THE SIGNIFICANCE OF METHODOLOGY OF DIALECTIC MATERIALISM FOR THE SOLUTION OF INDIVIDUAL EPIDEMIOLOGICAL PROBLEMS

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Report I. The Laws of Dialectic Materialism and Their Manifestations in Epidemiology

[Following is the translation of an article by Ye. P. Klimenko, Institute for the Organization of Public Health and the History of Medicine imeni N. A. Semashko, Moscow, published in the Russian-language periodical Zhurnal Mikrobiologii, Epidemiologii i Immunobiologii (Journal of Microbiology, Epidemiology and Immunobiology) No 6, 1965, pages 7--10. It was submitted on 20 Nov 1964. Translation performed by Sp/7 Charles T. Ostertag, Jr.]

Marxist-Leninist philosophy is the methodological foundation of all sciences, including medicine. It arms the doctors of all specialities with a unique universal outlook and scientific methodology of knowledge. If a doctor does not know the foundations of dialectic materialism, if he is not guided by the general laws of the development of nature and society, he inevitably puts himself on the path of prejudiced, often subjective and superficial concepts concerning individual phenomena with which he comes in contact in his practical and scientific activity. In this case his conclusions for the various problems studied, and his deductions based on the results of an extensive experiment or practical observation may bear a metaphysical or idealistic nature. The mission of any science, including medicine, should not be limited by a description of facts or their constancy. "Knowledge," says Claude Berner [7], "consists not of facts, but of the results which stem from them." Only by relying on the method of dialectic materialism, which is an unique reliable weapon in the perception of truth, scientific workers and doctors can systematize, develop and understand the regular bond between the individual facts and then correlate them.

Thorough knowledge, a skillful utilization of the laws and categories of materialistic dialectics and their disclosure in the process of studying concrete sciences are of great importance in the activity of a doctor. They orient him on the correct path for searches and investigations and also on the uniquely correct conclusions and deductions based on observations.

It is known that the nucleus of dialectic materialism is the law of unity and the struggle of contrasts. This law reveals the internal source for the process of development, and reflects the internal contradictions which are peculiar to the very objects and phenomena of the

material world. A knowledge of this law helps the doctor to reveal and understand the contradictions in the development of this or that process in the organism of a healthy or sick person, and to reveal the regularities which lie at the basis for the appearance of various diseases and their distribution.

The interrelation of the microbe-parasite and the macroorganism always has an antagonistic nature. The causative agent of an infectious disease, being a parasite, lives at the expense of the juices and tissues of the organism, breaks them down, causes a change in metabolism and reactions, breaks up the entirety of the organs and the work coordination of a number of systems, thus, causing a specific infectious disease. However, the macroorganism cannot be indifferent to this extreme stimulus and responds to its residence in this or that tissue with a complex of protective adaptative reactions (temperature reaction, phagocytosis, plasmatic reaction, leading to the formation of various antibodies, etc.). This struggle between the organism of man and the pathogenic microbe leads either to the victory of one of them due to antagonistic aspects (the death of the causative agent and the recovery of the infected person, or as is observed less often the death of the latter) or to the establishment of an apparent equilibrium on the strength of a very high adaptation capability of the macroorganism (chronic stage of carriage). But in actuality even in this case the antagonism between the causative agent and the organism of man is not removed, since the microbe continues to be a parasite in the organs and tissues, disrupting their normal activity.

In the practical and scientific activity of the doctor, and in particular of a doctor-epidemiologist, there is great importance in a knowledge of the routes and forms of transition from an old condition to a new, from a previous, existing earlier, to the present, acquired with time. The law of the transition of quantitative changes to qualitative, which reveals the internal mechanism of this development, also answers the question of how this development takes place. Being a general law, explaining the development in nature and society, it explains a number of regularities which are peculiar to medicine, and, in particular, to epidemiology as a science, "studying the objective regularities which lie at the basis of the origination, spreading and cessation of infectious diseases in the human collective, and measures for their prevention and liquidation" (Yelkin).

If an analysis is made of the epidemic process, that is the process of the distribution of infectious diseases in the human collective, then the law of the transition of quantitative changes into qualitative finds confirmation, particularly in the nature of the spreading of infections of the respiratory tract.

Being continuous, the epidemic process may have various levels. Following the recording of individual cases of influenza, measles, parotitis, chickenpox, etc. in a human collective, in the given phase of development of

science there are no objective possibilities to stop their spreading. In the event of the natural spreading of these infections due to the absence of immunity in the population, the number of cases increases. Morbidity reaches its maximum level in a more or less short period. Here a large part of the population endures the disease, and this is accompanied by the development of non-susceptibility for a certain period (depending on the infection). The appearance of a considerable immune layer (equal to 70% and higher) among the population leads to a reduction of morbidity with influenza, parotitis, etc. without the intervention of medical workers. The immunity which was developed in the human collective as a result of having had the disease is held in check for the subsequent development of an epidemic. The quantitative changes, that is, the very high level of disease endurance by the population, lead to a new qualitative status in the population, to the appearance of a high immune layer, which in turn leads to the sharp lowering of morbidity.

Knowing the regularities in the distribution of infectious diseases, their peculiarities under concrete conditions and in concrete nosological forms, medical workers may actively interfere in the epidemic process during infections, in respect to which science and practice have at their disposal either effective specific prophylactic preparations (diphtheria anatoxin, smallpox vaccine, vaccines for poliomyelitis and whooping cough) or other active measures for combatting them (sterilization therapy for malaria patients and effective means for combatting mosquitoes). The extensive application of these measures led to the complete liquidation of certain infectious diseases (smallpox, parasitic worms, recurrent typhus, etc.) or to their sharp reduction (poliomyelitis, tularemia, diphtheria, whooping cough in a number of places, etc.).

The law of the transition of quantitative changes into qualitative also finds expression in the clinical aspects of infectious diseases: The dose of the causative agent of this or that disease determined the gravity in the flow of the disease.

The third basic law of materialistic dialectics is the law of denial. It reflects the direction and tendency of development and is manifested both in society and in nature. The skill to expose the specific manifestation of this law in the area of medical sciences promotes the uncovering of those dialectic processes which take place in the living organism.

Following the introduction of the causative agent of an infectious disease into the healthy organism, there is an immediate mobilization of the various defense mechanisms on the part of the macroorganism, which in the final calculation in the majority of infectious diseases causes the death of the microbe (its denial). The causative agent represents a specific agent, a living stimulus, which causes a strictly specific immunity which is inherent only for a specific infectious disease. Prior to the introduction of the causative agent, the organism of man was not able to

overcome its pathogenic action, since it did not possess a specific immunity which was effective just for this microbe. With the majority of infectious diseases, man acquires a non-susceptibility following recovery from them. Besides this, residual symptoms are recorded in the organs and tissues of a person who has recovered, trace reactions remain, etc.

In his practical and theoretical activity the doctor-epidemiologist should also consider the position of materialistic dialectics in the common bond and interdependency of phenomena and processes. In living nature, plant and animal organisms are tightly bound between each other and their surrounding environment. Changes of the environment determine the development of the organism as a result of changes in its metabolism which unavoidably set in with a change of the interaction of the organism and the environment. Any organ of the human organism is bound with other organs and with the external medium. In this the bonds may be diverse. In some cases they may be significant and in others - insignificant, internal and external, directly expressed and indirectly expressed bonds and relations.

Bearing in mind the objective nature of the common interrelation and interdependency, the doctor may not view a disease as the result of a local change of tissues and organs. In this plan it is correct to examine the question of the carriage of causative agents of infectious diseases, which has a very serious theoretical and practical importance for public health. Many practical and scientific workers view carriage from a purely mechanistic position. Several investigators assert that the carriage of causative agents of infectious diseases is a local process. However, this contradicts the parasitic nature of the causative agent, which in the course of evolution became adapted to live mainly at the expense of the tissues of the macroorganism, by destroying them. And if the microbe destroys tissues, then can such an infected organism be considered healthy? With nothing less than a metaphysical approach to an understanding of the phenomena of bacterial carriage is it possible to explain the numerous operations for the removal of the gallbladder during typhoid carriage which have been undertaken by doctors, especially foreign ones. Such an operative intervention did not lead and could not lead to the liberation of the organism from the carriage state. This can no better refute the view on bacteria carriage as a local process. The detailed investigations which have been conducted in recent years showed that in 95--98% of the so-called healthy carriers of the dysentery bacillus, some sort of pathological condition was exposed in the organs and tissues.

In their daily practice, doctor-epidemiologists are convinced in the mutual bond and interconditionality of processes and phenomena observed during the spreading of infectious diseases.

If an analysis is made of such a category of epidemiology as the mechanism of transmission of infection, then here there is exposed a significant, direct bond between the localization of the causative agent in the organism of an infected man and the mechanism of removal of the microbe from him. Thus, infections of the respiratory tracts, in which the causative agent is localized in the respiratory tract, are always spread through the air. The droplet mechanism of transmission is the main one, fundamental in the distribution of the infectious origin with this group of infections, while intestinal infections are transmitted as a result of the entry of the causative agent with the excrement of a sick person or of the so-called carrier into the water, soil, on the hands, that is, for this group of infections the fecal-oral mechanism of contamination is characteristic. Blood infections, during which the causative agent is found in a closed system (blood), may be spread only with the help of blood sucking carriers (tick-borne and mosquitoe-borne encephalites, malaria, dengue fever, etc.).

It is characteristic that there is also a significant bond between the mechanism of transmission and the resistance of the causative agent outside the organism of man. The easier the mechanism of transmission is brought about, then as a rule the less resistant is the causative agent in the external medium. In the course of evolution the causative agents of influenza, whooping cough, measles, parotitis, etc. become adapted to live and multiply mainly in the upper respiratory tract. Such a localization ensured the ease of transmission of the microbe-causative agent of the infectious disease to another non-infected organism. In the course of evolution the microbe did not have a biological stimulus for developing a more significant stability for the possibility of a more prolonged stay outside of the organism of man.

The causative agents of intestinal infections, due to their more complex mechanism of transmission, during which implantation into a new susceptible organism is difficult, are more resistant, and in the final calculation this guarantees the continuity of the epidemic process and the preservation of the causative agents as biological species. In the course of evolution a number of microbes became adapted to the development of spores (anthrax and tetanus bacilli), thanks to which they are preserved for tens of years in a state of anabiosis, which furthers the preservation of these species of causative agents during a very low morbidity rate.

Thus, the separate provisions examined b[illegible]se point to the significance of the laws of dialectic materialism in epidemiology. A knowledge of these laws is necessary for doctors for the correct synthesis of his daily prophylactic and sanitary-antiepidemic work.