a cognitively substantiated category for the discussion of salience of a given lemma in the corpus" (Kuźniak, 159). This methodological proposal stems from the survey of Idealised Cognitive Model of "bigness," where constituent sub-domains (weight and height) are "reducible to a common denominator, at least in a logical-mathematical sense" (Kuźniak, 159). The set in which mathematical information is processed is the British National Corpus. In other words, the "*x* is like *y*" analogy is mediated through a mathematical-statistical device.

At this stage the difference between a conceptual metaphor as discussed by Lakoff and Johnson (1980; 1999) and the meta-cognitive metaphor of Kuźniak's book is quite clear. To begin with, the two domains of the metaphor are distinct; they are not blended together as in the "grim reaper" image (Fauconnier and Turner 2002). There is no common ground that could be analysed in the two separate domains and their cross-mappings. Also, there is no isomorphism accessible to a human conceptualiser within *current discourse space*, as it is understood in, for example, Langacker's writings (2008).

Instead, the grounds for the correspondence between physical laws and language laws are deduced from lemma occurrence in the British National Corpus (BNC). In this sense the meta-cognitive metaphor *Language Laws are Physical Laws* profiles "laws." But "laws" are themselves metaphoric constructs that are anchored in some metaphysical framework if they are understood

as real, and which are but meaningless mathematical formulas if they are accepted without ontological implications. Thus, the seemingly fantastic correspondences between languages and celestial bodies are adduced from matching results in mathematical formulas.

If this is so, the crucial element in Kuźniak's argument is the CRAC value, which refers records in the BNC to words as discrete language entities. Language laws are mathematical formulas quantifying words occurrence, and thus their ontology assumes the existence of "words" in the first place. This is problematic: such ontology is linked with the problem of "meaning." But Kuźniak decides to frame words as phonological phenomena (Kuźniak 2009), which defers the cumbersome problem of "meaning" without solving it completely.

This brings us to central questions about Kuźniak's preference for analogy where isomorphism is not acceptable.

- First, what grounds are there to make claims about "Language Laws" as analogical with those of physics based on lemma reference if "lemma" study depends on the concept of "word" that is inseparable from semantics? Is it justified to posit analogy based on mathematical formula results if the formula standing in centre ground is dependant on the concept of "meaning" which is not accounted for?
- And finally: can a metaphor be mediated through a mathematical-formulaic correspondence?

Kuźniak has every right to pass over the semantic anchor of his mathematical-formulaic CRAC device as long as physics does the same in its concept of "mass," which is intrinsic to classic mechanics. In doing so he mirrors the methodological canon of physics. "Language Laws" in *Foreign Words and Phrases in English* are as real (i.e. they have the same status) as the "Physical Laws" of Newtonian physics because both "laws" inevitably build on semantics. To explain that, it is necessary to look in more detail at the methodological quandary regarding the status of "matter" in physics.

The physical laws of classical theory are adduced from observation of objects, which may be defined in terms of matter and its quantity (*quantitas materiae*). Quantity of matter is mass, as established by Newton in his epochal *Philosophiae Naturalis Principia Mathematica*. But "matter" is no longer a part of the conceptual system of physics (Heller 2011: 179), as modern physics has renounced the idea of location of matter in space in favour of the concept of a "field that extends infinitely" (Heller 2011: 178). Mass in modern physics, even when reduced to a "material point," is a far cry from the naïve concept of "matter" (Heller 2011: 179), which prototypically builds on cognitive experience of handling objects — on tactile sensory input. Today regarding physics as a science of matter is nothing but a "habit of thought" (Heller 2011: 179).

However counterintuitive this may seem, for modern physics matter is a definitional proxy tolerated as a conceptual tandem with "mass," but its usefulness

does not go beyond popular glossaries. The theory of fields dissolves anything that is material about the physical world and dismisses the relevance of the cognitive level, where “matter” exists, citing mathematical operations. And so, Newton’s theory works because it is an approximation of general relativity theory for our slow-speed cognitive-level; “objects” and “objectively correct solutions” are merely a statistical effect, the most probable sum over histories of Feynman’s theory. Heller explains:

Wszystkie modele rzeczywistości konstruowane przez nowoczesną fizykę są modelami matematycznymi; nie ma w nich nic poza kształtem, strukturą, czysto formalnymi schematami. Funkcja eksperymentu, w istocie rzeczy, polega tylko na identyfikowaniu tych struktur formalnych, które nie mogą być modelami świata (falsyfikacja modeli). Jeśli nawet rzeczywisty świat zawiera coś oprócz formy, to metoda dzisiejszej fizyki nie jest w stanie sięgnąć do tego czegoś; to coś niezauważalnie przepływa przez oka sieci matematyczno-empirycznej metody. W tym sensie świat fizyki jest czystą formą. (Heller 2011: 180)

[All models of reality constructed by modern physics are mathematical. They contain nothing but form, structure and schemata. The function of an experiment, indeed, consists only in identifying formal structures which cannot be models of the world (falsification). If the real world does in fact contain anything else than form, the methods of modern physics cannot reach to whatever it is. That something filters through the mesh of the mathematical-empirical method. In this sense the world of physics is pure form.]

If quantity and mass are not dependant on any semantic-cognitive import, physics is the science of matter that objectively exists in time-space and Kuźniak’s proposition is fantastic. But if we take the propositions of physics for what they really are, namely mathematical formulas, there is no reason why the “structure” of the world-as-infinite-field should not be underlying other domains, such as language.

For the above reasons we conclude that there are positive answers to questions about Kuźniak’s method: yes, he is right to sidestep the problem of meaning, as it is mediated in the correspondence “number-lemma-word-meaning,” based on the principle of cognitive relevance. We propose this term to evoke the ultimate semantic grounding of the concept of “mass” and “CRAC” value, thus reaffirming Kuźniak’s proposal advanced in his discussion of “bigness” accounted briefly above.

Let us turn, then, to the second question raised in our discussion, namely: can a metaphoric mapping be mediated through mathematical-formulaic correspondence? While an answer to this question will elaborate the CRAC-mass correspondence, it will also turn our attention to the problem of temporality signalled in the opening of this section.

In section III of his book Kuźniak sets out a consolidation of astrophysics and language phenomena. This is an important point in the exposition of the meta-cognitive metaphor *Language Laws are Physical Laws*. The table

contains cross-domain juxtapositions (Kuźniak, 187–190). Its first part proposes ontological correspondences:

Table 1. Ontological correspondences between physical and linguistic phenomena

Ontological correspondences	
The Earth	The English language
Planets	Major donor languages
The Moon	The donor languages that affects the English language the most
Planetoids	Minor donor languages
Meteor	Lexeme
Meteor falling into the atmosphere	Incorporation of a foreign word or phrase into the target lexical system
Number of individuals observing the meteor	Number of occurrences of the lexeme in the corpus of the target language
Number of places where the meteor was noticed	Number of texts in which the lexeme appears in the corpus of the target language

Source: Kuźniak (2009: 187–188).

First of all, what draws one’s attention here is the use of definite and indefinite articles, as well as the singular and plural. Number is crucial: it is the key to tracing the arithmetic basis of Kuźniak’s mapping. The entities predicated under Kuźniak’s *Language Laws are Physical Laws* metaphor share generic features that determine their extension, singularity, class or type: they are one or many; they belong to sets; they are entities.

Second, certain predicates may be quantified, and, possibly, expressed in a mathematical sense. The phrase “number of occurrences” corresponding with “number of individuals”/“number of places” evokes an ontological universe of set-theory, where set elements (“individuals observing the meteor” — “occurrences of the lexeme in the corpus of the target language”) are symbol values that each correspond to an event.

As we go down the list in the table, the ontological universe of Kuźniak’s mapping extends. Simple objects are followed by predicates referring to events. By rules of grammar, with its singular and plural, the correspondence that initially matched points now deals with vectors.

At this juncture the meta-level metaphorical mapping touches the problem of time as it transpires in human conceptualisation. But events are specific: they exist in time-space. We face predicates that conceive of “events” as satisfying conditions sufficient to subsume them under a notion of “class.” This opens the way to functionalising them, but at the same time extricates the actual event from its natural time-space context. Events — “occurrences,” which Kuźniak is speaking about, are, in linguistic terms, neuronal activation in response to visual and other sensory

input. “Event” — the word itself — refers to a singular perceptual moment input and mental image; it evokes a time-space situation.

Meanwhile, the astrophysical objects of Kuźniak’s ontological juxtaposition are non-contingent, or so they would seem. But their non-contingence is really an effect of scale. Just as events are really perceptual moment records of time-space transformation, planets — in cosmological terms — are different-order events caused by the very same force dynamics. In the long — really long — run, the Earth is an event.

In *The Great Design* Hawking and Mlodinow argue for “[m]odel-dependent realism [which] corresponds to the way we perceive objects” (2010: 46). Planets are objects by virtue of model-dependent reality which determines the conditions of permanence or non-contingency in terms of the embodied mind. And indeed, the very conceptual shift that abolishes contingency stressing that local stability of time-space in the universe is a minority phenomenon, entails the reverse movement of thought: any vacuum, if looked at from far enough (in time-space terms), is a planet in potentiality.

We seem to have established by now that *Language Laws* are as time-bound as *Physical Laws*. Yet, they are not cognitively commensurate: their time frames are those of a human and a planet, respectively. The concept of scale may be used to posit a certain degree of isomorphism between the two in strict quantum physics terms, but the cognitive discrepancy between the two scales in question is irreconcilable: nobody can conceive of planets as events in a manner that offers any cognitive insight or explanation. The expository value is merely abstract and theoretical. And it is precisely this vertiginous discrepancy that makes Kuźniak’s proposition meta-discursive. This is exactly what Kuźniak proposes: a meta-cognitive metaphor, by which physics and language are explained through the mathematics that underlies physical formulas.

This is striking: Kuźniak’s metaphor is a spring board to discuss Aristotle’s concept of *entelechia* and his notion of movement as co-notational with Newtonian mechanics, as well as model-dependent realism as discussed by Hawking and Mlodinow (2010). But such discussion may well be a circular argument which, having abolished the possibility of identity on an ontological level in step one, seeks further to undermine limit and annihilate category, consequently rendering epistemology a futile enterprise.

Clearly, there is danger in thinking further down this path. It would certainly be in contradiction with Kuźniak’s metaphoric proposition. Although its implications for thought are very rich, as seen in the paragraph above, they are suspended on the very assumptions of metaphoric mapping. To conclude, Mutschler showed persuasively that identifying “thought with being” was a necessary condition for the philosophical problem of *theodicee*, (2007: 178–182) vindicating God’s goodness in face of evil and suffering present in this world. A similar identification in which “logic and being” are one is the foundation of analytic philosophy (Mutschler 2007:

183–194). Kuźniak invites us on a journey where "x is like y," and it is a journey full of metaphoric adumbrations and metaphysical incursions of thought. But this journey has a distinct limit — it is the human body living in time.

4. Conclusion

The project unfolding on the pages of Marek Kuźniak's book reaches to the very heart of epistemology. In this short analysis we have attempted to focus on the crucial methodological decision point of Kuźniak's project. We discussed identity (x is y) as metaphoric by necessity in cognitive sciences. Next, we scrutinised the metaphoric link of the meta-discursive proposition *Language Laws are Physical Laws*. We concluded that an arithmetic formula allows cross-mapping between different level domains relative to a naïve view of the natural world and the expert physical view of the natural world.

In our reasoning we deliberately omitted a number of important details and nuances of *Foreign Words and Phrases in English*. For example, we focused on the expert Newtonian model leaving out the naïve model of Ptolemy. This model, in turn, might reasonably be presented as isomorphic with Talmy's Force Dynamics, rendering as a consequence much of our argument superfluous. We take note that this seems to be free from contradiction in light of model-dependent realism as cited above.

One more theme, however, calls for inspection here. In the last chapter of his book, Marek Kuźniak demonstrates important implications of his model, such as predictive regularities. He also offers a synthetic passage that is of great interest in view of arguments we have raised so far:

Language undergoes continual change. Change can be discussed in terms of motion. Language can, thus, be described as being in constant motion. Motion is determined by forces. Forces that determine language change are analogical to physical forces. There are two fundamental types of forces: centripetal (centre-seeking) and centrifugal (away-from-the-centre) forces. These physical forces are present in circular motion. Therefore, language change can analogically be modelled as a circular motion. Languages being in constant motion may be compared to planets. (Kuźniak, 350)

Over these pages we pursued the ambition to dissect Kuźniak's methodology, and we clang on to the lowest possible ontology. We dealt with identity; we discussed singularity and plurality. Meanwhile, the lexical assimilation study is purported to shed light on "language," the most obvious and most obscure term at the same time. Let us consider this shift once more: "Language undergoes continual change ... Language change can analogically be modelled as a circular motion. Languages being in constant motion may be compared to planets" (Kuźniak, 350).

We noted that in absence of a clear definition of what meaning is, the phrase "Language Laws" profiled laws. Analogically, with no clear definition of "matter"

in sight, the “Physical Laws” of Newton’s physics were inferable from experiments, whose results only make sense if we appeal to an indefinite concept of “matter” as their ultimate substrate. But the language “change” that the author is referring to is not a “law”: it is a reinvention of ontology. Language is about words (ontological level) and whatever regularities “bind” or “separate” them (laws). What, then, is language change?

Kuźniak does not seem to be offering an outright answer to this question. Rather, in a manner that rings well with his meta-discursive perspective, he hints at the answer through parable. He says (let us listen again): “Language undergoes ... change. Change can be discussed in terms of motion.” These two statements may be interpreted as steeped in Force-Dynamics metaphors from the beginning, in as much as “change” and “motion” are inseparably integrated conceptualisations. But another interpretation is possible, too: the paragraph opens at a higher ontological level, where “language” (be it a set or a system) exists and it changes. This metaphoric image of language is elaborate: forces are proposed that operate “within” language. In the final step of the quoted passage realist ontology is shrugged off: “Languages being in constant motion may be compared to planets” (Kuźniak, 350).

We take the above metaphoric mappings to be cognitively relevant and valid through their explanatory power. But at this stage we wish to offer an alternative viewing of “language motion” that perhaps looks to future discussion of centripetality and centrifugality. The perspective we have in mind has been repeatedly brought up in this text: it is temporality as cognitive experience.

We take centripetal and centrifugal forces of language to be rooted in primitive experiences of perceptual moment and memory — integration of sensory input and recollection of past integrated information. It is at this level that motion is cognitively fundamental. It is to be derived, to repeat the phrase we offered above, from the pulsating reality of embodied time: small portions of sensory input conceptualised by humans second by second, cycle by cycle, in circle. We believe that the defining moment of language change is to be found at this level, or else explanatory extrapolations find here strong cognitive foundation.

Building on physics and embedding the study of conceptual organization with a meta-discursive framework in *Foreign Words and Phrases in English*, Marek Kuźniak does what may amount to a prefiguration of linguistic cosmology. Or, if we accept the alternative, he treads on the thin ice of implied essential realism. One way or another, the enterprise in question merits utmost attention; it calls for thorough study, further discussion and multi-perspective verification.

References

- Evans, V. 2004. *The Structure of Time. Language, Meaning and Temporal Cognition*. Amsterdam, Philadelphia: John Benjamins Publishing Company.

- Fauconnier, G. and M. Turner 2002. *The Way We Think. Conceptual Blending and Mind's Hidden Complexities*. New York: Basic Books.
- Frege, G. 1987 [1897]. *Die Grundlagen der Arithmetik*. Reclam: Stuttgart.
- Hawking, S. and L. Mlodinow 2010. *The Grand Design*. New York: Bantam Books.
- Heller, M. 2010 [1997]. *Oswoić przemijanie*. Kraków: Znak.
- Heller, M. 2011. „Ewolucja koncepcji masy”. In: Heller, M. and J. Życimski *Pasja Wiedzy*. Kraków: Petrus.
- Kuźniak, M. 2009. *Foreign Words and Phrases in English. Metaphoric Astrophysical Concepts in Lexicological Study*. Wrocław: Wydawnictwo Uniwersytetu Wrocławskiego.
- Lakoff, G. 1987. *Women, Fire, and Dangerous Things*. Chicago: Chicago University Press.
- Lakoff, G. and M. Johnson 1980. *Metaphors We Live By*. Chicago: Chicago University Press.
- Lakoff, G. and M. Johnson 1999. *Philosophy in the Flesh*. New York: Basic Books.
- Langacker, R. 2008. *Cognitive Grammar. A Basic Introduction*. Oxford: Oxford University Press.
- Mlodinow, L. 2009. *The Drunkard's Walk. How Randomness Affects Our Lives*. New York: Vintage Books.
- Mutschler, H.D. 2007. *Fizyka i religia*. Transl. J. Bremer. [*Physik und Religion* (2005)]. Kraków: WAM.
- Putnam, H. 1981. *Reason, Truth and History*. Cambridge: Cambridge University Press.
- Quine, W.V.O. 1969. "Speaking of Objects". In: Quine, W.V.O. *Ontological Relativity and Other Essays*. New York: Columbia University Press.
- Talmy, L. 2002. *Toward a Cognitive Semantics*. Vol. I: *Concept structuring systems*. Cambridge: MIT Press.
- Turner, M. 1996. *The Literary Mind. The Origins of Thought and Language*. Oxford: Oxford University Press.