
Abstracts

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Tekst jest udostępniony do wykorzystania w ramach dozwolonego użytku.

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Roman Murawski, Some Words on a Proof in Mathematics

The aim of the paper is to study the role and features of proofs in mathematics. Formal and informal proofs are distinguished. It is stressed that the main roles played by proofs in mathematical research are verification and explanation. The problem of the methods acceptable in informal proofs, in particular of the usage of computers, is considered with regard to the proof of the Four-Color Theorem. The features of informal and formal proofs are compared and contrasted. It is stressed that the concept of an informal proof is not precisely defined, it is simply practised and any attempts to define it fail. It is — so to speak — a practical notion, psychological, sociological and cultural in character. The second one is precisely defined in terms of logical concepts. Hence it is a logical concept which is rather theoretical than practical in character. The first one is — in part at least — semantical in nature, the second is entirely syntactical. A proof-theoretical thesis, similar to the Turing-Church Thesis in the recursion theory, is formulated. It says that both concepts of a proof in mathematics are equivalent. Arguments for and against it are formulated.

Keywords: proof, mathematics, formal proof

Marcin Koszowy, The Methodological Approach to Argument Evaluation: Rules of Defining as Applied to Assessing Arguments

The main thesis underlying the methodological approach to argument evaluation holds that some arguments which employ knowledge-gaining procedures can be successfully evaluated by applying tools elaborated by the methodology of science, such as the rules for reasoning, classifying objects, defining, and questioning. The application of those rules to argument evaluation consists in comparing them with procedures employed in the case of argumentative practices performed either in scientific inquiry or in everyday life. In order to show how building the methodological ap-

proach to argument evaluation could be started, I examine two cases of evaluating arguments by means of several methodological rules of defining. The idea of applying the rules governing various knowledge-gaining procedures to evaluating arguments is present in philosophy of science and in argumentation theory, but so far it has not been systematically elaborated. The paper aims at justifying this idea as a promising research project.

Keywords: argument evaluation, general methodology of science, knowledge-gaining procedures, rules of defining, using definitions to evaluate arguments, persuasive definitions

Błażej Skrzypulec, The Concept of Object in Theories of Visual Binding

The article investigates the concept of object used in the theories of visual binding. Two different theories of visual binding are considered: (1) the classical, psychological Feature Integration Theory (FIT) and (2) the model of neural synchronization formulated by Schillen and König.

The description of the conceptual structure of those theories is first presented and then followed with a list of postulates which have to be satisfied by a concept of object coherent with the considered theories. Subsequently, the characteristics of the notions of object which satisfy the postulates formulated for each theory are proposed by using notions developed in the field of analytic metaphysics.

In conclusion, it is stated that theoretical differences between psychological FIT and the neural model lead to significant differences in the used notion of object. However, the extent of that difference depends on the interpretation of the concept of representation which is ambiguous within the framework of the considered neural model. Despite the differences, it appears that the concepts coherent with the above-mentioned postulates bear some resemblance to the notion of object proposed by the metaphysical substratum theories.

Keywords: perception, metaphysics, vision, object, binding

Wacław Janikowski, Rationalist Pragmatism and the Critique of Empiricism in the Philosophy of Robert B. Brandom

At the outset of the article I set forth a general characterization of Robert B. Brandom's philosophy, as belonging to the post-empiricist tradition with inferentialism as its main idea. In section 2 I discuss four dichotomies important to the methodology which allows Brandom to construct his philosophical system. My point is to indicate the arbitrariness of the absolutist account of these dichotomies, which gives rise to misuse of relative categories. In effect, Brandom's dichotomic way of theoretical exposition does not respect Davidson's principle of relationism, which Brandom himself declares to accept. In the next section, I go on to consider two basic motives for the resolute Brandomian attack on empiricism: strong inferentialist and antirepresentationalist theses. Pertaining to this view is also the claim of irreducible linguistic normativity. In section 4, these questions are treated in the context of the

apparently novel theory of semantic pragmatism. Section 5 is crucial to my purposes. There I criticize the excessively narrow Brandomian conception of empiricism in the theory of meaning. I argue that Brandom's attack on empiricism depends on a false analysis of the distinction between circumstances and consequences of application holding for sentences. In addition, the problem of conceptual content's fine graininess is treated, as well as the Kantian dichotomy of reasons *versus* causes, interpreted by Brandom in terms of the social/natural distinction. Finally, section 6 deals with the relation holding between the concept of reason on the one hand, and the objectivism and representationalism theses, on the other. Despite appearances, in Brandom's philosophical system there is no place for objective standards of procedural reason.

Keywords: Robert Brandom, Donald Davidson, empiricism, inferentialism, relationism, representationalism, semantic pragmatism

Aleksandra Horecka, On Semiotic Functions of Trade Mark (Brand)

The main aim of the paper is to define trade mark and to indicate varied semiotic functions which it fulfils. We define trade mark as a product of man used on the market to identify products or services of a certain firm or to distinguish products or services of a certain firm from those of other firms. All trade marks fulfil an identificative or differential function. We distinguish trade mark from trade name: the trade name becomes a trade mark iff it has such-and-such a specified visual form. We claim that trade name is a proper name which refers to a certain firm and has no connotation. Trade mark in advertising (1) refers to particular products or services and (2) connotes the product's (service's) property being produced or distributed by a particular firm. The trade mark placed on the package of some product is both: (1) an index sign, which „points to” the fact that the object in the package is produced or distributed by such-and-such a firm and (2) a performative (a sign which generates a new state of affairs), which certifies that the object in the package is produced or distributed by such-and-such a firm.

Keywords: semiotic function, trade mark

Katarzyna Paprzycka, On Lowe's Argument for His Conception of Intentional and Physical Causation

Lowe argues for a dualistic account of mental causation. He claims that the agent's decision as well as a neural event both causally determine the resulting behavior in parallel and complementary ways. The decision determines that the arm arising occurs at all but it does not determine the detailed physical parameters of the movement. The neural cause determines the detailed parameters but does not determine that the movement occurs. Lowe's main argument for this view is the argument from counterfactual implications, which also undermines the psychoneural token-identity thesis. He argues that if the mental event token (the decision to raise an arm) had not occurred, the arm would not have risen, while if the neural event token (the complex neural event, which causes the arm to rise) had not occurred, the arm would

still have risen albeit slightly differently. I first raise two counterexamples. Parallel arguments can be constructed to show that token identity fails at other micro-macro junctures. A token splash of hot water could be argued not to be identical with the token event of the motions of H₂O molecules characterized by appropriate kinetic energy. A token expression of the will of the people could be argued not to be identical with the token event of such and such voting behavior on an election day. I then diagnose the problems with Lowe's arguments for either counterfactual. The argument for the mental counterfactual relies on a premise that is quite plausibly false. The argument for the neural counterfactual is questionable because it involves the application of the possible-worlds semantics to counterfactuals with disjunctive antecedents. His argument against the token-identity thesis thus fails and his dualistic account of mental causation is called into question.

Keywords: Lowe, psychoneural token-identity, mental causation, physical causation, non-Cartesian substance dualism, counterfactuals, possible worlds

Mariusz Grygianiec, On E. J. Lowe's Argument for *Broddingnagian Atomism*

In a number of his essays E. J. Lowe has presented an interesting argument for the ontological simplicity of the self. This argument became the subject of Eric T. Olson's polemic reaction, who tried — unsuccessfully — to discover a formal mistake in the argument. Eventually, the modified and improved version of Lowe's reasoning came out in his paper *Identity, Composition, and the Simplicity of the Self*. It seemed that the argument for the ontological simplicity of the self has resisted criticism. In my paper, I present a few manoeuvres which can be used by advocates of animalism to dismiss conclusions of Lowe's argument. An animalist may want to do that for a simple reason: on the basis of animalism it is difficult to argue for the thesis of the simplicity of the self, as persons are — according to animalism — human organisms, that is, composite objects. My analysis shows that the simplicity argument — although it remains formally valid — is not sound in the light of the shown difficulties and shortcomings. This enables me to insist on an animalistic interpretation of the subject according to which the self is a composite material object, identical with a living human organism.

Keywords: Lowe, person, body, proper part, organism, sum, simplicity, argument

Zbigniew Król, The Implicit Logic of Plato's *Parmenides*

This paper is devoted to the reconstruction of the implicit logic of Plato's *Parmenides*. The reconstructed logic, F, makes it possible to form a new semi-intuitionistic system of logic of predicates, FN. The axioms of Peano Arithmetic (PA) and an axiom of infinity follow from FN. Therefore, FN can be seen as a new attempt at the realization of Frege's logicist program. Some very strong systems can be seen as other variants of FN, e.g. Leśniewski's ontology. The hypothesis from *Parmenides II* contains proof of the existence of the two highest principles, i.e. the One and the Dyad, their mutual relationship, their relations to other things, and the

reasoning regarding the mutual relationship follows some exact formal rules. Six types of Plato's negation of a predicate are defined. The system is a first-order logic with non-classical negation of a predicate (*local negation*) that is non-definable by classical sentential negation. Therefore, the implicit logic of Plato's *Parmenides* differs from classical syllogistics (formed in the Łukasiewicz's style) as well as from the classical predicate calculus.

Keywords: philosophy of mathematics, foundations of mathematics, intuitionistic logic, logicism, Frege, Plato, history of logic

Ewa Piotrowska, David Hilbert's Picture and Vision of the Mathematics

It has been widely believed that David Hilbert, a precursor of formalism, considered mathematics an ordinary „game of signs”. In this paper, I try to show that Hilbert worked out and applied in his research a cohesive, holistic and organic, as well as universal picture of mathematics (as a supranational discipline) and a vision of its development. This scientific area was supposed to constitute a complex construction, and was perceived by him in an optimistic and humanistic way (it enabled solution to any research problem and fulfilled diverse human needs). External experience (e.g. in the case of geometric pictures) and abstraction of its internal structures (a priori state, mathematical analysis of infinity) are particularly important for this exact science. Mathematics creates a bridge between theory and practice, between thinking and observation.

Keywords: philosophy of mathematics, formalism, Hilbert, mathematics and natural science, cultural and humanistic aspect of mathematics

Michał Sochański, Visualization in Mathematics and Spatial Intuition

After several decades during which diagrams were neglected as a reliable source of mathematical knowledge, in recent years we have witnessed a revival of interest in the role of diagrams in mathematical cognition. In the paper, I consider how those investigations relate to the concept of spatial intuition and its role in mathematical cognition. It is argued that some characteristics of mathematical cognition that involve the use of diagrams are analogous with characteristics usually attributed to intuitive knowledge, above all the immediacy of access to the analyzed object that intuition is said to deliver. First of all, this is due to the special characteristics of diagrams, such as their structural similarity to the mathematical object represented and their ability to convey a lot of information. However, it is argued that the immediacy of mathematical cognition related to diagrams should not cancel the necessity to use concepts or reasoning, which are in fact indispensable in mathematical practice. Several other possible ways of using the concept of „intuition” are then indicated. One of them is connected with the common distinction between „intuition that” and „intuition of”. Visual „intuition that” is a mathematical belief that appears in us as a result of a visual contact with a diagram, and visual „intuition of” a mathematical object may appear when we have a tendency to visualize this object while thinking

or reasoning with it (this may be the case with objects like a triangle, graph, lattice, as well as number line). Finally, it is stressed that many analyses of the use of diagrams and visualization in mathematics completely dispense with the use of the term „intuition”.

Keywords: philosophy of mathematics, visualization, diagrams, epistemology