Chapter 7
Arnošt Kolman's Critique of Mathematical Fetishism

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> …is a huge, blindingly transparent tank taking the form of a kind of endlessly complex polyhedron, located somewhere beyond space and time. It is a tank filled with pure thought, symbols and without any form of judgment and devoid of any content. It is a tank into which their worshipers plunge their eternally reproducing logical constructions and mathematical schemes of the world. … Such is logicism. … This is the escape of philosophers into absolute logical truth, an escape not only from material existence but also from spiritual experiences as well, into a world which is said to be elevated over both subjectivity and objectivity. … But neither does the suicidal fetishization of perishing, which the existentialists worship, nor the fetishization of 'pure science', which the 'logical positivists' pray to (and which actually means the death of science), have any firm ground beneath them.[1]

When Arnošt Kolman uttered these impassioned words at the *Tenth International Congress of Philosophy* in Amsterdam in 1948, he drew a strong condemnation from Bertrand Russell. Their exchange ended up in personal attacks.[2] In this paper, we would like to look at Kolman's arguments against logical atomism which revolve around the notion of the fetishization of mathematics.

[1] Arnošt Kolman, "Úkoly soudobé filosofie", in: *Tvorba*, Vol. 17, No. 33, 1948, p. 647. English translation: Arnošt Kolman, "Tasks of Contemporary Philosophy", in: *Russell: the Journal of Bertrand Russell Studies*, Vol. 36, No. 2, 2016. The congress is covered in Russell's *Collected Papers, Volume 11: Last Philosophical Testament 1943–68*, ed. by John G. Slater, London and New York: Routledge, 1997, pp. 115–116. All other translations from Czech and Russian are ours.

[2] For details of this exchange see Jakub Mácha, "Arnošt Kolman and Bertrand Russell at the 1948 International Congress of Philosophy", in: *Russell: the Journal of Bertrand Russell Studies*, Vol. 36, No.2, 2017, pp. 128–138.

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7.1 Commodity Fetishism in Marx

Kolman derives his notion of fetishism from Marx's conception of commodity fetishism, or from capital fetishism as expounded in Marx's *Capital*.[3] What Kolman is aiming for is not the nature of the relations between individuals and their praxis in commodity production. Here he is aiming for the fact that an entity (system, structure, logical construction) acquires besides its real existence another formal existence. It is this doubling of its existence and then the becoming of an independent driving force that is developing independently of, but at the same time determining the character of the field of its activity. Fetishes belong to human existence. No nations, no individual can do without them. They appear in public life as a part of ideologies in a new form, as a bearable guise of real and unwanted truth, however they should not have any place in science.

7.2 Application of the Concept of Fetishism on Mathematics

According to Marx, commodity fetishism occurs if the exchange value of a commodity (i.e. its exchange form) appears to have no connection with the use value of the commodity (i.e. its natural form). The commodity-form which is detached from the physical nature of the commodity has a phantasmagoric appearance. Fetishism means this fantastic detachment of the physical characteristics of real things or phenomena from these things.[4] The distinctive feature of a mathematical fetishism is that the detached characteristics are *quantitative* properties.[5] Kolman speaks mostly of mathematical fetishism, less often of logical fetishism. We will return to this distinction in the contexts of Kolman's critique of reducing mathematics to logic and logic to mathematics. It is noteworthy that these quantitative properties do not need to necessary be illusory or erroneous. The formal or abstract concepts, which we use to express these properties, acquire a standalone existence. In the second step (on a higher level) of this development, mathematical or logical categories are proclaimed to be the only true reality. Mathematical principles are proclaimed to be

[3] Karl Marx, *Capital. A Critique of Political Economy*. Moscow: Progress Publishers, 1977. The passage on commodity fetishism is Section 4 "The fetishism of commodities and the secret of thereof".

[4] Arnošt Kolman, *Kritický výklad symbolické metody moderní logiky* [The Critical Exposition of the Symbolic Method of Modern Logic]. Praha: Orbis, 1948, p. 280.

[5] Kolman had already written in 1931 that the roots of mathematical fetishism go back to Hegel. Kolman appreciated that "by coming out against the fetishisation of quantity, which after all is only a reflection of the abstract money-trading relations of the bourgeois order, Hegel in this case actually burst apart the framework of bourgeois philosophy." (Ernst Kolman, Sofya Yanovskaya, "Гегель и математика" ["Hegel and Mathematics"], *Под знаменем марксизма* [*Under the Banner of Marxism*], No. 11–12, 1931, pp. 107–120. English translation in: *Mathematical Manuscripts of Karl Marx*. London: New Park Publications, 1983, pp. 235–255, p. 242.)

the principles of all being.[6] Mathematical concepts and principles, therefore, can undergo change independently of the things from which they have been abstracted. There is no reluctance to the formation of new, more and more complex mathematical structures which allegedly then disclose the deepest metaphysical truths about all being.

Mathematical fetishism is according to Kolman something that is typical of our way of thinking which "has an inert inclination towards turning this relative side of knowledge into an absolute one."[7] However, more important here are the social conditions that lead to fetishism. In order to investigate them closer let us turn now to ancient societies where these relations were much more transparent than they are today.

7.3 Pythagorean Fetishism

Kolman discovers the roots of contemporary mathematical fetishism to be in Ancient Greece in the form of the Pythagorean teachings. The core of Pythagorean fetishism is the taking of mathematical relations or ratios for the origins (ἀρχή) of all being. Kolman quotes the following passage from Aristotle:

> …the so-called Pythagoreans applied themselves to mathematics, and were the first to develop this science; and through studying it they came to believe that its principles are the principles of everything. And since numbers are by nature first among these principles, and they fancied that they could detect in numbers, to a greater extent than in fire and earth and water, many analogues of what is and comes into being—such and such a property of number being justice, and such and such soul or mind, another opportunity, and similarly, more or less, with all the rest—and since they saw further that the properties and ratios of the musical scales are based on numbers, and since it seemed clear that all other things have their whole nature modelled upon numbers, and that numbers are the ultimate things in the whole physical universe, they assumed the elements of numbers to be the elements of everything, and the whole universe to be a proportion or number.[8]

For explaining the origin of Pythagoreanism, some additional social circumstances are needed. These circumstances remained covert to Aristotle. In Pythagoreanism, the abstract is detached from the concrete and the reason for this detachment is to disguise the real nature of things for the majority of ancient society. The abstract realm is portrayed here as less easy to understand.

The true root of fetishism is commodity production.[9] The numerical form of things is fetishized into the form of number, in order to better enable the monetary exchange of goods. Together with this absolutization of numbers, monetary relations

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[6] *Ibid*., p. 251.

[7] *Ibid*., p. 19.

[8] Aristotle, *Metaphysics*. Trans. A. Armstrong. London: Heinemann 1933, I.5, 985b–986a.

[9] Arnošt Kolman, "O podstatě a původu pythagoreismu" [On the Nature and Origin of Pythagoreanism], in: *Česká mysl*, No. 40, 1947, p. 148.

are rendered to be absolute as well. We can perceive here in an embryonic form that things start to acquire properties that are not contained in them. They are at the same time objective properties still, because one could indeed exchange the commodity at this value. Aristotle asks in vain: Why do the properties of mathematical objects occur in perceivable things, if they are not contained in them?[10] The explanation of metaphysical theories lies in the social base and "the objectively existing commodity fetishism of human relations finds its reflection also in an ideological superstructure".[11] Pythagorean fetishism and their numeral mysticism, thus has a socio-political rather than naturalistic origin.[12]

Pythagoreanism is a typical example of the metaphysical way of thinking, characterized by Kolman as the transposing of that which is created by our thinking onto the world, nature and society.[13] Laws of thought, i.e. logical laws, are not found in nature nor derived from praxis; they are given to us *a priori* and independently of any praxis. They are only applied on nature and social praxis. To acknowledge the praxis as the sole criterion of truth means to accept the material character of reality. Anything else is idealism. With this delimitation in mind we can now turn to logical positivism.

7.4 Logical Positivism

Already by 1931 in the journal *Under the Banner of Marxism* in the article "Hegel and Mathematics",[14] Kolman had positively assessed the merits that Hegel enjoyed in this area of mathematics. Hegel refused the a priori formalist approach to mathematical axioms and theorems. Kolman wrote critically about the "logicists" (Russell, Frege), who in his opinion had overturned mathematics into a grammar, into a colossal tautology, which was then unable to bring any new knowledge to the subject of its investigation. This one-sided approach to reality could not comprehend the desired connection with the practice of mathematics. According to Kolman, the role of mathematics in science is limited—unlike that of Kant's approach where science requires or better presupposes mathematics. Mathematical concepts do not express any absolutely unchanging, eternal truths; they are connected with society itself, alongside with the other (natural or social) sciences.

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[10] Cf. Aristotle, *Metaphysics*, XIII.9, 1085a–b.

[11] Arnošt Kolman, "O podstatě a původu pythagoreismu", *op. cit.*, p. 149.

[12] Max Weber also thought that Pythagoreanism had a socio-political origin. But for him, this movement does not express or mirror the ideology of a ruling class, but rather "emerge[s] when the ruling strata, noble or middle class, have lost their political power to a bureaucratic-militaristic unitary state." (Max Weber, *Economy and Society: An Outline of Interpretive Sociology*. Trans. and ed. G. Roth, C. Wittich et al. Berkeley: University of California Press 1978, Vol. 1, p. 503.)

[13] Arnošt Kolman, *Logika* [*Logic*]. Praha: Svoboda 1947, p. 161.

[14] Ernst Kolman, Sofya Yanovskaya, "Гегель и математика" ["Hegel and Mathematics"], *Под знаменем марксизма* [*Under the Banner of Marxism*], No. 11–12, 1931, pp. 107–120.

In his main work, *The Critical Exposition of the Symbolic Method of Modern Logic* (1948), Kolman knuckles down to a sharp critique of the tenets of analytic philosophy of that time, i.e. logical empiricism and neo-positivism. The core of this critique is already present in his critique of Pythagoreanism: "They are ancient, long time refuted thoughts that are go back to Platonism, Pythagoreanism."[15] Kolman uses the expressions "logical positivism", "modern positivism", "logical atomism" almost interchangeably as different labels for a more or less unified philosophical movement. He finds the main features of this movement to be: (1) neutral monism (reality is neither material, nor ideal), (2) the task of philosophy is the description of phenomena, not their explanation, (3) diminishing or refuting the significance of philosophy.[16] If the task of philosophy is only the describing of positive facts or showing that anything that goes beyond them is nonsensical, "then it is natural that the method of the most universal science—mathematics—becomes the universal method of knowledge".[17] According to Kolman—and this is the core of his argument—the fetishization of mathematics follows then from the limited role of philosophy. If philosophy were deprived of every critical and explanatory task, then only a logical analysis of language would remain. The principles of such an analysis must (logically, not temporally) precede every statement itself. Logical laws must be *a priori*. The independence of the logical laws of facts means that they can be applied to *all facts*, i.e. to the whole world which is the totality of facts.[18] Logical laws are thus the principles of all being.[19]

7.5 Logic and Mathematics

Kolman, being a mathematician in the first place, speaks mainly about mathematical fetishism and less often about logical fetishism.[20] He also criticized the attempts of reducing mathematics to logic (logicism) and vice versa. Mathematics and logic have according to Kolman different tasks. Logic "studies arbitrary forms independently of their content".[21] The task of logic is a clarification of the (logical) structure

[15] Arnošt Kolman, *Kritický výklad symbolické metody moderní logiky*, *op. cit.*, p. 7.

[16] *Ibid*., p. 276.

[17] *Ibid*., p. 277.

[18] Ludwig Wittgenstein, *Tractatus Logico-Philosophicus*. Trans. by D. Pears and B. McGuinness. London: Routledge 1961, §1.1.

[19] This argument can be applied to any a priori law or structure. See in this context the chapter "The Criticism of Kantianism from the Left and From the Right" from Lenin's *Materialism and Empirio-criticism*. (Vladimir Ilyich Lenin, *Materialism and Empirio-criticism: Critical Comments on a Reactionary Philosophy*. Lenin Collected Works. Vol.14. Trans. A. Fineberg. Moscow: Progress Publishers 1972.)

[20] Arnošt Kolman, Kritický výklad symbolické metody moderní logiky, *op. cit.*, pp. 212 & 219.

[21] *Ibid*., p. 18.

of sciences, including mathematics,[22] while mathematics studies only the quantitative forms and relations. In order to clarify the logical structure of science, simple logical systems are enough. These systems can be modeled mathematically (classical logic can be taken as Boolean algebra). Mathematics is on the one hand a part of logic (because it studies quantitative forms only), its combinational possibilities on the other hand far exceed the possibilities of classical logic.

Kolman ascribes this attempt of reducing mathematics to logic to Frege and Russell[23] and the opposite attempt of reducing logic to mathematics to the Vienna Circle,[24] but also to Russell and Wittgenstein.[25] Kolman is inaccurate here and his arguments are abridged. In the end, it is not decisive whether the most fundamental abstraction is mathematical or logical. As we have seen above, from one perspective, mathematics is a part of logic; from another perspective it is the other way around. It is nevertheless a formal abstraction and Kolman criticizes their arbitrary detachment from the content and their fetishization. Ultimately: "Formal logic as well as mathematics … divides what is actually connected, and connects what in fact is divided."[26]

7.6 Critical Assessment of Kolman's Reception of Logical Positivism

Do Russell, Wittgenstein and members of the Vienna Circle commit fetishization of mathematics or logic?

Bertrand Russell was a leading proponent of neutral monism in the twentieth century. After years of sympathizing with this doctrine he fully subscribed to it in his book *The Analysis of Mind*: "both mind and matter are composed of a neutral-stuff which, in isolation, is neither mental nor material."[27] In Russell, we find also Kolman's second and third characteristic of logical positivism. The task of philosophy is the logical analysis of positive facts, not their explanation: "The business of philosophy … is essentially that of logical analysis, followed by logical synthesis"[28]; or: "The most important part … consists in criticizing and clarifying notions".[29] The significance of philosophy is reduced to the anticipation of the yet unknown. The

[22] *Ibid*., p. 220.

[23] *Ibid*., pp. 199 & 203.

[24] *Ibid*., p. 205.

[25] *Ibid*., pp. 253–4.

[26] *Ibid*., p. 230.

[27] Bertrand Russell, *The Analysis of Mind*. London: George Allen & Unwin 1921, p. 25.

[28] Bertrand Russell, *The Philosophy of Logical Atomism*. London: Routledge 2010, p. 147.

[29] *Ibid.*

difference between philosophy and science is only in that philosophy is concerned with what we do not know, while science with what we already know.[30] In this scientific image, Russell did not hesitate to accept that there are general principles that cannot be derived from experience.

In Wittgenstein's *Tractatus* there are plenty of assertions that meet Kolman's characteristics. Wittgenstein clearly meets the second and third characteristic of logical positivism: (2) Philosophy is the logical analysis of (scientific) language[31] and (3) very little is achieved by solving (all) philosophical problems.[32] For the first characteristic—neutral monism—there is no unambiguous confirmation to be found in the *Tractatus*. Objects make up the substance of the world. But Wittgenstein leaves open whether these objects are dependent on the thinking subject. Kolman (without any backing argument) inclines to the so-called epistemological interpretation, which is close to Russell and was later revived by Hintikka[33]: Objects are sensory perceptions, i.e. sensory data.[34] Apart from this interpretation, both realistic and idealistic interpretations of objects have appeared. Wittgenstein was reluctant to decide as to the character of the basic building blocks of the world. Therefore, we can also—albeit indirectly—attribute neutral monism to him. The absolutization and fetishization of logic should therefore result from these three characteristics. And indeed, such claims are to be found in the *Tractatus*. Logical tautologies describe the basic structure of the world. Wittgenstein speaks directly about the scaffolding of the world "Gerüst der Welt".[35]

Rudolf Carnap in his book *The Logical Structure of the World* (*Der Logische Aufbau der Welt*)[36] explicitly endorses Mach's neutral monism. The basic building blocks of his *Aufbau* are called "elementary experiences", which Carnap later called "basic elements" and likened to Mach's elements, i.e. the concrete sensory data. Carnap's conception of philosophy draws on many ideas from Wittgenstein's *Tractatus*. Philosophy is the logical analysis of language. For Carnap, the principles of logical analysis are expressible in terms of logical syntax. (For Wittgenstein, these principles are ultimately unnecessary, since they are shown in a logical notation of ideal scientific language.) A language for the describing of logical syntax is

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[30] *Ibid*., p. 124.

[31] Ludwig Wittgenstein, *Tractatus Logico-Philosophicus*, *op. cit.*, §6.53.

[32] *Ibid*., Preface.

[33] Merrill Hintikka and Jaakko Hintikka, *Investigating Wittgenstein*. Oxford: Basil Blackwell 1986, pp. 51ff. maintain that the primary language of the *Tractatus* is phenomenological. The objects of the *Tractatus* are very close to Russell's objects of acquaintance, i.e. to sense-data. See also Andreas Blank, "Wittgenstein's *Tractatus* and the Problem of a Phenomenological Language", in: *Philosophia*, Vol. 29, No. 1–4, 2002, p. 327.

[34] Arnošt Kolman, *Kritický výklad symbolické metody moderní logiky*, *op. cit.*, p. 204.

[35] Ludwig Wittgenstein, *Tractatus Logico-Philosophicus*, *op. cit.*, §6.124.

[36] Rudolf Carnap, *The Logical Structure of the World*. Trans. R. George. Chicago: Open Court Classics 2003.

a meta-language which refers to the object language. The basic principles of a meta-language must be based on another meta-meta-language, or there must be obvious logical axioms. Like Russell, Carnap is forced to accept that there are general principles that cannot be derived from experience. This is approaching Hilbert's meta-mathematics. It also may explain why Kolman attributes to Carnap an attempt "to create a universal mathematical philosophical theory of all being".[37]

Curiously enough though, for Carnap logic laws were not the principle of all being. Logic, according to Carnap, is conventional. His view is expressed, for instance, in the following passage:

> It is important to notice that the logical and mathematical objects are not actually objects in the sense of real objects (objects of the empirical sciences). Logic (*including mathematics*) *consists solely of conventions* concerning the use of symbols, *and of tautologies* on the basis of these conventions. Thus, the symbols of logic (and mathematics) do not designate objects, but merely serve as symbolic fixations of these conventions.[38]

Carnap also endorses Kolman's three main features of logical positivism without explicitly slipping into logical or mathematical fetishism. If it were possible, this would pose a serious problem for Kolman's main argument as exposed above. The language of logic (or of meta-language) is conventional. For Carnap (as well as for Wittgenstein), there are no logical or mathematical objects to which logical or mathematical concepts refer (cf. Wittgenstein's fundamental idea that logical constants do not represent any objects or facts). Wittgenstein concludes that "The propositions of logic describe the scaffolding of the world, or rather they represent it."[39] How then is Carnap able to resist coming to this conclusion? Well, only by the construing of a hierarchy of meta-languages. But as already said this hierarchy cannot run into infinity. Sooner or later, one will be forced to admit some principles or axioms that are not derived from any meta-language. They must be in a certain sense obvious. This is to say that the reason why these principles are "obvious" is inexpressible, but one part of their obviousness is that they can be applied (through the hierarchy of meta-languages) to all facts. It is, however, not plausible to claim that these principles are conventional, which therefore means, they are arbitrary. Carnap is, in the end, forced to Wittgenstein's conclusion and thus to the fetishization of logic and mathematics.

We can therefore conclude that Kolman's understanding of logical positivism—as he demarcated this view—is correct, even considering some inaccuracies and false attributions.

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[37] Arnošt Kolman, *Kritický výklad symbolické metody moderní logiky*, *op. cit.*, p. 254.

[38] Rudolf Carnap, *The Logical Structure of the World*, *op. cit.*, p. 178; Carnap's italics.

[39] Ludwig Wittgenstein, *Tractatus Logico-Philosophicus*, *op. cit.*, §6.124.

7.7 Arguments Against Fetishization

The above mentioned philosophers do something that has always been one of the main tasks of metaphysics: They are all looking for the essential features of reality by abstracting from accidental features. Why should Kolman, and hence Marxism, be bothered about this?

Lenin's work *Materialism and Empirio-criticism*[40] is a fundamental attack on Mach's neutral monism from a Marxist standpoint. Lenin shows that although Mach and his successors were trying to be neutral as regards the decision between materialism and idealism, nevertheless they lapse into Berkeleyan subjective idealism in yet another guise. Kolman applied Lenin's arguments to Russell's neutral monism. This idealism has socio-political origins, as we have seen in a much simpler form with Pythagoreism: "the socio-political sense of this fetishization of mathematics and of the entire neopositivism … is that this 'reality' that is neither material nor spiritual, allows the opportunity to take our ideas for being just as the 'real' essence as things and phenomena of the material world are, and thus ultimately justify 'real' politics … based on the misleading views on the possibility and necessity of reconciliation with this nasty order of parasitism, violence and lies."[41] Mathematical fetishism arises from the mycelium of neutral monism, whose socio-political sense is that it allows for maintaining the status quo of social relations and conditions.

Is this a serious argument, or rather just a piece of communist propaganda? Is there any connection between the fetishization of logic or mathematics and conservatism in social order? If there is any connection at all, it is not *a priori* but rather *a posteriori*. Hegelian and Marxist philosophy is not an inquiry into *a priori* laws or forms. Hegelian philosophy can understand social practices ("shapes of the spirit") only in retrospect. If this understanding is correct, if the theory correctly interprets its object, then it can have a prospective effect.[42] Kolman only suggests that it is plausible to see a connection between mathematical and logical fetishism and conservatism.

A priori laws are derived, by means of abstraction, from experience. Kant, for example, derived his list of categories from the forms of possible judgment. These forms of judgment are given to us in the experience of judging. Kant gives no argument that he had enlisted all the possible forms of judgment. There is no convincing argument that Kant's list is exhaustive (and it is clear that by considering only the subject-predicate forms he must have missed some other forms). In a further step, we see that empirical evidence (the list) is *fixed* at some point and a priori laws are derived from it. These a priori laws may include also social laws. The connection to social conservatism lies in this fixing of the experience

[40] Vladimir Ilyich Lenin, *Materialism and Empirio-criticism: Critical Comments on a Reactionary Philosophy*, *op. cit.*

[41] Arnošt Kolman, *Kritický výklad symbolické metody moderní logiky*, *op. cit.*, p. 277.

[42] See Shaun Gallagher, *Hegel, History, and Interpretation*. SUNY Press: Albany, New York 1997, p. 9.

used for the derivation of a priori laws. No further experience is conceived of, no experience that may possibly contradict the actual a priori law. Hence, it is plausible to see a connection here between mathematical and logical fetishism and conservatism.[43]

Kolman's second main argument is that the logical and mathematical fetishes are epistemologically deprived of any historical and dynamic dimension. This argument or rather objection goes back to Herder's and Hegel's critique of Kant's apriorism. Formal logic examines only the isolated and unchangeable forms of thoughts, "but they are not sufficient for an adequately truly scientific understanding of the world".[44] Logic and mathematics are historical sciences and their truths are historically contingent. Mathematical and logical fetishism overlooks this conditionality. Logical positivists may concede that there are different logics. Moreover, they may admit that one logical system evolved from a historically earlier logical system. They may admit as matter of fact that logic has history. But this development is something external and accidental to a particular logical system which cannot explain its essential characteristics as being necessarily evolved from previous systems.

The basic foundation of all epistemology is not logic or mathematics, but the praxis. If we did not admit the criterion of praxis for the sufficient criterion of knowledge, then we would not recognize the materiality of the world.[45] Or, in Lenin's words: "The standpoint of life, of practice, should be first and fundamental in the theory of knowledge."[46]

[43] Curiously enough, there has been developed quite opposed arguments claiming that there is a substantial connection between logical positivism and Marxism or communism. Heidegger is the most striking case. He wrote in a reply to Carnap's paper "Überwinding der Metaphysik durch logische Analyse der Sprache": "It is also no accident that this kind of 'philosophy' stands in both internal and external connection with Russian communism." His argument, for the internal relatedness, is that in the mathematical philosophy, truth is diverted into a certainty, which leads to the profaning [Entgötterung] of the world. If we get over Heidegger's too quickly equating Russian communism and Marxism in general, we see he is not the only one holding this view. The goal of Neurath's scientific philosophy was social and political progress in broadly Marxist perspective. Also Carnap, at least partly, admitted this internal connection when he reported his "Marxist views on how metaphysics will be overcome through reformation [*Umgestaltung*] of the substructure." (The quotations are taken from Michael Friedman, *A Parting of the Ways. Carnap, Cassirer, and Heidegger*. Chicago and La Salle: Open Court, 2000, pp. 22, 21. See for more discussion therein.) It seems, thus, that logical positivism and Marxism are allies rather than enemies. All these facts pose serious problems for Kolman's view.

[44] Arnošt Kolman, *Kritický výklad symbolické metody moderní logiky*, *op. cit.*, p. 211.

[45] Arnošt Kolman, *Logika*, *op. cit.*, p. 167.

[46] Vladimir Ilyich Lenin, *Materialism and Empirio-criticism*, *op. cit.*, p. 142.

7.8 Kolman in Context

Although Arnošt Kolman's critique of mathematical fetishism is unique in the Czech context, he was not the first one who criticized logical positivism. The aim of this final section of our paper is to place Koman's thinking into a broader context of the Marxist critique of logical and mathematical methods in philosophy.

David Guest (1911–1938) was a British philosopher and communist activist who studied under Moore and Wittgenstein in Cambridge at the beginning of the 1930s. Then he visited Russia and published, in the Soviet journal *Under the Banner of Marxism*, a paper "The Machian Tendency in Modern British Philosophy" (in Russian).[47] *Under the Banner of Marxism* was the most significant philosophical journal in the Soviet Union at that time attracting the most outstanding Soviet scholars. Kolman was back then a member of the editorial board and one of the most frequent authors.[48] Let us look closely at Guest's arguments that must have inspired Kolman's subsequent writings.

Guest aims in the paper to expose Machian tendencies, and primarily the neutral position between idealism and materialism, in Russell, Wittgenstein and Whitehead. The most elaborate part of the paper is devoted to Russell. Guest traces back Russell's neutral monism through his writings from early on to his most recent book *The Analysis of Matter* where neutral monism is fully accepted. Guest identifies a methodological principle which leads to neutral monism in Russell's *Principle of Economy*: "The supreme maxim in scientific philosophizing is this: Wherever possible, logical constructions are to be substituted for inferred entities."[49,50] Hence, Guest argues, Russell's scientific philosopher has to construct objects, space and time out of complexes of sense-data.[51] Guest further focuses on Russell's account of particulars. Material objects are given to us through sense-data. This means, however, that material objects are constructed out of sense-data. Applying the Principle of Economy shows that particulars, thus, must include sense-data or—as Russell calls them—appearances, but not material objects. Russell is forced to accept that there exist possible, i.e. non-actual appearances (or "sensibilia" as Russell also calls them). This possibility of non-actual appearances follows from the fact that appearances are more basic than physical states made of material objects. Actual brains are physical states, hence "'Appearances' may perhaps exist without there being brains

[47] David Guest, "The Machian Tendency in Modern British Philosophy", in: Carmel Haden Guest (Ed.), *David Guest: A Scientist Fights for Freedom (1911–1938). A Memoir*. London: Lawrence & Wishart 1939, pp. 219–249. First published in Russian in: *Under the Banner of Marxism*, No. 5, 1934, pp. 31–45.

[48] See the discussion of Kolman's paper "Hegel and Mathematics" above.

[49] Bertrand Russell, "The Relation of Sense-data to Physics", in: *Mysticism and Logic*. London: George Allen & Unwin 1917, p. 115.

[50] Carnap took this maxim as the epigraph of *The logical Structure of the World* (1928).

[51] David Guest, "The Machian Tendency in Modern British Philosophy", *op. cit.*, p. 224.

to perceive them."[52] Guest acknowledges that this argument is derived from Lenin's critique of so-called "brainless philosophy".[53] Guest's critique of Russell continues: Appearances exist in time. Russell admits that there are chains of appearances or sensibilia that can be attributed to one's experience. Such chains are called "biographies": "By this means, the history of the world is divided into a number of mutually exclusive biographies."[54] But, given that there can exist appearances without being actually realized in anybody's brain, biographies consisting of such appearances are simply disembodied spirits.[55]

Guest further moves on to Russell's *Analysis of Matter* (1927), where the principle of economy is called "the principle of logical construction" and the neutral elements are called "events". Events are, according to Russell, metaphysically primitive entities. But again, *percepts* (as Russell now calls his appearances or sensebilia) are events, but physical objects such as electrons, protons or points in space-time are not. Guest, thus, concludes that this is "the very same theory of disembodies perceptions" that we met earlier.

Guest's argument as to why Berkeleyan idealism in the guise of neutral monism has to be rejected is very sketchy. He says: "What is common to all these views is that they are all on the inclined plane slipping down to mysticism and religion."[56] The same is true of Kolman's arguments in this respect as well. Guest's paper continues in the same vein with a critique of Wittgenstein's *Tractatus*. Guest takes the *Tractatus* as a kind of confirmation of the intricate connection of logical positivism and religion or, better to say, mysticism:

> We have here a masterly example of an undialectical philosophy, anti-historical and metaphysical to an extreme. … And here too we can learn how an attitude of extreme empiricism … when pushed to its logical conclusion leads to utter mysticism.[57,58]

In conclusion, Guest's paper—strong in its application of Lenin's critique of Machian philosophy onto Russell's neutral monism—must have been an inspiration for Kolman's more elaborate critique of logical positivism.

Guest's critique might have been influenced by Wittgenstein himself who, in his lectures at the beginning of the 1930s, criticized Russell's and his own earlier account of logic.[59] Although Wittgenstein did not explicitly address neutral monism

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[52] *Ibid*., p. 226.

[53] Vladimir Ilyich Lenin, *Materialism and Empirio-criticism*, *op. cit.*, p. 49.

[54] Bertrand Russell, "The Relation of Sense-data to Physics", *op. cit.*, p. 123.

[55] David Guest, "The Machian Tendency in Modern British Philosophy", *op. cit.*, p. 227.

[56] *Ibid*., p. 232.

[57] *Ibid*., p. 238.

[58] It is a historical irony that some contemporary interpretations take the *Tractatus* to be dialectical, historical and anti-metaphysical. See, e.g., Mathew Ostrow, *Wittgenstein's Tractatus: A Dialectical Interpretation*. Cambridge: Cambridge University Press 2002 and Ben Ware, *Dialectic of the Ladder. Wittgenstein, the 'Tractatus' and Modernism*. London: Bloomsbury 2015.

[59] Our claim is that there is a significant substantial affinity between Kolman's notion of mathematical fetishism and Wittgenstein's notion of sublimation of logic. Moreover, there might have been a two-way influence. There are some hints at least. Wittgenstein had visited Russia in 1935. His

(or we do not possess any record of it at least), the idea behind was clear: Logic is nothing sublime. Wittgenstein speaks later in the *Philosophical Investigations* about "the tendency to sublimate the logic of our language".[60] The sublimation of logic means to bestow upon it a universal significance. More specifically:

> For logical investigation explores the essence of all things. It seeks to see to the foundation of things, and shouldn't concern itself whether things actually happen in this or that way. — It arises neither from an interest in the facts of nature, nor from a need to grasp causal connections, but from an urge to understand the foundations, or essence, of everything empirical.[61]

In other words, logic does not express the essence of all things. This is, the same point that is pressed by Kolman, i.e., logic must not be fetishized. Not logic, but practice lies at the bottom of our knowledge. If Wittgenstein says that we should look at the use of our language, he comes very close to Marx' and Lenin's standpoint of practice. This observation—this primacy of practice in Marx as well as in Wittgenstein—has not escaped the attention of some commentators. So David Andrews proposes that "commodity fetishism should be understood as the form of life, the activity of the participants of the system of commodity production, which corresponds to what I have called the value language-game."[62] Andrews argues that commodity fetishism arises because people see commodities as objectified products of labour, while in fact "commodities do not possess any other objective character".[63] Commodity fetishism is not only an illusion, "it is a feature of how things actually are in commodity production. Commodity fetishism is an activity in which people engage, a form of life."[64]

Translating Marx's idea into the language of the later Wittgenstein may make Marx's point about commodity fetishism more comprehensible for us. Now, with the help of Kolman, this point can be extended onto mathematical and logical fetishism. Fetishism in this respect is something natural in our philosophical praxis; it is the tendency to see mathematics or logic as something sublime, as something behind all facts, as something essential to them, as something *a priori*. It is (part of) the tendency to find the objective order out of chaos. Logical and mathematical properties and relations are, at the same time, not pure illusions. They have various roles

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main contact and host there was Sofya Yanovskaya, Kolman's long-time collaborator, who coauthored Kolman's early paper 'Hegel and Mathematics' (see footnote 5). Wittgenstein was familiar with the main tenets of dialectical materialism and had acquaintance with parts of Marx's *Capital*. (See John Moran, "Wittgenstein and Russia", in: *New Left Review*, No. 73, 1972, pp. 85–96.)

[60] Ludwig Wittgenstein, *Philosophical Investigations*. G. E. M. Anscombe and R. Rhees (eds), trans. G. E. M. Anscombe, P. M. S. Hacker and J. Schulte, revised by P. M. S. Hacker and Joachim Schulte, revised fourth edition. London: Blackwell 2009, §38.

[61] *Ibid.*, §89.

[62] David Andrews, "Commodity Fetishism as a Form of Life", in: Gavin Kitching and Nigel Pleasants (eds.), *Marx and Wittgenstein. Knowledge, Morality and Politics*. London: Routledge 2002, p. 85.

[63] *Ibid.*, p. 88.

[64] *Ibid.*, p. 89.

in our thinking or more specifically in our philosophical praxis, e.g. making our ideas clear, distinguishing between valid and invalid judgements, or making counting easier etc. But, if we, in our philosophical praxis, take mathematical or logical properties as expressing the objective character of things, they acquire a double fantastic existence—they become fetishes. These fetishes as autonomous existences then strike back, they put constraints on things and facts (e.g. in sayings like "logics does not allow this or that"). This is a kind of conservativism that has social impacts, and this is something Kolman wanted to overcome or at least to curb. In order to get rid of logical fetishes, it is not simply enough to recognize their illusory character. We must change our whole philosophical praxis. Philosophy, as Marx had put forward, has to become social criticism.

7.9 Appendix: Mathematical Fetishism Today

The focus of this paper is predominantly historical. But in this appendix, we would like to apply Kolman's arguments against mathematical fetishism onto its contemporary form which has received a lot attention nowadays. Kolman defines mathematical fetishism as the view that mathematical principles are the principles of all being, that is to say that mathematics has an ontological relevance. Aspects of this view are to be found in the time of Pythagoreanism and later in logical positivism in the first half of the twentieth century.[65] But mathematical fetishism is not something that belongs only to the past. One of the most prominent philosophers today, Alain Badiou, claims that "ontology, the science of being qua being, is nothing other than mathematics itself."[66] In his main work *Being and Event*, the mathematical foundation of ontology is made up by (classical) set theory where "every 'object' is reducible to a pure multiplicity".[67] Every situation (which is in Badiou's terminology any "presented multiplicity") is from the ontological point of view a set. Furthermore, "There is nothing apart from situations."[68] Hence, sets are everything that there is. Badiou also presents a mathematical theory of all being—which is something that Kolman (falsely) ascribed to Carnap.

Only Badiou's main thesis is sketched here (other important tenets of his theory will be presented below), but we can nevertheless ask whether it is a case of mathematical fetishism. And indeed, in their highly critical review of *Being and Event*, Ricardo L. Nirenberg and David Nirenberg objected to Badiou that set-theoretical objects are unchangeable: "An ontology that takes ZF set theory as its basis must

[65] This remark does not mean that mathematical fetishism is to be found only in Pythagoreanism and logical positivism. One could also mention Galileo at least.

[66] Alain Badiou, *Being and Event*. Trans. by Oliver Feltham. London: Continuum 2005, p.xiii.

[67] *Ibid.*, p. 14. In *Logic of Worlds: Being and Event II*. London: Continuum, 2009, Badiou provides a theory of appearance (which he calls phenomenology) based on category theory. For the sake of simplicity, we restrict the present discussion to Badiou's treatment of set theory.

[68] Alain Badiou, *Being and Event*, *op. cit.*, p. 25.

deny reality to that which is affected; it must take math as the only real knowledge and mathematical objects as the only real beings, as Badiou himself repeatedly asserts. On these grounds alone we feel justified in calling Badiou more of a Pythagorean than a Platonist."[69] What is the argument here at stake? The Nirenbergs object that Badiou's ontology is, in the end, static, incapable of any change. This argument resembles Kolman's first argument above. But Badiou's consequences for social philosophy are anything but conservative. On the contrary, his ontology is capable of accounting for radical novelty and change in the social order, i.e. revolution.

Novelty and change enter Badiou's ontology through his concept of "generic extension". Without going into complex technical details, a generic extension is when it is "added to the situation without being able to be directly deduced from it," it also "unveils unknown possibilities of the primitive situation".[70] This set-theoretical formalism allows, thus, the extension of a set in such a way that in this new set there is a discernible property that was indiscernible by any predicate in the initial set. Such an extension remains random from the perspective of the initial set; it depends only on a generic procedure. By analogy with his set-theoretical foundations, Badiou distinguishes four generic procedures: love, art, science, and politics. "What happens in art, in science, in true (rare) politics, and in love (if it exists), is the coming to light of an indiscernible of the times, which, as such, is neither a known or recognized multiple, nor an ineffable singularity".[71] Love, art, science, and politics are generic procedures, because they "generate—infinitely—truths concerning situations"[72] and other practices do not.

Badiou's set-theoretical foundation of ontology, thus, allows for radical change (personal or political freedom), that is it allows for the emerging of a situation that is radically different from the initial situation. Kolman's charge of political conservativism therefore does not apply here, for Badiou's mathematical ontology is much more thought-out than Kolman ever imagined. Badiou's ontology, thus, escapes from Kolman's first argument against mathematical fetishism.[73] But what about his second argument, i.e., that mathematical fetishes are deprived of any historical perspective? Let us put the problem this way: What is it that makes the connection between mathematical formalism (which has according to Badiou ontological primordiality) and (individual or social) praxis? Or why are there exactly these four

[69] Ricardo L. Nirenberg and David Nirenberg, "Badiou's Number: A Critique of Mathematics as Ontology", in: *Critical Inquiry*, Vol. 37, No. 4 (Summer 2011), pp. 606–7. The authors also mention Kolman and his role in the Luzin affair.

[70] Alain Badiou, "To Preface the Response to the 'Criticisms' of Ricardo Nirenberg and David Nirenberg", in: *Critical Inquiry*, Vol. 38, No. 2, 2012, p. 363.

[71] Alain Badiou, *Being and Event*, *op. cit.*, p. 17.

[72] *Ibid.*, p. 340.

[73] On the other hand, Badiou thinks, in agreement with Kolman, that analytic philosophy is inherently non-dialectical and it is internally related to conservativism. (Cf. Alain Badiou, "What is Philosophy?". In: European Graduate School Video Lectures, *YouTube*, 2 May 2011. Retrieved from https://www.youtube.com/watch?v=Z6FQkTajudY, 27 July 2015.)

generic procedures? Do really only love, art, science, and politics generate new knowledge and the other practices do not? A Marxist, for example, would opt for political economy as the only generic procedure?[74] Does it not hold that a new piece of knowledge may emerge in every kind of practice? And finally, can we answer these questions once and for all?[75] Our point is that no matter how we answer these questions, such answers are not deducible from the mathematical framework that Badiou employs. Naming the four generic procedures is, at best, an *analogy* to the set-theoretical concept of genericity. No mathematical formalism speaks for itself or, it is better to say, that every (piece of) mathematical formalism (i.e., every formal language) must be applied onto reality if it should deliver any substantial knowledge about reality. Such an application involves a non-trivial projection.[76] A projection is a way of reading off the formal language; it is an interpretation of this language. But then a projection is the *praxis* of interpreting the language. The upshot of this is that mathematics (which is ontology) depends on the praxis which is socially and historically determined.

To conclude, Badiou with his ingenious employment of mathematical formalism is able to escape from Kolman's charge of political conservativism, but not from Kolman's second argument against mathematical fetishism (that it is deprived of any historical dimension) which applies here too.

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[74] The fact that for Badiou (political) economy is not the generic procedure (or is not among the generic procedures) has been criticized by various commentators like Žižek or Livingston. See Paul M. Livingston, *The Politics of Logic. Badiou, Wittgenstein, and the Consequences of Formalism*. New York and London: Routledge, 2012, p. 300.

[75] The fact that there are exactly four generic procedures (love, art, etc.) is only an example of how Badiou applies mathematical formalism onto our praxis. All his "textual mediations" in *Being and Event* involve a certain kind of application of his mathematical and ontological discourse.

[76] This is the main thesis of Paul Livingston's critique of Badiou's project: "Badiou's application of mathematical formalisms to the diverse questions of social and political life repeatedly involves fundamental gestures of projection, whereby formal and mathematical structures bear the weight of the theorization of such diverse political and ontological concepts" (Paul M. Livingston, *The Politics of Logic. Badiou, Wittgenstein, and the Consequences of Formalism*, *op. cit.*, p. 10).