Franz Steiner Verlag | Sonderdruck aus:

Jahrbuch für Europäische Wissenschaftskultur

—

Yearbook for European Culture of Science

6 (2011)

Franz Steiner Verlag 2012

INHALTSVERZEICHNIS / TABLE OF CONTENTS

Fokus / Focus

Flowers of Passion and Distinction: Practice, Expertise and Identity in Clusius' World

Guest editors: Dr. Esther van Gelder & Prof. Dr. Nicolas Robin

Freier Beitrag

Fokus / Focus

Physics and Dialectical Materialism

Guest editor: Christian Forstner

Freie Beiträge

LAJOS JÁNOSSY'S REFORMULATION OF RELATIVITY THEORY IN THE CONTEXTS OF „DIALECTICAL MATERIALISM" AND TRADITIONAL SCIENTIFIC RATIONALISM*

László Székely

ABSTRACT

The late Hungarian physicist Lajos Jánossy is respected in international physics first of all for his results achieved in the field of cosmic radiations, but his work in the alternative, Lorentzian tradition of relativity theory is also of historical importance. As an adopted son of the Hungarian Marxist philosopher, Georg Lukács, he was socialised in a left-wing spirit. He formulated a philosophical criticism of Einstein's theory in terms of dialectical materialism in the 1950s and 1960s. In contrast to the new Soviet thesis valid in Soviet ideology from 1955, he insisted that the positivist, Machian epistemological foundation determinatively influenced the physical level of Einstein's relativity theory and distorted its real physical meaning. He also rejected the anti-commonsense character of Einstein's new concepts of space and time and argued for the necessity of a commonsense-conform physics. However, in contrast to the Soviet critics of relativity theory of the Stalinist period, Jánossy never used ideology to destroy the scientific authenticity of Einstein's theory, but, accepting the Einsteinian-Lorentzian mathematics as one of the great achievements of the history of physics, he announced and successfully implemented a positive program of a commonsense-conform, non-positivist, Lorentz-based reformulation of the theory. The social-cultural background of Jánossy's reformulation of relativity theory is characterised by the strain of two contradictory elements: on the one hand, his left wing, Marxist commitment, on the other, his socialization in Western, "bourgeois" science and culture. Through a Marxist, "dialectical materialist" criticism of the positivist, Machian aspects of Einstein's theory as well as through his work for a commonsense–conform physics, Jánossy defended not only Marxism but also the classical tradition of scientific rationalism as an essential element of European culture.

INTRODUCTION

The late Hungarian physicist Lajos Jánossy occupies a special place in the history of physics in the socialist period of the East-European – Central European region. On the one hand, he is an internationally respected scientist whose monograph on cosmic rays written in the forties of the previous century is considered to be one of the basic literatures of the topic. On the other hand, in Hungary and the coun-

* The author expresses his gratefulness to the Hungarian Scientific Research Fund (OTKA) for the support granted to his research (Project Number K 79-194)

tries of the former "Eastern Block" he is remembered as a dogmatic Marxist scientist, who under the influence of ideological prejudices commanded a sharp attack against Einstein's theory of relativity as late as the early Sixties when neither the Soviet nor the Hungarian Communist Party demanded such ideological orthodoxy and loyalty from scientists. Due to this received view about Jánossy's activity as a physicist, after the political changes in 1989–1990 his approach to relativity theory was often cited as a horrific example of ideological intervention into physics. In the light of this it is a bit ironic that beside his results on cosmic radiation also his works about relativity theory are much more recognized and respected in the Western countries than the works of those physicists who – in the name of pure science – defended Einstein's relativity against him. So, for example, Bell in his study "How teach relativity" mentions Jánossy's approach to relativity as one of the few acceptable discussions of Einstein's theory[1], and the Oxford philosopher of physics, David Brown expresses his indebtedness to Lajos Jánossy in his excellent monograph entitled *Physical Relativity*, emphasizing the merit of the Hungarian physicist in this field[2].

In what follows, we will analyse the philosophical background of Jánossy's work of relativity theory and place it in the context of the history of 20th century European science and culture.

LAJOS JÁNOSSY'S BIOGRAPHICAL BACKGROUND

Lajos Jánossy was a leading personality of Hungarian physical research in the Fifties and the Sixties of the previous century. The characterization „leading personality" here means both his authority and reputation as an excellent scientist, as well as his institutional position in the government organization of science. After seizing power with the help of the Red Army then occupying Hungary, the Hungarian Communist government – following the Soviet pattern – established a new, grand institute for physical research and (although not a party "cadre") Jánossy was offered the position of head of the cosmic rays department to be established in the framework of the new institute. As a matter of fact, in 1954 he was appointed deputy director, in 1956 director of the Institute and he served in this capacity until 1970.

Jánossy returned to Hungary from Ireland, where he was a member of the Institute of Advance Studies in Dublin, where he worked together with famous Austrian physicist Ervin Schrödinger, under whom he had studied physics in Berlin.[3] The fact that he accepted the position offered to him demands some explanation since in that period Hungarian intelligentsia typically moved into the opposite direction: educated people and scientific researchers attempted to emigrate to Western, democratic countries as long as it was possible. Jánossy returned to

1 Bell, 1976.
2 Brown, 2005, p. vii.
3 Király – Nárayné 1987.

Hungary in 1950, when the Iron Curtain had already been "drawn down" and it was impossible to leave the country without the consent of Communist authorities.

Lajos Jánossy's return to Hungary can be understood only considering his biographical data. He was born in a Hungarian village near Budapest in 1912 as the son of a Hungarian astronomer of Jewish origin who died relatively young and whose widow, Gertrud Bortstieber (a mathematician belonging to the first generation of Hungarian women with a university degree) married Georg Lukacs, the famous and controversial Hungarian Marxist philosopher. Thus Georg Lukacs became the foster father of Lajos Jánossy, which significantly influenced Jánossy's intellectual development.

After the fall of the Hungarian Soviet Republic in 1919 Lajos Jánossy's family moved to Austria and then to Berlin. Instead of following in his stepfather's footsteps in politics and philosophy, Jánossy became a physicist. He studied physics at the Humboldt University in Berlin in the Golden Age of twentieth century German (and European) physics, becoming a student of Edwin Schrödinger whose metatheoretical considerations on physics played a significant role in the formation of his approach to physical problems. While after Hitler's rise to power his stepfather left Hitler's Berlin for Stalin's Moscow and lived there with his political and moral compromises, Jánossy moved to the opposite direction and in the 1930s became a professor at Manchester University where he taught physics (and especially relativity theory). Later he did scientific research in the field of cosmic radiation as a professor at the Institute for Advanced Studies in Dublin and became an internationally respected scientist in the field. His monograph on the topic belongs to the basic literature on the subject even today.[4] But Jánossy's stay in Dublin had significance not only because of his scientific successes but also due to the fact that in this period his former professor Schrödinger was also working there, and so they could continue their informal metatheoretical discussions about the problems of modern physics.[5]

It is clear that Jánossy's invitation to participate in establishing the Institute for Physical Research of the Hungarian Academy of Sciences was due as much to his international reputation as a physicist as to the role his stepfather Georg Lukács played in Hungarian – Communist – ideological life. Although for the official Communist movement (that is, for the Communist Party of the Soviet Union and its East European allies) Lukacs was a problematic figure, the Hungarian party needed his support and his international reputation as a philosopher in Western (especially German) philosophical life, as well as Lajos Jánossy's scientific knowledge.

The biographical data above are of great significance concerning Jánossy's activity as physicist and especially as a critic of Einstein's theory of relativity. Namely, the critics of the relativity theory in the Soviet Union belonged to two specific groups. The first group consisted of physicists who had still been educat-

4 Jánossy 1948, 1950.

5 See: Király – Nárayné 1987.

ed in the Russian, pre-revolutionary era and (for different reasons) joined to the Communist party after the revolution. Consequently, their physical education had still been determined by pre-Einsteinian physics. The second group was made up of young physicists and philosophers already educated in the Soviet period, who during the campaign against the Western, bourgeois ideology and cosmopolitism, launched by Stalin's ideological leader, Zhdanov, attempted to take over the leadership of Soviet physics from their older, respected colleagues. A greater part of these physicists were of peasant or working class origin or belonged to the new, "Soviet intelligentsia". This means that they were neither of "bourgeois" nor Jewish origin, which was significant as the campaign against cosmopolitism definitely included anti-semitic elements.[6] Now, Jánossy was a Jew, who had been educated in the Berlin of the thirties, when the city was the stronghold of Western physics. Later on he had worked at Western, "bourgeois" universities, and had achieved his scientific successes there, collaborating with Western scientists. Hence the sociological explanation which is convincing with respect to both groups of Soviet scientists mentioned above is inapplicable to Jánossy's antirelativistic position. In fact, his family and professional background was similar to that of Soviet physicists who were defending relativity theory and were the target of the anti-bourgeois, anti-cosmopolitism campaign in Soviet science.

Neither can Lajos Jánossy's criticism of Einstein's relativity be interpreted as an expression of his party loyalty. Although his first critical paper on Einstein's concepts of relativity theory was published in 1952[7], his major works on the topic were written only in the late fifties and the early sixties, a period when – after the passionate ideological debates of the previous decades – Einstein's theory of relativity came to be recognized as a dialectical materialist scientific theory and, as a confirmation of the Marxist world view from the side of science, it became a favourite with official Marxist ideology.[8] While Jánossy occupied a high position in the institutional system of science in socialist Hungary, his critical work on relativity theory emerged in a period when the criticism of Einstein's theory contradicted the then officially accepted "Marxist-Leninist" doctrine.

PARALLELISM AND CONTRAST BETWEEN JÁNOSSY AND THE SOVIET CRITICS OF RELATIVITY THEORY

If we turn to the details of Jánossy's approach to Einstein's theory of relativity, then, apart from the criticism of the Einsteinian mathematical formalism, we encounter the same reproaches to the theory which had been formulated by Soviet critics:

i) the theory uses anti-commonsense concepts;

6 See e.g. Graham 1993: 147–148; Vucinich 2001: 91–116.

7 Jánossy 1952.

8 E.g.: Müller-Markus 1960, 1961; Graham 1972: 111–138; Székely 1987; Vizgin-Gorelik 1987.

ii) it does not provide a genuine physical-material explanation for relativistic phenomena;
iii) its concepts and explanations are determined by a Machian, subjectivist methodology.[9]

Furthermore, similarly to the majority of anti-Einsteinian Soviet physicists and philosophers, Jánossy also sought a solution to these problems in the direction of the Lorentzian ether-theory. Therefore he seems to be a follower of the Soviet antirelativistic tradition after this tradition had ultimately been defeated, and Einstein's theory came to be accepted as a 'dialectical materialist' theory by the official communist ideology. However, this is only the surface. Despite all parallelism, he represented a definitely new approach in Marxist criticism of Einstein's relativity theory, for, in contrast to Soviet critics who focused on ideology, Jánossy announced and successfully implemented a positive program of a new, consistent, non-Einsteinian physical explanation for relativistic phenomena.

JÁNOSSY'S METATHEORETICAL CONSIDERATIONS ON SCIENTIFIC RATIONALISM AND THEIR APPLICATION TO RELATIVITY THEORY

In the foreword to his essential monograph on the topic entitled *Theory of Relativity Based on Physical Reality* Jánossy recalls his encounter with relativity theory as a young man as follows,

> I got acquainted with the theory of relativity at a comparatively early age – I read the famous popular book written by Einstein. Reading the latter I had difficulties with some of Einstein's concepts; however, having been young and enthusiastic, I convinced myself in the end that I could understand those concepts – to prove this I tried to explain the theory to everybody who was interested. In the course of such attempts I learned the 'language of relativity' and I gradually 'got used' to the theory.[10]

Nevertheless, his enthusiastic feeling regarding the theory began to disappear and at the end turned into scepticism when he taught relativity theory to university students in Manchester:

> A certain *bad feeling* never ceased altogether. Many years later I read several years in succession a course of physics at the university of Manchester. My course contained also the special theory of relativity. As the years went on I developed a technique of presenting the subject so that in the end I could convince my students that they really understood the theory. However, as my technique presenting the theory improved, my own belief in the adequateness of the concepts vanished. In the end I became convinced that from the philosophical point of view the concepts had to be changed. Since about 1950 I have struggled with the problem of the reformulation of the theory…[11]

9 See eg.: Timiriazev 1925, Maximov 1953, Joravsky 1961 p. 279–287, Vizgin and Gorelik 1987, Székely 1987, 1988. Graham 1993.
10 Jánossy 1971: p. 13–14.
11 Jánossy 1971: p. 14, italics added by the author.

Jánossy's biographical data and this reminiscence exclude the application of Planck's well known formula to Jánossy's case. While according to Planck the opposition to new scientific theories follows from the conservatism of the old generation of scientists (a view incorporated into the philosophy of science by Thomas Kuhn and others), Jánossy belonged to the new generation of physicists. Initially, he as a young man was a devoted promoter of Einstein's theory (which is in accordance with Planck's view). When he later became its critic, he was an expert on it (which contradicts Planck's claim).

It is also clear that the recollection of his changing attitude to relativity theory is of philosophical significance: it is an indirect criticism of the attitude dominating modern physics which, (in Jánossy's view) suppressing rational philosophical analysis, wraps the problematic, non-commonsense character of the new physical theories in a cloak of enthusiasm. In another study Jánossy is more explicit and reproaches mainstream physicists not only for uncritically accepting the conflict between modern physics, on the one hand, and common sense rationalism represented by everyday thought, on the other, but also for actually idolizing this feature of the new theories. In his ironic characterization of the situation, being non-commonsense, or contradictory to everyday thinking, has come to be regarded as a merit, a criterion of scientific character.[12]

Jánossy's metatheoretical starting point for his alternative notion of relativity theory (as well as for his approach to the theory of measurement and quantum theory) is the conscious rejection of this attitude. In his succinct formulation, "The scientific way of thinking cannot be but the dialectical refinement, deepening and futher developing of everyday thinking."[13] Of course, the term "everyday thinking", as well as the term "common sense" loosely connected with it, does not have a well defined meaning requiring no further clarification. However, in the context of the present paper we cannot discuss this problem[14], but it is appropriate to use these terms in an intuitive sense, since in the community of physicists and philosophers of science there is a general consensus about the non-commonsense character of modern physics. The debate is not about whether 20th century physical theories correspond or run contrary to common sense and everyday thinking but how science and philosophy should relate to that character of new physics. Jánossy's formula above is a possible answer to this situation and is based on the comprehension that what we are facing here is not a scientific but a philosophical question which should be answered at a metatheoretical level. By his answer Jánossy established a metatheoretical norm which we will refer to as Jánossy's norm or Jánossy's principle.

Now the following question emerges: is Jánossy's principle as a metatheoretical norm of theory-building not too strict? Does it not restrict too strongly, too drastically the possibilities of scientific knowledge? Jánossy does not discuss the

12 Introduction to Jánossy and Elek 1963: p. 9–10.
13 Ibid p. 9.
14 In this regard see Székely 1987, 1988.

question in general. However, with respect to relativity theory, he answers it as follows:

> The best method to prove the thesis that scientific thinking is the dialectical improvement of everyday thinking is to point out that the whole complex of the theory of relativity can be built up by the means of neutral methods in conformity with everyday thinking. At the beginning of the (20th) century a great sensation was created by the statement that the scientific analysis of the experiments necessitates that we should break lose from the usual thinking and should introduce new »revolutionary« concepts concerning space and time. We are going to point out, by an objective and impartial analysis of the fact, that these sensation-creating statements were unfounded.[15]

LAJOS JÁNOSSY'S REFORMULATION OF RELATIVITY THEORY AS A LORENTZ-LIKE EXPLANATION OF RELATIVISTIC PHENOMENA

As is well known, Lorentz developed an explanation of relativistic phenomena based on the concept of ether. In his theory rods and clocks in relative motion to ether undergo physical changes: rods contract and clocks slow down according to the formulas of the Lorentz transformation. Consequently, in Lorentz's theory we do not have anything to do with space and time but with physical processes: the theory describes the physical behaviour of clocks and rods in relative motion to the ether which functions as a physically privileged reference system. In this explanation the Lorentz transformation (which forms the heart of the special theory of relativity) and the empirically observed relativity of inertial systems are only consequences (and not explanations) of physical processes occurring in bodies in relative motion to the ether. Despite the essential difference between the theory of Lorentz and that of the Einstein, in Lorentz we obtain the same predictions as in Einstein. Hence inertial systems are empirically equivalent not only in the German physicist's but also in Lorentz's theory. The difference between the two explanations of relativistic phenomena arises only at the theoretical level, since Einstein in contrast to Lorentz rejects not only the empirical but also the theoretical possibility of any privileged system.

In what follows, we will refer to all theories based on Lorentz's ideas as "Lorentz-like" theories. Since a Lorentz-like theory makes the same empirical predictions as Einstein's special theory of relativity, every observation that confirms Einstein, also confirms Lorentz, so there is no possibility of choosing between them on empirical grounds. (As a matter of fact Lorentz-like theories may predict slight differences in comparison to the Einsteinian theory but these may be ignored as unobservable effects.) Since the mathematical formalism of a Lorentz-like theory is the same as that of Einstein's theory, a Lorentz-like theory can be characterized as an alternative (non-Einsteinian) physical interpretation of the mathematical formalism of relativity theory, or – as Jánossy characterizes his own theory – a reformulation of relativity theory based on physical reality.

15 Ibid.

While Jánossy's basic ideas (the assumption of the ether as a privileged system, the contraction of rods and retardation of clocks while in motion relatively to the ether) are the same as in Lorentz, he provides us with a conceptually and mathematically well-elaborated new version of Lorentz's original theory which is also generalized to explain gravitational phenomena. That is, Jánossy promotes the Lorentzian alternative to Einstein's special theory to offer an alternative also to the general one.[16]

SPACE-TIME, PHYSICAL REALITY AND THE RELEVANCE OF JÁNOSSY'S ANTI-MACHIAN POSTULATUM

As far as the conceptual structure of Jánossy's theory is concerned, it develops the Lorentzian explanation of relativistic phenomena within the framework of the theory of measurement. Measures as numbers are, Jánossy emphasizes, arbitrary human constructions with the help of which we as theory-constructing beings represent certain properties ("quantities") of physical entities (for example the length of a rod or the rhythm of a periodical physical process). In his view, the basic problem of physics is how to grasp in terms of subjective measures the real, objective properties (quantities) of physical entities and the laws prevailing in the physical reality existing independently from us. This means that physics is supposed to construct appropriate measures with which to express objective properties and laws. Jánossy calls these "appropriate" measures "distinguished measures", which – as any other measures – are only arbitrary names for physical quantities but whose distinguished character is not "subjective" but determined by the "objective" physical world. According to his analysis, distinguished measures are characterized by the fact that in general both their sum and product (or in certain particular cases at least their sum) express significant physical quantities, that is, their sum and product also appear in our measurements and/or in the established physical laws. For example, the sum of the usual measures of two electric charges *E1* and *E2* (expressed by measures say *e1* and *e2*) will be equal to the measure we receive measuring the joint charge, while the product of *e1* and *e2* appears in Coulomb's Law.[17]

While this notion of physical quantities and their measures is open to controversy, it is based on justified metatheoretical postulates well established in the history of physics and as such it may serve as a metatheoretical starting point for physical theories. Furthermore, it is clear that Jánossy's definite differentiation between measures as arbitrary human constructions on the one hand and objective physical quantities on the other directly contradicts the Machian-positivist philosophical background of Einstein's notion of relativity and radically changes the physical meaning of the theory. The fundamental and far reaching character of this change becomes especially clear if in terms of the measurement theory intro-

16 Jánossy 1971.

17 Jánosssy 1971: pp. 14–16, 72–93; see also Jánossy 1965.

duced by Jánossy we reinterpret Einstein's "definition of time" in his classical study of 1905 presenting special relativity: what for Einstein is the "definition of time" that in Jánossy is only a construction of a system of temporal measures. Similarly, Einstein's new concept of simultaneity which was considered by the received view to be a far reaching conceptual change demanding reconsideration of our fundamental temporal categories, is no more in Jánossy than a particular concept of simultaneity valid only in a given system of temporal measures.

The measurement theoretical framework makes it possible for Jánossy to reinterpret the space-time concept of relativity theory and to illuminate the mystical character conferred on these entities by Einstein: "The Lorentz transformation produces in Einstein's terminology the »transformation of time«; in our concept it gives the connection between two equally distinguished measures of time."[18] Therefore the claim that Einstein's theory is a theory about space and time is, according to Jánossy, incorrect, for the physical laws expressed in the theory "have nothing to do with the structure of space and time"[19] but describe the physical behaviour of physical entities. If the application of the Lorentz transformation to a distinguished (that is, physically relevant) system of measures of space and time results in another distinguished system of spatial and temporal measure (that is, it is applicable to physical reality in a similar way as the original) then in Jánossy's context this property of the transformation cannot be explained by the "structure" of Einstein's space-time, which is only a mathematical entity constructed from measures. The case is just the contrary; what needs explanation is the applicability of the Lorentz transformation and that of the Einsteinian space-time as a theoretical construction and this explanation should be given by relating our measures in terms of which we describe physical phenomena to physical reality which is independent from our measures. And Jánossy's reformulation of relativity theory provides us exactly with this kind of explanation: the physical applicability of the Lorentz transformation and, consequently, the empirical equivalence of inertial systems (that is, Einstein's special theory of relativity with its Minkowskian space-time) in Jánossy follow from a physical process he calls "Lorentz-deformation" (described by the formulae of the Lorentz transformation and involving Lorentz's contraction and retardation hypothesis) which physical entities undergo while they are in relative motion to the ether. Hence relativistic phenomena emerge not due the structure of "space-time" but (in accordance with Lorentz's original idea) are generated in the physical interaction of two physical entities: the ether as a background physical field and the physical entity in motion relative to it. In this regard it should be also mentioned that Jánossy rejects the concept of the ether as an absolute, unmoving physical entity, as well as the concepts of absolute rest and motion.[20] His theory speaks only about motion relative to the ether.[21]

18 Jánossy 1971, 16.
19 Jánossy 1971, 13.
20 Eg. Jánossy 1971, 48–49.
21 For a more detailed analysis of Jánossy's reformulation of relativity theory see: Székely 2009.

As we have seen, the conceptual change and the new explanation of relativistic phenomena in Jánossy's theory follows from his anti-Machian starting point, that is, from the distinction between "measures" and the quantities "measured". In this anti-Machian framework of the theory of measurement even the often criticised allegedly ad hoc character of the Lorentzian ether disappears, and the Lorentzian hypothesis on the physical changes in the clock and rods appears to be a rational hypothesis, logically established by Jánossy's analysis of the relativistic phenomena. Therefore the conceptual structure of the theory of the Hungarian physicist also reveals the intimate connection between the Einsteinian notion of relativity theory and Einstein's Machian metatheoretical commitment, and points to the fact that the Einsteinian explanation of relativistic phenomena is philosophically not neutral: it does not follow necessarily from the nature of the physical world but rather is a consequence of Einstein's (Machian) metatheoretical framework. Thus Jánossy's analysis of relativity theory based on the theory of measures as a metatheoretical framework confirms indirectly and without any ideological arguments the view of Einstein's Soviet critics about the Machian character of the Einsteinian explanation of relativistic phenomena as well as the Soviet characterization of Einstein's usage of the concepts of space and time as idealistic.

Of course this did not mean that Jánossy saw allies in Soviet critics. On the contrary, he sharply criticised them for their inappropriate and at times dilettante approach liable to discredit Marxist philosophy and jeopardize the program of a rational reformulation of Einstein's theory.[22]

COMMON SENSE AND "DIALECTICAL MATERIALISM"

As already emphasized, the characterization of Einstein's theory of relativity as an anti-commonsense theory was and is generally received in physics and philosophy. Opinions begin to diverge only regarding the question whether physics and philosophy should or should not accept this new, anti-commonsense view of physical reality which first appeared in relativity theory and was later restated by quantum mechanics and other developments in 20th century physics. The Marxist critics of relativity theory (including Jánossy, who beyond his alternative relativity theory also suggested a new interpretation of quantum mechanics[23]) shared a common conviction that this fundamental turn in the character of scientific theories was unacceptable since it did not only contradict the rational tradition of science but also opened the door to irrationalism. This point of view is understandable considering that Marxist philosophy emerged in the rational tradition of European philosophy, a tradition strongly interwoven with the development of science.

On the other hand, a considerable part of Marxist scientists and philosophers (including the Bolshevik leader, V. I Ulianov, that is „Lenin", who ranked Ein-

22 See e.g. Jánossy 1958: p. 98.

23 See eg. Jánossy 1958; Király-Nárayné 1978.

stein as "a great reformer of natural science"[24]) welcomed Einstein's new theory. Many of them held it to be a scientific realization of the principle of dialectical materialism and the demonstration that the laws of nature correspond to the views of this philosophy.[25] In this context even the anti-commonsense character of the new physics becomes understandable. Namely, if we consider our common sense terms to be of empirical origin (as the materialist epistemology of Marxist philosophy supposes to be the case), then these terms will be inseparably connected to the macroscopic world in which we live. Therefore, it will be no more surprising if the worlds of extremely high velocities and the sub-microscopic relations of elementary particles are characterised with conditions and laws not corresponding to common sense. As Landau and Lifshitz write in their famous *Course to Theoretical Physics*:

> ... the principle of relativity of Einstein introduces very drastic and fundamental changes in basic physical concepts. The notion of space and time derived by us from our daily experiences are only approximations linked to the fact that in daily life we happen to deal only with velocities which are very small compared with the velocity of light.[26]

The pro-Einsteinian camp in the Soviet Union and the "socialist" countries defended Einstein referring to this "dialectical materialist" interpretation of his theory and in the end relativity theory got ideological endorsement in this context.[27]

From this point of view both Jánossy and the Soviet critics of relativity theory committed twofold errors. Firstly, they were too strongly confined within the old, mechanical physics and could not understand the physical revolution represented by relativity theory and quantum mechanics. Secondly, they could not understand the dialectical character of Marxist philosophy in an appropriate way and, consequently, they erroneously identified Marxist materialism with old fashioned, "bourgeois" materialism. Even the non-Marxist historical reviews and discussions on the Soviet-Marxist criticism of relativity theory follow this train of thought. In their context Einstein's critics appear as physicists and philosophers of inappropriate or limited understanding of Einstein's new theory and its philosophical meaning, independently of whether their limitations followed from their commitment to the old physics and the mechanical concepts of old materialism, or were a consequence of their insufficient education in physics and philosophy, or their loyalty to the party.

However, as we have seen, this view is incorrect regarding Jánossy, who was an excellent physicist educated in Berlin in the golden years of the 20th century physics. Furthermore, it also ignores the fact that scepticism concerning the anti-commonsense character of Einstein's theory and the characterization of its explanations as non-physical were not special phenomena of Soviet scientific and ideological life, but they always were present in modern physics and philosophy of science quite independent of Soviet conditions. The rejection of the "drastic and

24 See: Lenin 1922.
25 See e.g. Semkowskii 1926; Gessen 1928; Naan 1951; Alexandrov 1953; Vucnich 2001.
26 Landau and Lifshitz 1959: p. 4.
27 See e.g. Naan, 1951, Aleksandrov, 1953, Fock 1953.

fundamental" changes which Einstein's theory brought into the physical world view as well as the demand for an alternative physical interpretation of Einstein's mathematical formalism are considered as legitimate and rational views in physics and the philosophy of physics even today.[28] This fact makes necessary to leave the particular Soviet context of the relativity theory debate and turn to the general philosophical context of the problem.

THE CRITICISM OF RELATIVITY THEORY IN THE LIGHT OF THOMAS KUHN'S CONCEPT OF SCIENTIFIC PARADIGM

Regarding our topic, two ideas of modern philosophy of science are of significance: the Duhem-Quine underdetermination thesis formed by Imre Lakatos on the basis of Duhem's and Quine's considerations and the concept of scientific paradigm introduced by Thomas Kuhn.

The Duhem-Quine thesis calls our attention to the fact that empirical data never determine or verify the truth of a scientific theory, since it is always possible to interpret the same data by means of different theories. Hence in the evaluation of scientific theories observational data in themselves never suffice; we also need pure theoretical (including philosophico-metatheoretical) considerations. The case of the Lorentzian and Einsteinian explanations of relativistic phenomena provides us with a nice and suggestive example of this fact. At the same time, this case represents a very special and extreme example of underdetermination, where the empirical equivalence emerges due the fact that both theories cover empirical data with the same – Lorentzian-Einsteinian – mathematical formalism and so theoretical freedom are given not simply with respect to the observations but also regarding and despite the well defined common mathematics of the theories. The empirical equivalence of the Einsteinian and the Lorentzian theories and by this the fact that there is no possibility to decide between them with the help of experiments was emphasized even with such a devoted adherent and propagator of Einstein's theory as Max von Laue.[29]

As far as the Kuhnian concept of scientific paradigm is concerned, in an analysis of the Hungarian wing of the Soviet debate on Marr's linguistic theory (a passionate controversy which perhaps was much more burdened by ideological prejudices and arguments than the confrontation about relativity theory), Vera Békés, a Hungarian philosopher of science called the attention to the significance of Kuhn's theory in understanding the Soviet scientific debates. What in the standard approach seems to be a war between pure science as a rational enterprise on the one hand and ideology and politics on the other, in Kuhnian terms, Békés argues, it appears as a confrontation of two scientific paradigms. It is an incorrect, simplistic interpretation that the view defended by Marr's followers was determined by ideological commitments and in this sense represented the priority of

28 See e.g. Turner and Hazelett 1979; Duffy 1988; Brown 2005; Duffy and Levy 2008, 2009.
29 See: Laue 1952: 10.

ideology over science. On the contrary: if we approach the case of the Marr controversy in the framework of the Kuhnian philosophy of science, then it will become clear that Marr's followers were researchers committed to a linguistic scientific paradigm. In their argumentation ideology appeared only as an outer factor with the help of which they attempted to strengthen the position of their scientific paradigm against the rival paradigm. In other words, Békés suggests, it was not science which was made by Marr's followers into "the handmaid of ideology" but exactly the contrary: it was ideology that they applied as a weapon to defend the scientific paradigm they were committed to.[30] Of course, taking into account Soviet political and ideological conditions, it was not a morally neutral, innocent game but one that seriously jeopardized the possibility of free scientific research and even the personal freedom and life of the representatives of the rival paradigm who, in turn, were also compelled to draw the sword of ideology. Following Békés's suggestion, the Kuhnian concept of scientific paradigms is also applicable to the debate on relativity theory. The physicists who criticised relativity theory were not blind followers of Marxist philosophy (wrongly or correctly interpreted). They were scientists adhering to ether based electrodynamics as a Kuhnian paradigm, who – in the context of the Soviet ideological and political system – attempted to strengthen their position with the help of ideology. What was problematic was not their physical point of view but that they not only blurred the distinction between metatheoretical and/or philosophical analysis and ideological argumentation, but consciously appealed to ideology and through it to political power in the course of an intellectual debate.[31] In doing so, they jeopardized not only the followers of rival views, but also destroyed their own program. To use a picturesque expression, they stained their rational point of view with the liquid of political ideology which prevented them from providing an appropriate analysis and arriving at a clear understanding of the related problems and, consequently, even of their own point of view.

This Kuhnian approach also helps to understand the essential difference between Jánossy's view and the argumentation of Einstein's Soviet critics: despite Jánossy's commitment to Marxist philosophy and the common points his own view shared with that of Soviet critics, he did not attempt to use Marxist philosophy as an authority with the help of which the scientific authenticity of Einstein's theory might be destroyed. Instead, he moved successfully in the direction of a conceptual analysis of the theory and accomplished a positive program of a new, Lorentz-like interpretation of relativistic phenomena. In Kuhnian terms, he did not attept to destroy the rival paradigm and strengthen his own with the help of ideology but worked for the scientific improvement of his own paradigm.

30 Békés 1997.

31 See: Graham 1993; Josephson 1991.

GEORG LUKÁCS'S INFLUENCE AND JÁNOSSY'S THEORY AS AN ANSWER TO IRRATIONAL TENDENCIES IN 20TH CENTURY CULTURE

Jánossy's summarizing monograph *The Theory of Relativity Based in Physical Reality* represents the attitude analysed above: despite the author's commitment to Marxism, even such ideologically weak philosophical terms as "common sense" or "everyday thinking" are absent from the work. The only concept with philosophical connotation occurring in the monograph is perhaps the notion of "objective quantity" which expresses his commitment to scientific realism (which is perhaps an ideology in the weak sense of the term, but surely not in the sense in which "dialectical materialism" served as ideology for the Soviet system).

However, there is still a very definite ideological reference at the end of Jánossy's foreword: an expression of gratefulness to his stepfather, Georg Lukács.[32] It is true that his acknowledgement does not contain any ideological phrases. But does it not evoke the whole body of the philosophy of Lukács's later years?

Jánossy's biography and his brief reminiscence about his changing attitude towards relativity theory inform us that the primary incentive for him to reformulate relativity theory did not come from Lukács's philosophy. Furthermore, we also know that Edwin Shrödinger, his physics professor in Berlin and colleague in Dublin had significantly influenced his notion of physics. However, it was not even the German physicist but Jánossy's personal intellectual experience of relativity theory which motivated him to work on the topic. Nevertheless, the acknowledgement to Lukács in the foreword to a physical monograph indicates that the discussion with his stepfather played an essential role in the formation of Jánossy's metatheoretical views, helped him to discover and express in philosophical terms the reason for his intuitive "bad feeling" concerning Einstein's theory. And this claim about the connection between Lukács's philosophy and Jánossy's approach to relativity theory is not just a suspicion or assumption of high probability. It is well known that after his Sturm und Drang period as a romantic-existentialist philosopher enthusiastic for Kierkegaard, and also after his philosophically "revolutionary-avantgarde" interpretation of Marxist philosophy in his work *History and Class Consciousness*, Lukács interpreted Marxist philosophy as the heir to classical bourgeois rationalism in an epoch when – due to the alleged crisis of capitalism – this tradition was disintegrating into positivist rationalism on the one hand, and bourgeois irrationalism on the other. This concept of Marxism became especially important for Lukács after Hitler took power in Berlin and the Comintern announced its Popular Front strategy, since he regarded the increasing influence of irrational philosophical tendencies as the most significant ideological basis for Nazism.[33] Paul Forman in his famous study argued that the popularity of the Copenhagen interpretation of quantum mechanics was connected with the post-war intellectual atmosphere in the Weimar Republic; with the inclination of

32 Jánossy 1971, p. 17.
33 Lukács 1954.

the German intelligentsia of the epoch toward irrational trends of philosophy.[34] Even though Lukács did not deal with sciences, in his late period he defended rationalism exactly against these irrational tendencies emphasized by Forman.

Also well known is the significance the Hungarian philosopher attached to everyday life ("Alltagsleben") and everyday thinking ("Alltagsdenken", "Denken von Alltag") in his *Aesthetics* as the origin and basis of every higher form of human spiritual activity, just as his analysis in which he shows how those higher forms (eg science and art) rise on a dialectical spiral from everyday life and thinking into their own spheres.[35]

In his metatheoretical considerations, Jánossy never referred directly to Georg Lukács. However, his terminology, the central place of scientific rationalism in his thought and the connection he made between that rationalism and everyday thinking clearly show that Schrödinger's influence and his "bad feeling" regarding relativity theory found conscious expression and formulation in his thought with the help of Lukács' philosophy. As a matter of fact, the second chapter of Lukács's *Aesthetics* can be read as a philosophical background and illumination of Jánossy's metatheoretical principle connecting everyday and scientific thinking. Furthermore, Jánossy and Lukács were on common ground in their rejection of "modern" positivist rationalism which Lukács considered to be a result of the decline and disintegration of classical rationalism and which, along with the irrational tendencies of modern thought, was the main target of his philosophical criticism in his *Ontology of Social Being*.[36] In terms of Lukács' *Ontology* Jánossy's project of a relativity theory to base Einstein's original theory on "physical reality" appears as a project of the ontological interpretation of relativity theory and thus, in the field of physics as a special science, corresponds to Lukács' philosophical project of ontology. This connection between Jánossy and Lukács explicitely appears in Jánossy's paper "Philosophical problems of the special theory of relativity", where the Hungarian physicist cites the ontological criticism of Einstein's positivist notion of simultaneity by Nicolai Hartmann[37], another significant representative of philosophical ontology in the 20th century and a favourite philosopher of Lukács in his later years. Lukács considered the elaboration of a new, materialist, "Marxist" ontology– continuing the best traditions of bourgeois thought – to be the most effective remedy against irrational philosophical tendencies. Jánossy found the means of correcting the anti-commonsense character of relativity theory in its interpretation "based on physical reality", that is, in its ontological foundation. In this sense Jánossy's theory of relativity is an answer in the field of physics to those irrational tendencies in the European culture of the first half of the 20th century which were challenged by Lukács's philosophy and which appear in Forman's analysis as a decisive factor in the birth and swift reception of the Copenhagen interpretation of quantum mechanics.

34 See: Forman 1971, 1987.
35 Lukács 1963; Megill 1969.
36 Lukács 1984, 1986.
37 In: Jánossy1963, p. 140–141.

CONCLUSION: THE SOCIAL DIMENSION

Despite his commitment to Marxism and the high positions he occupied in the organisational structure of Hungarian science in socialist Hungary Jánossy did not immerse himself in politics and ideology; he was able to formulate his criticism of the Einsteinian notion of relativity in ideologically neutral terms. We have seen that apart from his intellectual ability this was due to his Berlin and Dublin years and the philosophical influence of his stepfather, Georg Lukács. These factors, that is, the experience of Western scientific life free from direct political or ideological intervention or pressure and his stepfather's fairly autonomous Marxist philosophy with its emphasis on the continuation of the great tradition of Western rationalism, helped him to preserve his classical "bourgeois" education and his affinity for classical rationalism despite his commitment to the "revolutionary labour movement". And this is the point where the ultimate cultural context of his theory comes to light. His work of relativity theory was motivated and determined by his socialization and education in the great tradition of European culture, characterized by Marxism as "bourgeois". This was the culture and education he encountered in his family and, paradoxically, it was present even in the influence of his revolutionist stepfather. And this was also the culture and education confirmed during his years in the West, in Berlin and Dublin. Both for him and Lukács, the revolutionary labour movement and Marxism appeared, respectively, to be the only social power and philosophy able to continue the positive elements of "bourgeois" culture in an epoch when destructive tendencies seemed to increase. In this sense both Lukács and Jánossy were conservative thinkers despite their commitment to a revolutionary movement. If Lukács' philosophy attempted to give an answer to the tendencies of irrationalism which, according to Forman's analysis, formed the cultural context of the Copenhagen interpretation of quantum mechanics, then Jánossy's criticism of the Einsteinian version of relativity theory is an answer to the consequences of these tendencies inside physics, to the uncritical acceptance and cult of anti-commonsensism. In this sense Jánossy's Lorentz-like reformulation of the theory of relativity is not merely a Marxist scientist's theory determined by Marxist ideology, but also a theory defending classical scientific rationalism as an essential element of European culture.

Contact:

Dr. László Székely
Research Center for the Humanities
of the Hungarian Academy of Sciences -
Institute of Philosophy
HU-1250 Budapest, Post Box 9.
HUNGARY
email: Sz-L@ludens.elte.hu

LITERATURE

Aleksandrov, A. D. 1953 : *Voprosy Filosofii 1953/5*

Bell J. S. 1976: "How to Teach Special Relativity?" *Progress in Scientific Culture, Vol. 1,* No. 2. (Reprinted in Bell 1987, *Speakable and Unspeakable in Quanten Mechanics*. (1. Edition) Cambridge University Press, Cambridge)

Békés Vera 1997: *A hiányzó paradigma.* (The Missing Paradigm.) Debrecen : Latin Betûk Kiadó. (In Hungarian)

Brown, H 2005: *Physical Relativity.* Clarendon Press, Oxford.

Duffy M C. (ed) 1988: *Physical Interpretations of Relativity Theory.* (Proceedings of the conference held in London at Imperial College, September 1988). London: The Brit. Society for Phil. of Science.

Duffy M. C. and Levy J. (eds.) 200: *Ether, Space-Time and Cosmology. Volume 1.* Liverpool

Duffy M. C. and Levy J. (eds.) 2009: *Ether, Space-Time and Cosmology. Volume 2.* Montreal: Aperion.

Fock, V. A. 1953: *Voprosy Filosofii, 1953/1*

Forman, Paul 1971: "Weimar culture, causality, and quantum theory: adaptation by German physicists and mathematicians to a hostile environment," *Historical Studies in the Physical Sciences*, *Vol. 3,* 1–115.

Forman, Paul 1984: "Kausalität, Anschaullichkeit, and Individualität, or How Cultural Values Prescribed the Character and Lessons Ascribed to Quantum Mechanics." In: *Society and Knowledge* (eds. Nico Stehr and Volker Meja) Transaction Books, 333–347.

Gessen, Boris 1928: *Osnovnye idei teoriji otnositel"nosti.* Moskow.

Graham, L. R. 1972, *Science and Philosophy in the Soviet Union.* Knopf, New York.

Graham, Loren R. 1993: *Science in Russia and the Soviet Union: a Short History.* Cambridge University Press.

Király P. – Nárayné Ziegler M. (eds) 1987: *In Memoriam Lajos Jánossy – 75; Erwin Schrödinger – 100.* Budapest: MTA Központi Fizikai Kutatóintézete. (In German, English and Hungarian)

Jánossy L. 1948, 1950, *Cosmic Rays.* Clarendon Press, *Oxford.*

Jánossy, Lajos 1952: *Acta Physica Hungarica 1.*

Jánossy, 1958: "Znachenia filosofii dlja fizicheskih issledovanij" *Voprosi Filosofii* 1958/4. 98–110.

Jánossy, L. and Elek, T. 1963: *A relativitáselmélet filozófiai problémái* (Philosophical Problems of Relativity Theory) Budapest: Akademia. (In Hungarian)

Jánossy, L. 1963: "A speciális relativitáselmélet filozófiai problémái." In: Jánossy and Elek 1963, 107–143.

Jánossy, L. 1965: *Theory and Practice of the Evaluation of Measurements,* Oxford, Clarendon Press.

Jánossy, L. 1971: *Theory of Relativity Based on Physical Reality.* Budapest: Akademia.

Joravsky, David 1961: *Soviet Marxism and Natural Science, 1917–1932.* New York: Columbia University Press and London: Routledge and Kegan Paul.

Josephson, Paul R. 1991: *Physics and Politics in Revolutionary Russia.* Bekeley and Los Angeles (California): University of California Press.

Landau, L. D. and Lifshitz, E. M. 1976. *Course of Theoretical Physics. 2. Volume. The Classical Theory of Fields* (Trans. by N. Hamermesh) London-Paris: Pergamon Press 1959

Max von Laue 1952: *Die Relativitaetstheorie.* 5. neue bearbeitete Auflage. Erster Band. Braunschweig: Vieweg Verlag.

Lenin, V.I. 1922: "On the significance of Militant Marxism." (Trans. by David Skvirsky and George Hanna) In: Lenin's *Collected Works, Volume 33*. Moscow: Progress Publishers, 1972, 227–236. (The original: *Pod Znamenem Marksizma* 1922/3.)

Lukács, Georg 1954: *Die Zerstörung der Vernunft: Die Weg des Irrationalismus von Schelling zu Hitler.* Berlin: Aufbau-Verlag.

Lukács, Georg 1963: *Die Eigenart des Aesthetischen.* Vols. I, II. Neuwied am Rhein, Berlin Spandau: Luchterhand**.**

Lukács, Georg 1984, 1986: *Zur Ontologie des gesellschaftlichen Seins. I–II.* Darmstadt und Neuwied: Luchterhand**.**

Megill, Kenneth 1969: "Georg Lukács as an Ontologist." *Studies in Soviet Thought 9.* (1969) 334–353.

Műller-Márkus S. 1960: *Einstein und die Sowjetphilosophie. Krisis einer Lehre I.* Dordrecht: Reidel.

Műller-Márkus S. 1961: "Einstein and Soviet Philosophy." *Studies in Soviet Thought, 1*. 78–87.

Maximov, A. A. 1953: "Borba za mateiralism v sovremennoi fiziki." In: *Voprosy Filosofii, 1953/1*

Naan, G.I. 1951 "K voprosy o principe otnositel"nosti v fizike" *Voprosy Filosofii 1951/2* 57–77.

Semkowskii, S. J. 1926: *Dialekticheskii materialism i printsip otnositel'nosti.* Moskow and Leningrad,

Székely, L. 1987, "Physical Theory and Philosophical Values." *Doxa 9.* (Published by The Institute for Philosophy of the Hungarian Academy of Sciences.) 159–181.

Székely, L. 1988, "A Hungarian Interpretation of Relativity Theory." In: Duffy (ed.) 1988.

Székely, L 2009: "Relativity in Terms of Measurement and Ether: Lajos Jánossy's Ether-Based Reformulation of Relativity Theory." In: Duffy and Levy 2009

Timiriazev A. K 1925: *Estestvoznanie i dialekticheskii materialism.* Moskow.

Turner, D. and Hazelett, R (eds.) 1979:. *The Einstein's Myth and the Ives Papers. A Counter Revolution in Physics.* Pasadona (US) : Hope Publishing House.

Vizgin, V.P., and G.E. Gorelik 1987:. "The Reception of the Theory of Relativity in Russia and the USSR." In: (Glick, T.ed.): *The Comparative Reception of Relativity.* Dordrecht: D. Reidel, 1987, 265–326

Vucinich, A. 2001: *Einstein and Soviet Ideology.* Stanford (California): Stanford University Press

Franz Steiner Verlag

Neuerscheinungen
Frühjahr 2013

83

Jahrbuch für Europäische Wissenschaftskultur / Yearbook for European Culture of Science

Herausgegeben von **Olaf Breidbach** und **Stefano Poggi**

2012. 325 Seiten. Kart.
Abonnement 2013: € 54,– zzgl. Versandkosten
Einzelheft: € 58,– zzgl. Versandkosten
Versandkosten: Inland € 5,80 / Europa € 9,40 / restliches Ausland: € 17,40

Schwerpunkt: **Flowers of Passion and Distinction: Practice, Expertise and Identity in Clusius' World**
Gastherausgeber: **Esther van Gelder** und **Nicolas Robin**
Schwerpunkt: **Physics and Dialectical Materialism**
Gastherausgeber: **Christian Forstner**

AUS DEM INHALT VON BAND 6 / 2011

B. W. Ogilvie: Humanist correspondence manuals and the late Renaissance community of naturalists → **S. van Zanen**: Jacques Plateau and Carolus Clusius: a shared passion for gardens and plants → **V. Pugliano**: Botanici e artigiani a Venezia: i (pochi) amici di Carolus Clusius → **M. Rikken**: Abraham Ortelius as intermediary for the Antwerp animal trailblazers → **A. Fischel**: The "verae icones" of natural philosophy – new concepts of cognition and the construction of visual reality in Conrad Gessner's *Historia animalium* → **S. Klerk**: Teaching the *materiae medicae* at Leyden University: between natural history, botany and the foundations of medicine → **P. Bungener**: Le réseau épistolaire de Candolle à Montpellier: la lettre au service de la botanique et de la carrière académique → **O. Freire**: On the Connections between the Dialectical Materialism and the Controversy on the Quanta → et al.

▼ WISSENSCHAFTSGESCHICHTE

Markus Thurau

Paul von Schanz (1841–1905)

Zur sozial- und theologiegeschichtlichen Verortung eines katholischen Theologen im langen 19. Jahrhundert

Contubernium – Band 80

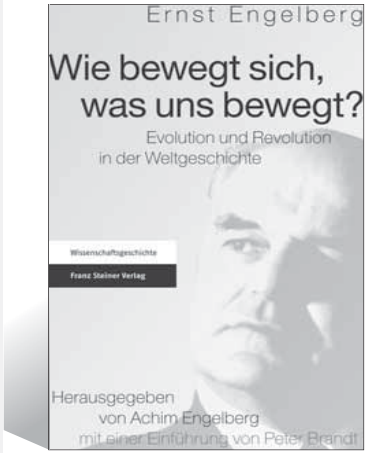
2013. XII, 511 Seiten mit 21 Abbildungen. Geb.
€ 76,–
ISBN 978-3-515-10335-0

Im Zentrum des Bandes stehen Leben und Werk des katholischen Tübinger Theologen Paul von Schanz. Entlang der sozialgeschichtlich verorteten Biographie wird durch die Erschließung des Werkes ein Stück deutscher Theologiegeschichte rekonstruiert. In seinen Tätigkeiten als Professor für Mathematik und Naturwissenschaften, für neutestamentliche Exegese sowie für Dogmatik und Apologetik entfaltete Schanz ein Werk, das sich von den Vorgaben des Ersten Vatikanischen Konzils her verstand und das Wissenschaft und christlichen Glauben widerspruchsfrei zu denken versuchte. Schanz erwies sich hierbei als Vertreter einer „katholischen Wissenschaft", die versucht hat, den Katholizismus mit der Kultur und Wissenschaft der Moderne zu vermitteln.
Markus Thurau zeigt Chancen und Grenzen dieses Versuchs auf, indem er das komplexe Agieren eines explizit „katholischen Wissenschaftlers" deutlich macht. Damit erhellt er auch das Vorfeld der katholischen Modernismuskrise des frühen 20. Jahrhunderts.

AUS DEM INHALT

Frühe Jahre → Studienzeit → Nach dem Studium: Seminarist und Vikar → Repetent in Tübingen → Gymnasialprofessor in Rottweil → Universitätsprofessor in Tübingen: Nachfolger Aberles → Der Nachfolger Kuhns: Apologetik und Dogmatik → u.a.

▼ WISSENSCHAFTSGESCHICHTE



2013. 229 Seiten. Kart.
€ 44,–
ISBN 978-3-515-10270-4

DER HERAUSGEBER

Achim Engelberg studierte Geschichts- und Theaterwissenschaften, promovierte über John Berger. Als Journalist bereist er Europa, als Historiker publiziert er Bücher und wertet den Nachlass seines Vaters in der Staatsbibliothek zu Berlin, Preußischer Kulturbesitz, aus.

Ernst Engelberg

Wie bewegt sich, was uns bewegt?

Evolution und Revolution in der Weltgeschichte
Herausgegeben, bearbeitet und ergänzt von **Achim Engelberg**
Mit einer Einführung von **Peter Brandt**

„In diesem Sinne halte ich es, salopp gesprochen, damit, dass die beste Theorie diejenige ist, die man in der Geschichtsdarstellung kaum merkt." – Ernst Engelberg (1909–2010) leitete nach seiner Zeit als Direktor des Akademieinstituts für deutsche Geschichte jahrelang die Forschungsstelle für Methodologie und Geschichte der Geschichtswissenschaft. Sein Vorhaben, seine theoretischen Schriften zu überarbeiten und zu ergänzen, blieb fragmentarisch. Achim Engelberg verdichtet in diesem Band verschiedene publizierte und auch unveröffentlichte Arbeiten seines Vaters und fügt sie unter zentralen Fragestellungen zusammen: Was brachten die Werke von Marx und Engels für die Geschichtsbetrachtung? Was ist Weltgeschichte, was eine Revolutionsepoche? Wie ist das Verhältnis von Innen- und Außenpolitik, wie geschieht eine Revolution von oben?
Der Band skizziert in straffen Linien die Hauptstränge der historischen Entwicklung Europas und bietet Nachdenkenswertes über Geschichte am Ende eines langen Forscherlebens.