

OTS: 60-11,778

JPRS: 2859

13 June 1960

LENIN'S TEACHINGS ON TRUTH AND
MODERN SCIENCE

- USSR -

By G. A. Kursanov

Reproduced From
Best Available Copy

LENIN'S TEACHINGS ON TRUTH AND MODERN SCIENCE

DISTRIBUTION STATEMENT A
Approved for public release
Distribution Unlimited

Distributed by:

OFFICE OF TECHNICAL SERVICES
U. S. DEPARTMENT OF COMMERCE
WASHINGTON 25, D. C.

Price: \$0.50

U. S. JOINT PUBLICATIONS RESEARCH SERVICE
205 EAST 42nd STREET, SUITE 300
NEW YORK 17, N. Y.

19981209 052

LENIN'S TEACHINGS ON TRUTH AND MODERN SCIENCE

[Following is a translation of an article by G. A. Kursanov in Priroda (Nature), Vol. XLVIII, No. 9, 1959, pages 3-10].

In Lenin's works of genius "Materialism and Empiriocriticism" and "Philosophical Notebooks" profound ideas are developed in the doctrine on truth, which are being continually confirmed in contemporary science and practice. V. I. Lenin developed his ideas based on the most important thesis laid down by Marx and Engels and using and critically evaluating Hegel's conception of truth; he generalized the most recent data furnished by scientific cognition of the world and the development of social relations of his epoch. Simultaneously he subjects the views on truth of Machism, Neo-Kantism and pragmatism to profound and many-sided criticism.

V. I. Lenin's development of the idea of truth is based, in our opinion, on the following gnosiological principles: on recognition of the decisive role of practice in cognition as its basis and moving force, as the main goal of cognition and as the determining criterion of truth; and on analysis of the contradictory nature of the process of cognition of the world of man. Based on this, V. I. Lenin considers truth in the first place as a process of the reflection in the consciousness of man of the laws of the material world; in the second place as a definite concrete-historical result of cognition of the world; in the third place it shows the contradictory character of truth as an expression of the contradictory nature of the entire process of cognition.

At the same time, Lenin always emphasized the great active role of human reason in cognition of the world. For this reason it is possible, guided by Lenin's thesis, to define truth today as follows: truth is the process of the reflection in the consciousness of man of the laws of the material world, while at the same time, man forms a scientific picture of the world.

It is also necessary, in our opinion, to emphasize that there is only one truth, but it can be described from various logical sides: from the point of view of its objective, absolute, relative or concrete nature. It was these points of view in the doctrine on truth which were developed especially profoundly in the philosophical works of V. I. Lenin.

The objectiveness of truth: The idea of the objectiveness of truth is central to the doctrine of truth in general of dialectical materialism, which was developed from all sides by V. I. Lenin. Considering truth as a process, he emphasizes that this process is the coincidence of the thought with the object, while the entire process of cognition proceeds "from a subjective concept and a subjective goal to objective truth."¹⁾ In addition, V. I. Lenin consistently and undeviatingly holds to the thought that "to recognize objective truth" is the same thing as "to hold to the materialist theory of cognition."²⁾ The objectivity of truth is the determining basis of all other logical description of truth - its absolute, relative and concrete character. On this level, the only correct concept of truth in general is the concept of objective truth: truth is always and in every case objective truth. At the same time V. I. Lenin always points out that

* (see footnotes at end of report)

the concept of objective truth is wholly determined by the criticism of practice, without which^{it} is pointless to talk about truth at all.

The logical concept of objective truth can be characterized in two ways. In the first place, objective truth, as is truth in general, is a reflection in the consciousness of man of the attributes of and links and relations between objects of the material world - that which Hegel repeatedly calls the coincidence of the concept with reality, accordance of objectiveness with the concept, the identity of the concept and objectiveness. In spite of the obvious and clear nature of the given thesis, it is of importance in principle and is directed against subjectivism in cognition in general and against various subjective concepts of truth in particular. In the second place, as V. I. Lenin especially emphasizes, the subjective nature of truth consists in that the content of our knowledge does not depend on the subject, does not depend on the human being or on humanity.

This thesis acquires special significance in the light of the development of contemporary scientific knowledge.

Let us recall that already in his work "Marxism and Revisionism" V. I. Lenin emphasized that, if geometrical axioms were to come up against the interests of people, they would probably be refuted. Thus the absolute law of nature - the law of the conservation of matter and motion - refutes all assertions of idealists and theologians on the destruction of matter and the ruin of the world. It is thus natural that, in the course of many decades, it has been subjected by them to the fiercest attacks, while physical idealists and theologians strive

to interpret the most recent discoveries of science tendentiously, so as to create the appearance that this universal law of nature has not been fulfilled. In the contemporary period one of the sharpest such attempts were speculations with the phenomenon ^{of} β -disintegration, in the process of which it at first appeared, that the laws of the conservation of energy and the moment of the quantity of motion which express the absolute law of nature from the concrete side, were infringed. The opponents of materialism saw an infringement of the law of the conservation of energy in the fact that the atomic nuclei of a given radioactive isotope in the β -disintegration lose an identical quantity of energy, while the energy of the electrons eradiated in this has different values. Where then does the remaining part of the nuclear energy disappear to? Could this possibly be an infringement of the law of conservation with all the consequences resulting from it?

No, naturally, there can here also be no question of any infringement of the law. It was soon after suggested and later established firmly that in the β -disintegration, in addition to the electron (or positron) a very small particle of neutrino is emitted, which carries with it a definite amount of energy equal to the difference between the maximum energy E_{γ} , which was lost by the nucleus and the energy of the electron. However, the distribution of energy between the electron and the neutrino may vary. This was a new, brilliant confirmation of the objective truth of the absolute law of nature, the sense and content of which do not at all depend on the subjective opinions and desires of the idealists and theologians. At the same time, the

objective truth of truly scientific laws, theories and ideas is the granite base for the further fruitful development of science.

The principle of the objectivity of truth has not only decisive theoretical significance in cognition, but also makes it possible to explain the role and significance of science in the practical activity and life of man. Hegel already, in "The Phenomenology of the Spirit" showed that man with his reason, by mastering as a cognitive subject the object opposed to him, is transformed from a slave into a master. If, says Hegel, "the essence of domination is the reverse of what it wants to be, then slavery also, in its final result, becomes the opposite of what it seems directly; as it is alienated in itself, this consciousness returns to itself and turns to true independence."³) This true independence is acquired by the cognitive subject by filling his consciousness with objectively - true content. In his work: "Materialism and Empiriocriticism", V. I. Lenin gives a classical formulation, which expresses the most important thought on the supremacy of man over the surrounding world because of his objectively - true cognition. "Supremacy over nature which is manifested in the practice of humanity, is the result of an objective - faithful reflection in the human brain of phenomena and processes of nature; it is proof that the reflection is objective, absolute and eternal truth."⁴) In the light of ^{the} contemporary scientific achievements of humanity, this Leninist thought was brilliantly confirmed. The creation of artificial earth satellites and the first artificial planet of the solar system is an expression of profound penetration into the objective laws of the movement of earth

and heavenly bodies. The era of interplanetary travel and conquest of world space has begun and this signifies the beginning of a new epoch of the supremacy of man over nature, a supremacy achieved by objectively - true cognition of its laws. Obviously, this did not come about suddenly, not like a Deus ex Machina, but as a result of a long and complicated process of the development of human knowledge, as a result of uninterrupted and more and more profound discovery by man of heretofore inaccessible secrets of nature.

Finally, it is necessary to remark, that these Leninist ideas on the understanding of the objectivity of truth are the complete antithesis and show the groundlessness of the assertions of the gnosiologists of pragmatism with their instrumental conception of truth. As is well-known, the logical consequence of this concept, as long as it serves as necessary instruments in the "biological adaptation to the environment", quite independent of and against the objective - true sense and significance of all our concepts and theories. The opposition of Marxist to pragmatist theory of truth was clearly expressed by V. I. Lenin in the following words: "To consider truth as an instrument of cognition means in essence to go over to the side of agnosticism, i.e. to abandon materialism."⁶⁾ Furthermore / outstanding members of an Italian pragmatist society with the pretentious name "Leonardo" arrived at an assertion of the identity of truth and lies (1). This follows completely "logically" from the concept of instrumentalism and the denial of the objective nature of truth.

The contradictory nature of the process of the cognition of truth,

The dialectics of the absolute and relative nature of truth. The process of the cognition of truth is the process of achieving the objective truth of the theories, concepts, laws and other forms of human thought. Undoubtedly, in this process a certain role belongs to live contemplation, when sensations, perceptions and concepts arise in human consciousness. Nevertheless, the real process of getting to know the truth begins with the rise of scientific thought. At the same time always, as Lenin points out, practice checks on and confirms the objective truth of our every step in cognition of the world, starting from elementary sensual concepts and ending with higher scientific abstractions and scientific ideas.

In proceeding to a discussion of the dialectic of the process of the cognition of truth, V. I. Lenin highly values Hegel's thought, that truth is realized only in the sum total of all sides of reality, in all the variety of its connections and relations. For this reason it is natural that the process of the cognition of truth is an uninterrupted and endless movement of human knowledge from the appearance to the essence, from the less profound to the more profound essence, from one form of connection and interdependence to another, more profound and more general. The logical cristallization of this complicated and contradictory process is revealed in the dialectic of the absolute and relative nature of truth which was disclosed and discussed profoundly from all sides by V. I. Lenin.

The absolute nature of truth is expressed by the fact that it is possible for a human being to acquire complete and exhaustive know-

ledge of all laws of the surrounding world. The relative nature of truth is characterized by the approximate nature of our knowledge, the definite degree of the penetration of our consciousness into the inexhaustible essence of matter, the definite level of human knowledge achieved in any given epoch. At the same time, as was stated above, the absolute and relative nature of truth are entirely based - as logical characteristics of truth - on its objective character. The absoluteness as well as the relativity have meaning and significance only in connection with the objectivity of truth, without which all discussions of truth become nonsense.

In the historic process of the cognition of truth the mutual and contradictory connection between its absoluteness and relativity is revealed. It must be mentioned by the way, that this connection was intuitively pointed out in ancient Indian philosophy and the philosophy of Jainism and especially in Buddhist philosophy. On the one hand, the absolute nature of the world is realized in an uninterrupted series of relatively - true theses with an ever-increasing degree of profundity and accuracy, reflecting the infinitely complicated laws of the material world. But, on the other hand, the relativity of truth is at the same time also its absoluteness; thus: every relatively-true step in the cognition of the world means a step towards cognition of the full, absolute, inexhaustible content of reality. This is a general dialectic law of the entire process of human cognition which is being realized in many sectors of scientific knowledge.

Let us illustrate this with a characteristic fact in the development of contemporary science. One of the fruitful ideas of the theory

of relativity is the idea of the dependence of the geometrical attributes of space on its physical nature, an idea which was pointed out already by Lobachevskiy and Riman. Historically, the first step in the cognition of metrical attributes of space was the geometry of Euclid, from which follows the following expression for a linear element (in Descartian coordinates).

$$ds^2 = dx^2 + dy^2 + dz^2$$

This expression is the first approximation in the cognition of the geometrical relations of the real world, it characterizes with a certain degree of accuracy the real relations of spatial bodies, abstracting itself from their differing physical nature. The next step is the expression given in the theory of relativity, which utilizes, as is well-known, new interrelations of non-Euclidean geometry. The linear element is here expressed with the help of a fundamental metrical tensor

$$ds^2 = g_{\mu\nu} dx^\mu dx^\nu$$

where the functions of $g_{\mu\nu}$ are components of a symmetrical covariant tensor and describe the metrical relationships in the space-time continuum as well as the gravitational field. This means a more profound cognition of the attributes of real space but, at the same time, - this is particularly interesting from the gnosiological point of view - all this does not change the relationships of Euclidean geometry; they remain in force in an infinitely small field and are still the first approximation to cognition of the metrical attributes of real space in general (moreover, as a rule this is sufficient in ordinary engineering practice). However, even the given expression does not exhaust the entire wealth and variety of real space attributes. As is correctly

pointed out by academician V. A. Fok, this expression refers to movement of an uncharged material point in the field of gravitation. If, however, the material point is charged, it will be influenced also by the external electro-magnetic field. In this case the metrics of space become more complicated and the following formula will be in force for it:

$$dc^2 = g_{mv} dx_m dx_v - \frac{e^2}{m^2 c^4} \cdot (A_v dx_v + du)^2$$

where the second term of the right hand part of the equation expresses the influence of the potential of the external electromagnetic field.

In developing these ideas further, V. A. Fok remarks correctly that "the distribution of masses in space is of an insular nature", as is attested by astronomical observations. In connection with this he gives the following expression for the linear element (for infinite space):

$$dx^2 = (g_{mv})_{00} dx_m dx_v = c^2 dx_0^2 - dx_1^2 - dx_2^2 - dx_3^2$$

However, in Einstein's equation an equal distribution of mass in space is being considered, which, naturally, is a certain approximation.⁶⁾

However, regardless of the great scientific significance of these ideas, all the above-mentioned equations do not express the entire infinite variety of real spatial relations, they do not consider, in particular, the influence of the mezon, neutron and other physical fields on the geometrical attributes of space. For this reason, the terms of the equation can not be considered as absolute, complete truths, but express a certain degree of our penetration into the infinitely complicated and varied connections and relationships of real space, they express the unity of the absoluteness and relativity of truth, which corresponds to the given concrete level of human knowledge.

Leninist ideas on the question of the absolute and relative nature of truth serve as the strongest theoretical weapon in the struggle both against relativism and agnosticism in contemporary bourgeois gnosiology and against the dogmatism of contemporary theologians and neo-realists with their assertions of absolute and eternal "God's truth."

Relativism and agnosticism are preached particularly in contemporary gnosiology of Neo-Kantism and semantic idealism. Suffice it to cite the so-called "principle of tolerance" of Karpap, which leads to complete arbitrariness in setting up any logical or scientific systems, completely independently of the objective truth of any theories, concepts, ideas, etc. Lenin's idea of the organic link between the objectivity, absoluteness and relativity of truth shows the complete groundlessness of the assertions of the relativists, which in essence express repudiation of scientific cognition of the world.

In the same way the dogmatic assertions of contemporary theologians and neo-realists on the existence of absolute and immutable "God's truths" are shown to be completely groundless in the light of Leninist ideas. Thus, the Thomist Maritain asserts that truth is contained in God and, in addition, that God Himself is truth "primary and sovereign".⁷⁾ The same thing is preached by Santayana, who asserts that in the higher realm - the realm of the spirit-God appears as truth, happiness, good and beauty.⁸⁾ The same ideas also are developed by professors of theology of the Catholic university of Louvain, who recently published a special collection of articles devoted to problems of truth and freedom. Their main idea consists in proclaiming the existence, in addition to "ordinary" and

"scientific" and "philosophic" truth, of a higher "religious truth" which alone is capable of "penetrating the secrets of human existence and the secrets of the universe" in a "decisive and exhaustive" way, i.e. absolutely. The same spirit-there is not a single new idea in this-was also expressed in Pope Pius XII speech to welcome participants at the International Philosophers' Congress in Italy in September 1958. He called on them to get to know the "supernatural truth of the Christian faith" as it contains: "anticipation of true bliss, a pledge of God's favor, immortality and joy."⁹) All these and similar assertions are completely refuted on the basis of Leninist ideas on the absolute and relative nature of truth, on the basis of a profound understanding of truth as a process of uninterrupted, eternal approximation of human knowledge to infinitely complicated and inexhaustible reality. And this, obviously, excludes any dogmatic, theological assertions on "absolute" and "eternal divine truths.

The principle of the concrete nature of truth and its theoretical and practical significance. Truth, as it is the process of uninterrupted development of human knowledge, is also a definite concrete-his-toric result of cognition, expressing a qualitatively defined stage in the development of knowledge. On this level, truth reflects the corresponding concrete attributes and connections of material objects, the concrete conditions and corresponding real relationships which take place at a given moment of the development of any phenomena or processes.

The concrete nature of truth is manifested in the process of

cognition in various aspects. Primarily, it appears in the process of the formation and development of the most important scientific concepts, in the unity of the concrete and abstract aspects. As is well-known, this idea was given us already by Marx. He showed that the concrete aspect of a thought as a reflection of concrete reality, is revealed in a series of separate abstract definitions. And V. I. Lenin shows that only the infinite sum of abstract definitions renders this concrete aspect fully. This last thought of V. I. Lenin characterizes the entire uninterrupted process of human cognition. But at every definite stage of it, this cognition has a certain degree of accuracy and approximation-the concrete aspect of reality with the help of a number of developing abstract definitions (or particular concepts) synthesized in the corresponding concrete concept. In showing the futility of the formal-abstract method in political economy, Marx said that the establishment of economic systems and working out of the most important economic concepts proceeded exactly in the above-mentioned way: at first some abstract definitions were created-labor, distribution of labor, money, value, and others-and after this general and at the same time concrete concepts were formed, such as the state, international exchange, world market. The same law applies, obviously, also to the development of concepts in the natural and mathematical sciences. Thus, the rise and development of the concept of mathematical infinity historically required the creation of an entire series of separate abstract definitions-concepts of variable, potential and actual infinity, of differentials, integrals, limit, functions, great

numbers, etc. Here in all cases the concrete acts as a definite historical result of cognition but, of course, it is in no way complete, absolute or final, but only an important moment in the uninterrupted process of the development of knowledge.

The question of the concreteness of truth is also revealed in the dialectic of general and particular cognition. V. I. Lenin shows that the general is manifested in the particular as its decisive part, as its essence. But at the same time, the general does not exhaust or cover the variety of the particular as the concrete, which in this respect is richer than the general. These Leninist ideas are of great significance at the present moment for Marxist-Leninist theory. The resolutions of the 20th congress CPSU and the Moscow declaration of 1957 point out the enormous significance of analyzing and taking into account concrete peculiarities and concrete conditions in various countries in the struggle of the working class for building a socialist society. At the same time, analysis of concrete conditions and peculiarities of every country does not ever mean forgetting and denying the most important and determining general laws of the struggle for socialism. This theoretical statement, given in the above-mentioned documents, clearly shows the untenable position of both the abstract-dogmatic approach to these questions and the revisionist denial of the most important general principles of Marxism-Leninism.

Finally, the principle of the concreteness of truth in the theory of cognition in dialectical materialism is extremely important in yet another connection. This principle requires, as V. I. Lenin developed

particularly fully and profoundly, a concrete-historical analysis of developing social events. It is well-known that our communist party is creatively applying the general principles of Marxist-Leninist theory to changing historical conditions. A new remarkable model of a creative, concrete-historical analysis of the laws of development of the present epoch is contained in the most important thesis given in the report by N. S. Khrushchev to the 21st Congress ^{of the} CPSU, that "the countries of socialism, successfully utilizing the possibilities contained in the socialist system, will accomplish the transition to the higher stage of a communist society at more or less the same time." The dialectic thesis "there is no abstract truth, truth is always concrete" is of ^{*}unvarying theoretical as well as practical significance.

In connection with the Leninist thesis on the concreteness of truth, it is necessary to briefly evaluate the attempts at setting up a so-called absolute, logical algorithm . . . These attempts have their origin as early as in the notorious "art of lully" in the Middle Ages; later, such intellects as Leibnitz and Laplace attempted to work out an absolute/logical-mathematical algorithm with the aid of which it would be possible to solve any mathematical problem; in the last decade semantic gnosologists such as Karnap, Morris, Korzhivskiy and also the Polish logicians Tarski and Lukasiewicz are attempting to set up universal "tables of science" and various systems of "Metalogic", "Metalanguage" and "Metagrammar." In all such cases the scientific requirement of the concreteness of truth is infringed and an artificial extrapolation of a priori principles for an unlimited group of phenom-

mena, qualitatively different from each other, is taking place. For this reason all such schemes are fruitless in a scientific way as they are an abstract formalization of science and a denial of its concrete content.

"The decisive role of practice and the question of the "logical criterion of truth." Lenin's central idea in the theory of cognition is that of the decisive role of practice in the entire process of cognition. It is the only objective and decisive criterion of truth in cognition. This important role can be fulfilled and is really being fulfilled by practice in the process of the development of human knowledge, in all its various aspects and manifestations. Dialectical materialism considers practice to be the social-historical activity of people-activity in the field of production, the practice of the class struggle and the practice of scientific experiments and observations. Such a concept of practice makes it possible to reveal its role as the decisive criterion of truth, in the social, natural and mathematical sciences.

Above all, practice as the social-historical, material activity of people appears as a completely definite-and in this sense, absolute-criterion of truth in cognition, establishing the truth of truly scientific theories and refuting all lying theories and assertions. On this plane, examples from the history of science, which show the downfall of agnosticism, are of particular importance. Suffice it to recall the following convincing facts. In 1872 the permanent secretary of the Berlin Academy of Sciences Dubois-Reimond, in the speech "The Borders of Natural Science," enumerated seven

"world riddles"-scientific problems which, in his opinion, would never be solved. And what happened? At present all or nearly all these problems have been solved in principle; among them, one of the most difficult-the problem of the essence of life-has been profoundly elucidated by the Russian physiological school of Sechenov-Vvedenskiy-Pavlov.

In 1900 Gilbert, at an international mathematical congress, enumerated 36 mathematical problems which the then beginning 20th century would have to solve. We can say with pride that already long before its end, our century has solved these problems. Not long ago the great physicist of our age, Albert Einstein, ironically recommended that we return to a discussion on the use of atomic energy in 100 years. The creator of the theory of relativity could still in his life-time convince himself that his pessimistic prognoses had been groundless. Finally, many bourgeois philosophers and even many scientists-specialists would hardly have believed a few years ago that mankind was capable of putting the first artificial planet into orbit between the Earth and Mars in 1959! All this is convincing proof of the enormous force of human cognition, it reveals the complete groundlessness of agnosticism and demonstrates the role of human practice as the decisive, and in that connection absolute, criterion of the truth of our knowledge.

At the same time, practice also acts as a relative "indeterminate" criterion of truth in the sense, that it can not fully and absolutely confirm the truth of human knowledge as "final" and "absolute" truths.

as infallible and eternal dogmas, which mean the end of the development of the cognition of the world. This is also determined by the fact that not only human knowledge but also the social practice of people itself is continually developing and being filled with new content. Let us remember for example, the period in the history of science when it was considered to be one of the essential signs of a chemical element if it was impossible to divide or decompose it. This was proved by the practice of that time, which was limited in its technical means. Its further development showed that it was not permissible to consider practice absolute and correspondingly transform our knowledge into an absolute, into unshakeable dogmas for eternity. This applies to an even greater extent to the development of social theories.

It was pointed out above, that the new historical practice of the struggle of the working class for socialism and communism requires an enrichment of Marxist-Leninist science with new theses; this means that it is not permissible to absolutize and dogmatize old theses even though they correspond to the old conditions and practice of a definite historical period. This acquires a particularly great significance in the present epoch, when an unusual acceleration of historical development is taking place, as was foreseen by the genius of V. I. Lenin, when the masses with their titanic labor are transforming the world in a very short time and are building a new communist society. The entire historical practice of mankind will be developed extremely rapidly, profoundly and many-sidedly; this requires rightly and logically,

a corresponding development of social science and does not permit any absolutization or fetish, both in connection with various theses of science and in human practice itself, which is always of a concrete-historical and not abstract-dogmatic character.

In this briefly, consists the dialectic character of the criterion of practice in cognition, pointed out by V. I. Lenin in his work of genius: "Materialism and Empirio-criticism."

Let us briefly consider in this connection, the question of the so-called "logical criterion of truth." The essence of the "logical criterion" consists in determining the sense and meaning of logical theses by their connection and correspondence with other logical theses. The real sense of the "logical criterion" is determined by the fact, that it is founded entirely on the principle of the non-contradictory character of thought. For this reason it must be said that, in the first place the "logical criterion of truth" founded on the given principle, is one of the necessary factors of the real process of cognition, particularly important in the process of erecting and developing deductive scientific systems, in particular various systems of geometry; in the second place, the "logical criterion" can not be a criterion of objective truth in cognition, as it itself belongs entirely to the logical sphere and not to natural reality; thus, all the more unfounded are all formal-logical attempts to make it absolute; in the third place, the "logical criterion" can be of only relative significance, in connection with and depending on the essential and decisive criterion of truth in cognition-the criterion of practice in the broad Leninist

sense of the word.

Lenin's great ideas in the doctrine of truth are being confirmed over and over again in contemporary science and practice and serve as guiding stars in the cognition of the world, insuring a profound and progressive development of science.

1) V. I. Lenin: "Works", Vol. 38, p. 182.

2) V. I. Lenin: "Works", Vol. 14, p. 117.

3) Hegel: "Phenomenology of the Spirit", SPb, 1913

4) V. I. Lenin: "Works", Vol. 14, p. 177

5) V. I. Lenin: "Works.", Vol. 34, p. 366

6) See V. A. Fok: "Some Applications of the Ideas of Non-Euclidean Geometry of Lobachevskiy in Physics", in the book by A. P. Kotel'nikov and V. A. Fok: "Some Applications of Lobachevskiy's Ideas in Mechanics and Physics," 1950, p. 75.

7) See I. Maritain: "De la Vérité," 1931, p. 441.

8) See G. Santayana: "The Realms of Being," 1942, N. J., p.p. 839-841

9) "L'Osservatore Romano," 23 Sept. 1958

END