



**The  
Philosophy  
of  
Todor  
Pavlov**

**SOFIA  
PRESS**

<b>Academician P.N. FEDOSSEEV – A Great Philosopher and Revolutionary.....</b>	<b>9</b>
<b>Academician SAVA GANOVSKI – An Outstanding Scholar and Public Figure .....</b>	<b>13</b>

*Selected Pages from Todor Pavlov's Works*

<b>Theory of Reflection (Fragments) .....</b>	<b>27</b>
<b>Excerpts from Book One. Unity of Matter and Mind .....</b>	<b>33</b>
<b>Excerpts from Book Three. Unity of Theory and Practice .....</b>	<b>57</b>
<b>Excerpts from Book Five. Definition of Truth .....</b>	<b>81</b>
<b>Technology, Science and Man .....</b>	<b>127</b>
<b>Topical Problems of Lenin's Theory of Reflection .....</b>	<b>135</b>
<b>Against Robinsoniads. For a Marxist Social Pedagogy .....</b>	<b>217</b>
<b>Leninism in the Battle for Man .....</b>	<b>228</b>
<b>Lenin Teaches .....</b>	<b>245</b>
<b>Bibliography of Academician Todor Pavlov's Important Philosophical Works .....</b>	<b>247</b>

# THEORY OF REFLECTION

BASIC PROBLEMS  
OF THE DIALECTICAL AND MATERIALISTIC  
THEORY OF KNOWLEDGE

(Fragments)

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## CONTENTS OF THE ORIGINAL WORK

Preface to the First Bulgarian Edition

Preface to the Second Bulgarian Edition

Preface to the Third Bulgarian Edition

Preface to the Third Russian Edition

### BOOK ONE

#### UNITY OF MATTER AND MIND

**CHAPTER ONE** – Matter and Motion. Reflection as a Property Inherent to All Matter, Essentially Akin to but not Identical with Sensation

**CHAPTER TWO** – Matter and Life. Transition from Inorganic to Biological Forms of Reflection: unconsciously–reflex in plants and semi–consciously–instinctive in animals

**CHAPTER THREE** – Matter and Mind. Transition from Biological to Human and Conscious Forms of Reflection. Man's Scientific Thought as the Highest Form of Mind-Reflection

### BOOK TWO

#### UNITY OF OBJECT AND IMAGE

**CHAPTER ONE** – Object and Subject. The Idea as the Subjective Image of Objective Things

**CHAPTER TWO** – On the So-Called Primary and Secondary Properties of Things

**CHAPTER THREE** – Critique of the 'Criticism' of the Teaching of Dialectical Materialism on the Unity of Object and Image

### **BOOK THREE**

#### **UNITY OF THEORY AND PRACTICE**

**CHAPTER ONE** – Practice as the Basis, Aim and Criterion of Theory, Relative Independence and Effectiveness of Theory

**CHAPTER TWO** – Unity of Logical and Historical Method of Research and Exposition

### **BOOK FOUR**

#### **UNITY OF PHILOSOPHY AND THE SPECIAL SCIENCES**

**CHAPTER ONE** – Philosophy as the Most General Theory of Development and as World Outlook. Identity of Logic, Epistemology and Dialectics

**CHAPTER TWO** – Philosophy and Physics

**CHAPTER THREE** – Philosophy and Psychology

**CHAPTER FOUR** – Philosophy and Sociology

**CHAPTER FIVE** – Again on the Unity of Philosophy and the Special Sciences

### **BOOK FIVE**

#### **DEFINITION OF TRUTH**

**CHAPTER ONE** – Truths and Truth. Truth as the Supreme Form of the Subjective Reflection of Objective Reality in Man's Mind

**CHAPTER TWO** – Truth Has Its History as Well as Its Pre-History: Pre-Logical Thinking

**CHAPTER THREE** – Ideology as a Particular Type of Reflection of Social Being into Man's Social Consciousness. Ideology and Science

**CHAPTER FOUR** – Degrees and Types of Consciousness. Basic Forms of Scientific Thinking. Science and Truth

**CHAPTER FIVE** – Objective and Subjective Character of Truth

**CHAPTER SIX** – Abstract and Concrete Character of Truth

**CHAPTER SEVEN** – Absolute and Relative Character of Truth

**CHAPTER EIGHT** – Socio-historical and Individually-creative Character of Truth

**CHAPTER NINE** – Class-Party and Universal Character of Truth

**SUPPLEMENTARY CHAPTER** – The Theory of Reflection and Our Times.

A Few Supplementary Notes in Connection with Certain Misunderstandings.

Notes by the Author

Name Index

Subject Index.

EXCERPTS FROM BOOK ONE

UNITY OF MATTER  
AND MIND

MATTER AND MOTION. REFLECTION AS A  
PROPERTY INHERENT TO ALL MATTER,  
ESSENTIALLY AKIN TO BUT NOT IDENTICAL  
WITH SENSATION

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The entire history of philosophy is, as has been shown, nothing but the history of the origin, emergence and evolution of the scientific materialistic outlook and its laws. Insofar as materialism emerged and developed in its struggle against the idealistic currents, the history of philosophy is also the history of the struggle of materialism against idealism! Naturally, this struggle was not straightforward but passed through various zigzags, advances and retreats, mutual repudiations, compromises, etc.

In his classical work *Ludwig Feuerbach and the End of Classical German Philosophy*, Friedrich Engels demonstrated that philosophers were split into two great camps – idealists and materialists – depending on how they approached precisely this fundamental question of philosophy – the question of the relation of material being (matter) and consciousness or thinking (mind). But in that same work Engels himself points out that this question has two sides: it is a question of what is a primary and determining in the unity of mind and matter, and the question of how, why and to what an extent mind (thinking) is capable of the knowledge of the real world or of the material objective reality of which man himself, with his capacity to think, is a product, particle or function.

Further on we shall see how the different idealistic, materialistic and eclectic philosophical schools and individual authors have answered these questions. Here it is more important for us to note the following:

Once the first side of the fundamental question of philosophy is set and consistently solved, and if we solve it in materialistic sense, then inevitably we shall not only establish the fact that

thinking is a product and function of the material being, organized in a particular way, but we shall also have to accept that thinking too sets itself the task of scientifically cognizing matter and of practically mastering it, i.e. of creatively changing it with a view to man's possibilities and needs. This means that once the ontological problem (the first aspect of the fundamental question of philosophy) is raised and fully solved, in the final count it inevitably grows into an epistemological problem, i.e. the theoretical problem of knowledge (or the second aspect of the fundamental question of philosophy).

And vice-versa: the consistent solution of the epistemological problem inevitably leads to the solution of the ontological one.

Thinking (mind), taken as a product and function of the material being, of matter, organized in a specific way - and which we examine not only as something subjective and formal, but also as objective and content, thinking - has, above all, the task of providing us with scientific knowledge of the basic laws of the development of the objective material being. Conceiving human thinking in this very manner, we are bound to arrive at the formulation of the problem of its origin and dependence on material being. In other words, we cannot fail to raise the ontological question of the primacy of matter over mind. Scientific epistemology cannot break absolutely and once and for all with the problems of ontology. On the contrary, it has to raise them and solve them scientifically, i.e. it must not be a purely subjective, formal and meaningless epistemology, but an objective and meaningful theory or science of knowledge.

On the other hand, it was again Engels who demonstrated that thinking was nothing but a peculiar, highly complex and qualitatively specific form of motion, the latter being a basic form of the existence and manifestation of matter; and that the lower and less complex forms of motion were dialectically sublated (annihilated and at the same time preserved in a more developed form) in every higher form of motion: the chemical, physical and mechanical forms of motion are dialectically sublated in the biological form; the biological, chemical, physical and mechanical forms of motion in general are dialectically 'sublated' in the psychological form (in the form of mind or thinking).

And if this is so (a comprehensive analysis of thinking will show that this is indeed so), it is obvious that the complete and fully consistent scientific analysis of thinking, considered as the supreme form of reflection, is inconceivable without a scientific analysis of the biological, chemical, physical, mechanical and socio-historical material forms of motion. Consequently, though by different means, we again arrive at the same conclusion, viz. that scientific epistemology must invariably set itself and solve ontological problems as well.

At the same time there crops up here a particularly interesting and important question, likewise raised by Engels and especially by Lenin. The question is the following: in *Ludwig Feuerbach* Engels demonstrated that since the special sciences had defined their own spheres of explanation of reality and were solving their problems with their own specific methods and means, there remained for philosophy, if it wanted to remain a specific and independent science, 'only the realm of pure thought, so far as it is left: the theory of the laws of the thought process itself, of logic and dialectics.'<sup>\*</sup>

Lenin, in turn, on the basis of this statement of Engels and of an extensive and comprehensive study of the whole history and theory of man's philosophical thought and especially of the new philosophy (that of Locke, Hume, Kant and of more recent philosophers), arrived at the extremely bold thought - a thought so rich in consequences for the further philosophical development - that the *philosophical* concept of things (e.g. of space, causality, etc.) was precisely the *epistemological* concept of these things, and that epistemology, logic and dialectics were decidedly one and the same thing; so that in this particular case 'we do not need three words' but any one of them is sufficient.

In Book Four, devoted to an analysis of the relation between philosophy and the special sciences, we shall have the opportunity of dwelling at greater length on that remarkable thought of Lenin - a thought which was mentioned by Engels, but which received its complete and classical expression with Lenin. For the time being it suffices to point out that, precisely because this is so, the philosophy of dialectical materialism is not a traditional ontology, which also sets itself epistemological tasks, but is an epistemology (dialectical content logic), which also sets itself on-

\* F. Engels, *Ludwig Feuerbach and the End of Classical German Philosophy*



tological tasks. And precisely because ontology is dialectically 'sublated' in epistemology, the philosophy of dialectical materialism is the most complete, i.e. a classical type of philosophy, considered as scientific epistemology or as dialectical content logic, which is the same thing.

It was Lenin who said that materialism intentionally puts the theory of reflection at the basis of its epistemology. This means, among other things, that the theory of reflection, taken as the basis of the whole epistemology or logic of dialectical materialism, should discuss primarily the basic problems of epistemology, the totality of which represents a theoretical philosophical introduction to the whole epistemology or logic of dialectical materialism.

The present exposition of the dialectical materialistic theory of reflection is an attempt to pose this problem accordingly, and its sub-title therefore reads: *Fundamental Problems of the Dialectical Materialistic Theory of Knowledge*.

The task, which we set ourselves in the present book, is to provide a detailed *general theoretical* substantiation of our definition of dialectical materialism; naturally, it is assumed that it is valid both for dialectical materialism, taken as a whole, and for the theory of reflection in particular, taken as its *basis*.

The first question, which we shall now examine, is that of the unity of matter (being) and mind. Moreover, we shall divide this question into two: a) reflection as a property of all matter, essentially akin to but not identical with sensation; and b) sensation and thought as a conscious reflection, proper to highly organized matter and, in its supreme forms, to man.

Let us begin with the first of these questions.

*Idealism* has always proudly declared that it allegedly did not deny either the specificity of mind, or its activity or effectiveness, or else its creative character which the old materialism either completely denied or underestimated and hence logically often arrived at a vulgar identification of mind with matter as well as at fatalism or a passive and contemplative attitude towards the world.

As already mentioned, there is undoubtedly some truth in these accusations against old materialism. At the same time, however, idealism itself has always led to absurdities by exaggerating, holding absolute and hypostatizing the specificity,

the effectiveness and the creative power of the mind (i.e. by transforming it into independent 'essences', 'bases', 'causes'); it has always completely detached mind from matter and transformed it into metaphysical and mystical concepts of God, soul, consciousness in general, monad, etc. The idealists transformed the activity of the mind into an absolute externally completely unrestricted freedom and considered its creative power as a capability of creating the world from itself in one or another mystical manner, of prescribing to it the basic forms of existence and of determining its objectively idealistic character.

On more than one occasion we have had the opportunity of expounding Lenin's profound thought that the epistemological *possibility* of lapsing into idealism, conditioned by the character of every abstract thought (say, by differentiating between and relatively opposing a *concrete* house to a house *in general*), is transformed into *reality* and gives rise to idealism, however not under all conditions, but only under *specific* socio-historical conditions. And since the annihilation of *these very* conditions would mean the annihilation of this transition from possibility to reality, in the final count the struggle against idealism is a struggle for the abolition of these socio-historical conditions (of the division between manual and intellectual labour, the division of society into antagonistic classes, estates, etc.) We shall not dwell further on this subject at this place. The main task which we set ourselves in this specific case is to indicate how dialectical materialism vanquishes every idealism and every mechanical materialism by correctly formulating and positively resolving philosophical problems.

Dialectical materialism achieves this, above all, thanks to the fact that it 'defines' mind by proceeding from matter, but not in the sense that the latter 'gives birth to', or, say, exudes the 'spirit' as a sort of a peculiar immaterial substance which will then interact with it (with matter), not in the sense, either, that mind is a product similar to the bile secreted by the liver. Dialectical materialism speaks of the transformation of in-sensating into thinking matter (the human brain). From beginning to end mind arises and remains a property of highly-organized matter and not a peculiar spirit, monad, spiritual individual, and the like.

The emergence of mind actually means its emergence as a particular property of naturally conditioned highly-organized matter; it changes, disappears and decomposes when matter changes, disappears or decomposes.

Anatomy, physiology, psychology, psychopathology, sociology and other sciences, as well as our daily social and individual experience offer us a number of concrete data which confirm that consciousness undoubtedly depends upon the state and the functions of the brain. Dialectical materialists have always made use of these data, especially those, supplied by modern physiology and in particular by Academician Ivan P. Pavlov's teaching on the higher nervous activity of animals and man. One cannot deny, however, that this does not exhaust the problem, the more so as these teachings themselves often suffer from mechanistic tendencies and from obvious concessions to idealism, wherefore idealists have always attempted to use these data against materialism, interpreting them in their own, idealistic way. This is why dialectical materialism must go even further, by raising and solving on a broader scientific and methodological basis (fully applying the fundamental principles of materialism, dialectics and historicism), the question of the mind's origin from matter, of its specific forms and relatively independent development.

This is precisely what dialectical materialism achieves mainly through its teaching of reflection as a property of all matter, a property which at a certain stage of its development passes into sensation and, subsequently, into thought in the strict sense of this word (i.e. thought with the aid of concepts – scientific thought).

In the first place, when dialectical materialism asserts that man's social consciousness, determined by his social being, is the supreme form of consciousness, which is qualitatively distinct from the consciousness of animals, he does not in the least thereby raise absolute and impenetrable barriers between these forms of consciousness.

Insofar as man has developed from the animal, incapable of work yet engaging in certain work-like activities, something common with animal consciousness has remained in man's consciousness; there is a continuity in it, something linking it with the pre-historic past. It is no accident that Engels repeatedly

stresses this fact in his *Dialectics of Nature*. At the same time, we repeat, there is in man's consciousness something qualitatively new, manifesting itself in a saltatory way at a certain stage in animal evolution.

...In other words, man's thinking in the form of concepts acquires a development and significance to the extent that the concepts themselves become the object of research. These are already theoretical, artistic and other ideological activities which are possible only in the presence of man's labour and social life and more over, at a comparatively high level of his historical evolution. Only man can transcend the limits of his immediate biological generic experience and needs and show interest in things and phenomena which leave animals quite indifferent. This lends a particular scope, depth and force to human thought and makes it different from that of animals not only in degree, but also in quality, character, role and significance. Hence, there is both continuity and discontinuity or, to be more exact, a contradictory unity of these two elements, i.e. continuity and a leap; a new quality, but not an origin out of nothing; in other words, the biological is dialectically 'sublated' into the social, the instinct turns into reason and the animal into man.

On the other hand, between higher animals with developed nervous and brain systems and lower organisms, in which even the most careful anatomical studies have not yet discovered such systems, there is both a qualitative difference and continuity, i.e. a contradiction as well as a certain commonness.

Starting from the 'sensitiveness' towards the lower forms of motion, we shall arrive at the pure biophysical and biochemical reflex which is also a means of adaptation to the environment and of influencing the latter, but without a trace of the psychic.

Discending even lower, to inorganic matter, what do we find?

In brief, Marx and Engels reply to this question as follows: If we descend further, from organic to inorganic matter, we find forms of motion, change and interaction which are neither psychic, nor biological. There exists a qualitative difference between the biological and psychic forms (the higher forms of motion cannot be completely reduced to the lower ones). But there is also something common between the biological and psychic

forms. There are certain periods of transition, continuity, fusion between the former and the latter. Otherwise the higher forms would have to emerge from absolutely nothing. If, on the other hand, the higher forms were not qualitatively distinct from the lower ones, then – as Hegel already proved – there would have been no evolution, no emergence of new qualities and phenomena. It inevitably follows that there is a certain essential link or continuity, but not identity, between the form of sensation and the lowest form of motion, proper to all matter. For this very reason Marx and Engels have always firmly opposed both hylozoism (which ascribes psychic life to all matter) and mechanism which (transforms matter into a mathematical body without any qualities, devoid of motion, impulses, activity, power, etc.) Criticizing Leibniz for his idealism, at the same time they (and subsequently Lenin, too) particularly value his idea about the active power, deeply inherent to every real thing. Accepting the basic materialistic views of Hobbes, they, on the contrary, blame him for divesting matter of its qualities and transforming it into a geometric body, deprived of motion, impulsiveness, dynamics. In this connection, expounding Bacon's views, Marx writes: 'Among the properties inherent to matter, motion is the first and most important – motion, not only in the sense of mechanical and mathematical motion, but even as a tendency, as a living spirit, tension and, in one word, if we use Jakob Böhme's expression, as the "Qual" (Marx's quotes) of matter. The primary forms of matter are the substantial forces, living, individualized, inherent to it, creating specific differences.\*'

As already noted elsewhere, the form in which Marx expounded Bacon's views, which are more correct than those of Hobbes, could be used to interpret his words in a hylozoistic sense. Precisely for this reason in the English version of his work *Socialism: Utopian and Scientific*, Engels drops in his quotation of Marx some of the terms used in the above statement and writes instead the following: "Qual" is a philosophical play upon words. Literally 'qual' means torment, pang, a pain which drives one to any action. At the same time the mystic Böhms also introduces into the German word something of the Latin word *qualitas* (quality). His "Qual", in contrast to the pain caused

\* K. Marx and F. Engels, Works, Vol. III, 1938, p. 157

from outside, is an active principle, arising out of the arbitrary development of things, of relations or of the individual, subjected to its influence and, in turn, causing this development.' Engels's thought is quite clear and does not contradict but is in full agreement with what we said above about the struggle of dialectical materialism both against hylozoism and mechanism.

It is therefore no accident that in his *Materialism and Empirio-criticism*, universally recognized today as one of the classical philosophical works of dialectical materialism, Lenin renders concrete and further develops these basic theses of Marx and Engels.

Criticizing Karl Pearson, who said that it was not logical to maintain that all matter had the property of being conscious, Lenin wrote in brackets: '*But it is logical to suppose that all matter possesses a property which is essentially kindred to sensation: the property to reflect.*'\*

This thought of Lenin is of great and not yet sufficiently appreciated methodological significance, wherefore it has become and is increasingly becoming the subject of special investigations and studies in the modern literature of dialectical materialism. Proceeding from this significance, we dedicated to it a whole section in the first Russian edition of *Theory of Reflection* (the first chapter of the book entitled *Dialectics of the Transition from Matter to Mind*), which became the subject of a number of discussions in the press and a number of debates: in the Institute of Philosophy at the Academy of Sciences of the USSR, in the Red Professors' Institute, in the philosophical magazine 'Under the Banner of Marxism' and elsewhere. Naturally, this thought was also the subject of the attention of the Menshevik idealists (Deborin and others) and of the Mechanicists (Sarabyanov and others). Whereas the former interpreted it in a Spinozian-hylozoistic spirit, purely and simply transforming the said universal property of matter into a sensation, taken in its lowest form and degree of evolution, according to the latter this property of matter was purely mechanical, without any kinship with sensation or (this was especially true of Sarabyanov), they also saw in it a transitory property, which emerged like mind, and not a universal property, i.e. a property inherent to all matter. It is quite clear that both interpretations have absolutely nothing in

\* V.I. Lenin, Works, Vol. VIII, 3rd Russian Edition, p. 75

common with Lenin's remarkable and truly dialectical-materialistic thought.

First of all, this thesis of Lenin's makes it quite possible to overcome both the vulgar-evolutionary, purely quantitative conception of the origin and evolution of mind, according to which mind had no origin or development but only a quantitative growth, and the pseudo-dialectical conception, according to which mind appeared out of the blue, as a 'pistol shot', i.e. without any preliminary preparations and without any connection with the lower states of matter. In *Materialism and Empirio-criticism*, fighting against the vulgar concept of mind as a mechanical motion or as a material product of the brain similar to the bile secreted by the liver, and against the hylozoistic concept of mind as a property of all matter, Lenin wrote that 'in the foundations of the building of matter' one can 'only assume the existence of a capability which is similar to (but not identical with - T.P.) sensation.'<sup>\*</sup> But while not all matter but only highly-organized matter is endowed with conscious reflection, Lenin teaches us, one can logically assume or suppose that all matter possesses a capability, kindred to (but not identical with - T.P.) sensation, namely the capability of reflecting in its own way (but without elements of consciousness) the surrounding material things and processes.

In order properly to understand Lenin's thought, one must particularly bear in mind the following:

*First.* As we shall see later more in detail, according to Lenin the philosophical or the theoretical-cognitive concept of matter consists in the fact that matter is an objective reality, existing without and irrespective of our mind and reflecting itself in it.

*Second.* The objective and real existence of matter, its influence upon man's organs of sense and its subjection to the inverse influence on the part of the recipient (also objectively and really existing) are impossible outside space, time and motion - the basic forms of the existence of all matter. There is no objective and real matter outside space, time and motion; but there are no and there cannot be objective and real space, time and motion without matter, either. Without motion matter does not exist objectively and really, and the same is true of motion without matter. Whoever conceives matter without motion, in so

doing transforms it into a dead and empty abstraction. Whoever, on the other hand, conceives motion without a body in motion, thereby turns motion from an objective and real form or a basic property of matter into a purely subjective idealistic form or property of thinking mind, of the soul, the spirit, God, and what not. In other words, matter is not space in itself, it is not motion in itself, nor is it a simple arithmetical sum or 'synthesis' of space and motion, as the Menshevik idealists maintained. It is, above all, an objective reality which - precisely because it is objective and real - cannot exist outside time and space (as the so-called 'ideal-realists' and intuitivists of Losky's type and others believe); on the contrary, it is always something given in space and time or, to be more precise, space, time and motion are its basic forms of existence.

For dialectical materialism matter is neither pure (naked) space, nor pure (naked) motion, dynamics, energy, force. We repeat, it always and necessarily is spatial, full of motion, extensive and intensively dynamic, a most universal being and a most concrete becoming, a self-development, an action, a process. It inevitably follows that the motion of matter, always being the motion of a given extended body, is indissolubly linked with space; but, as Lenin himself put it in his *Philosophical Notebooks*, it is not a mere sum total of the points traversed by the body in motion along its path (trajectory), or abstract, empty moments in the 'course of time'. Nor is it a pure *act of transition* onto the path of pure (naked) energy, of the spiritualist force, a property or a form of manifestation of a 'spiritual nature'.

While the former view leads to the idea of a moving body without motion, the latter leads to the idea of motion without a moving body. While the former implies the metaphysical and mechanistic deadening of every real, concrete and living motion, the latter implies the transformation of the real, concrete and living motion into a spiritual 'essence' or 'foundation' of the world, rendered absolute, detached from the real objective world and transformed into a metaphysical and transcendental 'essence'. While the former view leads to a purely quantitative analysis of objects in motion and evolution, the latter leads to a purely qualitative definition and, therefore, to an absolutely spontaneous, intuitive, mystical conception of motion as a spiritual essence, or of evolution as a scientifically undefinable,

\* V.I. Lenin, Works, Vol. 13, p. 37

mysterious, divine 'creative revolution', a 'vital urge', 'entelechy', etc. We encounter the former view among mechanists, positivists, vulgar empiricists and others, while the latter view is held by intuitivists (Bergsonians), vitalists, neovitalists and, in general, by all irrationalists and mystics. Dialectical materialism has absolutely nothing in common either with the former, or with the latter view, nor can it adopt an appeasement-electric stand with regard to either. Precisely this enables dialectical materialism correctly and scientifically to raise the question of reflection as the property of all matter – a property essentially kindred to but not identical with sensation.

What does all this mean more precisely and more concretely? How should we understand this property of all matter more precisely and more concretely?

As the reader will see further on, the answer to these questions can be provided only by a comprehensive *exposition* of the whole dialectical-materialistic theory of reflection, and for this reason we shall be compelled to revert to them on more than one occasion in the present work. Nevertheless here, though merely in the form of a preliminary analysis of the question of the said property of all matter, we can say the following:

First of all, as it was shown in the first Russian edition of *Theory of Reflection*, the relation of reflection, as a property of all matter, to motion in general (which itself is a basic property of all matter) and to its different forms must be defined more strictly. In this connection let us briefly restate a few considerations developed in the first Russian edition. It is primarily a question of the relation between motion, taken as a purely mechanical displacement, and the change and interaction of bodies.

Every mathematician knows perfectly well that, strictly speaking, the mathematical point cannot really move, because the mathematical 'place' which it occupies in a given mathematical space cannot be vacated or 'occupied' by another point - which is precisely another point, because it occupies another 'mathematical place'; the latter, however, has neither length nor width, nor height (otherwise the point would not be a point, but a circle). Strictly speaking, mathematical 'motion' is only a conditional and unreal motion. We have an unconditional and real motion in the case of the motion of bodies, atoms, electrons, which can leave their places and be replaced by other

bodies. But once a real body leaves its old place and takes a new one, it comes under new real conditions, it is exposed to new influences which, to a given degree and in a given form (visible or invisible to the naked eye), produce specific changes in this body. Today every physicist knows perfectly well that a body undergoes specific changes under a new illumination and under new and specific electromagnetic and other conditions. This would imply that no real mechanical motion is possible without specific changes; and, inversely, that any change presupposes a mechanical motion of the different bodies (around or inside them). On the other hand, Engels was quite right when writing in *Dialectics of Nature* that 'from the fact that these bodies are interrelated it follows that they influence each other and it is precisely this interaction of theirs which is motion.' He also pointed out that 'change in the form of motion is always a process between at least two bodies, one of which loses a certain quantity of motion of a certain quality (say, heat), while the other acquires a corresponding quantity of motion of another quality (mechanical motion, electricity, chemical decomposition).'\* However, Engels has always stressed that all individual objects and processes are only parts or particular cases, components, facets, manifestations of Nature, or material reality, which is one in its multiformity and dialectically self-developing, and that any individual action and any partial interaction are, therefore, viewed more closely, only forms of manifestation of the one and universal self-development of the natural whole.

Thus, motion-displacement, motion-change and motion-interactions are different, but always necessarily connected, mutually conditioned and interpenetrative manifestations, facets or forms of motion in general, which itself is a basic form of matter.

One could adduce quite a few cases when centuries-old controversies become theoretically resolvable in principle solely on the basis of these theses of Engels and Lenin.

In our particular case, however, it is more important to find that precisely these theses of Engels and Lenin enable us theoretically to solve the problem which interests us, viz. that of reflection as a universal property of matter, a property essentially akin to sensation but not identical with it. In fact, if, in general,

\* F. Engels, *Dialectics of Nature*, 1946, p. 41

every external action and reaction of bodies (mechanical, physical, chemical, etc.) can and should be construed as a form of the universal internal self-development of nature, which is one in its infinite multiformity, it is quite logical to suppose that when individual objects react externally one to another - and precisely for this reason - they also and at the same time develop specific internal states in which, in different forms and to various degrees, is manifested or expressed the one 'nature of the natural whole', the one material essence or the deepest base of any individual material being, irrespective of its place in world space and time.

If external action were not a form of manifestation of internal action, and if the 'nature of the natural whole' were not common to all material objects, although manifest in them in most different forms and to different degrees, there could be no question of any internal reflection, internal reverberation and internal coordination between objects.

But if no external reaction of individual objects or parts of the natural entity is possible without the internal and dialectically contradictory self-development of the 'natural whole' and its parts, then it is quite logical to assume that precisely when, and insofar as, objects externally react to one another, they also develop specific internal states of their own, which precisely bear the character of mutual reflection (or reverberation) of their being, taken as a manifestation of the 'nature of the natural whole' or, which is the same, as a manifestation of their innermost material essence. Of course, this does not exhaust the question. On the contrary, it is precisely here that it begins and it is the task of philosophy and of the special sciences historically to review, logically to prove and experimentally to illustrate the infinite variety of the forms and degrees of reflection, taken as a material property - unconscious in the least organized and conscious in the most highly organized matter.

Thus, we repeat, the objective and real body neither exists nor is conceivable without external reactions; at the same time, however, it neither exists nor is it conceivable as a specific part of the natural self-developing entity, since the individual body itself does not develop, in connection with its external reactions, certain internal states, in which the other objective and real bodies which influence it are reflected. Of course, this reflection differs

in form and degree, plays a different role, it has a different significance in the different bodies: in the colloid (organic and inorganic) it is different from that in the crystal, the atom, the electron. It has its own, specific forms of existence which differ in the different bodies and the different stages of their development; it also has its own relative independence, in one word, its own law-governed processes which have not yet been sufficiently studied and determined but which attract the attention of research workers, especially of biologists, psychologists and epistemologists, owing to general theoretical reasons as well as to specific experimental and other considerations.

Of course, from all this it does not follow in the least that, say, the stars, the plants, the piece of a rock, the atom, the electron, the photon are capable of thinking, feeling or acting purposefully. Fechner's assertion about a 'soul of the planets', or the statements of certain contemporary philosophizing physicists about the indetermination of the electron, wilfully jumping from one orbit to another, have absolutely nothing in common with Lenin's theses or with genuine and strictly objective science. There can be no question of consciousness and indetermination in the case of the electron, the stone, the planets, etc.

And if certain philosophizing physicists have arrived at the absurd notion of the 'freedom' of the electron, this is not only the result of their socio-political views. It finds a certain epistemological justification in the fact that, strictly speaking, physico-mathematical analysis encounters certain phenomena, which cannot be fully explained by the available means and methods of physics. There is a certain 'residue' which awaits its rational elucidation and explanation. 'Physical vitalism', if we may put it that way, is no solution to this problem. Nor is purely mechanical analysis.

We have just said that reflection as a property of all matter differs in form and degree and plays a different role in different bodies. We now may add that it is not so much the task of philosophy as the task - of course, a particularly difficult one - of the special sciences to study and scientifically to explain the structure of this reflection in every particular case. The first Russian edition of *Theory of Reflection* noted therefore as symptomatic the thought expressed by Academician S.I. Vavilov, the



great Soviet physicist, who in his article *Physics\** spoke of the possibility of physics to include in its future analysis 'the capability, akin to sensation, and to explain many other things on this basis' as a primary and simplest phenomenon. Certain Soviet reviewers rejected Academician Vavilov's idea, but in our view this was not due so much to a profound study of the problem and a thorough grasp of its scientific and methodological importance, as out of fear lest 'something come out of it', i.e. lest a door be opened to idealism and vitalism. Fear by itself is, of course, useful but in this particular case it obviously has no justification whatever.

The basic argument adduced by Dobrovolsky and other reviewers, who opposed Academician S.I. Vavilov, boils down to the idea that 'reflection' is a psychological and, in the best case, a biological phenomenon and that for this reason physics cannot deal with it, if it is to remain physics. This argument is basically wrong, because it identifies reflection as a property of all matter with consciousness and with the biological reflex, i.e. it ascribes to Lenin a thought which is absolutely alien to him. At the same time it forgets about the 'kinship', the continuity between psychological, biological and physical reflection.

We do not know whether Academician Vavilov has abandoned his idea under the pressure of such 'criticism': however, irrespective of this, the idea as such has not lost its scientific and methodological significance. We repeat, in the case of electrons and their property to reflect there can be no question of consciousness and will. Therein precisely lies the qualitative difference between conscious reflection and reflection as a property of all matter. This difference, however, does not refute the 'essential kinship' between them.

On the other hand, this 'kinship' finds its expression in the following: Every reflection (both conscious and deprived of consciousness) is a particular internal state of reflection. When the external real object, which during its interaction with reflection is reflected in the latter, reflection does not disappear immediately and absolutely but continues to exist as a 'trace', as a simple possibility or as a predisposition in the reflecting object. Under these circumstances, as we shall see more in detail later, conscious reflection loses its currently effective force and acquires a

subjective, inactive and abstract character. We cannot speak of subjectiveness and abstraction in the case of unconscious reflection; but the latter also loses its currently effective force and remains only in the form of a trace or predisposition.

Under certain conditions the new relations between the environment and the thinking subject, the conscious subjective, abstract and inactive 'images-traces' may resume their objective, concrete, actually effective character and, in a certain form and to a certain extent, condition a given pattern of behaviour on the part of the consciously reacting subject. The electron lacks consciousness and cannot therefore react consciously and purposefully; however, we have no theoretical or experimental reason to reject the thought that under the new real mutual relations the old 'reflection-trace' resumes its definite, actually effective character which may condition a pattern of behaviour of the electron that cannot be otherwise fully explained solely by the new actually effective conditions of the environment. From the point of view of theoretical physics this not only may but must be accepted insofar as only in this way the electron's behaviour can be linked not only with the new actually effective conditions of its new environment but also with the influence of its past states upon its present state. This question has not yet been solved experimentally, it has not even been clearly and specifically raised in contemporary physics which, in the case of some physicists-idealists, preferred to adopt the line of ascribing 'freedom of action' to the electron. It is quite obvious, however, that new scientific prospects open up in this direction and Vavilov's thought therefore remains a methodologically sound and very valuable idea. The further we go down the steps of the evolution of reflection in general as a property of all matter, the more difficult it becomes to distinguish the external responsive reactions (chemical, physical and mechanical) of bodies from the internal states of reflection-traces or from the actual reflection of the environment in the body subjected to its influence. Here we no longer have subjective fantasy images or biological reflexes-reflections (which accumulate in the organism as the lowest type of unconscious memory). In this case the external responsive reaction (whether physical, chemical or mechanical) largely merges with the internal state of reflection; for this reason we can also assess the latter by and large, bearing in mind the external

\* Cf. *Pod Znamenem Marxizma*, No 4, 1936, p. 196 (in Russian)

responsive reactions of the given bodies, which are 'reflecting their environment'. Here again we take Academician Vavilov's idea to mean that the external responsive reactions and the internal reflections (whether current or in the form of traces of past reflections) do not and cannot fully and absolutely coincide.

The great scientific and methodological significance of Academician Vavilov's idea lies in that it recognizes the non-absolute coincidence of the external reactions of bodies with their internal reflection states (whether actual or in the form of traces of past reflections, accumulated and completely deprived of any consciousness). In order fully to explain their 'behaviour' (since we do not want to endow all matter with consciousness and with the capacity of a free choice of its own behaviour) we must, by logical necessity, accept the existence of reflection as a property of matter in general and thereby explain certain phenomena in the behaviour of atoms, nuclei, electrons, etc.

It is precisely in connection with these considerations that Lenin's idea about reflection as a property of all matter is of a tremendous epistemological significance for an understanding of the innermost connection between thinking and practice.

As a matter of fact, since reflection as a property of all matter is impossible and does not exist without and outside of the universal interaction of objective real things, it is not difficult to understand that human consciousness is the highest and most complex type or form of reflection in general and that man's socio-historical practice, which is the most complex and supreme form of interaction between things, is connected with this form of reflection.

This does not imply a denial or understatement of the specific socio-historical role and significance of man's practice, of which we have been quite ineptly accused. This only means that, remaining a specifically human socio-historical practice, it does not cease to be a specific and particular case of the universal interaction between things, always closely connected with the universal interaction of natural things.

And this, in turn, means that precisely through practice and in practice, considered as the deepest foundation of consciousness, the latter is closely connected with reflection as a property not only of organic matter, but of all matter. For this very reason, despite certain objections, we believe that we were

not wrong in principle when, in the first Russian edition of *Theory of Reflection*, we made use of the well-known thought of Marx and Engels to the effect that men, before starting to 'think' theoretically, acted, and that by acting they were able to master certain objects of the outside world so as to satisfy their needs (consequently they started with production).

Naturally, Marx and Engels as materialists could not possibly assert that man began first to think and then to act. But if this is so and if in the process of action, even before starting to 'think' theoretically, men knew how to 'master objects' and to 'satisfy their needs', it is clear that in the process of interaction with objects they received certain impressions (reflections) from them of which they were not yet conscious. With certain inaccuracies in terminology and with a certain schematism we advanced in the first edition the proposition that this thought of Marx and Engels was a 'logical assumption' of the existence of forms of reflection, kindred to conscious reflection, but not identical with it. If we logically pursue this thought and descend below man with his production practice to the lower organisms with their unconscious biophysiological 'practice', it will become abundantly clear why precisely and in what sense man's conscious socio-historical practice, qualitatively differing both from the biophysical 'practice' of the lower organism and from the universal interaction between all natural objects, preserves something 'essentially akin' to them, and for this very reason must be construed as a qualitatively particular case of the universal world interaction. This is the only correct setting of this problem from the point of view of dialectical materialism. Unfortunately, this has not been properly understood by some dialectical materialistic reviewers who, afraid of underrating the qualitative peculiarity of man's socio-historical practice, went to the other extreme, completely rejecting or underrating the profound connection between man's practice and the universal interaction between things which, as we already know, is not absolutely rejected, but only dialectically 'sublated' by practice.

As we have just said, this thought of Marx and Engels, if properly understood, as well as Lenin's thought about reflection as a property of all matter, open up vast perspectives not only in the field of sociology, but also in the field of biology, psychology, pedagogy, aesthetics, etc.



Here we must stress the following:

We must never forget or underrate the fact that when Marx and Lenin call something logically admissible, they do not mean subjectively admissible. When Lenin says: '...It is logical to assume that matter has a property, essentially akin to sensation, the property to reflect,'\* he wants to stress, above all, an extremely important thought of Marx and of his own, which must be understood and judged according to its merits.

The whole matter consists in that logical judgements, the logical concepts (categories, laws), as we shall see in greater detail later, are a natural result, generalization, crystallization, deduction from the development of man's thought over the centuries. They are a generalization of the millennia-long human experience; and although the logical concepts as such have an abstract character, they are profoundly historical in essence. Once they are arrived at, however, they are a powerful and invaluable weapon for the proper scientific knowledge and for the practical transformation of the world, as long as we do not consider them as static, dead, frozen, antithetical, but, on the contrary, as mobile, viable and interpenetrative, at that, always checked against the criterion of practice.

If we treat them in that way, they acquire a particular cognitive force and enable us to know the world and even to know it more truthfully, more accurately, more thoroughly than by means of our direct sensations and perceptions. This means that their abstract character does not prevent them from being concrete to the utmost.

So, when we master this great theoretical and logical weapon and when we operate with it correctly, i.e. according to dialectical materialism, we can create most valuable scientific theories and hypotheses which otherwise we would not be able to draw directly from the empirical data.

Of course, our deductions should always be checked with the aid of practice, but in any case theoretical-logical thinking is important not only as a proof but also heuristically.

Engels repeatedly pointed that by general theoretical-logical reasoning, the old natural philosophical thought had often run ahead of the special sciences, as, for instance, in the case of the

living cell, the evolutionary theory, the law on the conservation of energy, etc.

It is precisely the correct logical basis that gives hypotheses their true scientific significance. A hypothesis, checked against facts, can become a new theory: but even before that it can have major methodological and heuristic importance, if it is in logical agreement with the prevalent theories, i.e. if the scientific assumptions are made not on the basis of accidental, subjective 'inferences' or 'inspiration', but strictly according to logic.

A case in point is Lenin's 'logical assumption' regarding reflection as a property of all matter, essentially akin to but not identical with sensation. For this very reason this assumption, i.e. this hypothesis, is of a paramount scientific and methodological significance.

That is why any underestimation of this thought of Lenin's, any formal attitude towards it, as well as any unwillingness to grasp it and further to develop it in connection with the all-round evolution of human knowledge, are quite unwarranted.

Of course, it is also quite inadmissible to regard this thought not as a logical hypothesis, which will yet need concrete proof to become a scientific theory, but as a stereotype or a formula (similar to Hegel's famous 'triad'), replacing and displacing the concrete historical, experimental and practical analyses and demonstrations.

The valuable, important and essential in this Marxist-Leninist scientific hypothesis consists in the fact that it does not reject but presupposes and requires concrete studies and verifications in the sphere of biology, psychology, sociology, aesthetics, etc. At present its importance is chiefly methodological. But it also reveals a new set of problems, it sets new, interesting and important tasks to scientific thought, remaining, at least for the moment, only a 'logical assumption'.

It is the task of specialized research to seek forms and degrees of the 'reflection in general' which has the character of consciousness (psychical character) only in its higher forms and degrees, while remaining unconscious, non-psychical in all its lower forms and degrees; as such, it would be below consciousness, without of course this meaning that it would have ceased to be a reflection and that it is of no significance for orientation in the environment and for influencing it.

\* V.I.Lenin, Works, Vol. 13, 3rd edition, p. 75

From what we have said so far it should be quite clear that in Lenin's 'logical assumption' we must see an idea of major scientific and methodological importance, as yet unsuspected by many. This thought which opens up broad prospects before philosophy and the particular sciences, preserves its character of a logically-built thought.

Some of the the formulas and arguments in the first Russian edition of *Theory of Reflection* were criticized by some philosophers during a public discussion in the Institute of Philosophy at the Soviet Academy of Sciences. Whoever has read the first Russian edition of *Theory of Reflection* will find that all the more serious and justified objections and proposals have been taken into consideration in the present edition.

At the same time, however, it must be stressed that the basic thought, as formulated just now, is the same as in the original Russian edition and that if there it was indeed 'debatable', this 'debatability' in no way affected its substance. In substance the thought of Lenin and Marx has been correctly presented by us. And for this very reason not a single valid objection has been made so far in this respect.

EXCEPTS FROM BOOK THREE

## UNITY OF THEORY AND PRACTICE