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Dialectical Materialism in Soviet Science and Philosophy

SCIENCE AND PHILOSOPHY IN THE SOVIET UNION. By *Loren R. Graham*. New York: Alfred A. Knopf, 1972. xii, 584 pp. \$15.00.

Among Western scholars, dialectical materialism has provoked a variety of negative reactions ranging from ennui to fulmination. Its claims to philosophical merit are frequently rejected out of hand: dialectical materialism has been called an "utterly inadequate philosophy,"¹ "not really a theory at all . . . [but] a kind of preliminary patter to prepare the mind for historical materialism,"² a "jumble of truisms and borrowings from positivism and Hegelianism which violently contradict one another,"³ and simply "a philosophical farrago."⁴ In its impact on the sciences, dialectical materialism has typically been seen as not merely inadequate but positively pernicious—as a conceptual strait jacket forced upon Soviet scientists and responsible for Lysenkoism and other dark chapters in the history of science in the USSR.

Graham's exhaustive study of the relations between science and philosophy in the Soviet Union is a refreshing change from all that. Calling contemporary Soviet dialectical materialism an "impressive intellectual achievement" (p. 430), Graham argues that eminent scientists have accepted the position willingly and have thrived on it. "It is the thesis of this book," Graham writes, "that despite the bureaucratic support of the Soviet state for dialectical materialism, a number of able Soviet scientists have created intellectual schemas within the framework of dialectical materialism that are sincerely held by their authors and that, furthermore, are intrinsically interesting as the most advanced developments of philosophical materialism" (pp. 3–4). Graham is less confident of the actual positive impact of dialectical materialism on scientific theory and research in the USSR, but he asserts it nevertheless as a secondary thesis: "I am convinced," he states, "that dialectical material-

1. Alfred G. Meyer, *Communism*, 3rd ed. (New York, 1967), p. 26.

2. John Plamenatz, *German Marxism and Russian Communism* (London, 1954), p. 18.

3. J. M. Bocheński, *Soviet Russian Dialectical Materialism (Diamat)* (Dordrecht, Holland, 1963), p. 114.

4. H. B. Acton, *The Illusion of the Epoch: Marxism-Leninism as a Philosophical Creed* (London, 1955), p. 271.

ism has influenced the work of some Soviet scientists, that in certain cases these influences helped them to arrive at views that won them international recognition among their foreign colleagues" (p. 6). These theses are argued in eight meaty chapters, each covering one area of Soviet scientific theory: quantum mechanics, relativity theory, cosmology and cosmogony, genetics, the origin of life, structural chemistry, cybernetics, and physiology and psychology.

Even apart from the value of his novel theses, Graham's study is a monumental contribution to our understanding of intellectual life in the Soviet Union. In each of the areas discussed the book examines Soviet science in detail, tracing the origin and development of the theoretical approaches now prominent in the USSR, analyzing historical and current disputes within Soviet scientific thought, and comparing Soviet with non-Soviet positions. Only in the case of genetics (and possibly cybernetics) are there in print more complete and equally up-to-date analyses of Soviet science.⁵ In each of the other fields Graham's chapter is the best study now available, and the treatment of all these fields together is a scholarly tour de force. Furthermore Graham weaves his way through the complexities of the various sciences with admirable clarity and ease. The book is not for the scientific tyro; it is not a popularization. But no one moderately familiar with the fundamentals of the sciences discussed should have difficulty following Graham's presentation.

Let us, however, concentrate on Graham's theses concerning the status and the value of dialectical materialism, for these theses have a bearing not only on Soviet work in the natural sciences but on the whole question of the philosophical underpinnings of contemporary Soviet thought. Graham proposes a wealth of evidence for his conclusions, following a few distinct but complementary lines of argument.

First, Graham offers the familiar fact that Soviet scientists say that they espouse dialectical materialism. Cynical Western scholars are inclined to discount such utterances as products of political pressure: poor Soviet scientists—not only are they hobbled by a deficient view of reality, they are made to sing the praises of the very theoretical chains that bind them. But Graham bids us reconsider this attitude in the light of certain facts. For one thing, the utterances he cites come not from political hacks but from eminent scientists, men who have made significant, internationally recognized con-

5. David Joravsky, *The Lysenko Affair* (Cambridge, Mass., 1970); Zhores A. Medvedev, *The Rise and Fall of T. D. Lysenko*, trans. I. Michael Lerner (New York, 1969). I have not seen (nor does Graham cite) Peter Kirschenmann's *Information and Reflection: On Some Problems of Cybernetics and How Contemporary Dialectical Materialism Copes with Them* (Dordrecht and New York, 1970), which was originally published in German in 1969.

tributions in their fields: V. A. Fock in quantum mechanics and relativity, V. A. Ambartsumian in cosmology, A. I. Oparin in biology, S. L. Rubinshtein in psychology, P. K. Anokhin in physiology. Can all these distinguished scholars be philosophical hypocrites? Another consideration is that often the utterances have been made in circumstances in which they could just as easily have been avoided—during periods of lessened political pressure, for example, or in philosophical essays that need not have been written. Such reasoning by itself may not be entirely convincing, and Graham admits that there is no way to prove beyond the shadow of a doubt that a scientist's protestations of devotion to dialectical materialism are in fact sincere. But Graham's arguments do suggest a certain implausibility in the traditional hypothesis of universal or general hypocrisy. Perhaps the time has come to consider the far simpler hypothesis that Soviet scientists mean what they say when they say they accept dialectical materialism. Exactly what this signifies, however, and whether in fact it lends support to Graham's secondary thesis concerning the guidance provided by dialectical materialism, are further questions.

A second tack taken by Graham consists in arguing that the prominent outbreaks of pseudoscience and cases of the misdirection or confinement of scientific theorizing in the USSR are attributable, not to the control of Soviet science by dialectical materialism, but to the political enforcement of dogmas not logically connected with dialectical materialism. The chief illustration is, of course, Lysenkoism. With Joravsky, Graham believes that Marxist theory played only a minor role in the rise and triumph of Lysenko's views. He argues convincingly that the inheritability of acquired characteristics and the use of "vernalization" to alter heredity were not initially urged on any sort of theoretical grounds, either by Lysenko himself or by Marxist philosophers; only much later were reluctant philosophers required to provide a basis for these conceptions. Far more important in recommending the views, Graham holds, were Lysenko's peasant origin, his scrupulous adherence to every agricultural policy promoted by the party, his ability to mobilize and organize the labor of the newly collectivized peasants—for in the early and mid-thirties, Graham points out, "the primary question of the times was not so much whether vernalization would work as whether the peasants would work" (p. 208)—and finally the patronage of party leaders (though not, perhaps, of Zhdanov; in an interesting appendix Graham presents a case for questioning Zhdanov's presumed backing of Lysenko).

But Graham wishes to contend not only that Marxist principles played little part in the acceptance of Lysenko's theories, as a matter of historical fact, but also that there is no philosophical basis in Soviet Marxism for the theories. "Nowhere in systematic dialectical materialism," Graham states, "can support for these views be found" (p. 6). At first glance this contention seems to fly in the face of obvious conceptual links; certainly the bulk of

philosophical opinion has been that the Lysenko position is at least more in the spirit of dialectical materialism than is modern genetics. Gustav Wetter, for example, spoke of the “all-embracing concord between the Michurin-Lysenko theory and dialectical materialism,” arguing that because the theory denied “fixed unalterable species” it was “in striking accord with one of the basic principles of dialectical materialism, which rejects all unchangeable entities as ‘metaphysical.’”⁶ Again, Lysenkoism would appear to be an excellent illustration of the dialectical unity of an entity with its environment, stressed by Engels in *Anti-Dühring* as well as subsequently by Stalin: the organism changes not independently and haphazardly but in close connection with its immediate surroundings. Furthermore, Lysenkoist biology seems to conform nicely with the principle of the “unity of theory and practice”: arising out of agricultural experience in the field, it was a theory designed for direct practical application.⁷

Graham counters all of these supposed affinities of dialectical materialism for Lysenkoism as opposed to genetics, and it must be said that his arguments are telling. The gene is not permanently “unalterable”; and if its mutation is far slower than that of the plant under the Lysenko system, there is nothing in dialectical materialist philosophy to give the preference to the more rapid alteration: dialectical materialism is indifferent with respect to the empirical question of rate of change. A similar indifference or openness prevails concerning the “dialectical unity” of an entity with its environment. The “unity” is not as demanding as it may seem to be: it is consistent with the fact that a given entity (a seed, a stone) may persist over an indefinitely long period without being fundamentally altered by its environment; and thus it is certainly consistent with modern genetics, which does not assert an absolute isolation of the genotype from surrounding influences. Finally, the principle of the unity of theory and practice does not require immediate applicability of all scientific theories. Graham explains that the principle “is based on an unstated concept of time: Any theoretical development in science *should* be quickly applied, said the dialectical materialists, but how quickly was not specified” (p. 235). Thus the theory is sufficiently open to accommodate both positions easily.

All of this represents a signal service, for Graham is pointing to a distinction frequently overlooked by students of Soviet thought and society: the distinction between the actual logical requirements of dialectical materialism as a philosophical system, and the dogmatic requirements which are *thought* or *decreed* to be essential to dialectical materialism at any given point by

6. Gustav A. Wetter, *Dialectical Materialism: A Historical and Systematic Survey of Philosophy in the Soviet Union*, trans. Peter Heath (London and New York, 1958), pp. 190, 468.

7. *Ibid.*, p. 467.

some political authority. Graham is clearly right: there is no reason why a theory of the inheritability of acquired characteristics is more appropriate to dialectical materialism than the denial of that theory is. Yet for a number of years after 1948, Soviet philosophers were successfully urged to treat that theory as logically bound up with dialectical materialism. A similar phenomenon may be seen in other areas of Soviet thought as well: there is no reason why a Marxist aesthetic theory, even one called "socialist realism," should require Soviet socialist reality to be portrayed only in a favorable or "positive" light; but that familiar demand was enforced in the USSR for years as a necessary ingredient of a Marxist philosophy of art. For an adequate understanding of Soviet culture it is essential to make such distinctions between philosophical requirements and political requirements, and one of the virtues of Graham's book lies in doing just that.

Ironically, however, this very contribution casts a shadow over the remainder of Graham's argument. For in demonstrating that dialectical materialism is so indeterminate with respect to the empirical state of the world that it is consistent with the most diverse scientific theories, Graham is showing the indefiniteness or lack of positive content of dialectical materialism as a philosophy of nature. Not only in genetics is this the case: in the other fields of science as well, Graham shows that dialectical materialism permits broad disagreement among Soviet scientists—a range of disagreement comparable in many cases to the differences of opinion found in the West. But if that is so, two doubts arise: (1) It becomes difficult to understand how so undemanding a philosophy could significantly direct, structure, or otherwise influence scientific theory and research. (2) It becomes difficult to see why so indeterminate a philosophy should be called an "impressive intellectual achievement." The grounds for each of these doubts may be developed more fully.

(1) In none of the sciences does Graham appear to find genuinely compelling evidence of the positive impact of dialectical materialism. All that seems to be shown in each chapter is that Soviet scientists' work is *consistent* with dialectical materialism—which is of course not surprising given the contention that the philosophy has an indeterminate character.

Oparin's view of the emergence of life from nonliving matter is a scientific conception identified by Graham as one "in which dialectical materialism may have played a role" (p. 437). The connection between the philosophy and the scientific view in this case is apparently found in the fact that "dialectical materialism has been deeply penetrated by the concept of an over-all development of matter, with no impassable barriers" (p. 296). But at the same time Graham asserts that this concept is not logically essential to the philosophical view: "Nothing in the philosophic system of a materialist absolutely requires him to believe that living matter on earth evolved from

nonliving matter. . . . he can maintain that matter has existed eternally in the universe in *both* its living and nonliving forms" (p. 295). This is indisputably true. But then in what way is *dialectical materialism* responsible for the Oparin position? Seemingly the position is rooted not in dialectical materialism but in an associated unnecessary assumption—giving us a situation which is logically indistinguishable (though politically and historically quite different) from the Lysenko controversy, where associated unnecessary assumptions were provided by Soviet philosophers on demand to buttress one scientific theory against another.

To take an instance of another type, P. K. Anokhin's work on the conditioned reflex is also said to show the productive influence of dialectical materialism. Graham paraphrases Anokhin's own statement of the connection as follows: "Not only does dialectical materialism cite space and time as the forms of existence and movement of matter, but it characterizes all matter as possessing the property of reflection. Therefore, the conditioned reflex must be described in terms of space and time, and it must be a reflection within living matter of material conditions external to living matter" (p. 420). To begin with, nothing in the second sentence follows from the philosophical premises laid down in the first sentence. One might as well say "therefore consciousness must be described in terms of space and time" or "therefore the institution of marriage must be described in terms of space and time"—propositions not all dialectical materialists would be eager to accept. And from the presumed fact that all matter possesses the property of reflection it does not follow that the conditioned reflex must *be* a reflection, or be a reflection of conditions *external* to *living* matter, or indeed have anything to do with reflection at all. Furthermore the fact that Anokhin does use the categories of space and time in describing the conditioned reflex certainly establishes no connection with dialectical materialism, which has no monopoly on those highly general terms. Even Anokhin's subsequent use of the term "reflection" in discussing the conditioned reflex establishes nothing more than a verbal link with dialectical materialism, for that term itself stands for a notion which is nearly as broad and as inoffensive to other philosophical outlooks as are space and time. As a general characteristic of matter, "reflection" is regarded by dialectical materialists as the "property" which every material thing has of reacting in definite (but unspecified) ways to definite (but unspecified) "external" influences. In practice it frequently seems indistinguishable from the tautology that things are influenced by what influences them. Thus Graham quotes the psychologist S. L. Rubinshtein as stating that "this property of reflection is expressed in the fact that every thing is affected by those external influences to which it is subjected" (p. 385). Such a view is hardly in danger of contradiction: for if A is *not* affected by B, then B is not an *influence*, or at least not one to which A is *subjected*.

In any event, actual intellectual connections, beyond verbal echoes and broad consistencies, do not seem to be established in either instance. Hence if dialectical materialism deserves no blame for Lysenko, it is hard to see why it deserves credit for Oparin and Anokhin.

Graham's case cannot fairly be judged, of course, on the basis of these instances alone, for the book considers a great many such possible links between dialectical materialism and the work of Soviet scientists. Furthermore, Graham claims for dialectical materialism only a rather generalized impact—what he calls an “important educational or heuristic value”—without contending that the philosophy has “immediate utilitarian value to scientists in their work” (p. 430). But the examples above are cited to suggest that perhaps the connection between dialectical materialism and Soviet science is even more tenuous than Graham believes. Indeed some of his own statements appear to imply as much, as when he writes that dialectical materialism “would never predict the result of a specific experiment” (p. 439). If that is so, then the result of no experiment can be inconsistent with dialectical materialism, or in other words the philosophy is compatible with any state of the universe whatever. Which is to say that dialectical materialism makes no actual commitment concerning the real world, and so could scarcely be thought to offer much in the way of guidance to the scientist.

(2) Graham is certainly justified in holding that dialectical materialism has been the victim of a bad press in the West. Critics, mistaking clumsy political accretions for philosophical development, have failed to consider that the philosophy beneath this overgrowth may have virtues which recommend it to scientists (and others) in the Soviet Union and which elicit the positive responses Graham cites. When it comes to identifying the virtues, however, there is a hypothesis other than Graham's which seems at least as compatible with the evidence in the sciences and elsewhere. That hypothesis is that dialectical materialism, rather than being an “impressive intellectual achievement” valued for its scientific suggestiveness, is an increasingly indeterminate or open theoretical structure valued for its intellectual permissiveness.

The permissiveness was made possible in the beginning by the theoretical insouciance of Marx, who had (he thought) more urgent things to do than polish philosophical principles. It was promoted by Engels, who, in his attempts to express the ideas of the master more fully and more attractively, actually subjected them to a process of progressive attenuation. In his letters to Bloch, Schmidt, and others in the 1890s, Engels reformulated historical materialism to assert not that economic causes are alone active but that economic causes are alone *ultimately* active, thereby rendering Marxian economic determinism vacuous, since no time limit was ever specified for the “ultimately” and in the meantime anything could cause anything. Engels sought also to develop the principles of the “dialectic” which Marx claimed

to have rescued from its Hegelian mystifications, but he succeeded only in enunciating three “laws” so vaguely that no one has ever known quite what to make of them. It is interesting to note that Graham, though he refers to the laws often and discusses them at some length in an introductory chapter on the elements of dialectical materialism, does not ever attempt to formulate them fully or precisely. Past attempts to state them have encountered a dilemma: when given positive content, the “laws” prove to be empirically false; when qualified to avoid empirical disconfirmation, they become tautologically noncommittal. The latter result has generally been deemed preferable to the former by dialectical materialists, to the point that the three laws of dialectic have become, in Acton’s measured phrase, “formulae which may be used to express any state of affairs that it is desired to bring within their ambit.”⁸

Lenin did for materialism what Engels did for dialectics—broadened it to accommodate a great range of possibilities. Neither Marx nor Engels had defined the key term “matter.” Faced with threatening developments in the physical sciences and philosophy in the early twentieth century, Lenin both expanded and legitimized the indefiniteness of the founding fathers by defining “matter” as the “objective reality which is given to man in his sensations”⁹—a conception ample enough to embrace virtually everything but gods and ghosts. This was a stroke of tactical philosophical genius, for it put dialectical materialism beyond the reach of empirical refutation on this score: whatever the sciences find presented to us, *that* is matter. But it also, of course, rendered “materialism” indistinguishable from any other realist position with an empiricist basis.

The exigencies of constructing socialism under Stalin were thought to require greater content and precision in a number of intellectual areas than were obtainable from the principles of Marxism; hence those areas had to be built up by external means. A good many of the scientific, educational, aesthetic, and political doctrines we think of as elements of “Soviet Marxism” were provided ad hoc by party decisions during the thirties and forties, along with the concept of *partiinosť* to justify them—all in the name of dialectical materialism (or of its social “application,” historical materialism) but with no actual justification in the principles of that capacious outlook. Conversely, de-Stalinization in philosophy has consisted in the gradual removal or neutralization of these supernumerary, politically imposed dogmas, to reveal not some original Marxist truth but the original indeterminacy, and hence room for debate and for genuine philosophical development. Curiously enough, even some of the political dogmatizations had as their most lasting

8. Acton, *Illusion of the Epoch*, p. 101.

9. V. I. Lenin, *Materializm i empiriokrititsizm* (Moscow, 1952), p. 113.

consequence a further softening of Marxist principles. Thus when Stalin took a direct hand in the linguistics controversy in 1950, his contribution required the introduction of a “neutral,” nonsuperstructural class of cultural phenomena, thus providing a kind of historical materialist no-man’s-land in which formal logic, the natural sciences, and ultimately cybernetics could survive and flourish.

This is not to say that there is nothing left of dialectical materialism. But what is left is bland and tolerant, certainly no strait jacket (but also no guide-book) for the scientist or anyone else—an orientation that is broadly realist, empiricist, antimystical, unfavorably disposed toward reductionism in the sciences (though this last point is again not particularly stringent, since to say that higher levels must not be described in terms of lower does not commit one to the identification of any particular phenomenon or even any science as higher or lower). A prominent Soviet philosopher, P. N. Fedoseev, is reported to have said at a conference in Moscow a decade after Stalin’s death that dialectical materialism in the USSR requires agreement on only two points: that matter is primary and that the world is knowable. Given the flexibility of the Leninist conception of “matter,” this is surely the least demanding of modern philosophical programs.

Graham’s contention that Soviet scientists and philosophers have created interesting positions “within the framework of dialectical materialism” is both true and important. In many areas—not only in the sciences discussed by Graham but in philosophical disciplines such as logic, ethics, and aesthetics—Soviet thinkers are developing intelligent and sophisticated views. And these views are certainly consistent with dialectical materialism. But to go further and call the views themselves “dialectical materialist” would be to characterize them only in the most general and uninformative way. Consequently it seems somewhat misleading to state, as Graham does, that Soviet *dialectical materialism* has no peers among modern systems of thought with respect to “degree of development” (p. 430). The development is not in dialectical materialism but in Soviet science and philosophy; the former expression no longer says a great deal about the latter fields. Just as there is nothing in dialectical materialism that requires Lysenkoism in biology, so there is nothing that requires or even prefers particular answers to questions of causality raised in quantum mechanics, to problems concerning the interpretation of modal terms in modern logic, or to the issue in aesthetics as to whether “the beautiful” is a natural quality of things or a property created by human activity. Soviet scientists and philosophers are addressing themselves more and more to just such substantive issues, and their treatment of these issues is worth examining for its intellectual merits quite apart from any reference to the indulgent principles of dialectical materialism.