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## INCONSISTENT INTERPRETATIONS OF MARXIAN METHODOLOGY IN THE HISTORY OF SCIENCE

In the socialist countries during the 1970s the paradigm which—following Marx—considered science as a particular “intellectual production” had been formulated.<sup>1</sup> The books enumerated in the footnote are not in the field of history of science, but, having general character of the sociology and philosophy of science, they may exert an influence on historiography as well. For example, this paradigm was treated in the monograph *Socialism and Science* edited by the outstanding science historians: Soviet S. R. Mikulinsky and Czechoslovak R. Richta. They, too, have co-edited *The Foundations of Science of Science*.<sup>2</sup> These works summarize the Marxian conception of science and as such they are authoritative to historiographers of science. Some authors—e.g. Kelle, Laitko and Ruben—formed this conception relying directly on Marxian texts.<sup>3</sup> Marx calls the process of the production of people’s ideas an “intellectual production”. And there are many references to another idea of Marx which specifies science as universal labour: “Universal labour is all scientific labour, all discovery and all invention. This labour depends partly on the cooperation of the living, and partly on the utilization of the labours of those who have gone before.”<sup>4</sup> Marx’s *Grundrisse* influenced greatly the emergence of the paradigm of science as an intellectual production.<sup>5</sup>

<sup>1</sup> V. Zh. Kelle, “Science as a Form of Intellectual Production”, in *Sociology of Science and Research*, ed. by J. Farkas, Akadémiai Kiadó, Budapest 1979; H. Laitko, *Wissenschaft als allgemeine Arbeit*, Akademie Verlag, Berlin 1979; Farkas János, *A tudomány társadalmi lényege (The Social Essence of Science)*, Akadémiai Kiadó, Budapest 1982. In Hungarian.

<sup>2</sup> *Socialism and Science*, ed. by S. R. Mikulinsky and R. Richta, Nauka, Moscow 1981. In Russian; *Foundations of Science of Science*, ed. by N. Stelánov, H. Iagiel, J. Farkas, S. Kröber, I. Malecki, S. R. Mikulinsky, R. Richta, Nauka, Moscow 1985. In Russian.

<sup>3</sup> K. Marx, “The German Ideology”, in K. Marx and F. Engels, *Works*, vol. 3, Moscow 1955, pp. 26, 59—60.

<sup>4</sup> K. Marx and F. Engels, *The Capital*, vol. 3. Moscow 1966, p. 104. In Russian.

<sup>5</sup> K. Marx, “Critique of Political Economy”, Part 2, in K. Marx and F. Engels, *Works*, vol. 46, Moscow 1969, pp. 206—208. In Russian.

Incidentally, both in West-European and U. S. history of science and theory of science the trend studying the process of the social production of science had been unfolding during the second half of the 1970s.<sup>6</sup>

I myself have recognized and accepted this paradigm when analysing Marxian texts and György Lukács's works.<sup>7</sup> For me the approach of Lukács proved to be relevant because its starting point not epistemological but ontological; for it is not indifferent at all whether we start from the unity of social reality as existence that embraces the natural environment and the forms and institutions of thinking as well, or we depart from a segment of reality, i.e. its cognition. If, based on Lukács, we accept the ontological approach, the neo-Kantian and neopositivist conceptions of science, being concerned with science only epistemologically, can be subject to criticism. For example, the foundations of science are jeopardized by neopositivism since in its interpretation individual disciplines are decomposed to their isolated constituents, and it does not ascribe any importance to studies of a reality existing in itself. Thus, empiricism without theory and a "pure" theory having hardly any contacts with reality may emerge. The reduction of the scientific outlook partly to "empirism" and partly to "pure" theory is dangerous, especially for the social sciences, because this gives way to their manipulation.<sup>8</sup> So the attempt of Lukács, who based the philosophical conception of the world on existence, seemed to me to be fruitful, for some prospects of preventing scientific foundations from disintegration opened up. In my opinion the ontological philosophy of Lukács covers both objective reality and science. This is why the critique stating that Lukács failed to differentiate clearly between science and philosophy cannot be accepted.<sup>9</sup> That is, in *Ontology* theory and practice do not coincide, for the totality of social practice supposes the development of various complexes, e.g. that of science, functioning within totality as well.

When writing *Ontology* Lukács turned to Marx's methodological principles. These were expounded most clearly in the Introduction to Marx's *Grundrisse*.<sup>10</sup> I think this methodology is relevant to the historians of science, too, owing to its generality. More precisely, the historian of science who wants to study his subject with a Marxist approach should use this methodology. At first Marx departs from the concrete production process and proceeds towards the general

<sup>6</sup> See e.g. E. Mendelsohn, P. Weingart, R. Whitley, *The Social Production of Scientific Knowledge*, Reidel, Dordrecht, Holland 1977.

<sup>7</sup> G. Lukács, *A munka (The Labour)*, Magyar Filozófiai Szemle, Budapest 1972, vols. 1—2; G. Lukács, *Zur Ontologie des gesellschaftlichen Seins (On the Ontology of Social Existence)*, vols. 1—3, Magvető Kiadó, Budapest 1976.

<sup>8</sup> Comte and Taine separated economics and sociology from each other in the nineteenth century.

<sup>9</sup> See G. H. R. Parkinson, *Georg Lukács*, London—Boston 1977, pp. 145—146.

<sup>10</sup> K. Marx, *Grundrisse der Kritik der politischen Ökonomie*, Dietz Verlag, Berlin 1974, pp. 3—31.

determinateness of production. Then, from the aspect of "accomplished" generality he analyses the concrete determinateness of abstract categories. Naturally, this methodology refers to material production and the categories of political economy. But as has been mentioned, the experts conceiving science as intellectual production use this methodology as an analogy. Although Marx calls "production in general" a rational abstraction, he directs our attention to the limitations of this concept: "[...] even the most abstract categories, in spite of the fact that—by virtue of their abstract character—they are valid for all periods, still in the determinateness of this abstract nature, they are also products of historical relations and are fully valid solely for and within these relations."<sup>11</sup>

And the other side of the problem is that categories as general determinatenesses, too, exist only under definite social conditions. For example, the category of work postulates the existence of definite conditions, i.e. Marx makes a clear distinction between production and its conditions. Further on, he differentiates between conditions and basis. Conditions are those of the individual engaged in production; the basis is the totality of the natural endowments and conditions of a definite community. Since Marx regards the conditions of the activities of the individuals in production as social conditions, he is able to discuss, fully, the real links among the individual's activity, society as a whole and nature. That is, the relation between the individual's activity and nature as a basis is established by the social conditions of productive activities. Science as an intellectual production as well emerged on the basis of the individual-society-and-nature relationship. The emergence of sciences is a particular social response to physical conditions. The tendency in modern sociology of science, which studies the social production of knowledge, is to be concerned with the interrelationship of the cognitive, social and communal structures of scientific research.<sup>12</sup> This tendency appeared at the concurrence of the sociology of knowledge and the sociology of science in the 1970s. Up till now it has had no traceable effects on the history of science—at least, I do not know about it—but, theoretically, there is nothing to prevent us from applying its paradigm retrospectively in historical analyses.

The new approach which conceives the physical, technological, and social aspects of the production of knowledge as interacting ones has two sources. On the one hand, there is the Marxian heritage of the working process and production, on the other hand, parallel to this—and principally in the form of the so called "strong programme"—a group of experts (mostly in England)

<sup>11</sup> *Ibid.*, p. 25.

<sup>12</sup> M. Mulkay and V. Milič (ed.), "The Sociology of Science in East and West", *ISA, Current Sociology*, vol. 28, No. 3, Sage Publications, 1980; K. D. Knorr-Cetina, M. Mulkay (ed.), *Science Observed: Perspectives on the Social Study of Science*, Sage Publications, London—Beverly Hills—New Delhi, 1983; K. D. Knorr-Cetina, *The Manufacture of Knowledge*, Pergamon Press, Oxford 1981.

elaborated an approximately similar conception.<sup>13</sup> However, the methodology of Marx has not been realized consistently in the interpretation of Lukács, e.g. his analysis of the means of production is divided into a physico-technological part and a social one. The reason of this is—according to Balogh—that the relation of ontology in general to social ontology, i.e. that of nature to society, is left unresolved with Lukács.<sup>14</sup> Partly the Lukácsian differentiation between “production” and “social production” is problematic, and partly, the departure from the general concept of work is questionable as well. Balogh points out that “Lukács departs not from some given historical form of production but from a structural description of work which he assumes to be the model of social practice as a whole. Consequently, Lukács is compelled to link all the important social activities directly into this notion of work, to derive them ‘genetically’ right from the concept and model of labour. Furthermore, he is constrained to mention only as an isolated example—or to ignore it altogether—the real social history of the formation of social objectivations, activities and spheres.”<sup>15</sup>

Thus we arrive at the history of the origin of sciences: “Scientifically-bent thinking, and later the various natural sciences, took shape in the course of the preparation and realization of the working process, from the tendencies in the search of tools toward self-reliance. Of course, this takes place not in the way that a new area of activity suddenly arises from another, but this genesis comes to pass recurrently in the entire history of the sciences, even today, in grossly disparate forms, though.”<sup>16</sup> Lukács originates other social institutions and activities, e.g. law, from work in general. However, this does not promote the investigation of concrete historical social formations. This thesis was criticized even by his disciples: “The fact that certain basic categories of social ontology come into being in work does not mean that work can serve as a model of heterogeneous forms of activity, i.e. obviously, the categorial structures of various forms of activity differ from each other decisively.”<sup>17</sup> Thus, from the abstract concept of work the phenomena of scientific and intellectual production, which are always bound to definite production relations, cannot be deduced. Of course, Marx, too, uses the abstract concept of work: “[...] work is posited in a form in which it exclusively is man’s own”; then the simple phases of the working process present themselves: expedient functional activity, i.e. “work

<sup>13</sup> B. Barnes, *Scientific Knowledge and Sociological Theory*, Routledge and Kegan Paul, London 1974; D. Bloor, *Knowledge and Social Imagery*, Routledge and Kegan Paul, London 1976.

<sup>14</sup> I. Balogh, “A Philosophical Inquiry into Socialism: Lukács Ontology”, in *Socialism in the World*, Beograd 1983.

<sup>15</sup> *Ibid.*, pp. 187—188.

<sup>16</sup> G. Lukács, *A társadalmi lét Ontológiájához (Ontology)*, Magvető, Budapest 1976, vol. 2, pp. 31—32.

<sup>17</sup> A. Heller, M. Vajda, F. Fehér, Gy. Márkus, *Megjegyzések Lukács elvtársnak az Ontológiáról, 1968—1969 (Comments on Comrade Lukács’s Ontology, 1968—1969)*, Magyar Filozófiai Szemle, Budapest 1978, p. 106. In Hungarian.

itself, the object of work and the means of work".<sup>18</sup> But Marx has another concept of work in which he conceives work, on the one hand, as a human (physical and intellectual) effort, on the other hand, as a concrete expedient activity. When considering the great many kinds of work, he sees as a common feature in them the fact that they have the duality of abstract and concrete sides, and this duality differs historically. This concept of work gives way to the deductions of concrete social and economic objectivations from it. But Lukács' duality of causality and teleology does not provide the same constitutive element from which objectivations and the categories corresponding to them may emerge. Causality and teleology can be found in every social formation. This is why they are only abstract and extensive generalities. "So when Lukács chooses the duality of the causality and teleology of work, and not that of concrete and abstract work, as the theoretical and structural starting point of *Ontology*, seemingly, he does nothing but 'regress' from the Marxian category of work to a more general and more primordial category. But by disregarding the methodological consequences of this seemingly simple procedure, he forthwith lands on such a starting point where he is no longer offered the opportunity for exploring the concrete route of social history, the various concrete social forms, and merely a pseudogenetic explication of concept can be executed."<sup>19</sup> Marxist philosophers of science who have come to the paradigm of "intellectual production" without relying on the interpretation of Lukács, commit the same mistake. Owing to their starting from the abstract Marxian concept of work which can be found in *Capital*, Vol. I, they, like Lukács, although independently of him, neglect, necessarily, the historically concrete categories and objectivations of value, exchange value, capital, and use-value. I must emphasize that this paradigm of Marxist philosophy of science is still quite new. This is why it has been able to penetrate the approach of science historians. But all is not lost that is delayed: sooner or later this paradigm may be tried, primarily, among Marxist historians; therefore I should like to forewarn about the ensuing theoretical and methodological problems.

Naturally, the question may be posed: Why did Lukács choose the theoretical abstract category of work as the basic category of *Ontology* from the theoretical abstract and concrete abstract categories of work elaborated by Marx? The above-mentioned István Balogh says that, actually, in his posthumous work Lukács outlines the perspectives of communism. This will be the social formation in which teleology will appear as an end in itself since man's aim is the maximal improvement of his intellectual and physical capabilities, and causality as the world of richness will be the basis of this end. The duality of causality and teleology is actually, that of necessity and freedom, which will be resolved by communism, and thus alienation will cease. Since the former and today's societies have not been able to get rid of alienation, Lukács

<sup>18</sup> K. Marx, *The Capital*, *op. cit.*, pp. 168—169.

<sup>19</sup> I. Balogh, *op. cit.*, p. 191.

takes refuge in the categories of future relationships ("sollen"). Thus, for the analysis of the relationships of "sein" his system of categories is inadequate, and the criteria of its validity will be transferred to the world of possibilities, i.e. to the future. Although he does not express this explicitly, since he thinks his categories to be valid both for past and present, Lukács outlines the society desired, where teleological assumption and the man making the assumptions find each other. However, for today's studies in science history, a more creative approach appears to be the experiment of the theory of science which is able to concretize the relationship of teleological assumption and causal chain as the contradictions between intellectual work and physical labour, theoretical activities and everyday life, as well as those between the scientific management and executions of social processes. József Szigeti's tetralogy seems to be such a significant undertaking. In his volume published so far he traces, promisingly, the process of how scientific cognition has been separated from the material working process; how the subtler forms of intellectual cognition have appeared which, for the time being, do not derive directly from production any longer, but exist historically and functionally by it.<sup>20</sup> Szigeti points out that the foundations of the "economy of thoughts" are included in real economy. "[...] science is rooted—mostly in its original forms—in the statistical spread, the frequent, the everyday, the repeated and the general."<sup>21</sup> The most important thesis of his work is the elaboration of the communications which emerge between the work operations of material and intellectual productions. Szigeti makes a distinction between "an upward" relationship of determination and a "downward" one. The "object of work → working tool → target" chain is the Individual—Particular—General (downward) categorial form of communication, and the relationship of determination General—Particular—Individual (upward) expresses the line of analysis of the "target → working tool → object of work" chain. The historic impact of material production on science takes place in the I—P—G (downward) relationship of determination, and intellectual production exerts an influence on material production in the first G—P—I (upward) form of mediation.<sup>22</sup> I regard this system of categories as highly appropriate for the application to studies of science history and of sociology of science, but here there is no time for a detailed exposition of it.

Summing up the afore-mentioned, I am convinced that the efforts made in the theory of science and philosophy of science based on the Marxian categories of abstract and concrete work will provide the most significant methodological help to historians of science, since the concrete relationship between theory and practice cannot be revealed without taking into account

<sup>20</sup> J. Szigeti, *Dialektikus materializmus—rendszer és módszer: A tudományos gondolkodás forradalma I (Dialectical Materialism—a System and Method: The Revolution of Scientific Thinking)*, Kossuth K., Budapest 1984. In Hungarian.

<sup>21</sup> *Ibid.*, p. 53.

<sup>22</sup> *Ibid.*, pp. 199—260.

the role of material production. At the same time, the real alienation of material production and intellectual (scientific) production from each other cannot be resolved either, if we tried to seize it by the same categories of thought which themselves are the products and expressions of this alienation. A point of view must be found which would grasp the totality of the social wholeness (including material and intellectual productions) in its totality, indeed, and not only along the partial aspects. The elaboration of this point of view (paradigm) is going on all over the world. The formulation of it for historians of science would be important as soon as possible, in order to get rid of the positivist method of the history of science, describing facts in an externalizing and historicizing way.

#### SUMMARY

Marxist sociologists of science usually derive the social essence of science from the working process. The methodological problems of this argumentation being when they depart not from some given historical form of production but from a structural description of work which they assume to be the model of social practice as a whole. Consequently, they are compelled to link all the important social activities (e.g. science, too) directly into this notion of work, to derive them "genetically" right from the concept and model of labour. Furthermore, they are constrained to mention only as an example—or to ignore it altogether—the real social history of the formation of social objectivations, activities and spheres. Thus are we led to the history of origin of the sciences.