



## Anatoliy Arsen'ev, Evald Ilyenkov & Vasily Davydov: The Machine and the Human, Cybernetics and Philosophy

*Translated<sup>1</sup> by Iurii Maksymets*

**ABSTRACT:** This article is a translation of a 1966 text by Evald Ilyenkov, Anatoliy Arsen'ev and Vasily Davydov on the science of cybernetics and the belief of many cyberneticians that they can create a “thinking machine” by modelling the human brain. The authors argue against such belief while not denying the benefits of cybernetics. The article examines concepts such as “thinking,” “the machine,” and “the human” from the perspective of Marxist philosophy. The authors criticize the ideological influence of cybernetics on Soviet thought about social organization.

**KEYWORDS:** Cybernetics, Human, Machine, Philosophy, Thinking

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1. With special thanks to Kyrill Potapov and Trevor Wilson

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## Introduction

Ilyenkov complains of being called a “Luddite” (Ilyenkov 1968). To this day, he has often been associated with a rejection of technology and science. This article demonstrates that Ilyenkov and his close colleagues had a far more nuanced understanding and position on technology and cybernetics.

The article was first published in “Lenin’s Theory of Reflection and Modern Science” (Konstantinov et al. 1966, 263–84), which is one of the few collections of articles presented at the 1965 Meeting of Modern Problems of Materialist Dialectics in Moscow. This was a conference of over six hundred presentations.

Cybernetics, initially labeled as “pseudoscience” by the Soviet establishment, was no longer banned and was gaining popularity among Soviet scientists. Cyberneticians were enthusiastic about advancing their field and sought further development. Consequentially, a debate arose between them regarding the possibility of creating a thinking machine, with many philosophers taking part in it as well. Some Soviet philosophers sided with cyberneticians aiming to create an artificial mind, while others opposed them on various grounds, including the same flavour of orthodox Marxism-Leninism which had initially been used to justify the banning of cybernetics in the USSR. Ilyenkov, Arseny’ev and Davydov<sup>2</sup> were members of the Scientific Council on Cybernetics and took part in multiple discussions on these topics, with Ilyenkov often introducing their political implications.

This article demonstrates their contribution to the debate. They argue that philosophy can help cybernetics flourish by sharing its judgments on concepts such as “thinking,” “machine,” and “human,” and thus showing the impossibility or impracticality of some cyberneticians’ ambitions. Two years later, Ilyenkov developed some of these arguments in his book *Idols and Ideals*.

This article remains relevant in the context of modern debates on the possibility of creating artificial intelligence, as well as its ethical and practical implications. It mentions early work on neural networks—mathematical models in the field of *machine learning* that define much

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2. Arseny’ev was Ilyenkov’s friend and fought alongside him in WW2. Though he had no training in philosophy, he later became interested in existentialist psychology. Davydov was a psychologist and philosopher influential in the fields of education and child development. Ilyenkov was a philosopher but took interest in specific scientific projects happening in the Soviet Union (Thank you to Andrei Maidansky for additional context).

of contemporary technology branded as “artificial intelligence.” It engages with Kolmogorov, an influential figure in computer science who worked on Markov’s process models. Cyberneticians mentioned in the article suggested that we could apply these models directly to human cognition, and such views are again gaining popularity (Friston et al. 2021). The article explores wider social and philosophical issues implicated in these debates.

### **Evald Ilyenkov et al.: The Machine and the Human, Cybernetics and Philosophy**

Philosophy is least of all interested in imposing onto the development of cybernetics—this important branch of modern technology and its theory—any once and for all defined limits. Establishing the “boundaries of knowledge” is generally a thankless task and is not characteristic of Marxist-Leninist philosophy, unlike neo-Kantian philosophy.

If the “limits” of development of cybernetics are prescribed anywhere, it is not from philosophy but from those false notions regarding the nature of thinking, regarding the connection of thinking with material mechanisms of the brain and with the outer world, which once entered cybernetics and hamper its progress.

Philosophy must express its judgments in this respect. Not to restrict cybernetics in any way or impose something on it, but on the contrary, to remove problematic obstacles from its way, to open the widest path for it. The problem of the nature of thinking, its connection with the brain and with the world of objects [“предметный мир”] has long occupied philosophy. And philosophers have something to share with cybernetics in this regard.

Dreaming of a thinking machine which is as perfect, or even more perfect than a human, many cyberneticians proceed from the notion that it is *the brain* that thinks. Therefore, they imagine that it is enough to build a model of *the brain* to get artificial thinking as well.

Unfortunately, no. Because it is not the brain that thinks, but the human with the help of the brain. For the theorists who could not see a big difference between the two, Feuerbach suggested conducting a simple thought experiment more than a hundred years ago. Try to separate the brain from the human body, put it on a plate and watch—is it going to think?

Of course, it will be thinking just as little as any telegraph pole or mould spread on the rocks of distant planets.

The thing is that for the emergence of such a function as thinking, some other material preconditions are required, in addition to the brain which is structurally adapted to it. In particular it is the organs that provide the sensory-object contact of this brain with the world outside of it, something like eyes, ears, tactile hands and other “external receptors.” Or, speaking the language of cybernetics, for the brain to think it also requires a continuous flow of “information.” Otherwise, it quickly slows down (falls asleep).

Perhaps a system of artificial organs of perceptions could help? Let us assume that our hypothetical artificial brain has a super-perfect “perceptron” attached to it. Let us even assume that we have also equipped this brain with all the other organs that ensure its independent and active life, —we have created an artificial model of the human organism as a whole.

It does not even matter of which material this model, this artificial creature will be constructed from, iron or protein.

Will it “think?” No. Science possesses factual evidence in this respect. Organisms which had a healthy brain and other organs, but had not been thinking, have been observed many times. They had not been thinking because there was a lack of one important and also material prerequisite for thinking, located outside the organism—a developed human civilization.

Mowgli and Tarzan existed not only in the imagination of filmmakers and poets. Such Tarzans, fed and raised by animals, were caught by people more than once or twice. And these Tarzans had very little resemblance to their Hollywood namesakes. Strictly speaking, these were not people at all. They couldn’t even walk on two legs. These were ugly animals, that not only did not possess thinking, but even elementary glimpses of consciousness.

Materialist philosophy and psychology have long established the fundamental fact that the ability to think is not inherited by a human with a brain, that this ability is not “encoded” in the human generically, biologically. It is “inherited,” transmitted from generation to generation in a completely different way—through the *forms of the world of objects*, created by labour, through the body of *civilization*. For an individual brain to acquire the ability to think, its owner must be included from childhood in the system of social-human relations and developed in accordance with its demands and norms. Only by learning to actively act [“активно действовать”]—act in an active, rather than passive, manner] with the things of the surrounding world in accordance with the

norms of culture, a human becomes a human—he acquires the ability to walk on two legs, speak and think...

The ability to use one's brain for thinking, —as well as one's hands for labour, as well as one's tongue for speaking, —is, from beginning to end, one hundred percent, *a social product*, an activity-bearing ["*деятельная*"] function of *social* human being. This function is not defined by the morphological organisation of the individual's body in itself, but by the organisation of that enormously complex system which in the language of science is called "the totality of social relations between people." And this system includes, in addition to the mass of people, linked with each other by mutual relations, also the full totality of the instruments of labour, machines and consumer goods, in production of which these relations are only formed.

"Thinking" is an activity-bearing function of *this* system. Derived from its structure, from its "morphology," from its organisation, from its needs and capabilities. The *thinking* individual himself is only an organ of this system.

That is why the degree and measure of development of the ability to think in a single individual are determined not by his individual-morphological peculiarities, but by completely different circumstances. And first and foremost, by the volume of that sphere (field) of culture, which this individual has personally assimilated, has turned into a personal asset. The latter is again determined not by the biochemical peculiarities of his body, but only by the social conditions—*the form of division of labour*. Thinking has always been and remains an individually realised function of the body of civilization that is common to all people.

That is why to create an artificial mind, which is least equal to a human one, it will be necessary to create not only and not so much a model of a separate human being, but rather a model of the entire grandiose body of culture, within which the entire individual with its fifteen billion brain cells is only a single "cell," which by itself is capable of thinking just as little as a separate neuron... That is why, if you want to create an artificial mind, equal to a human one, you must create not one single artificial being, but an entire community of such beings, which has its own culture, i.e. a whole machine civilization, as rich and ramified as the "natural"—human one...

Among other things, this artificial civilization must be absolutely independent in relation to the human one, it must develop without human help. Otherwise it will remain just a non-self-sufficient, just a derivative outgrowth of human culture and human mind, and the artificial mind

will remain merely a “piece” of the human mind, dependent on it in its goals, and its means, and its materials.

And this system must pursue its own goals, independent of the goals of the human and humanity. In other words, it must be an “end-in-itself,” it must consider its own “self-improvement” as the only task and goal, it must carry out an extended reproduction of itself. It must also develop its internal contradictions within itself, because otherwise it will be deprived of self-movement, of the stimulus for activity.

Consequently, to instil an artificial mind, at least equivalent to the human mind, into one single machine—means to create a whole machine civilization on Earth, competing with our human civilization.

Reasoning abstractly, this can be done, but under specified conditions and prerequisites found out in a scientific manner by genuine materialism (and not medical or cybernetic “materialism”) in understanding the nature of thinking.

Although it is possible to take a different path—try to create such a machine, which could be included as a full member in our, ready-made, naturally developed human civilization and developed into a “thinking” being on the basis of human mental culture. But in that case this being would have to be made absolutely like us, living humans. It would have to be equipped with all the organs, without exception, by the help of which a living human joins to the ready-made culture and assimilates it. Including the organs that allow to experience sexual love for a person of the opposite sex and cause reciprocal feeling. Otherwise, the door to such area of human mental culture as poetry and art will remain closed for this artificial being. As a result, it will not be able to think at the level of living people and will remain only a defective freak in the family of people, because art and poetry are not idle pastime, but a form of development of imagination. But without imagination there can be no talk about genuinely creative thinking.

In addition, this artificial being cannot and must not be created “ready-made,” neither in the sense of the “program” of its actions, nor even in the sense of the “structure” of its organs, including, first of all, the brain. For the real human brain is “structurally” distinguished precisely by the fact that it is as free as possible from the chains of biologically inherited schemes of action and that is why it is capable of executing *any* scheme of action, dictated to it by constantly changing conditions,—by the fact that its “structure” itself is a lifetime formation, formed in accordance with “functions.” Here the “structure” is a derivative of the “function,” and not vice versa. But the functions performed

by the brain are determined by the whole totality of historically developing conditions of human activity with all the dramatically-contradictory collisions within these conditions. Therefore, similarly, an artificial brain must be capable of radically changing any of the schemes of its previous activity, and, therefore, the “structural scheme” providing it.

In short, this “structure” must be capable of complete redesign of all its schemes, in other words, it must be absolutely plastic, i.e. universal, “a form of (all possible) forms.” This is exactly what a real human and his brain are like.

Therefore, if you want to create an artificial mind following this path, then would you be so kind as to artificially create an absolute copy of a living human being and do not forget to equip it not only with all the “pros” but also with all the “cons” of the human kind, otherwise you will not be able to connect it to the battery of our civilization.

In one of his articles, academician Kolmogorov said:

In a joking manner: it is possible that an automaton capable of writing poetry of the level of great poets cannot be built more easily than by modelling the whole development of the cultural life of the society in which the poets actually develop. (Frank et al. 1964, 57)

We think that this should be stated not in a joking manner, but in the most serious one, and not only about poets, but also about mathematicians, and about people engaged in planning the national economy, and about any human, if he is truly a thinking individual.

Dreaming of creating machines “smarter than humans” can be done on one of the two paths we have analysed. It is possible if you get inspired by the slogan— “machine for the sake of machine.” Possible, just like you can create “art for the sake of art,” “science for the sake of science,” “technology for the sake of technology.” But not for the sake of human, not for the sake of his development. Possible, if, consciously or unconsciously, you firmly stand on the ground of technocratic prejudices, from the point of view of which a living human being is only a raw material and a “means” for the development of technology, and not an end-in-itself.

The alternative here is inexorable. Either technology (cybernetic or non-cybernetic) is considered only as *a means*, only as *a tool* for the fulfilment of human goals, or it turns into an end-in-itself, and the human becomes a means, a raw material.

Is it possible to think like this? It is. Unfortunately, some theorists actually think this way. But this way of thinking is not philosopho-theoretically justified.

The human remains a human, and the machine remains a machine. And the question of the mutual relationships between human and machine is primarily a *social* question, and not at all a cybernetic one. And this question does not disappear, is not removed from the agenda, when some hotheads from among the admirers of cybernetics declare that the human is also a machine, and, therefore, turn the most pressing social problem into a family affair between two machines... For then the question does indeed look purely technical.

Trying to provide a scientific basis for the “thinking machine,” some philosophers appeal to the latest achievements of mathematics and mathematical logic. But if one considers such arguments carefully, one will immediately find that they presuppose—as a condition of their provability—exactly what they want to prove. Namely—extremely simplified and approximate ideas about human thinking. Here is an example.

L.B. Bazhenov, in his article “On some philosophical aspects of the problem of modelling thinking by cybernetic devices” seriously believes that all arguments against the possibility of creating artificial thinking are easily dismissed by a simple reference to the authority of the McCulloch-Pitts theorem:

The McCulloch-Pitts theorem states that any function of the natural nervous system that can be logically described using a finite number of words can be implemented by a formal neural network. This means that there are no functions of thought which, being cognized and described, could not be realised by a finite formal nervous network, and hence in principle reproduced by a machine. (Berg et al. 1964, 327)

In order to accept this argument as evidential, it is necessary to take the following premises for granted: 1) that “thinking” is a “function of the natural neural network” without specifying, what exactly is the special characteristic of *this* particular function of the “neural network,” as opposed to, say, a toothache; 2) that this vague “function” must be “logically described using a finite number of words,” i.e. represented as a formally non-contradictory system of terms and statements; 3) that such a “description” actually *is* the exhaustive *cognition* [“познание”] of “thinking,” i.e. the modern stage of development of logic as a science.

If all this is taken on faith, then the “McCulloch-Pitts” argument really proves what they want to prove with it. But if we have more concrete and substantive ideas about “thinking,” then the McCulloch-



Pitts theorem proves the possibility of modelling it in a machine no more than Pythagoras' theorem.

The McCulloch-Pitts theorem does indeed establish that any of those “functions of a natural neural network,” that is fundamentally amenable to a “logical (here, formally non-contradictory) description with a finite number of words” can be realised in the form of a “formal neural network.” We will not risk disputing this theorem itself.

But behind all this there is still a small, but very insidious question—does “thinking” constitute *such* a function, i.e. is it amenable to such “description?”

And do not forget that what is meant here is precisely *thinking*, and not any particular “finite” form or case of its application. Logic as a science has long been convinced that creating a formally-consistent “description” of *all* logical forms is not as easy as promising it. Moreover, logic has good reasons to assert that this undertaking is as unfeasible as a perpetual motion machine. And it is unfeasible for the reason that the formal-logical consistency of the description of each *particular* form of the operation of the intellect is inevitably compensated by the contradiction within the complete “synthesis” of all these particular logical forms, within logic as a whole.

This was already perfectly understood by I. Kant, who, in his “Critique of Pure Reason,” has shown that thinking as a whole is always dialectical, contradictory, which has opened a new chapter in the history of logic as a science. That same logic, which for some time sees *contradiction* as the basic logical form of the real developing thinking and proves, that this real thinking is realised precisely as a process of revealing and resolving contradictions within each “particular” sphere of thinking, within each “particular” sphere of cognition. This is proved by not only logic, but also the real experience of the development of science.

Of course, a wordy description of any artificially limited scope of *application* of thinking can be made formally-consistent. But this is only because such a description *is not* thinking, for which every step forward along the path of acquiring knowledge consists precisely in “sublation” of each previously established “description” with its formalisms.

An important conclusion can be drawn from this. If you really want to “model” real thinking, you must first of all teach the “formal neural network” to bear the “tension of contradiction,” the state of “ $A = \text{not } A$ ,” in the form of which inside the formally-consistent scheme is always expressed its contradiction with the real concrete variety of phenomena

of nature and history, i.e. the fact of its own “finiteness,” destroyed by each new act of real *thinking*.

If you manage to create an artificial intelligence, which, when a logical contradiction appears within it, would not fall into a state of hysterical self-excitation, destroying the whole scheme of its operation, but, on the contrary, would only then begin to carry out its special “function,” then you would have taken the first step on the way to “modelling” real human thinking.

But this possibility is excluded by the formal-mathematical logic itself, for which “logical contradiction” is a purely destructive form, which ruins the “finite” scheme, and not at all by philosophy, not by logic, for which contradiction is a constructive-regulative principle of real (creatively-human) thinking.

All of this, apparently, was completely forgotten by L.B. Bazhenov. With the help of McCulloch-Pitts’ authority he proved only one thing—that in a machine it is possible to reproduce only the machine-like functions of intelligence, but in no way intelligence itself, as a “function,” the special characteristic of which consists precisely in the constant process of “sublation” of any finite scheme, in revealing logical contradictions within this scheme and revolving them by further investigation of *the concrete reality*, namely this reality itself [“именно самой этой реальности”].

He proved only one thing: that a mind, equivalent to the real human one, can be created only on the basis of dialectical logic and in no case on the basis of axioms and postulates of the logic of formal-mathematical constructions. These axioms and postulates, including the McCulloch-Pitts theorem, actually prove the impracticability of his dreams.

But can you consider “the human” as a very complex, very perfect “machine”? You can. But only with the same right and with the same limitations with which a zoologist considers the human as a highly developed “mammal,” and a geometer—as a terribly intricate spatial shape.

The special concepts of cybernetics precisely distinguish in human only those features (attributes, definitions) that he shares with machine. Machine itself is defined abstractly in these concepts in the same way.

But this is precisely why the concrete specificity of neither—nor human, nor machine itself—can be expressed by these concepts in

principle. For this is precisely what they detract from in the very beginning.

Therefore, it is not surprising that in the special concepts of cybernetics it is impossible to even *pose*, and not only to *solve*, the question of the real relationships between human and machine as two really different “systems.”

Cybernetics has not provided and cannot provide a universal definition of not only “human,” but also of “machine.” These things are generally beyond its special tasks and concepts and can only be defined in the system of real interaction between human and machine, including the historically established system of social division of labour and all the consequences it entails.

And this is what happens when definitions, legitimate and accurate as long as they are applied within cybernetics itself, for its own internal needs, are taken as universal scientific-theoretical [“научно-теоретические”] definitions of human and machine.

“As is known, within cybernetics, machine is a system capable of performing actions that lead to a certain goal. This means that living beings, in particular human, are machines in this sense” (Berg and Kolman 1964, 83), —writes academician S. Sobolev on behalf of cybernetics (and, perhaps, completely justifiably [“с полным основанием”]).

In this sense—yes, of course. But only in this sense. And here is what happens if one considers “this sense” to be the only scientific one and envisions that cybernetics has finally given a truly scientific definition of “machine,” and declares all previous definitions pre-scientific and unscientific.

In this sense human has to be called a “machine.” But then you lose the right to call “machines” a steam locomotive, an automobile, a rolling mill, and in general any of the existing or ever existing machines, because, “as is known,” these “systems” are as little capable of any *expedient* [“целесообразным”] action as any stick or cobblestone. Actions “that lead to a certain goal” are produced not at all by them, but only by the human, who sets them in motion and controls them according to his expedient will.

Thus, the concept of “machine,” formulated by academician S. Sobolev, refers only to human as a subject of expedient (i.e. reasonable [“разумной”]) will and to nothing else. And also, perhaps, to those fantastic machines of the future, which some (by no means all) cyberneticians dream of, and most of all, those who work near

[“подвизающиеся” —vaguely means “staying close and profiting of”] cybernetics.

This concept is not applicable to existing, real machines. Therefore, those also cannot be called “machines.” It is then necessary to come up with a new name for them. The easiest thing to do is perhaps to call them “humans” [“человеками” —a worldly joke, the plural form of “человек” (human) which is not used in Russian] from now on, since this name, as it turned out, has remained unemployed since human was called a “machine.”

But this is a joke. Seriously though, real, factually existing, and not imaginary machines *presuppose* human as a system, which differs from them precisely in the ability to act according to “expedient” (and not “causal”) determination.

Outside this system (i.e. outside and without human), the steam locomotive, and the calculating-solving machine, and all modern technology in general, is not a “machine” at all, but only a pile of rusting metal, only one of the bodies of nature, entirely subject to action of simple physico-chemical laws (oxidation, weathering, etc.). Without human and outside human—it is a “machine” in name *only* and only for a short time, like a hand cut off from the body.

But if we are talking about not just *the name*, but the scientific *concept* of “machine,” applicable to both past and present machines, as well as all future machines, then science has one. Machines are “natural material transformed into organs of the human will and its active manifestation in nature. They are organs of the human brain, created by the human hand; the power of knowledge, objectified” (Marx 1939, 594).

This actually is, in contrast to the cybernetic definition, *the universal, scientific-theoretical* definition of the concept of “machine.” All the past, present and future variety of actual machines are subsumed under it without any hitches. And the human is not.

Of course, it is also possible to imagine machines, in the manufacture of which brain and hand of the human will not be *directly* involved. It is even possible to show the necessity of this in the future. But this does not change the matter. As long as a machine remains a machine, it remains only an artificially created organ of the socio-human intelligent will, the means of its active manifestation. And in this sense—an organ of the human brain, for by “brain” Marx always meant not only and not so much an organ of the individual’s body, but an organ of the socio-

human intelligent will, socio-human needs and of the “goals” that ideally express these needs.

Well, but what if someday a machine will be created, that will no longer be subsumed under the above concept; will not fit the details [“определениям”] listed in the above definition [“дефиниции”] of “machine?” Then, of course, it can no longer be called “machine.” It will be something completely different. What exactly? We can fantasise about it as much as we want, but this is beyond the limits of science.

But if these limits are adhered to, then a “machine,” which is not suitable as a means of realising the intelligent will of human, which cannot serve as an obedient “organ of the human will” —any sensible person will try to send it to meltdown, to scrap it as soon as possible. And it is even easier to not make such a device at all. This is what all people, who are of sound mind and memory, have been doing up to now, not even being familiar with the Marxist concept of “machine.”

However, there is another possible option, which has lately become beloved by the authors of fantasy novels. Namely: such a “machine” does not want to be sent to meltdown, no longer wants to be subject to human intelligent will, does not want to be just its tool, but wants to serve the aims of its own self-improvement. It begins to implement expanded reproduction of its own kind and subjects all branches of production to this egotist machine goal. It breaks out of submission to its creator and threatens to crush him, if he tries to get in its way, prevent it from becoming the goal and heart of all production, if he wants to remind it, that it is only a means and an organ of his will.

A fantasy, a bogeyman, invented by malicious opponents of cybernetic progress? Unfortunately, no. If it was just a fantasy, we could treat it leniently—let people dream if they like it.

However, this fantasy only reflects the *real* machine. The trouble is that this machine has long existed, there is no need to invent and build it. It has long been out of submission to its creator, human. It has long been pursuing its own goals, has long ago become an end-in-itself, and considers human as a means and raw material for its own self-improvement. Furthermore, it has long learned to use human with his brain as its own “partial component,” has learned to suppress his will and oppress his mind.

The organisation of this—unfortunately, not fantastic at all—machine, was already understood in detail a hundred years ago and described in a famous work called “Capital.”

It is what capitalism is—production for the sake of production; a grandiose machine, that has become an end-in-itself, and has turned human into a means, a raw material for the production and reproduction of its insatiable organism. This grandiose machine, consisting of millions of partial machines, has gone beyond the control of human reason and will, it has become smarter and more powerful than any separate human individual that within it is playing the unenviable role of a cog.

And this “big machine” exercises its power with the help of its “child systems” —with the help of the state-bureaucratic machine, with the help of the military machine, with the help of the police apparatus, the voting machine, and so on and so forth.

And this is not a play on words at all. A bureaucratic or military machine—are both machines in a completely literal, not figurative sense of the word. All of these are systems working according to strictly stamped algorithms, pursuing goals which are strictly programmed in them and are as soulless as any meat grinder. And the protein substance of the human brain plays the role of a partial component in their device, providing them with “self-consciousness.”

Try to look at the bureaucratic, military and other “social machines” through the eyes of cybernetics and you will immediately see that they fit the cybernetic ideas of a machine much better and more accurately than a printing press or a cotton harvesting machine. The powerlessness of the human individual in the face of this gone out of people’s control apparatus, this “demon of machinery,” is what creates all sorts of mythology in the West.

Ignorant people are waiting for salvation from the second coming with the help of the power of this machine daemonium. People with higher education are pinning their hopes on the descent of some scientifically super-wise ruler onto the sinful world, kind of an electronic Lohengrin, because they have become rather disappointed in the wisdom of the living rulers. Supposedly, such one will come and will immediately adjust all human relationships with mathematical precision—will calculate the proportions of production, will relieve from crises, and generally will establish heaven on earth, will even choose a suitable wife for everyone.

But, immediately, doubts begin to overwhelm, for what if this cybernetic Lohengrin takes the enemy side in the conflict between human and machines? After all, he is a machine too, whatever you say.

And so this kind of reasoning keeps revolving around the problem: can human create an artificial mind smarter than his own mind and is it not risky to do so?

As a result, the very problem posed on this ground starts to tragically resemble an old tricky question, once invented by excessively diligent friends of theological scholastics, can an omnipotent god create such a stone, that he himself will not be able to lift?

Thus, in a social sense, the “human—machine” problem stands quite differently, than in a purely cybernetic one. In this sense the matter is not to create a machine that would be smarter, stronger and more perfect than human, but to again make the living *human* himself smarter and stronger than the entire world of machines created by him, which has gone out of his control and enslaved him; to transform human from a raw material and a means of technical progress, from a component of “production for the sake of production” into the supreme goal of this production, into an end-in-itself, and to put the social machine back in its place—on the role of means and organ of the human rational will. This is a social problem, and we must not forget about this for a moment.

This is why the Western technical intelligentsia, including cybernetic-mathematical intelligentsia, has become confused with the “human—machine” problem, because it does not know how to pose it correctly, i.e. as a *social* problem, as a problem of relations between human and human, mediated through the material body of civilization, including the modern machinery of modern production.

In the light of Marxist-Leninist teaching, in general theoretical terms, the way out of the current situation has been already found in “Capital.” This way out, as is known, lies in the communist transformation of the whole system of relations between *human and human*, in the creation of such conditions within which each member of society, and not only its privileged strata, would have all the real, materially and spiritually secured conditions for *comprehensive* development, for mastering all the heights of intellectual and physical culture; the conditions under which every individual, and not only the chosen lucky ones, would be turning in the course of his development into a full-fledged representative of the universal, socio-human, intelligent will and would not allow anyone to monopolise the right to act on its behalf.

Only under these conditions, as Marx and Lenin have shown, disappears the need for a special, standing above society, apparatus of human governance—the state machine and its subsidiary systems, —a special apparatus of governance of *people* disappears altogether, and its place

is taken by the governance of *things*, of *machines*. And people, according to the same theory, must govern themselves, on the basis of complete self-governance.

The prerequisite and *conditio sine qua non* for the elimination of the state machine, that governs people “from above,” is—as is also known—full and comprehensive development of each human’s abilities, because only such people will not need to be governed “from above.” As long as this is not the case, there is still a need for the state, as a special apparatus. This is perfectly explained in another scientific work — in the book “The State and Revolution” by V.I. Lenin. For anyone who has read this book it is clear, that the general line of communism remains to be the course precisely towards the destruction of the state, as a special sphere of the division of labour, as a special apparatus for governing people.

When some people think, that the whole problem lies in simply replacing the current state organs with thinking—planning and governing—*machines*, boxes like refrigerators, they are stepping on the ground of a kind of cybernetic-bureaucratic illusion, mythology. They think, that communism can be built along the way of mathematical-electronic improvement of the current system of relations, i.e. along the way of *perpetuating the current state of affairs*, along the way of transferring the current governance functions of the state machine not to a democratically organised human collective, but to other machines.

And this is a purely technocratic illusion, which is no better and no smarter, than the illusion of classical bureaucrats. A one hundred percent bureaucrat can, of course, be replaced by a machine. And it is even easier to simply retire him. And to not replace the vacant position by a machine with the same functions, but just eliminate it, thus making a step towards the transferral of governance functions to a democratically organised collective of living people. For only this path leads to the creation of “an order under which the functions of control and accounting, becoming more and more simple, will be performed by each in turn, will then become a habit and will finally die out as the *special* functions of a special section of the population” (Lenin 1965, 50).

After all, in the world we are building, it will not be “mathematicians,” “waiters,” “politicians,” “violinists,” “philosophers” and similar characters, doomed to fulfil one or another partial function who will inhabit it and will build their mutual relations in it, but living and with that comprehensively developed people. People, each of whom is broader and richer than any “particular function,” who are able to look at, say,



mathematics through the eyes of a human, and not at a human through the eyes of a mathematician.

Nowadays, the opposite is quite often the case, and professional cretinism, which takes itself as the supreme virtue, is a very serious and contagious disease. It is the disease, connected to which is the inclination towards mythology in terms of social thinking, in particular the desire to turn cybernetics—a very good science in its place—into another panacea.

It is also no coincidence, that it is precisely among excessive, “reckless” cyberneticians that there are calls every now and then to turn the secondary school towards the path of deepening narrow professionalism, towards the path of furcation, towards the path of creation of especially privileged schools for especially gifted prodigies, etc. It is not at all an accident that cybernetic mythology fuses even with dreams of artificial selection of mathematical talents, of breeding a hereditarily-gifted mathematical elite, a kind of nobility of the cybernetic era, etc., etc., with reasoning about “genetically-biological coding” of mathematical abilities and other, to put it mildly, nonsense.

On the other hand, the theoretically developed thesis of scientific communism concerning the “comprehensive development of personality” inevitably begins to seem to be a “utopia,” “poetry,” etc. to the supporters of this mythology. This, sadly, is not fiction.

It is hardly necessary to prove, how far these ideas are from the scientific understanding of the ways and prospects of social progress, developed by Marx and Lenin. But it is necessary to say it seriously and loudly. It is necessary to clearly understand what happens when someone wants to use cybernetics—this crucial scientific and technical discipline—to create a new religion with a new god and its other attributes.

If we remain on the ground of the social perspectives outlined by the theory of scientific communism, the current state of affairs is characterised not at all by the fact that we only lack a machine smarter than human for complete happiness, but quite the opposite, the fact that we have not yet had time to create all the conditions for the full and comprehensive development of every member of society, every human, by the fact that living people are still too often forced to perform purely machine functions. It is the complete liberation of human from such functions that communism considers its goal in terms of technical progress.

That is why cybernetics here also knows very well, what to do and how to do it, exactly what kind of machines it should construct, in order to free the living human from the burden of monotonously-machine labour as soon as possible, from working according to a stamp, according to a template, according to a hard-coded program. So that a living person could devote all the freed-up time to truly human labour, labour regarding scientific, technical, artistic, social *creativity*.

That is why every living human rejoices, when cybernetics promises him in the very near future liberation from the burden of machine-like work and to transfer this labour to machines. And it is precisely for the same reason that every living human in our society feels a natural and completely legitimate protest, when some excessively diligent friends of cybernetic progress instead make up fairy tales about a machine smarter than human and promise to create an electronic Pushkin, an electronic Botvinnik and an electronic Shostakovich, and to replace the ministry with a box, that will allegedly manage the economy better than people...

Listening to such speeches, you even envy the machine, that is so gently cared for. For they want to overjoy it with those merits that the great majority of living people on the globe are unfortunately still deprived of, instead of helping all living people to reach the expanses of truly human development.

Every human brain is a ready-made and rather perfect system, capable—under the right conditions—of thinking. So isn't it easier to create it in the old, antiquated way and take more care about creating those proper conditions, under which it could work at its full, so to speak, design capacity?

After all, trying to build an artificial brain instead of developing the “natural” one is like building a factory in the middle of the Karakum Desert, that would utilise technological processes of utmost complexity to produce synthetic sand for the brick factories in the Far East. Not at all smarter and not more economical, although such a task may actually captivate some super-inventive chemical engineer.

It is much more reasonable to dream not of a machine smarter than human, not of an electronic brain, comparable to the human one, but of every living human brain working at the level of truly contemporary human culture, which for now, unfortunately, it still cannot do, being loaded with machine work.

And the creation of an artificial intelligent being is a myth, which unfortunately consumes a certain amount of effort and resources and

distracts cybernetics from solving its direct tasks. And philosophy should actually help cybernetics to free itself from myths, especially since cybernetics has a lot of genuine tasks set before it by life, by the needs of creating the material-technical foundation of communism, tasks that are really huge and noble, fascinating and inspiring. Academician A.I. Berg has rightly spoken about this many times.

Nobody feels a malicious desire to set the limits to the development of cybernetics and computer technology, nobody wants to clip the wings of the dream of its enthusiasts. But a dream is only good when it works in alliance with sober scientific ideas, already developed by science, in particular by philosophy. In alliance with clear dialectical-materialist concepts of thinking, will, goal, the connection of thinking with the brain, with sensory-object activity and with the world, to the relation between the ideal and the material, etc.

Unfortunately, some cyberneticians do not take into account everything that they can get in this respect from modern philosophy and psychology and try to solve the listed problems by their own means, they want to use their special concepts to scientifically redefine both “thinking,” and “machine,” and “ideal,” and “goal.” We have seen how it turns out.

On the other hand, this situation forces philosophy and psychology to take care of more concrete and clear defining of such concepts as *brain and thinking, will and reason, goal and ideal, machine and human* and many other concepts, in order to meet the demands of cybernetics, and not only cybernetics.

Thus, we are not talking about limiting the prospects of the development of cybernetics, but only about the absurdity of the “mythology,”<sup>3</sup> that arises around cybernetics exclusively due to the philosophical carelessness of some of its representatives, although it also has objective grounds in the form of the existing system of social division of labour. We are talking about establishing a closer creative contact between Marxist philosophy and cybernetics.

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3. This mythology is fought against by the most sensible representatives of cybernetics itself, e.g. see (Taube 1964)

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## Biography

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