Abstracts

MUZEUM HISTORII POLSKI

Abstracts

Anna Brożek, Jacek Jadacki, Thought Experiments in Science

Our conception of thought experiment may be summarized as follows.

Let us suppose that we want to know what is entailed by the occurrence of a given state of affairs α_k. Let us call the state of affairs entailed by it 'β_k'. If α_k is «ready», it is sufficient to conduct respective observation: thanks to it we shall «see» β_k. Otherwise, we have to bring out the occurrence of α_k. This is what real experiment consists in. We have called α_k "the basis of experiment", and we call β_k — "the result of experiment".

If establishing that the occurrence of α_k entails the occurrence of β_k is the first step to put the hypothesis — let us call it 'γ' — stating that the occurrence of the phenomenon α entails the occurrence of the phenomenon β, the experiment is heuristic (α is here a type of states of affairs exemplified by α_k, and β — is a type of states of affairs exemplified by β_k). Other experiments are of testing character. If we already had put γ, then establishing that the occurrence of α_k entails the occurrence of β_k confirms this hypothesis, and if the occurrence of α_k does not entail the occurrence of β_k — the hypothesis is falsified.

If we are not able or we do not want to bring out the occurrence of α_k, we may make use of a thought experiment: we suppose or imagine that α_k occurs. Imagining or assuming only that α_k occurs does not suffice, of course, for establishing what state of affairs occurs as an effect of the occurrence of α_k (for instance, that β_k is such one). At our disposal, we have to have a hypothesis — let us call it 'δ' — different from γ, such that δ and the sentence stating the occurrence of α_k entails the occurrence of β_k. We have called γ "the horizon of experiment". Sometimes it happens that we realize that we accept γ by carrying out the thought experiment — when we ask ourselves why we presuppose or imagine that the presented basis has this, rather than some other, effect.

The result of thought experiment follows from its horizon; thus presenting the basis of the experiment is — from the theoretical point of view — superfluous. A thought experiment is nothing but the inference of the result from the horizon and basis. However, experiments fulfill some practical functions: they help us to realize the elements of the horizon and to illustrate or to exemplify important dependencies.

Let us ask ourselves why physicists use counterfactual thought experiments.

Firstly, the differences in alternative descriptions of a certain part of reality come out in boundary situations and such situations are difficult to bring out (it is usually at least technically difficult) — they may be only thought (presented). All observable bodies move in accordance with both Newtonian and Einstein's theories — the differences come out by enormous velocities.

Secondly, one uses thought experiments because in our thoughts one may «arrange» idealized conditions which cannot be «created» in reality.

Thirdly, the exemplifications presented as thought experiments appeal illustriously to imagination what simplifies the reception of new, unintuitive ideas among scientists.

Keywords: philosophy of science, thought experiment, real experiment, hypothesis testing, reasoning

Maciej Witek, Tacit Mechanisms and Heuristic Theorizing: Comments on Ryszard Wójcicki's "Is There Only One Truth? An Introduction to the Pragmatic Theory of Knowledge Acquisition"

The purpose of this paper is two-fold. First, it aims at developing a preliminary typology of subconscious, tacit mechanisms that underlie the conscious exercise of practical skills as well as the formation and functioning of conscious mental representations such as perceptual experiences, mental images, explicitly held beliefs and explanatory hypotheses. Second, it employs the typology to consider whether these tacit mechanisms can be examined and explicated by what Ryszard Wójcicki calls *heuristic theorizing* or *heuristic reasoning*, i.e., by a cognitive procedure whose job is to study one's tacit or personal knowledge.

The paper consists of two sections. Section 1 outlines the general structure of what Michael Polanyi calls *personal knowledge* or *tacit knowing*. It also discusses a few examples of tacit knowing — in action, perception and cognition — and argue that they all have to be explained in terms of *implicit mechanisms* rather than in that of *implicitly held beliefs* or *theories*. Section 2 start with an observation that despite having the same structure, the implicit mechanisms consideration in section 1 fail to form a homogeneous class: there are mechanisms that operate on propositional representations such as tacitly held beliefs and theories, mechanisms that involve *non-propositional* representations such as perceptual experiences and topographic or classificatory cognitive schemas, and mechanism whose characteristic feature is their using specific processing rules reflecting the structural properties of a given stimuli domain. In other words, it is argued that what Polanyi calls personal or tacit knowl-

edge may take either the form of representational states — propositional or non-propositional — or the form of processing rules. Finally, it is demonstrated that these and similar differences are significant for understanding the role of *heuristic theorizing* in the acquisition and justification of objective knowledge.

Keywords: tacit knowing, objective knowledge, Polanyi, mental processing, heuristic reasoning

Artur Koterski, Quine's "Two Dogmas" as a Criticism of Logical Empiricism

'Two Dogmas of Empiricism' has quickly become a classic of analytical philosophy and has invoked the since lasting discussion about possibility of analytic/synthetic distinction. It has been also considered a nail to the coffin of logical positivism. Accordingly, Quine tried to show that logical positivism was possible solely due to assumptions taken without justification in terms of standards preached by neopositivism itself. Quine aimed to point out that since they functioned as dogmas, the rescuing of empiricism was possible only if another approach was accepted, the one characterized as holism.

The results obtained by Quine are still presented as an argument for the internal decay of logical positivism. However, Quine's article was anachronistic already at the time of its publication. It was years before 'Two Dogmas' appeared that leading representatives of logical empiricism (1) rejected both dogmas, and (2) advanced holistic version of empiricism.

Already in 1930 Tarski started convincing Carnap that the analytic/synthetic distinction must be relativised. Further argumentation was presented by Tarski in Paris (1935). Carnap, who found his remarks 'very deep', never abandoned the distinction but he was aware at least since then that it could not be absolute. Carnap's case was not exceptional. It may be argued as well that relativised analyticity is the only option for Neurath's encyclopedism if he in fact needed this notion.

With relativised analyticity logical positivists did not need to ground synonymity in a verificational theory of meaning. Therefore, they were not forced to accept reductionism either. Carnap, whom Quine accused of 'radical reductionism', abandoned the *Aufbau* theory altogether with its alleged reductionism at the very beginning of the thirties. His newly accepted physicalism did not admit strict verificationism either. This view, as well as his conventional approach to analyticity, was reinforced in his *Syntax*. Within Neurath's physicalism both reductionism and verificationism were classified derogatorily as metaphysical theories.

In the mid-thirties Neurath's physicalism started turning into a sophisticated conception, 'encyclopedism.' It was a holistic and naturalized theory of science, strongly opposed to older types of positivism. Although in some respects different from Quine's own proposal, it is its equivalent. The postulate of 'empiricism without the dogmas' was put forward in the Vienna Circle long before Quine.

Neurath's turn to encyclopedism was catalyzed by a Poznański-Wundheiler paper, 'The Notion of Truth in Physics' (1934). Its main task was to examine the possi-

bility of retaining the notion of truth in science. There they sketched a theory depicting science in terms of radical fallibility, anti-foundationalism, and holism. Their standpoint is a counterpart of Neurath's later encyclopedism. Because science had encyclopaedic structure there, they could opt solely for relative analyticity; being physicalists they obviously could not accept reductionism. Thus, they realized Quine's postulate and advanced empiricism or theory of science without the dogmas.

The aim of this paper is twofold. Firstly, I am going to sketch Quine's argument against the background of the views held by Carnap and Neurath at the peak of the Vienna Circle activities; they will be supported by philosophers from the Lviv-Warsaw School (Tarski, Poznański and Wundheiler). It will be claimed that Quine's criticism was late more than fifteen years. Secondly, I am going to examine Quine's postulate of empiricism without the dogmas and compare it briefly with theories advanced by Neurath, Poznański and Wundheiler. It will be claimed that it came to its realization and that Quine was late again.

Keywords: analyticity, verificationism, reductivism, logical positivism

Wojciech Krysztofiak, The Logical Syntax of a Numeral. A Study in Cognitive Science, Part I

In the paper there are presented main assumptions underlying the construction of theoretic models of mental processes of numeral reference in mathematical practice which comprises such abilities as counting, solving story-tasks, estimating cardinalities and comparing magnitudes. Numerals are understood as any expressions which enable mind to refer to numbers, cardinalities and magnitudes. The main research question formulated in the article sounds: What cognitive processes do there occur in the mind during execution of various numeral acts of reference?

In the first section there is presented the Jumblese quasi-paradox of the surface syntactic structures of numerals. The solution of this quasi-paradox is based on the assumption that numerals possess hidden deep structures alongside their surface structures. The second section comprises syntactic analyses of deep structures of numerals. They are understood as grammatical structures of mental representations of numerals, encoded in mind. The main conclusion of this section is a contention according to which deep structures of numerals are encoded in mind with the help of special functors reflecting the property called *positionality of digital record*. The third chapter is an analysis of numerals and their deep structures on the ground of categorial grammar. This section results in the construction of the categorial model of deep structures of numerals with help of Ajdukiewicz's indices of syntactic categories. In the last part there are specified basic mental mechanisms of processing representations of numerals with respect to their deep structures.

Results of the paper are intended as an intuitive basis for formal theory of numerals' syntax. They will be presented in the next paper.

Keywords: numerals, categorial grammar, deep structures of numerals, Jumblese structures, numeral reference

Marcin Poręba, Kant's Views on Mathematics and Constructivism

The author rejects the opinion that Kant's views on mathematics lend in any interesting sense support to constructivism, understood as the thesis that the truth conditions of mathematical propositions consist in the existence of their constructive proofs or in the possibility of proving them constructively. Kant's insistence on the role of intuitive construction in mathematics is here interpreted as a thesis concerning mathematical concepts, not mathematical objects, and therefore not in any sense implying that the objects of mathematical cognition cannot be interpreted classically.

Keywords: construction, constructivism, intuition, intuitionism, Kant, mathematics, mathematical proof

Andrzej Biłat, Modal Logic vs. Ontological Argument

The contemporary versions of the ontological argument originated from Charles Hartshorne are formalized proofs (in the metalogical sense of the word) based on unique modal theories. The simplest well-known theory of this kind arises from the system B of modal logic by adding two extra-logical axioms: (AA) "If the perfect being exists, then it necessarily exists" (Anselm's Axiom) and (AL) "It is possible that the perfect being exists" (Leibniz's Axiom). In the paper a similar argument is presented, however none of the systems of modal logic is relevant to it. Its only premises are the axiom (AA) and, instead of (AL), the new axiom (AN): "If the perfect being doesn't exist, it necessarily doesn't". The main goal of the work is to prove that (AN) is no more controversial than (AA) and — in consequence — the whole strength of the modal ontological argument lays in the set of its extra-logical premises. In order to do that, three arguments are formulated: ontological, "cosmological" and metalogical.

Keywords: ontological argument, modal logic, Anzelm's Axiom, Leibniz's Axiom

Mariusz Grygianiec, Causal Relevancy and Nominalism. A Few Notes on Davidson's Ontology

The paper presents a rejoinder to Katarzyna Paprzycka's critique of my defence of Davidson's ontology. According to Paprzycka the epiphenomenalists objection to the doctrine of anomalous monism, considered as an internal objection, is unquestionably flawed, but when it comes to some external interpretations of the objection in question — it is justified. The text provides a couple of arguments and comments which are intended to show that in most cases the external objection to anomalous monism is in fact either uncharitable or inaccurate, thus unsound one.

Keywords: epiphenomenalism, Davidson, events, properties, causal relation, objection, ontology

Katarzyna Paprzycka, On External Criticism and External Praise, on Interpretive and Personal Charity — A Reply to M. Grygianiec

The paper is a reaction to M. Grygianiec's reply in a discussion sparked on by his paper on the status of the epiphenomenalism objection. I correct some misunderstandings. In addition I offer an intuitive summary of my reconstruction of the debate. I show that Grynianiec's reply does not undermine the reconstruction. I argue that to the extent that (external) praise of Davidson's ideas is possible, so is external criticism. Moreover, I argue that interpretative charity demands a charitable stance not only to Davidson but also to his critics.

Keywords: epiphenomenalism, Davidson, anomalous monism

Andrzej Biłat, With *A Companion to Metaphysics*

The paper is a review of the book *Przewodnik po metafizyce* (ed. S. Kołodziejczyk, WAM, Kraków 2011). The book consists of fourteen essays concerning key issues of metaphysics, mostly written by leading Polish experts. The review contains a number of critical and polemic comments on some of the essays.

Keywords: metaphysical discourse, neo-aristotelian metaphysics, existence, identity, universals, nominalism, four-dimensionalism, personal identity, situations, causality, possibilia, minds, free will, realism, God

Sebastian T. Kołodziejczyk, Reply to "With *A Companion to Metaphysics*"

Presented paper is my reply to Prof. Andrzej Biłat's review of the book *Przewodnik po metafizyce* (*A Companion to Metaphysics*) edited by myself and published by WAM Press. It contains answers to both general and particular remarks and comments risen by Prof. Biłat.

Keywords: metaphysics, ontology, analytical philosophy, Aristotle, neoaristotelism, phenomenology