

The centenary of V. I. Lenin's birth is an event not only of national and state concern, but of world-wide significance. It is celebrated by all progressive mankind and is being solemnly observed by UNESCO. This event is linked with the triumph of a new ideology, the creation of a socialist society over a wide area of the world, and confidence in the ultimate victory of all the world's workers and in the triumph of mankind's great ideals of freedom, peace, work, thought, and progress.

Lenin's activity as the supreme authority of the theory of practice of revolution, founder of the Communist Party of the Soviet Union, director of a tremendous social revolution, founder of the first socialist state in the world, inspiration of the international working class and of workers, is organically connected with his activity as a scientist.

Lenin the scientist is remarkable for the richness and variety of his ideas, their depth and unsurpassed value, for the fantastic extent of his scientific activity and the manysidedness of his creative genius. His investigations were not confined to sociology, economics, politics, history, philosophy, logic, and the humanities, but also extended to many aspects of natural science. Lenin's ideas and his approach to the analysis of many of these problems are still of enormous scientific value even today. Lenin was a scientist at all times and in all things; in all spheres of practical activity — in his work for the Party or revolution, in his political, administrative, and economic activity, his characteristic feature was a scientific approach to the solution of each problem. Each problem became a matter for scientific analysis and practical action; a result of scientific analysis was the decision on methods to be used for the concrete solution of particular problems.

The strength of Lenin's scientific analysis, his ability to pick out the important from a mass of phenomena and events, allowing for all their connections and consequences, his ability to enunciate every problem correctly before finding its solution — all these were the result of a deep understanding and remarkable grasp of materialistic dialectics as a philosophical doctrine and as a method of learning. In his practical work Lenin demonstrated the whole force of dialectical materialism and its importance for scientific activity.

Lenin organically combined the dialectical method of analysis with the essentially materialistic and strictly scientific demand for reliance on factual data, on the use of precise and faultlessly analyzed factual material. When he wrote such fundamental books as "Materialism and Empiricocriticism," and "Imperialism as the Highest Stage of Capitalism," Lenin used a colossal amount of material from different fields of science, philosophy, economics, technology, politics, diplomacy, and other sciences. He pointed out that in the analysis of any phenomenon, in the construction of a scientific concept, the scientist must "lay a foundation of precise and indisputable facts, on which to build . . . so that this foundation should be a real one it is essential to choose, not individual facts, but all the facts without exception pertaining to the problem concerned, for suspicion must inevitably arise, and it is perfectly legitimate that it should, that the facts have been chosen or selected arbitrarily. . . ." [1].

However, facts alone, however great their objective value and however perfect the method used to obtain them, cannot constitute a theory, or even an hypothesis. Theoretical generalizations are necessary, and the more voluminous the facts, the wider the generalizations must be. Methodologic analysis of the generalizations must then follow. At the present time of rapid development of science, biology, and medicine the need for generalizations of this type and for methodologic analysis is even greater. The appearance of a colossal volume of factual material must convince everybody, including scientists who are positivistically

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inclined, of the rightness of Lenin's view that to understand any phenomenon means to express it in the form of concepts. Lenin emphasized that "theoretical understanding must endow an object with its necessity, its multilateral relationships, and its contradictory movement...." [2].

It is worth noting that many non-Soviet scientists, including biologists and medical scientists, are pointing to the difficulty of integrating the ever-increasing volume of facts and are more and more reaching the conclusion that experimental data require philosophical interpretations, philosophical generalizations, and methodologic analysis of theoretical constructions. In particular, this matter was discussed at a joint Pavlov Conference of the New York Academy of Sciences and the Academy of Medical Sciences of the USSR in 1960.

However, the problem is not merely the progressive accumulation of factual material on a gigantic scale. The difficulties constantly faced by science in connection with its development also include, first and foremost, the replacement of familiar ideas by unfamiliar, the discarding of obsolescent concepts, and this problem is becoming increasingly perceptible, important, and continuous. Whereas previously, because of the relatively slow development of natural science, its revolutionary transformations were periodic in character, it has now become a constant feature of the tremendously accelerated development of science. Under these conditions the further progressive development of science will be impossible in the future without a philosophical analysis of the factual material, without generalizing theories and a clear understanding of the principles governing their replacement and of the factors causing the breakdown of habitual views. "Natural science progresses so rapidly, it is passing through a period of such profound revolutionary change in all its fields, that it is impossible for science to dispense with philosophical conclusions in any single case" [3]. The increasing importance of this view, held by Lenin, with the passage of time is obvious.

Following Marx and Engels, but under much more complex conditions, at a time of great upheaval in science which many, even eminent scientists regarded as a crisis, Lenin developed the gnoseology of dialectical materialism and based it on fresh examples. Lenin's development of a theory of knowledge is an example of scientific creativeness, of clarity and precision of wording, of the logic and organic interlinking of all elements of the theory, and of the unity of its methodological principles.

The principal elements of the Marxist-Leninist theory of knowledge — the material nature and objectivity of the world around us, the existence of objective truth and our ability, in principle, to discover it — are the starting points for natural science. The view that the world and its laws are cognizable is a philosophical stimulus ridding natural scientists of their bonds, spurring them to practical activity, and guaranteeing its success. The greatest service of Marx and Lenin was that they asserted not only that man could understand the world, but also that he could transform it. Having pointed out at the beginning of the 20th Century the inexhaustibility of matter, Lenin at the same time emphasized the infinite possibilities of its understanding by the human mind, thereby leaving no loophole for agnosticism.

Progress in physics, chemistry, and biology today, with man's ability to probe the secrets of outer space and the microworld, his mastery of atomic and nuclear energy, his understanding of the laws of heredity and its material carrier, his progress along the path of synthesis of living matter, his ability to control the heredity and development of the animal organism, his ability to probe the secrets of the brain and mental activity and to control that activity by means of chemical substances — these and many other triumphs of modern science, biology, and medicine convincingly confirm Lenin's view that the world can be understood, that "human consciousness not merely reflects the objective world, but creates it" [4].

Lenin's ceaseless and unremitting struggle against idealism, the need for which he was constantly emphasizing, was due not only to the fact that idealism is a foreign doctrine inimicable to the toiling masses, but also to the fact that idealism, whether subjective or objective, implies that the world is not cognizable in principle, and that it is alien to science. In his analysis of Johannes Müller's law of specific energy, the facts on which this law is based, and the main conclusions drawn from it, Lenin showed how methodologically incorrect conclusions can be drawn from indisputable factual material, leading to physiological idealism.

For the scientist an understanding of the causes of the appearance of idealism in scientific research is very important. The ability of physiological and other types of natural scientific subjective idealism to appear is due to the very nature of research itself, because methods of investigation and the instruments used for this purpose never reflect and never can reflect the direct essence of a phenomenon or the property of an investigated object; the results are obtained indirectly through the properties of the instruments. Here, also, the investigator is concerned essentially with the "law of specific energy," but it is not a question of natural

sense organs, but of artificial sense organs made by man himself, instruments transmitting information in a language of their own. At the present time, when research techniques present fantastic possibilities, this indirect link between the objects studied and man, reflecting also the property of the methods and instruments themselves, has become more complex still. That is why views have arisen according to which theories describe, not the test object itself, but the result of its interaction with an instrument. Under these conditions the vital clue for the scientist is Lenin's theory of objective truth, existing outside and independently of human consciousness and investigative activity, the theory of the relationship between relative and absolute truth, that the process of reflection of reality by man proceeds from knowledge of the essential quality of one order to knowledge of the essential quality of another order, and so on. Lenin pointed out that knowledge proceeds from subject to object, i.e., in the process of cognition everything connected with the work of the sensing apparatus (organs of the senses and instruments) of the subject is eliminated and everything corresponding to the object is preserved and is revealed more definitely.

Lenin showed that the cause of idealism is the absence of dialectical thinking during interpretation of the results and during the construction of concepts. A rough, mechanical, metaphysical materialism, divorced from the dialectics of cognition, must sooner or later lead to idealism. "Straightforwardness and oneness, obstinacy and rigidity, subjectivism and subjective blindness — these are thegnoseological roots of idealism" [5]. This warning given by Lenin is of inestimable importance to natural scientists.

Clearly science existed and developed even before the time of dialectical materialism. Certainly discoveries, many of them important and fundamental, have been and are being made by scientists who subjectively are not supporters of dialectical materialism. However, every scientist, when explaining a particular phenomenon, when discovering a general rule, i.e., when discovering an objective truth, is working objectively and, as Lenin said, spontaneously on a basis of materialism, he is assuming the objective reality of the world and man's ability, in principle, to understand it. Such is the intrinsic logic of investigation which stems from the same theory of knowledge implicit in dialectical materialism. Pavlov, when he discovered the objective laws of higher nervous activity, did so from the standpoint of materialism, as Sherrington himself remarked. However, Sherrington himself, although skeptical of Pavlov's materialistic ideas of mental activity, also worked from materialistic principles in his classical neurophysiological investigations. These investigations, reflecting the objective laws of activity of the nervous system, have survived long after Sherrington's views on the relationship between the brain and mental activity. As a result of the materialistic views of Sechenov and Pavlov, the brain and its highest property, that of mental activity, have become the object of scientific investigation and understanding.

According to Sechenov's views on reflexes of the brain and mental processes, which Pavlov described as an inspired stroke of genius, "all mental processes are reflex in the method of their origin." Sechenov's conclusion is in full agreement with one of the basic principles of Lenin's theory of reflection, according to which intellectual activity is the highest form of reflection of the outside world by a particular form of organized matter.

It should be emphasized that Lenin never tied philosophy to science, never placed philosophy above science, never made a magic wand of philosophy, knowing no difficulties and solving all problems without any connection with science. He constantly pointed to the need for an organic link between philosophy and science, the importance of science to philosophy, and the existence of a "powerful current" flowing from science to sociology. Marx and Engels, in their struggle with the vulgarizers, repeatedly emphasized that dialectical materialism does not solve scientific problems but merely provides the proper environment for their solution, and helps the scientist to realize correctly what is going on. "Modern scientists," wrote Lenin, "find (if they know how to seek and if we learn to help them) in Hegel's materialistically interpreted dialectics many of the answers to those philosophical problems which create a revolution in science...." [6].

In the briefest and most succinct form, Lenin described those principles which have now become classic, the guiding principles for activity of all scientists: "to know an object in reality it is necessary to study all its aspects, all its connections and its consequences. We can never do this completely, but the requirement that we must study all its aspects will protect us against mistakes and against stagnation. Second, dialectical logic requires that an object be studied in its development, its "self-movement," in its change. Third, all man's practical experience must enter into the complete "definition" of an object, both as a criterion of truth and as a practical index of the connection between the object and man's need. Fourth, dialectical logic teaches that 'there is no such thing as abstract truth, truth is always concrete....' " [7].

Lenin attached particular importance to science in a new, socialist society. Besides the basic philosophical and methodological principles described above, of fundamental importance to science in general, Lenin enunciated a number of fundamental principles for the development of science in a socialist society. These principles are determined by the ideology and tasks of the new society.

To begin with, Lenin emphasized the new relationships existing between science and the people in a socialist society. Two months after the October Revolution, at the Third All-Russian Congress of Soviets of Workers', Soldiers', and Peasants' Deputies, Lenin said: "Previously the whole of man's mind, the whole of his genius created only so that all the benefits of technology and culture should be given to some while others did not even have the bare essentials: education and development. Now, however, all the marvels of technology, all the gifts of culture will be accessible to the whole population, and henceforth the human mind and genius will never be turned into the materials of force, the materials of exploitation" [8]. In the new socialist society, an unbreakable link will be forged between science and the people, science will become for the people, it will serve the people and be created by the people, by its genius and its material and spiritual values. Even in the difficult years of birth of the new Soviet Republic, in the years of the civil war, of famine, and destruction, the people gave all they could for the development of science. This attitude of the people to science has remained unwavering throughout the history of the Soviet state. Without mentioning the tremendous funds assigned by the State budget for science, it will be enough to mention that the money raised as a result of the All-Union Saturday, held in honor of the 50th Anniversary of the First "Saturday" in which Lenin took part, was given by the public to build scientific institutions, including the largest cancer research center in the country.

As the most important and essential condition for the development of science in the new society, Lenin specified the principle of acquisition of all the cultural and scientific achievements due to mankind. Without this, Lenin stated, it is impossible either for science to develop or for communism to be built. The principle of acquisition of cultural and scientific achievements of the part follows from the very nature of dialectical materialism. Lenin himself was always strict and cautious in his attitude toward the scientific and cultural heritage of the past. His attitude to the collection of factual material as an essential part of scientific research has already been mentioned above. Lenin fought relentlessly against those who, under the cloak of pseudorevolutionary phrases, sought to reject the achievements of the classical science of the pre-revolutionary period and to create new, "proletarian" branches of science.

Lenin attached tremendous importance to the connection between theory and practice under the conditions of a new, socialist society. In this he was not only concerned with the philosophical aspect of the problem, not only with its practical aspects as criteria of the truth, but also with the possibility of establishment of new relationships between theory and practice — with their unity. After the victory of the October Revolution, Lenin wrote: "... the historic moment has now arrived when theory is converted into practice, practice is revived, practice is directed, practice is verified ..." [9]. This definition goes beyond the bounds of politics and has the widest interpretation. True unity of theory and practice, the constant conversion of theory into practice in the name of the public interest are possible only when science becomes public property. The dialectical nature of the wording and the stress laid on the importance of practice as the verification of theory are the outstanding points in this statement by Lenin regarding theory and practice.

Two other principles enunciated by Lenin are intimately connected with the principle of unity of theory and practice: the planned direction of science by the State and the scientific forecasting of the ways and means of its development. Lenin himself played a direct part in the drawing up of the first plan of scientific and technical research in revolutionary Russia. In the spring of 1918, on his initiative, the important "Draft Plan of Scientific and Technical Research" was produced. The importance of the planning principle in science in a socialist society has increased with the progress of science and the development of society itself. Another special feature of Lenin's approach to this problem must also be emphasized. As a scientist, and with a profound understanding of the specific nature of creative work and scientific research, Lenin rejected decisively the concept of administration in science which had nothing in common with the state planning of its development, and he demanded a careful and attentive attitude toward the scientific resources of the country.

Lenin himself showed an example of scientific forecasting in the solution of highly complex political, economic, and philosophical problems. He suggested, in what was a fundamentally new departure from Marxism, that the system of capitalism could be broken in one link, that victory of the proletarian revolution can occur in one country, he specified that Russia can be that country, and he defined the course of development of revolutionary activity in Russia until the time of the armed rebellion, the character of behavior of the political parties, the course of the civil war, the construction of socialism in the country, the

development of its energy resources, and he predicted and gave his reasons for decline of the world capitalist system as a result of socialist revolutions in new countries, the conversion of the dictatorship of the proletariat from a national to an international force, and so on. All these were the result of a penetrating scientific analysis of concrete data and developmental tendencies, the result of practical application of those aspects of the theory of knowledge which were discussed above.

Lenin's principle of the need for scientific forecasting of the method and character of development in the life of the community and in science is particularly important in these days of rapid development of science and of technological revolution.

Lenin attached great importance to the principle of collectivism in science. This principle, a product of the ideology of the new, socialist society, becomes increasingly important as research topics become more complex with the development of science. Even in those days, Lenin pointed out the need for collective solution of the most important economic problems and demonstrated how this principle can be applied when the plan of the state commission for the electrification of Russia was drawn up. At the present time the principle of collectivism has a definite role in scientific research.

As Lenin stressed, humanism and internationalism must be the characteristic features of science in a socialist society. The humanism and internationalism of science in the new society mean that science serves the people and the cause of peace and progress, and its achievements are of benefit to the population as a whole and to the whole of mankind. The principles of humanism and internationalism are determined on the basis of a socialist society, the task of building communism, the principle of peaceful coexistence of states with different social systems, which Lenin enunciated, a policy of peace between nations, the principles of proletarian internationalism, and generous aid to all developing countries. The principle of internationalism, closely linked with the principles of humanism and collectivism, is also manifested by the manner in which, in a socialist society, people of different nationalities work on an equal footing in science; each national republic has all that it needs for the full development of all branches of its own science, and itself makes an important contribution to the over-all scientific progress of the country. The principle of internationalism is also manifested in the generous provision of aid to developing countries for the benefit of their science and culture. With the appearance of the world socialist system a new form of international collective scientific collaboration has developed.

We have examined the more important of Lenin's principles of scientific construction in a socialist society. Although expressed many years ago, not only have they not lost their importance at the present time but, on the contrary, their role has increased and will increase further with the development of science and the development of socialism.

However, Lenin did not simply define the character and principles of development of science in a socialist society, but as was touched upon above, he put these principles into practice. It is impossible even to attempt to specify everything which Lenin did, as the leader of the party and of the Soviet state, for the development of science in the country, for technological progress, for the development, in particular, of medicine and biology, and for the creation of a new national health service.

Lenin's constant care and anxiety concerning the state of the Academy of Sciences, his endeavor to give it all possible assistance, to facilitate the work of scientific institutions and the publication of Academy proceedings, to satisfy the needs of scientists and give them all possible help, are well known. His truly titanic and constant struggle on behalf of the intelligentsia, to bring them over onto the side of Soviet power, and to obtain their cooperation in the building of socialism is also well known. Because he understood the class background of the intelligentsia, yet at the same time he realized the certainty of victory of the new ideology, and the fact that the scientist, because of the objective laws of historical development and because of his own activity as a scientist, must come to accept communism, Lenin emphasized the need for a special relationship toward scientists, requesting that "... specialists in science and technology must be approached extremely carefully and skillfully, learning from them and helping them to broaden their outlook, starting out from the achievements and results of modern science, and remembering that the engineer does not come to accept communism in the same way as the political propagandist, or the writer, but through the result of his own science..." [10]. Lenin himself provided a clear example of work with scientists and specialists, for he succeeded in enlisting the aid of the leading scientists and engineers, many of whom initially were antagonistic to Soviet power, in the work on electrification of the country. "More than 200 specialists," he wrote, "nearly all without exception opponents of Soviet power, worked on this project with interest although they were not communists" [11]. Progressive scientists, including doctors and biologists, immediately

began to collaborate with the Soviet government and participated in the work of laying the foundations of the Soviet state.

Such eminent scientists as V. M. Bekhterev, A. N. Bakh, D. K. Zabolotnyi, E. I. Martsinovskii, M. N. Shaternikov, L. A. Tarasevich, and others played an active part in the creation of a new socialist health service and network of scientific institutions and in the organization of scientific research. The enthusiasm with which K. A. Timiryazev greeted the establishment of Soviet rule and the joy with which he received Lenin's letter expressing profound respect to that scientist for his work and his progressive views, are well known. The Decree of the Council of People's Commissars of the RSFSR, dated January 24, 1921, entitled "Conditions facilitating scientific work of Academician I. P. Pavlov and his collaborators," which was published on Lenin's initiative and signed by him, has become a historical document. A striking feature of this decree is the expression in writing justifying assistance to Pavlov and the estimation of his research as "of tremendous importance for the workers of the whole world." These words reflected the principles of science in a socialist society: service of the people, humanism, and internationalism. There is now a new generation of scientific workers, and to those who are insufficiently familiar with the history of the Soviet Union, the item of that decree granting Pavlov "a special ration equal in calorific value to two academic rations," must appear strange and naive. To appreciate this in its true light, it must be remembered that the whole country was on starvation rations and that Lenin gave to homes for starving children the provisions sent to him by peasants for the sake of his health.

Lenin steadfastly emphasized the need for continuously raising the standard of education of the whole population. "Learn, learn, and learn" — this saying of Lenin's which he used on all occasions was adopted as the basis of behavior by all, starting from illiterate workers and peasants and ending with the leaders of the state and party. Lenin assumed the task of training increasing numbers of specialists within the shortest possible time and introducing a radical reform of higher education. An interesting document of this period is the decree establishing a common scientific minimum essential for education in all the higher schools of the RSFSR. In the natural sciences, it was necessary to have completed a course in physics and cosmic physics, in chemistry and biology. In the period from 1918 to 1921, 16 new higher medical teaching institutes were established. And all this was done at a time of civil war, devastation, and famine!

Lenin paid the closest attention to the development of the scientific basis and practical organization of the health service in the Soviet republic. During his life and with his immediate participation, the basic principles of the Soviet health service were defined: free medical care and medicines, available to all, under the control of the State, an organic link between theoretical and practical medicine, emphasis on preventive health services, active participation of the workers themselves in building and developing the national health service.

Lenin's principles of development of the Soviet health service and of medical science have proved their value more than ever before at the present time, under the new conditions of development of the socialist society, with its increasing material and technological resources and with the higher standard of living of the people. Over vast areas of the country, including what were at one time hopelessly backward areas, a network of hospitals and preventive institutions have grown up, consisting of a vast number of new hospitals, polyclinics, dispensaries, children's institutions, sanatoria, health resorts, new medical schools, universities with facilities of biology and medicine, research institutes, and laboratories. More than 90 higher medical institutions turn out 30,000 doctors every year. Care of the public health has become one of the most important tasks of the Soviet state. Before it was adopted, the new law on the Soviet health service "Basis of Legislation of the USSR and Union Republics on the Care of Health," was widely discussed by the general public in all its aspects. The development of medical science in the country can be judged from the example of the Academy of Medical Sciences of the USSR, founded during the Second World War, when the country was experiencing enormous difficulties and everything was being devoted to the cause of victory, and when the Academy of Medical Sciences consisted of comparatively small institutes with 60 active members. Now the Academy of Medical Sciences of the USSR consists of 34 major research institutes and separate laboratories, with up-to-date equipment. There are about 300 Academicians and Corresponding Members and nearly 600 Doctors, and more than 2300 Candidates of Sciences work in it; it employs a large number of specialists from related fields of science, and important scientific problems are investigated collectively. Branches and scientific centers of the Academy of Medical Sciences have been founded in various parts of the country. In this way Lenin's ideas and principles of development of science in a socialist society are being converted into reality.

On the occasion of the centenary of Lenin's birth, Soviet medical scientists and biologists, along with the whole people and all progressive mankind pay their deep respects and gratitude to the man whose name has become the symbol of new human relationships, the symbol of life, science, and progress.

#### LITERATURE CITED

1. V. I. Lenin, Complete Collected Works [in Russian], Vol. 30, p. 350.
2. V. I. Lenin, Complete Collected Works [in Russian], Vol. 29, p. 193.
3. V. I. Lenin, Complete Collected Works [in Russian], Vol. 45, p. 31.
4. V. I. Lenin, Complete Collected Works [in Russian], Vol. 29, p. 194.
5. V. I. Lenin, Complete Collected Works [in Russian], Vol. 29, p. 322.
6. V. I. Lenin, Complete Collected Works [in Russian], Vol. 45, p. 31.
7. V. I. Lenin, Complete Collected Works [in Russian], Vol. 42, p. 290.
8. V. I. Lenin, Complete Collected Works [in Russian], Vol. 35, p. 289.
9. V. I. Lenin, Complete Collected Works [in Russian], Vol. 35, p. 202.
10. V. I. Lenin, Complete Collected Works [in Russian], Vol. 42, p. 346.
11. V. I. Lenin, Complete Collected Works [in Russian], Vol. 44, p. 51.