

PREFACE TO CARPENTER'S ARTICLE, "MODERN SCIENCE"

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Π αντί λόγῳ λόγος φησὶ ἀντικείμεται.

I think that the following article by Carpenter on modern science can be of especial use in our Russian society, in which more than in any other European society there exists the wide-spread and deep-rooted superstition according to which it is thought that for the good of humanity there is no need whatever of the diffusion of religious and moral knowledge, but only of the study of the experimental sciences, and that the knowledge of these sciences satisfies all the spiritual demands of humanity.

It can easily be seen what evil influence (just like that of the religious superstitions) must be exerted upon the moral life of men by this gross superstition. And so the diffusion of the ideas of the writers who assume a critical attitude toward experimental science and its method is particularly desirable for our society.

Carpenter proves that neither astronomy, nor physics, nor chemistry, nor biology, nor sociology gives us a real knowledge of reality, that all the laws discovered by these sciences are only generalizations, which have an approximate significance as laws, — and that, too, only if we neglect or ignore the other conditions, — and that even these laws appear to us as laws only because we discover them in a sphere which is so remote from us in time and space that we cannot see the discrepancy between these laws and reality.

Besides, Carpenter points out to us the fact that the method of science, which consists in the explanation of phenomena that are near and important to us by more remote phenomena, which are a matter of indifference to us, is a false method, which can never lead us to the desired results.

" Each science," he says, " has been reduced to its lowest terms. Ethics has been made a question of utility and inherited experience. Political economy has been exhausted of all conceptions of justice between man and man, of charity, affection, and the instinct of solidarity ; and has been founded on its lowest discoverable factor, namely, self-interest. Biology has been denuded of the force of personality in plants, animals, and men ; the ' self ' here has been set aside, and the attempt made to reduce the science to a question of chemical and cellular affinities, protoplasm, and the laws of osmose. Chemical affinities, again, and all the wonderful phenomena of physics are reduced to a flight of atoms ; and the Hight of atoms (and of astronomic orbs as well) is reduced to the laws of dynamics." It is assumed that the reduction of the

questions of a higher order to those of a lower order will resolve the questions of the higher order. But this elucidation is never brought about, and what takes place is this, that, descending in our investigations lower and lower, from most essential questions to less essential ones, science finally arrives at a sphere which is absolutely foreign to man and is only contiguous to him, and upon this sphere it arrests its attention, leaving all the most important questions of man without any solution whatever.

What takes place is very much what a man would do, who, wishing to understand the significance of an object before him, instead of getting nearer to it and viewing and feeling it from all sides, should go farther and farther away from the object, and finally should get away to such a distance that all the peculiarities of colour and all the unevenness of relief are destroyed and nothing but the outlines, which distinguish it from the horizon, are left, and here should begin to describe this object in detail, on the assumption that now he had a very clear conception about it, and that this concept, formed at such a distance, would contribute to the complete comprehension of the object. It is this self-deception that is partly dispelled by Carpenter's criticism, which shows, in the first place, that the knowledge which science gives us in the field of the natural sciences is only convenient methods of generalization, but by no means the representation of reality, and, in the second place, that that method of science, by which the phenomena of the higher order are reduced to phenomena of the lower order, will never bring us to the explanation of the phenomena of the higher order.

But even without anticipating the question as to whether experimental science will with its method ever bring us to the solution of the problems of life most important for humanity, the activity itself of experimental science in relation to the eternal and most legitimate demands of humanity startles us by its incorrectness.

Men have to live. To live, they must know how to live. And all men – whether ill or well – have always found this out, and, in conformity with this knowledge, have lived and moved on, and this knowledge of how men should live has since the days of Solomon, Moses, Confucius, always been regarded as science, as the science of the sciences. It is only in our day that the science as to how to live is not at all a science, and that only experimental science, which begins with mathematics and ends with sociology, is the real science.

From this results a strange misunderstanding.

A simple, clever working man, employing the ancient reasoning, which at that is common sense, assumes that if there are people who study all their lives, and who, in consideration of their being fed and supported by him, do his thinking for him, these men are no doubt busy studying what people need, and he expects science to solve for him those questions on which depend his good and the good of all men. He waits for science to teach him how to live, how to

treat the members of his family, his neighbours, people of other nations, how to struggle with his passions, what to believe in and what not to believe in, and many other things. And what does science say to all these questions of his ?

It announces to him triumphantly how many millions of miles it is from the sun to the earth, with what rapidity light passes through space, how many millions-of vibrations the ether makes for light and how many vibrations air makes for sound ; it tells him about the chemical composition of the Milky Way, about the new element, helium, about microcosms and their evacuations, about those points in the arm where electricity is centred, about X-rays, and such things.

" But I do not need any of these things," says the simple, sensible man. " I want to know how to live."

" What do I care what you want to know ? " science replies to this.

" What you ask about belongs to sociology.

But before answering sociological questions, we have to answer zoological, botanical, physiological, in general biological, questions, but to answer these questions we must first solve physical, then chemical questions, and we have to come to an agreement as to what is the form of the infinitely small atoms, and in what manner the imponderable and inelastic ether transmits motion." And people, especially those who sit on other men's backs, and who, therefore, find it convenient to wait, are satisfied with such answers, and sit " flapping their eyes " in expectation of what is promised ; but a simple, sensible working man, on whose back are sitting those men who busy themselves with science, the whole vast mass of men, all humanity, cannot be satisfied with such answers, and naturally asks in perplexity, " When shall that be ? We have no time to wait. You yourselves say that you will find it out in a few generations. But we live now : to-day we are alive, and to-morrow we shall die, and so we must know how to live the life we are now in. Teach us."

" Foolish, ignorant man," science answers him. " He does not understand that science does not serve utility, but science studies what is subject to investigation, and cannot choose its subjects for study. Science studies everything. Such is the property of science." And the men of science are actually convinced that the property of busying oneself with trifles, neglecting that which is more essential and important, is not their property, but the property of science ; but the simple, sensible man begins to suspect that this property does not belong to science, but to men who are inclined to busy themselves with trifles, ascribing an important significance to these trifles.

" Science studies everything," say the men of science.

But everything is too much ; everything is the infinite number of objects, - it is impossible to study everything at once. As a lantern cannot at once illumine everything, but illumines only the one spot toward which it is directed, or that direction in which the

bearer carries it, so also science cannot study everything, but inevitably studies only that toward which its attention is directed. And as a lantern illumines most powerfully the nearest spot to it and less and less well the objects more and more removed from it, and does not at all illumine those to which the light does not reach, even so human science, no matter what it may be, has always investigated in the most thorough manner what to the investigators seems to be most important, less thoroughly what represents itself to them as less important, and entirely neglects the remaining infinite number of objects. But what has determined for men what is very important, what less important, and what is not important at all, is the common understanding, by the men who have busied themselves with science, as to what constitutes the meaning and aim of life, that is, religion.

But the present men of science, recognizing no religion, and so having no grounds on which to pick out, according to their degree of importance, the subjects of study, and to separate them from less important subjects, and finally from that infinite number of subjects which, on account of the limitation of the human mind and the infinitude of these subjects, will always remain unstudied, have formed for themselves a theory, – "science for science's sake," – according to which science does not study what men need, but ever y tiling.

Indeed, experimental science studies everything, but not in the sense of the aggregate of all subjects, but in the sense of disorder, a chaos in the distribution of the subjects studied ; that is, science does not study preferably what is most needed by men, and less so what is needed less, and not at all what is entirely useless, but it studies everything, anything. Though there exist Comte's classification of the sciences and other classifications, these classifications do not guide them in the selection of subjects for study ; what directs the selection is the human weaknesses to which the men of science are as prone as anybody else. Thus in reality the men of experimental science do not study everything, as they imagine and affirm, but what is most advantageously and most easily studied. What is most advantageously studied is, what can contribute to the welfare of those higher classes to which the men who busy themselves with the sciences belong ; and it is easier to study everything which does not live. And so do the men of experimental science do : they study books, monuments, dead bodies.

This study they consider to be true "science." Thus what in our time passes for true "science," the only "science" (as the only book worthy of that name was called the "Bible"), is not the consideration and investigation of how to make the lives of men better and happier, but the collection and copying from many books into one of what has before been written by people about a certain subject, or the pouring of a liquid from one glass into another, the artificial splitting of microscopic apparatus, the cultivation of bacteria, the cutting up of frogs and dogs, the investigation of X-rays, the theory of numbers, the chemical composition of the stars.

But all those sciences which have for their aim the making human life better and happier, – the religious, moral, social sciences, – are not considered by the ruling science to be sciences, and are left to the theologians, philosophers, jurists, historians, political economists, who, under the guise of scientific investigations, are interested only in proving that the existing order of life, the advantages of which they enjoy, is precisely the one that ought to exist, and so ought not to be changed, but, on the contrary, ought to be supported in every possible way.

To say nothing of theology and jurisprudence, the most advanced of this kind of sciences, political economy, is most striking in this respect. The most widely disseminated political economy (that of Marx), in recognizing the existing order of life to be such as it ought to be, not only does not demand of men any change in this order, that is, does not show them how they ought to live in order that their situation be improved, but, on the contrary, demands the intensification of the cruelty of the existing order, in order that there may be a realization of those more than doubtful predictions as to what must happen, if the people continue to live as badly as they are living now. And, as always happens, the lower a human activity descends, the more it departs from what it ought to be, the more does its self-confidence grow. The same has happened with science in our time. True science is never recognized by the contemporaries, but, on the contrary, is for the most part persecuted. Nor can it be otherwise. True science points out to men their errors, and new, untried paths of life. Either is disagreeable to the ruling part of society. But the present science not only does not contradict the tastes and demands of the ruling part of society, but is in full agreement with them : it satisfies idle curiosity, makes people marvel, and promises them an increase of enjoyments. And so, while everything truly great is quiet, modest, imperceptible, the science of our time knows no limits to its selflaudation.

" All the former methods were faulty, and so everything which formerly used to be regarded as science is a deception, error, trifles; our method is the only true method, and our science is the only true science. The progress of our science is such that thousands of years have not done what we have accomplished in the last hundred years. Proceeding on the same path, our science will in the future solve all questions and will make all humanity happy. Our science is the most important activity in the world, and we, the men of science, are the most important and necessary men in the world." Thus think and speak the men of science of our time and the crowd is with them, whereas at no time and with no nation did science, all science in all its significance, stand on such a low level as at present. One part of it, the one which ought to study that which makes human life good and happy, is busy justifying the present bad order of life, while the other busies itself with the solution of questions of idle curiosity.

"What? Of idle curiosity?" I hear voices, which are indignant at

such blasphemy. " And what about electricity, and telephones, and all the perfections of mechanics ? To say nothing of their scientific significance, see what practical results they have produced. Man has overcome Nature, has subdued her forces to himself, and so forth."

" But all the practical results of the victory over Nature have so far – and for a long time – been applied to factories, which are injurious to the masses, to engines of destruction, to the increase of luxury and debauchery," replies a simple, sensible man, "and so the victory of man over Nature has not only not increased men's good, but has, on the contrary, made their condition worse." If the structure of society is bad, as ours is, where a small number of men rule over the majority and oppress them, every victory over Nature will inevitably serve only for the increase of this power and this oppression. And so it is.

In connection with a science which does not take its object to be the study of how men should live, but the study of what is, and so is preeminently busy investigating dead bodies and leaves the structure of human society such as it is, no improvements, no victories over Nature can improve the condition of men.

" And medicine ? Do you forget the beneficent advancement of medicine ? And the inoculation of bacteria ? And the modern operations?" exclaim, as usual, the defenders of the science of the last resort, adducing the advancement of medicine in proof of the fruitfulness of all science.

" We can by means of inoculation prevent diseases, and cure, we can perform painless operations, – cut up the internal organs, clean them, – we can straighten hunchbacks," generally say the defenders of science, for some reason assuming that one child cured of diphtheria among all those children, who annually die in Russia to the number of fifty per cent., and in asylums to the number of eighty per cent., ought to convince people of the beneficence of science in general.

The structure of our life is such that not only children, but even the majority of adults, through bad food, injurious labour above their strength, bad housing, insufficient clothing, and want, do not live one-half of the years which they ought to live ; the structure of life is such that infantile diseases, consumption, syphilis, alcoholism are taking possession of an ever greater number of men, that a great portion of men's labours is taken from them for preparations for war, that every ten or twenty years millions of men are destroyed by war, – and all this is due to the fact that science, instead of spreading among men correct religious, moral, and social ideas, in consequence of which all these calamities may naturally be destroyed, busies itself, on the one hand, with the justification of the existing order, and, on the other, with toys ; and in proof of the fruitfulness of science we are told that it cures onethousandth part of those diseased who fall sick for the very reason that science does not perform its proper work.

If only a small portion of those efforts, of that attention, and of that labour, which science wastes on those trifles with which it busies itself, were directed by it upon the establishment among men of regular religious, moral, social, even hygienic ideas, there would not be even onehundredth part of those diphtherias, diseases of the womb, hunchbacks, on the cure of which science prides itself so much, effecting these cures in its clinics, the luxury of whose establishment cannot be diffused among all men.

It is the same as though men, who had ploughed a field badly and sowed bad seed in it, should walk through this field and cure the broken stalks, which grew up among the sickly ears, all the time treading down all the other stalks, and should adduce this their art of curing the sickly stalks as a proof of their knowledge of agriculture.

For our science to become science and to be truly useful, it must first of all renounce its experimental method, according to which it regards as its business only the study of what is, and should return to the one rational and fruitful comprehension of science, according to which the object of its study is, how men should live. In this does the purpose and meaning of science consist ; but the study of what is can be the object of science only to the extent to which this study contributes to the comprehension of how men should live.

It is this recognition of the insufficiency of experimental science and of the necessity of acquiring a different method that is pointed out in the present article by Carpenter.