mltheory.wordpress.com

Cybernetics in the USSR: A Marxist-Leninist Perspective

89–113 minutes

“The synapse is nothing but a mechanism… and must have its precise analogue in the computing machine.” (Norbert Wiener, Cybernetics: Or Control and Communication in the Animal and the Machine, p. 14)

“The synapse in the living organism corresponds to the switching device in the machine” (Norbert Wiener, The Human Use of Human Beings, p. 34)

“to say that thought is material is to make a false step, a step towards confusing materialism and idealism” (V. I. Lenin,

Materialism and Empirio-criticism)

“One day we shall certainly “reduce” thought experimentally to molecular and chemical motions in the brain; but does that exhaust the essence of thought?” (Friedrich Engels, Dialectics of Nature)

INTRODUCTION

Cybernetics is a set of theories and practices developed mainly by American mathematician Norbert Wiener in the late 1940s. He invented his theories during WWII while working for the US military. Cybernetics is difficult to define exactly, but its supporters usually say it deals with “information”, “control” of processes, and it uses analogies which equate living beings and society to machines. For example, a cyberneticist might describe the functioning of a state as a kind of machine, or the functioning of the human mind as a calculator. The precise definition of Cybernetics and the precise meaning of cybernetic ideas will be discussed later in this article.

In 1952 Mikhail G. Yaroshevsky published an article in the Soviet literary gazette, titled “Cybernetics – “science” of obscurantists”. Other articles appeared, and cybernetics was heavily criticized in the USSR, finally being authoritatively labeled a reactionary pseudo-science in the 1954 Short Philosophical Dictionary. However, in the 1960s and 70s cybernetics became fully accepted in the revisionist USSR and was heavily promoted by the government, to the point that it was included in the khrushchevite party program and Khrushchev praised it as vital for building communism. The period of the early 1950s is therefore now described as the

“anti-cybernetics campaign”.

This article investigates the significance of this “campaign”, the reasons why cybernetics was later accepted, and the supposed merits and demerits of cybernetics.

WHY IS CYBERNETICS A PSEUDO-SCIENCE?

Let’s first discuss the Soviet criticism of cybernetics. Its worth quoting the full entry of the 1954 Short Philosophical Dictionary. Afterwards I’ll try to unpack its meaning:

“CYBERNETICS (from the Greek word meaning helmsman, manager) is a reactionary pseudo-science, which arose in the U.S.A. after World War II and which was spread widely in other capitalist countries. It is a form of modern mechanism. The adherents of cybernetics define it as a universal science of the connections and communication in technology, of animals and the life of society as well as of the “general organization” and direction of all processes in nature and society. Thereby cybernetics identifies mechanical, biological, and social correlations and laws with one another. As every mechanistic theory, cybernetics denies the qualitative specificity of laws in the various forms of being and of the development of matter, reducing them to mechanical laws. In contradistinction to the old mechanism of the 17th and 18th Centuries cybernetics considers the psycho-physiological and social phenomena no longer as analogous to the simplest mechanisms but to electronic machines and apparatus, whereby it equates the work of the brain with the work of an automatic calculator and the life of society with a system of electrical and informational communications. In its very essence cybernetics is directed

against the materialistic dialectic, against modern scientific physiology, which was founded by I. P. Pavlov, and against the Marxist, scientific conception of the laws of social life. This mechanistic, metaphysical pseudo-science is most compatible with idealism in philosophy, psychology, and sociology.

Cybernetics makes particularly clear one fundamental trait of the bourgeois outlook, namely its inhumanity, its effort to turn the worker into an accessory of a machine, into an instrument of production and into a weapon of war. The imperialist utopia of replacing the living, thinking man, struggling for his own interests, with a machine in production as well as in war is characteristic of cybernetics. The instigators of a new world war use cybernetics in their dirty, practical affairs. Under the guise of propaganda of cybernetics in the countries of imperialism, scientists of various specialties are being attracted to develop new methods of mass extermination of people – electronic, telemechanical, automatic weapons, the design and production of which have turned into a large branch of the military industry of the capitalist countries." (Short Philosophical Dictionary, 1954)

1. Cybernetics is not a science, therefore it is a pseudo-science

First of all Soviet marxists denied that cybernetics is a science. It does not have a precise subject-matter, a precise definition, and all supposed cybernetic advances have actually been discovered by other disciplines such as electronic engineering, computer-science, mathematics or physiology. Cybernetics overlaps with other sciences in a confused and arbitrary way.

While a real “hybrid science” like biochemistry studies chemical processes involved in biology, cybernetics does not do anything comparable. Instead cybernetics is more like a worldview or a philosophical theory than a science.

Slava Gerovitch writes in his book about cybernetics:

“Cybernetics is an unusual historical phenomenon. It is not a traditional scientific discipline, a specific engineering technique, or a philosophical doctrine, although it combines many elements of science, engineering, and philosophy. As presented in Norbert Wiener’s classic 1948 book Cybernetics, or Control and Communication in the Animal and the Machine, cybernetics comprises an assortment of analogies between humans and self-regulating machines: human behavior is compared to the operation of a servomechanism; human communication is likened to the transmission of signals over telephone lines; the human brain is compared to computer hardware and the human mind to software; order is identified with life, certainty, and information; disorder is linked to death, uncertainty, and entropy. Cyberneticians view control as a form of communication, and communication as a form of control: both are characterized by purposeful action based on information exchange via feedback loops. Cybernetics unifies diverse mathematical models, explanatory frameworks, and appealing metaphors from various disciplines… physiology (homeostasis and reflex), psychology (behavior and goal), control engineering (control and feedback), thermodynamics (entropy and order), and communication engineering (information, signal, and noise) **and generalizes each of them to be equally applicable to**

living organisms, to self-regulating machines, and to human society.” (Slava Gerovitch, From Newspeak to Cyberspeak: A History of Soviet Cybernetics, p. 2)

2. Cybernetics ignores qualitative differences. It is a vulgarizing theory.

This leads us to the second problem of cybernetics. It tries to be a universal science which applies equally to living, non-living, material and non-material, conscious and non-conscious, social and non-social fields. All of these areas are qualitatively so different that they cannot be equated. In order for the same law to truly apply in all these fields, the law must be extremely broad, akin to a philosophical generalization such as the laws of dialectics. Secondly, we would expect the law to function somewhat differently at qualitatively different levels of organization. However, cybernetics doesn’t heed any of these criticisms but instead imposes the same exact laws on all levels of existence.

“To sum up: the many automata of the present age… lend themselves very well to description in physiological terms. It is scarcely a miracle that they can be subsumed under one theory with the mechanisms of physiology.” (Wiener, Cybernetics, p. 43)

“there is no reason… why the essential mode of functioning of the living organism should not be the same as that of the automaton” (Wiener, Cybernetics, p. 44)

W. Ross Ashby writes in his book *Introduction to Cybernetics* that “the worker in any of the biological sciences”, “The

ecologist", "The economist", "The sociologist", "And the psychotherapist" all may want to apply cybernetic principles. Someone might argue that the same "simple mechanisms" of cybernetics are not adequate for these different fields. However, Ashby assures as that "This, however, is not so." (p. 244)

In reality cybernetic "laws" are not laws at all, so it would be better to call them principles. These principles involve things like "loops" and "feedback". According to cybernetics, everything transmits and reacts to "information" in loops: some kind of stimuli is received and it causes reactions. This process keeps going as a loop. Something like walking has often been used as an example by cyberneticists. As the process happens, the body receives new stimuli based on changing circumstances and corrects its actions based on this new information. This is called "feedback". A process or "loop" which receives "information" and corrects itself according to "feedback mechanisms" is called "controlled" or even "self-controlled".

These concepts are borrowed from actual fields of science or engineering, such as physiology, control engineering etc. They are often valid in their own fields, but cybernetics applies them arbitrarily to fields where they don't belong, and applies them imprecisely. Principles describing the motion of mechanical machines are too crude to describe living beings, and principles describing the motion of non-conscious living beings are too crude to describe consciousness or society. Yet, cyberneticists have equated the media to a sensor which receives a stimuli from the people, and the president to a logic

circuit which reacts to the stimuli.

“Cyberneticians combined concepts from physiology (homeostasis and reflex), psychology (behavior and goal), control engineering (control and feedback), thermodynamics (entropy and order), and communication engineering (information, signal, and noise) **and generalized each of them to be**
equally applicable to living organisms, self-regulating machines (such as servomechanisms and computers)**, and human society.**” (Gerovitch, Newspeak to Cyberspeak, p. 87)

Wiener understood the difference between life and death, conscious and unconscious, not as qualitatively different levels of organization of matter, but as only quantitative differences, different amounts of entropy, a term which he borrowed from physics and imposed on every other field.

Wiener “suggested that it was “best to avoid all question-begging epithets such as ‘life,’ ‘soul,’… and the like” and speak merely of the decrease of entropy in both humans and machines.” (Gerovitch, Newspeak to Cyberspeak, p. 90)

An example of how unscientificly, imprecisely and loosely Wiener operated with his concepts, and how deeply vulgarizing this method was, is that Wiener even equated organization with beauty and entropy with ugliness, and presumably it would therefore be possible to demonstrate that a work of art is more beautiful if it is more organized and less entropic. (On what basis do we consider something to be more organized? That Wiener did not say) Therefore beauty and aesthetic value itself would be reduced to mere numbers and

quantities:

“For Weiner, the notion of entropy… became a measure of choice, randomness, and organization, with all the rich cultural connotations of these concepts, including beauty and melody.” (Gerovitch, Newspeak to Cyberspeak, p. 91)

The popularization of cybernetics in western academia relied on circular reasoning which Gerovitch describes in his book.

“The historian Geoffrey Bowker has described this circular process as a chief feature of the language of cybernetics. It served an important social function by supporting “legitimacy exchange” among scientists: “An isolated scientific worker making an outlandish claim could gain rhetorical legitimacy by pointing to support from another field—which in turn referenced the first worker’s field to support its claims. The language of cybernetics provided a site where this exchange could occur.” In Bowker’s words, the author of the “conditional probability machine,” A. M. Uttley, “used mathematics to support his physiology and physiology to support his mathematics, using cybernetic terminology to spiral between the formal properties of classification machines and the nature of the brain.”… [A similar trick was carried out by Wiener] On the first pages of his Cybernetics, Wiener suggested the computer as a model for the nervous system… A few pages down, he turned this analogy around and described the computer itself in neurophysiological terms… In another example, physiological homeostasis was conceptualized as a feedback-controlled servomechanism, while servomechanisms themselves were described in

anthropomorphic terms. The historian Lily Kay argued that “signifying homeostasis as negative feedback and then resignifying such servomechanisms as organismic homeostasis amounted to a circularity.”” (Gerovitch, Newspeak to Cyberspeak, pp. 94-95)

Cyberneticians then expanded this method of false equivications to broad philosophical questions, and by using semantical tricks and logical fallacies came to their desired conclusions:

“First the cyberneticians asked grandiose questions: What is life? How do we know the world? What governs human behavior? Next they translated these questions into cyberspeak, then substituted for them much narrower versions that could be answered within a particular specialized field of study: mathematics, logic, control theory, or communication engineering. Then they said that these grandiose questions had now been “precisely defined.” After obtaining the answer to a “precisely defined” question, they claimed that it could be applied universally, far beyond the original specialized field. Thus cyberspeak became a universal language for answering grandiose questions.” (Gerovitch, Newspeak to Cyberspeak, p. 96)

3. Cybernetics is a form of mechanism

The problem which was often emphasized by the Soviets is that cybernetics is a modern form of mechanism or mechanical materialism. As the dictionary states, the mechanical materialism of the 17th and 18th centuries equated people and nature to simple mechanical machines. Cybernetics equates

everything to computers or electric calculators. This tendency is extremely widespread today and people have gotten so used to it that they hardly even question it.

However, it goes beyond simply equating living things and societies to dead machines. Cybernetics also sees everything mechanically, metaphysically, i.e. anti-dialectically. It reduces everything to simple “loops”, “feedback mechanisms”, “algorithms”, and “controls”. These loops, circuits and controls are all static and rigid, while reality is fluid, dynamic, complicated and contradictory. The only kind of development and change that cybernetics understands is feedback. It is blatantly evident that this worldview was developed by a bourgeois mathematician and not by a dialectical philosopher.

It is true that some revisionists have tried to explain feedback “dialectically”. Dialectics explains that things have self-motion, i.e. they develop due to their internal contradictions which develop towards something. Some revisionists have claimed that feedback can be understood as a dialectical contradiction. However, dialectical contradictions are not a simple process of action, reaction and another action. That is a simplification which characterizes them taking turns temporaly. In reality the contradictions mutually define each other at every single instant. Sometimes a reaction can simply be caused by an action, but their temporal causality can also be reversed, or they can both happen simultaneously.

To make this easier to understand let’s use an example. A commodity is a unity of two contradictory things, use-value and value. The contradictions exist within each other, and

cannot be separated into any kind of action at moment 1 and reaction at moment 2.

Let’s take another example. In capitalism there exist such categories as wage-labour. This is a phenomenon created by capitalism and maintained by capitalism every day. However, labor is much older than capitalism. Chronologically it emerged much earlier. As such it could not be created by capitalism. The fact is that labor was the basis of capitalism just like capitalism is now the basis for wage-labor. Marx begins his analysis of capitalism with the analysis of the commodity, the product of capitalism. Yet, this product is also much older than capitalism. Capitalism is just as much the product of commodities as the other way around. Such a paradox is difficult to explain as a feedback mechanism.

Commenting on Zeno’s paradoxes Engels actually defined motion itself as a paradox and a contradiction. At one moment a body is located at point A and the next at point B. At each separate instance the body is stationary at some point which can be clearly mapped, and yet it is moving and not stationary. How to depict this using cybernetics?

4. Cybernetics is merely a vulgarization of real science Cybernetics tries to explain phenomena similar to automation science, scientific physiology developed by I. P. Pavlov, laws of nature, society and thought discovered by dialectical materialism etc. However, cybernetics does it much more poorly than these other disciplines. In dealing with physiology cybernetics actually plagiarizes Pavlov, but distorts everything and dumbs it down by a factor of ten. This is

understandable since Norbert Wiener had read Pavlov and was aware of his work, but lacked an adequate grasp of physiology or Pavlov's theories. Wiener was a mathematician and if one only has a hammer, all problems look like nails.

5. Cybernetics supports idealism Cybernetics is fully compatible with idealistic notions in sociology, psychology and other sciences. Wiener denied the material basis of cybernetic processes saying "Information is information, not matter or energy." (Wiener, Cybernetics, p. 132)

6. Cybernetics depicts bourgeois inhumanity

Needless to say the capitalists would love to replace every worker with a machine. Machines don't need to be paid wages, and most importantly they will not go on strike or rebel. Imperialists have also harnessed automated or semi-automated machines such as drones for their purposes. The imperialist dream is to have automated weapons systems, which will unhesitatingly commit any atrocity.

Someone might point out that Wiener used pacifist phrases, and eventually did not want to support the USA war machine anymore. However, we are interested in the objective significance of his theory, not his subjective opinion. Wiener actually began developing his theory of cybernetics after his career as a weapons researcher for the military. His attempt had been to create anti-aircraft guns with aim-assisting functions, and later he often claimed that this experience was crucial for the invention of cybernetics. It turns out the guns developed by Wiener did not work, he was fired and the project was ended:

“his anti-aircraft predictor did not work very well, and in January of 1943 his wartime project was terminated” (Gerovitch, Newspeak to Cyberspeak, p. 61)

“[David] Mindell argues that “cybernetics… recast military control in a civilian mold”… some view it as an extension of military patterns of thinking and behavior into the civilian realm” (Gerovitch, Newspeak to Cyberspeak, pp. 54-55)

Defenders of cybernetics have sometimes asked “how can cybernetics be a dangerous weapon of imperialism, if it is also a useless pseudo-science?”. The last few sentences in the dictionary make this perfectly clear. Cybernetics itself is a pseudo-science, but it is used in propaganda to attract scientists into the field of automation in service of capitalism and imperialism. The media hype about cybernetics all turned out to be false. It did not create superhuman robots which would easily replace men. It did not create any such thing. However, it served the imperialists in an ideological campaign against marxism, as a form of sabotage inside the USSR, and as propaganda in favor of automatic weapons systems. It also served as reactionary utopian propaganda which claimed that all the societal ills of capitalism could be solved with the introduction of cybernetics – thus it prolonged the existence of capitalism and defended it from criticisms.

THE PROPAGANDA TO PROMOTE CYBERNETICS IN THE CAPITALIST WORLD When Wiener’s book “Cybernetics” was published, it was immediately promoted heavily by the imperialist media monopolies. The media companies praised the book to high heavens claiming it to be

an absolutely essential classic of our era:

“The Saturday Review of Literature noted that it appeared “impossible for anyone seriously interested in our civilization to ignore this book.” “It is,” the magazine commented, “a ‘must’ book for those in every branch of science.”” (Gerovitch, Newspeak to Cyberspeak, p. 96)

After reading the book, I can conclude that it is mostly very low level “pop science”, with very little scientific merit at all. The book consists of stories about Wiener’s career, philosophical ramblings and analogies about how there is no difference between societies, humans, animals and machines.

Couple of chapters consist of mathematical formulae, which I cannot comment on. Those chapters make exactly the same conclusions and claims as the rest of the book. In any case, it seems these chapters were intended to impress non-mathematicians and make the book seem more “scientific” and smarter then it actually is. But why would we ask a mathematician to answer philosophical, social, or even biological questions? Yet it seems these chapters really did impress people, and made them think that this “smart mathematician” could answer all questions about life. Cybernetics promised simple solutions to big problems:

“A large portion of the book was occupied by complex mathematical chapters, which a broad audience could not possibly understand. **These chapters, although “largely irrelevant,” fulfilled an important rhetorical function**: they greatly impressed lay readers, thus conferring legitimacy on the bold claims made in a plain language in the rest of the

book. Cybernetics promised solutions to a wide range of social, biological, and technological problems… Complex social and biological phenomena looked simpler… when described in cybernetic terms." (Gerovitch, Newspeak to Cyberspeak, pp. 96-97)

The massive propaganda campaign continued until cybernetics became universally accepted in the West:

"The popular press hailed digital computers as "electronic brains." Scientific American published an accessible account of cybernetics under the provocative title "Man Viewed as a Machine." The computer specialist Frank H. George threw a challenge to the readers of the English journal Philosophy: "You can't tell me anything that your wife can do that a machine can't (in principle). [sic!!]" Political scientists spoke of the "nerves of government."… Business consultants began to sell "management cybernetics." (Gerovitch, Newspeak to Cyberspeak, p. 97)

The effects of this campaign are still very much present today. Cybernetic terminology is still widely used in politics, sociology etc. In the field of genetics simplistic cybernetic terminology has become the norm, genes or dna are described as carriers of information, codes, or as blueprints:

"Molecular biologists conceptualized the gene as "the smallest message unit"… Biological specificity was "re-represented through the scriptural tropes of information—message, alphabet, instructions, code, text, reading, program. The narratives of heredity and life [were] rewritten as programmed communication systems."" (Gerovitch, Newspeak to

Cyberspeak, p. 97)

Let us now deal with the history of cybernetics in the USSR.

WERE CYBERNETICS BOOKS BANNED IN THE STALIN ERA?

A cyberneticist named Kopelev claims they were, but historian V. Shilov says that: “Kopelev’s story made in 1949 is hardly possible.” (Valery Shilov, Reefs of Myths: Towards the History of Cybernetics in the Soviet Union, p. 2)

The information about this is actually very conflicting. Perhaps some books were banned, but the sources don’t agree about this. The fact is that cybernetics books would have been available only in the foreign language libraries, for those who spoke foreign languages, and the general public or even most scientists didn’t care about them.

G. N. Povarov said that “in the Library of Foreign Literature one could get this book freely. There I read it. It was approximately in 1952–1953. So this book was not prohibited by censorship” [3, p. 12]] (Shilov, p. 2)

A.V. Shileyko claimed he had access to the book [Wiener’s “Cybernetics”] at a philosophical seminar in the early 1950s. (Shilov, p. 2)

V. A. Torgashev declares that “Wiener’s book “Cybernetics” published in 1948 was translated in USSR in 1949 (in fact its second edition appeared in the open sale only in 1958. However, the book was available in libraries earlier)” [7, p.48-49].” (Shilov, p. 2)

The notorious revisionist and defector Kolman seems to be the source of many of these myths:

“A. Kolman in the article published after his [defection to] the West wrote that he had read Wiener’s book due the help of some unnamed secretary (very important person!) of the Communist Party Central Committee. But in memoirs published 5 years later he told this story in another way – more extensively and heroically” (Shilov, p. 2)

Of course there would be nothing wrong in principal with refusing to publish cybernetics books, or to remove them from public libraries. The only reason cybernetics books should be and were available to some degree is so that people could criticize them.

THE ANTI-CYBERNETICS CAMPAIGN IN THE USSR

Gerovitch claims in his book, that soviet philosophers were not knowledgeable on cybernetics, and many had not read Wiener’s books but only his interviews. He claims the campaign was based on ignorance and strawmen. However, it seems his source for these statements is Khrushchev’s secret speech and other similar statements at the CPSU 20th Party Congress, which slandered and attacked previous policies and rehabilitated cybernetics. So Gerovitch’s claim is not very credible right off the bat. Secondly, it is clear that the authors of the Philosophical Dictionary were knowledgeable, and their criticism is still fundamentally not different, let alone contradictory, with the criticisms made by the earlier supposedly “ignorant” soviet critics.

It is true that the criticisms of cybernetics evolved somewhat, but that is only natural. During intellectual discussion views always develop and evolve. Initially certain philosophers linked cybernetics with semantic idealism, but this connection was later dropped. Different authors pointed out different aspects of cybernetics, but the main point was always the same: it is a form of modern mechanism and idealism.

But for the sake of argument, let's assume that some soviet critics really did not read Wiener's book *Cybernetics Or Control and Communication in the Animal and the Machine.* Indeed, it seems certain only some read it. Is it necessary to read Wiener's book, in order to conclude that Cybernetics is idealistic and mechanistic? No, it is not necessary at all. The basic premises of cybernetics are fundamentally idealistic and mechanistic and it is completely unnecessary to delve into the intricate details of it to come to this conclusion.

However, I read Wiener's *Cybernetics*, his later book *The Human Use of Human Beings*, as well as other influential cybernetics texts such as *Design for a brain* by W. R. Ashby and his textbook *Introduction to cybernetics*. These books are not worth reading. They are low quality philosophical ramblings and vulgar pop-science, with some mathematics thrown in. These books also did not change my perception of cybernetics one bit, but only confirmed what was already blatantly evident.

Gerovitch claims soviet critics took Wiener's statements out of context, but the same controversial claims demonstrating mechanism (equating humans and societies to machines, to

animals, to viruses etc.) and idealism (claims that "information" and "signals" are not material) are repeated numerous times in books by Wiener and also by Ashby, so this is not a case of taking quotes out of context or of mere slips of the pen on the part of Wiener.

THE SIZE OF THE CAMPAIGN

Marxist philosophers certainly opposed cybernetics. This is made clear by the entry in the short philosophical dictionary. However, it was not considered a very important problem and the "campaign" against it was small:

"the campaign against cybernetics… was not of large scale – there were near ten publications… Anti-cybernetics articles were not published in the occasional press organs" (Shilov, p. 3) but in specialist technical journals, philosophy journals etc.

Shilov is confident he has the complete list of anti-cybernetic articles, and the list includes only 10. However, many of the 10 publications which Shilov lists as "anti-cyberneticist" did not even mention cybernetics. Even the famous article mentioned by every historian "Mark III, a Calculator" by Boris Agapov which ridiculed the Times article "Can Man Build a Superman?" did not directly mention cybernetics. In the opinion of historian Loren Graham there were only 3-4 articles against cybernetics:

"At the beginning of 1950s Soviet ideologists were definitely hostile to cybernetics, despite that the total number of anti-cybernetics articles was probably not more than three or four" (Loren R. Graham, Science, Philosophy, and Human Behavior

in the Soviet Union, p. 272)

If we assume Shilov is correct and Graham is wrong, than this is yet another example of the shoddy quality of bourgeois research. It probably also indicates that the campaign against cybernetics was indeed small, since some of the articles were in publications too niche for Graham to even know about them. However, I think Shilov is exaggerating and trying to increase the number of articles to the maximum, at least by including both the dictionary entry (which Graham doesn't include because it is not an article) and Agapov's "Mark III" (which doesn't mention cybernetics) as anti-cybernetic articles.

Shilov's list of "anti-cybernetics" articles:

-Boris Agapov, "Mark III, kal'kuliator", Literaturnaya Gazeta. 4 May 1950. P. 2.
-Mikhail G. Yaroshevsky, "Kibernetika – «nauka» mrakobesov", Literaturnaya Gazeta. 5 April 1952. P. 4.
-Bernard E. Bykhovskii, "Kibernetika – amerikanskaia lzhenauka", Priroda. 1952. 7. P. 125-127.
-Kirill A. Gladkov, "Kibernetika, ili toska po mekhanicheskim soldatam", Tekhnika – molodezhi. 1952. 8. P. 34-38.
-Yu. Klemanov, "«Kibernetika» mozga", Meditsinskii rabotnik. 25 July 1952. P. 4.
-Bernard E. Bykhovskii, "Nauka sovremennykh rabovladel'tsev", Nauka i zhizn'. 1953. 6. P. 42-44.
-Materialist, "Komu sluzhit kibernetika?", Voprosy filosofii. 1953. 5. P. 210-219.
-"Kibernetika", Kratkii filosofskii slovar'. Moskva, 1954. P.

236-237.

-Theodor K. Gladkov, “Kibernetika – psevdonauka o mashinakh, zhivotnykh, cheloveke i obshchestve”, Vestnik Moskovskogo universiteta. 1955. 1. P. 57-67.

DID THE CAMPAIGN PREVENT DEVELOPMENT OF COMPUTER TECHNOLOGY?

Cybernetics is a confused and badly defined “science”. As a result it was very often confused with computer technology and automation in general. As a result many people questioned the very existence of the campaign against cybernetics since computer technology was simultaneously highly developed in the USSR:

“Many problems are still the object of acute disputes… Was it [an] anti-cybernetics campaign at all?” (Shilov, p. 1)

P. L. Kapitsa, a conservative but skilled physicist from the tsarist days is a perfect example of this confusion. He argued that since computers are very important, it was a bad idea to attack cybernetics. As if the two are somehow the same thing:

“In 1962 Academician P. L. Kapitsa remarked caustically that … had our scientists back in the year 1954 paid attention to the philosophers, had they accepted that definition [of cybernetics as a reactionary pseudoscience] as a guide to further development of this particular science, we may safely say that our conquest of space, of which we are so proud and for which the whole world respects us, could never have been a reality, since it is wholly impossible to steer space vehicles without recourse to cybernetics.” (David Holloway, Innovation

in Science-The Case of Cybernetics in the Soviet Union, p. 309)

Iurii Zhdanov, the son of the party theoretician Andrei Zhdanov, also makes the same mistake. He argued that Stalin always supported computer technology and as a result he did not oppose cybernetics:

“Iurii Zhdanov, the former head of the Science Department of the Central Committee in 1951-53, recalled in his memoirs: “While Stalin spoke against modern genetics, he never opposed cybernetics [by which Iurii means computer technology]. On the contrary, in connection with the space enterprise every effort was made to advance computer technology. In particular, our department had an assignment to help Academician S. A. Lebedev with the construction of the first machines of the BESM type (the High-Speed Electronic Calculating Machine [Bystrodeistvuiushchaia elektronnaia schetmaia mashina]). And that was done…”

The MESM, the first stored-program electronic digital computer in Europe, was already working in Kiev, and two more machines were under construction in Moscow… On 11 January 1950, following the first successful tests of the MESM, the government authorized two independent projects to build large high-speed digital computers: one at the Institute of Precise Mechanics and Computer Technology in Moscow (the BESM), the other at the Special Design Bureau No. 245, also in Moscow (the Arrow [Strela]).” (Slava Gerovitch, “Russian Scandals”: Soviet Readings of American Cybernetics in the Early Years of the Cold War, pp. 563-564)

Gerovitch states categorically:

“The myth that the anticybernetics campaign was a major obstacle to the development of Soviet computing has already been exposed… On the contrary, party and government authorities provided complete support to computing, control engineering, and communications engineering” (Slava Gerovitch, “Russian Scandals”, p. 566)

“Even though cybernetics was labeled in the Soviet press a “pseudoscience,” computers were not considered “pseudo-machines.” Soviet critics of the cybernetics campaign only branded as “idealistic” and “mechanistic” the use of man-machine analogies in the life sciences and the social sciences; they did not at all object to the use of computers for automation and scientific calculations, which were regarded as acceptable “materialistic” applications. The critics even called the invention of a computer a “real scientific and technical achievement” and argued that computers had “great value for the most diverse phases of economic construction.” Computers, they claimed, could make “calculations of any degree of complexity in the shortest possible time,” being capable of “completely flawless operation and procurement of results.”” (Gerovitch, Newspeak to Cyberspeak, p. 142)

The USSR developed the first digital computers in Europe, the second in the world, and was at the cutting edge of computer technology in the Stalin era. Fields related to computer research and automation were rapidly being developed in the USSR exactly at the same time as the pseudo-science of

cybernetics was condemned:

“it is possible to find in Soviet literature mention of the rationalization of mental labor and of thinking machines as early as 1926” (Maxim W. Mikulak, Cybernetics and Marxism-Leninism, p. 454)

“As early as 1934 the Soviet Academy of Sciences had organized a commission on remote control and automation. The year 1936 witnessed the introduction of the journal Avtomatika i telemekhanika. In 1950 the Institute for Precision Mechanics and Computer Technology came into existence; its chief function was to develop the practical aspects of programming. And it took three volumes to record the reports made in 1953, at the Second All-Union Conference on the Theory of Automatic Regulation, on the progress of automation and cybernation from 1940 to 1953. Excellent textbooks on servomechanisms and control systems were written by B. S. Sotskov (1950), G. A. Shaumian (1952), and E. P. Popov (1956).” (Maxim W. Mikulak, Cybernetics and Marxism-Leninism, p. 464)

David Holloway is an anti-communist historian, but he describes this accurately:

“a distinction was drawn between computer technology and the theories of cybernetics. The former was regarded as an important technological advance, while the latter were seen as a malignant ideological growth on the real science of automatic control. Second, the central focus of cybernetics was seen to be the analogy drawn between the brain and the computer; and particular exception was taken to the view

ascribed to cyberneticians that the only feature distinguishing brain from computer is the former's size and capacity. Cybernetics was condemned for attempting to transfer the laws of motion peculiar to some forms of matter to qualitatively different forms where other, higher, laws operate. It was mechanistic in its disregard for such differences; but in so far as it ignored, dismissed, or failed to solve the problem of human consciousness, it was held to leave the door open to idealism and clericalism. Cybernetics was seen as an excrescence on the decaying body of capitalism, reflecting its inhumanity, its aggression, and its fear of the proletariat. The fascination of the 'thinking machine' for the bourgeoisie lay, it was said, in the hope of substituting automatic machines for recalcitrant workers, or for pilots who might refuse to bomb peasant women working in the rice fields. Finally cybernetics was said to embody the vain hope that 'the contemporary technocrats-the cyberneticians' would be able, with the help of computers to effect substantial changes in the social system. But these ambitions were doomed to failure, for the fundamental problems of capitalist society were not amenable to technological solutions. It was the character of the economic system that determined the course of technological development, not technology that determined social development." (David Holloway, Innovation in Science-The Case of Cybernetics in the Soviet Union, pp. 310-311)

"Soviet critics complained that the concept of feedback was much cruder than the Pavlovian concept of reflex. Moreover, cybernetics left open the question of the nature and origins of consciousness, which Pavlov was said to have explained by

reference to speech, the ‘second signalling system’ which was peculiar to man alone. This had developed as a result of man’s involvement in labour and social interaction, with the consequent need for extensive communication between man. Further, in neglecting the content of speech, cybernetics denied an active role to man’s mental activity.

One of the Soviet critics went on to comment on cybernetics as a social theory. He argued that cybernetics, by claiming that man is not, in essence, different from a machine, played down the crucial fact that man lives in society. Hence it made no distinction between different socio-economic formations, and conceived of society merely as a complex mechanism, consisting of a certain number of elements, and subject to mechanistic laws such as that of feedback. By focusing on the structure of communications it ignored the laws of social development; by ignoring the content of social information it made it impossible to grasp ‘the essence of the phenomena of social life’. As a social theory cybernetics rationalized capitalist society by explaining social change in terms of improvement in ‘group information’, without reference to the mode of production. The crisis of capitalist production could be explained away as the self-regulating mechanism of the market. Because of the need for centralized control the cyberneticians argued that world civilization should be centralized-with its headquarters in Washington.” (David Holloway, Innovation in Science-The Case of Cybernetics in the Soviet Union, p. 311)

One of the main advocates of cybernetics, the notorious revisionist Aksel Berg claimed that condemnation of

cybernetics had hindered computer research, but even anti-communist Holloway has shown this is completely false:

“In 1960 Academician Berg wrote that ‘it took such a long time to form a sensible attitude to cybernetics that undoubted harm was done to our science and technology ‘… Berg had referred to the way in which the fears of philosophers had held up the development of computer technology; but, as has been mentioned, computer technology was exempted from the initial attacks on cybernetics. In 1949 the first department of Computer Mathematics in the Soviet Union had been set up at Moscow University, and in the following year the Academy of Sciences established an Institute of Precision Mechanics and Computer Engineering. Work on digital computers had begun in the late 1940s, and by 1953 several different computers had been completed.” (David Holloway, Innovation in Science-The Case of Cybernetics in the Soviet Union, p. 312)

“In the 1990s, the cybernetics boom was blamed for numerous shortcomings of Soviet science. “This doctrine, which called itself a science of control, chained the technological élan of a great nation,” wrote one commentator in a Russian on-line magazine. “Domestic science wasted immeasurable time and effort on the chimera of cybernetics, while the field of computer technology was deprived of full-scale funding.”” (Gerovitch, Newspeak to Cyberspeak, p. 4)

DID SCIENCE SUFFER UNDER STALIN AND FLOURISH UNDER KHRUSHCHEV?

Anti-communist Gerovitch finds it “paradoxical” that science actually developed much better in the Stalin era. There are two simple reasons why this happened: 1) the government gave more funding to science 2) the party gave more guidance to scientists and encouraged criticism of false and fruitless ideas. However, anti-communists have always called this guidance and criticism as something tyrannical which hinders science.

“this image of science suppressed by political interference is hard to reconcile with the impressive scientific achievements of the Stalinist era, which earned Soviet scientists a host of Nobel Prizes in physics and chemistry. In the postwar period, scientific and engineering institutions and large-scale industrial and construction projects aimed at fulfilling Stalin’s ambitious plan of the “great transformation of nature” mushroomed, and the Soviet Union celebrated an unprecedented “cult” of science and technology. It was during this period that Soviet scientists built their first atomic and hydrogen bombs. **Paradoxically, Soviet science appeared to thrive under Stalin’s totalitarian rule better than in the relatively liberal climate of the Khrushchev regime**.” (Gerovitch, Newspeak to Cyberspeak, p. 5)

“[Loren] Graham has dispelled the popular myth of Soviet scientists’ being blinded by Marxist ideology and has shown how dialectical materialism, the official Soviet philosophy of science, was fruitfully integrated into the scientific outlook of many Soviet scholars.” (Gerovitch, Newspeak to Cyberspeak, p. 5)

“Although Soviet science enjoyed reform and looser

ideological constraints under Khrushchev, it is worth noting that, strictly speaking, Soviet science may have accomplished more under Stalin… Under Stalin, Soviet physicists and chemists pioneered work for which chemist Nikolai Semyonov, physicist Igor Tamm, economist Leonid Kantorovich, and physicist Pyotr Kapitsa received Nobel Prizes decades later. Other Soviet scientists – including Igor Kurchatov, Lev Landau, Yakov Frenkel… and other world-renowned figures – also developed atomic and thermonuclear bombs, a lynchpin in Stalin's rapid and forceful industrialization of the remnants of the Russian Empire from a backwater country into a global superpower in only a few decades… Many Soviet scientists successfully employed dialectical materialism as a genuine source of inspiration, not a forced ideology, in their scientific work." (Benjamin Peters, Normalizing Soviet Cybernetics, in Information & Culture Vol. 47, No. 2 (2012), p. 153)

CYBERNETICS PROMOTED BY REVISIONISTS

The first stages

In the mid-1950s the revisionists supported cybernetic ideas being advocated. In 1955 a new edition of the Short Philosophical Dictionary was issued, where the entry on cybernetics was removed. In the late-50s cybernetics was no longer called a pseudo-science. However, Soviet scientists, philosophers and engineers still resisted the western pseudo-science. Because they could no longer condemn it as a pseudo-

science, they merely pointed out that it did not have an original subject-matter and did not contribute anything that wasn't already being performed better by actual sciences:

"Ernest Kolman… confirmed the nihilistic state of mind of some of his colleagues toward Wiener's theory and other branches of Western science and revealed the continuing Soviet antagonism to cybernetics; its opponents no longer referred to the theory of control and communication in the machine and living organism as pseudoscience but now argued that it was identical with automation and therefore deserved no separate title to existence. It was apparent to Kolman from the sessions on automation sponsored by the Soviet Academy of Sciences in October 1956 and from the discussions held by the Moscow Mathematical Society in April 1957 that **the very same engineers, technicians, and mathematicians who were furthering automation opposed Wiener's cybernetics** and that the narrow specialists in biology, physiology, psychology, and linguistics could not reconcile themselves to cybernetics because it represented a misalliance" of incongruous disciplines."" (Maxim W. Mikulak, Cybernetics and Marxism-Leninism, Slavic Review Vol. 24, No. 3 Sep., 1965, p. 453)

In other words, real scientists opposed cybernetics even after the communist party had stopped condemning it and had adopted a tone of approval. The opposition to cybernetics was not simply imposed on the scientific community by any "tyrannical stalinist official". The scientists opposed it even on their own.

"It is important to note, however, that it was not the

philosophers alone who rejected cybernetics: In the arguments which were carried on about cybernetics some engineers, technologists and mathematicians, who were themselves doing both practical and theoretical work in the field of automatic systems, came forward as its opponents. They asserted that cybernetics had no right to existence as an independent science, that theories of automata were sufficient." (David Holloway, Innovation in Science-The Case of Cybernetics in the Soviet Union, p. 314)

KolmanCybernetics was heavily promoted in the USSR by Ernest Kolman who Benjamin Peters in his article "Normalizing Soviet Cybernetics" characterizes as "a failed mathematician" (p. 159). Kolman, who saw himself as a philosopher of science was described as a "true stalinist" but in reality he was only a careerist. His commitment to marxism had always been self-serving and disingenuous. He was hardly someone defending the integrity of marxism from bourgeois pseudo-science and "had spent time in a Stalinist labor camp after World War II for straying from the party line in his interpretation of Marxism." (Peters, p. 160). This is probably not the actual reason for his imprisonment, but in any case it suggests he was at best guilty of ideological deviations and in all likelihood guilty of crimes against the Soviet Union.

Later Kolman defected to Sweden where he openly rejected Leninism entirely and strongly criticized both Marx and Engels. Many of his stories about his past have also been debunked, so nobody should really trust him.

In the late 50s he began promoting cybernetics through

writings and speeches. To give cybernetics some credibility Kolman actually linked it to the idealist revisionist Bogdanov, and revisionist traitor Bukharin:

“Along with Bogdanov’s tectology, Kolman also numbers Bucharin’s praxeology among the first beginnings of Soviet cybernetic research” (Michael Csizmas and Patrick McNally, Cybernetics, Marxism, Jurisprudence, Studies in Soviet Thought Vol. 11, No. 2 (1971), p. 90)

The other main supporter of cybernetics, Aksel Berg, also described cybernetics as a universal science of government similar to the ‘universal organizing science’ or tektology of Bogdanov, which also had a large influence on Bukharin:

“Berg actively used his huge influence and connections in the party and government to promote cybernetics as a universal “science of government,”” (Slava Gerovitch, “Russian Scandals”, p. 566)

Other revisionists, for example the East German Georg Klaus made the laughable claim that developers of cybernetics Ashby and Wiener both “produce… clearly recognizable dialectic and materialistic trains of ideas” (Kybernetik in philosophischer Sicht, p. 23, quoted and translated in Gotthard Günther, Cybernetics and the dialectic Materialism of Marx and Lenin, p. 8)

The trio Sobolev, Liapunov and Kitov

Together with Kolman and Berg, the originators of cybernetics in the USSR were mathematicians Sergei Sobolev,Aleksei Liapunov and computer engineer Anatoly Kitov. Together they

wrote the influential early pro-cybernetics article “The Main Features of Cybernetics”. (Gerovitch, Newspeak to Cyberspeak, p. 173)

“In the autumn of 1954 Liapunov organized a “seminar on machine mathematics” at Moscow University. He did not limit seminar topics to purely mathematical problems, however. Liapunov… incorporated the entire range of cybernetic issues into the seminar’s agenda. Liapunov’s seminar met regularly for several years and served as a nexus of public exchange of cybernetic ideas… While cybernetics was still referred to in the press as a “reactionary pseudoscience,” the participants of Liapunov’s seminar openly discussed most recent Western cybernetic works” (Gerovitch, Newspeak to Cyberspeak, pp. 174-175)

During the discussion of the article “The Main Features of Cybernetics” by Sobolev, Liapunov and Kitov “The Deputy Editor-in-Chief of Voprosy filosofii, Mark Rozental’, objected to the use of the word memory with respect to computers, arguing that memory was a mental attribute. Kitov replied that memory was nothing more than “the ability to preserve information” and contended that “one should not be afraid of calling this thing memory both here and there [in men and machines].” “Why can’t we say memory but have to say storage device?” he asked. “The matter is to preserve a difference between man and machine,” Rozental’ explained. “The real difference is that man is a social being; he is formed under the influence of his [social] environment. There is no need to see a difference where it is not even tangible,” Kitov retorted.” (Gerovitch, Newspeak to Cyberspeak, p. 181)

“In October of 1958, speaking on cybernetics at the All-Union Conference on Philosophical Problems of Natural Science, Sobolev brushed aside the philosophical critique of cybernetics as utterly irrelevant:

“We [Sobolev and Liapunov] admit that we do not even understand some of these [philosophical] questions in relation to cybernetics… One cannot divide physics into materialistic physics and idealistic physics… There is no such thing.”

…Sobolev did not use any philosophical arguments to refute the charge of idealism; instead, he claimed that philosophical terminology simply was not applicable to cybernetics.” (Gerovitch, Newspeak to Cyberspeak, pp. 181-182)

One could ask, if the cyberneticians even admit that they do not understand philosophical questions or philosophical objections to cybernetic claims, how can they be so arrogant as to simply reject these criticisms without even understanding them?

Sobolev and Liapunov also clearly were not familiar with Lenin’s words that:

“no natural science… can hold its own in the struggle against the onslaught of bourgeois ideas and the restoration of the bourgeois world outlook unless it stands on solid philosophical ground. In order to hold his own in this struggle and carry it to a victorious finish, the natural scientist must be a modern materialist, a conscious adherent of the materialism represented by Marx, i.e., he must be a dialectical materialist.” (Lenin, On the significance of militant materialism)

Cybernetics is accepted officially by the Khrushchevites

Cybernetics was finally adopted officially by the revisionists at the 20th party congress, and adopted into the party program at the 22nd party congress:

“In 1961 the Central Committee began promoting cybernetics at the Twenty-Second Party Congress as “one of the major tools of the creation of a communist society.” First Secretary Nikita Khrushchev in particular promoted a far-reaching application of cybernetics.” (Benjamin Peters, “Normalizing Soviet Cybernetics”, Information & Culture Vol. 47, No. 2 (2012), p. 164)

“In 1958 an entry on cybernetics finally appeared in the additional volume 51 of The Great Soviet Encyclopedia… This article acknowledged Norbert Wiener’s pioneering role in the development of cybernetics and effectively legitimized this field in the Soviet Union. The author of this article was none other than Andrei Kolmogorov [famous mathematician and cybernetist]. A separate article, co-authored by Kolmogorov’s student, was devoted to Wiener…” (Gerovitch, Newspeak to Cyberspeak, p. 151)

To rehabilitate cybernetics its supporters avoided discussing philosophical problems, instead going for a “neutral” technocratic approach. Cybernetics terminology was changed to hide its mechanistic character, the word “mechanism” was removed from all descriptions of cybernetics by its developers, Wiener’s “feedback mechanism” was renamed “the theory of feedback”. The revisionist authors emphasized the theoretical

nature of cybernetics to distance it from American pragmatism. (Benjamin Peters, “Normalizing Soviet Cybernetics”, p. 156)

By the 1960s the revisionist leaders had decided that cybernetics was so important, that it should be given its entire division in Soviet science. Keep in mind, the entire scientific establishment in the USSR consisted of only three large divisions: physico-technical and mathematical, chemico-technical, and biological. The revisionists claimed that the fashionable western pseudo-science was as important as these major divisions of science!

“In the later 1960s the Academy of Sciences of the USSR vaunted cybernetics as an entire division of Soviet science, one of only four divisions.” (Benjamin Peters, “Normalizing Soviet Cybernetics”, p. 167)

Things became even more ridiculous, when revisionists began arguing that really all the other fields should be subordinated under cybernetics, and seen as mere subcategories of it:

“Others waxed extravagant in arguing that even the remaining three divisions – “the physico-technical and mathematical sciences, chemico-technical and biological sciences, and social sciences” – could be read, without much conceptual violence, as subfields of the overarching expanse of Soviet cybernetics, given its ecumenical commitment to stitching together the mechanical, the organic, and the social: a totalizing mission begun with Wiener’s attempt to analogize (in his subtitle to his 1948 Cybernetics) “the animal and the machine” and later (in his subtitle to 1950’s The Human Use of Human Beings)

“cybernetics and society.”” (Benjamin Peters, “Normalizing Soviet Cybernetics”, p. 167)

Cybernetics departments kept multiplying like viruses. Cybernetic were created for everything imaginable. Cybernetic psychology, cybernetic geography, cybernetic economics. What’s next? Cybernetic art and cybernetic cuisine?

“Adopting this broad view institutionally, the Academy of Sciences originally categorized cybernetics into eight sections, including mathematics, engineering, economics, mathematical machines, biology, linguistics, reliability theory, and a “special” military section. With Berg’s influence on the Council on Cybernetics, the number of recognized subfields grew to envelop “geological cybernetics,” “agricultural cybernetics,” “geographical cybernetics,” “theoretical cybernetics” (mathematics), “biocybernetics” (sometimes “bionics” or biological sciences) , and, the most prominent of the Soviet cybernetic social sciences, “economic cybernetics.””(Benjamin Peters, “Normalizing Soviet Cybernetics”, p. 167)

Cybernetic legal theory was added, and naturally the new western fad “semiotics” developed by bourgeois linguists and idealist philosophers, was thrown in and given its own department:

“By 1967 the range of sections had expanded to include information theory, information systems, bionics, chemistry, psychology, energy systems, transportation, and justice, with semiotics joining the linguistic section and medicine uniting with biology.” (Benjamin Peters, “Normalizing Soviet

Cybernetics", p. 167)

CYBERNETICS AS A SHIELD FOR OTHER REACTIONARY THEORIES Leading cyberneticists were reactionaries who had been fighting against genuine science:"In July 1954 Sobolev published an article in the leading Party organ, Pravda… Using dogmatism as a euphemism for the Stalinist legacy in Soviet science, Sobolev specifically attacked the schools of Lysenkoist biology and "Pavlovian" physiology" (Gerovitch, Newspeak to Cyberspeak, p. 164)

Cybernetics became a haven for all kinds of idealists and revisionists, pseudo-scientists in all fields from psychology, linguistics to law and natural science:

"Sheltering a huddling crowd of unorthodox sciences, including "non-Pavlovian physiology ('psychological cybernetics'), structural linguistics ('cybernetic linguistics'), and new approaches in experiment planning ('chemical cybernetics') and legal studies ('legal cybernetics'),"" (Benjamin Peters, "Normalizing Soviet Cybernetics", p. 167)

The acceptance of cybernetics did not only mean that a useless pseudo-science was adopted in the field of automation or eletronics. It served to promote pseudo-science and to attack real sciences in many other fields, particularly in physiology, but also psychology, biology etc.

"Cybernetics began to serve as an institutional umbrella for various unorthodox research trends previously suppressed by dominant Stalinist schools… "biological cybernetics" (genetics), "physiological cybernetics" (non-Pavlovian

“physiology of activity”), and “cybernetic linguistics” (structural linguistics).” (Gerovitch, Newspeak to Cyberspeak, p. 8)

In 1960 “there appeared an article by Ljapunov and Sobol’ev, ‘Cybernetics and Natural Science’, in which the thesis of acquired inheritance was rejected” and the authors attacked michurinism and defended mendelism by saying that “classical genetics is in agreement with cybernetics.” (Michael Csizmas and Patrick McNally, Cybernetics, Marxism, Jurisprudence, p. 94)

“Problemy kibernetiki, for example, published papers on the application of cybernetics to genetics, thereby providing a haven for geneticists.” (David Holloway, Innovation in Science-The Case of Cybernetics in the Soviet Union, p. 327)

Pavlovian physiology was not compatible with cybernetics, and therefore it had to be destroyed. The council setup to maintain Pavlov’s work was dissolved:

“Of the more specific objections raised to cybernetics, that based on Pavlovian theories about higher nervous activity no longer carried the same force, since the Pavlovian orthodoxy had been greatly weakened in the mid-1950s… The Council on the Problem of the Physiological Teaching of Academician I. P. Pavlov, which had been set up to ensure that the resolutions of the 1950 Conference were enforced, seems to have held its last meeting in 1953. See Vestnik Akademii Nauk 0953, 6), 6I-2.” (David Holloway, Innovation in Science-The Case of Cybernetics in the Soviet Union, p. 331)”The frontiers between physiology and engineering are

those where cybernetics has had most effect on the conduct of research, and here the situation was more complex. Cybernetics was condemned as incompatible with Pavlov's theories; consequently the reaffirmation of Pavlovian teaching in 1950, and the subsequent purge of those who had attempted to revise his work, provided a powerful obstacle to cybernetics. One of those purged in 1950 exemplifies this clearly. In the 1930s P. K. Anokhin… had introduced into the physiology of the nervous system the idea of the 'return afferentation' of the results of an action to the actor-almost identical with the concept of feedback. This work, however, was condemned for conflicting with the Pavlovian theory of the reflex arc. Anokhin had attempted to rehabilitate his own work in the light of cybernetics:

When cybernetics appeared on the scene and when I began to talk of our Soviet priority in the theoretical treatment of physiology, friends told me: 'Give up talking about that!' It's alright to outstrip a scientific discovery by eleven years, but we don't advise you to outstrip bourgeois obscurantism by eleven years. In as much as research in physiology was held up it was by the stress on Pavlovian orthodoxy, and only at second remove by the attacks on cybernetics." (David Holloway, Innovation in Science-The Case of Cybernetics in the Soviet Union, pp. 312-313)

"Nikolai Aleksandrovich Bernshtein (1896–1966), who would later play the leading role in Soviet "physiological cybernetics." Throughout his career, Bernshtein spoke openly and consistently about his disagreement with Pavlov's doctrine of conditional reflexes… As early as 1934, Bernshtein

proposed to replace the classical Pavlovian concept of the “reflex arc” with a “reflex circle.”” (Gerovitch, Newspeak to Cyberspeak, pp. 44-45)

“Bernshtein… disagreed with Pavlov conceptually and did not even attempt to portray himself as an orthodox Pavlovian, became a prominent target of ideological criticism… His critics… accused him of attempting to “belittle” Pavlov’s significance. Furthermore, since Bernshtein cited foreign [imperialist] authors, he was charged with “kowtowing before foreign scientists” and “anti-patriotism.” The critics also attached to Bernshtein’s doctrine the usual labels: idealism (for using mathematical analysis) and mechanicism (for regarding the human body as a self-regulating mechanism). They even accused him of holding onto the “false theory of mutations” (i.e., genetics). At the 1950 “Pavlov session,” critics alleged that he knew “neither the letter nor the spirit of Pavlov’s teachings.”” (Gerovitch, Newspeak to Cyberspeak, p. 46)

“The “father of Soviet cybernetics,” Aleksei Liapunov, had developed a longterm friendship with a number of leading Soviet geneticists since the early 1940s, when he was involved in a controversy between Kolmogorov and Lysenko over the validity of statistical analysis in the interpretation of genetic experiments. In the late 1940s, Liapunov organized a kruzhok (a “circle,” a home study group)… he offered informal courses on genetics and the theory of probabilities and statistics, which were not taught to biology students at the university. Risking his position as a Party member and a researcher at a closed institution working on classified projects, Liapunov often invited persecuted geneticists to give guest lectures and

transmit their “forbidden knowledge” to this select group. Geneticists… seized this opportunity… Such prominent biologists as Dubinin, Romashov, Sakharov, Timoféeff-Ressovsky, Zavadovskii, and Zhebrak spoke at the meetings of Liapunov’s kruzhok.” (Gerovitch, Newspeak to Cyberspeak, p. 183)

Liapunov was involved in signing the anti-lysenko letter of 94 reactionary scientists in 1955 which was expanded in 1956 to the so-called “letter of 300”.

“Liapunov signed the addendum and took an active part in soliciting signatures from influential Soviet scientists; in particular, he managed to obtain Sobolev’s support” (Gerovitch, Newspeak to Cyberspeak, p. 184)

“Liapunov’s propagation of cybernetic ideas was closely connected with his defense of genetics.” (Gerovitch, Newspeak to Cyberspeak, p. 186)

“The cybernetics movement began to spread over a wide range of disciplines. “Biological cyberneticians” challenged the Lysenkoites in biology; “physiological cyberneticians” opposed the Pavlovian school in physiology; “cybernetic linguists” confronted the traditionalists in linguistics. The opponents of dominant schools in various fields began speaking the language of cybernetics.” (Gerovitch, Newspeak to Cyberspeak, p. 204)

“As the historian Mark Adams has demonstrated, genetics “hid under protective language: to cognoscenti, such terms as ‘radio-biology,’ ‘radiation bio-physics,’ and ‘physico-chemical

biology' functioned as a kind of protective mimicry, serving as euphemisms for both orthodox genetics and molecular biology." Genetic research was conducted not in biological institutions (which were controlled by the Lysenkoites) but under the roofs of physical and chemical research institutes. One of the code names for genetics in this period was cybernetic biology." (Newspeak to Cyberspeak, p. 211)

"In October of 1958, at the All-Union Conference on Philosophical Problems of Natural Science, Aleksei Liapunov and Sergei Sobolev delivered a paper in which they portrayed [mendelian] genetics as an implementation of the cybernetic approach in biology" (Newspeak to Cyberspeak, p. 211)

"Liapunov became the head of the Biological Section of the Council on Cybernetics; as the editor of the series Problemy kibernetiki… he published works on genetics. In particular, Liapunov helped his close friend Nikolai Timoféeff-Ressovsky [a mendelist who had defected to Germany and worked for the Third Reich]… to resume active research and publications after returning from Stalinist labor camps. Timoféeff-Ressovsky's first lecture after his return to Moscow was given at an informal gathering in Liapunov's apartment… Thanks to Liapunov's efforts, however, this article, written in collaboration with the geneticist Raisa Berg, appeared in the fifth volume of Problemy kibernetiki in 1962. To justify this publication, Timoféeff-Ressovsky and Berg injected a few cybernetic terms in their article." (Newspeak to Cyberspeak, p. 212)

"Speaking at the 1962 conference, the leading specialist in

pattern recognition, the mathematician Mikhail Bongard of the Institute of Biophysics, argued that Pavlovian reflex theory, if subjected to a cybernetic test, failed to explain pivotal physiological mechanisms" (Newspeak to Cyberspeak, p. 222)

"Bongard argued that reflex theory was clearly not adequate for explaining higher nervous activity… Instead, Bongard argued, one must look for a solution by building cybernetic models." (Newspeak to Cyberspeak, pp. 222-223)

"Sobolev, in particular, argued that there was no limit to the applicability of notions of cybernetics to living organisms: "In cybernetics, a machine is defined as a system capable of accomplishing actions that lead to a certain goal. Therefore, all living organisms, and human beings in particular, are in this sense machines. Man is the most perfect of all known cybernetic machines. . . . There is no doubt that all human activity manifests the functioning of a mechanism, which in all its parts obeys the same laws of mathematics, physics, and chemistry, as does any machine." Pavlovian physiologists tried to oppose this trend, but they could hardly resist the thrust of the cybernetics wave." (Newspeak to Cyberspeak, p. 224)

TECHNOCRACYEver since the rise of Khrushchev, the Soviet revisionists had tried to create a "less political" technocratic system. Western imperialist ideas were not seen as questionable by the revisionists, instead they were embraced in the hope of gaining somekind of pragmatic usefulness. Khrushchev's corn fiasco, which attempted to transplant American hybrid corn into the USSR is only one notorious example. The technocrats also encouraged Soviets to

not criticize Western imperialist “innovations”, and as a result doctrines like cybernetics, “brutalism” in architecture etc. were imported from the West to the USSR. The technocrats wanted optimal pragmatic solutions, and considered them “non-ideological”—their use of brutalism being a prime example. But brutalism is also a prime example of how this kind of supposedly non-ideological system is actually completely ideological. Brutalism, an imperialist Western trend, replaced Socialist Realism in architecture.

Lenin said:

“to belittle the socialist ideology in any way, to turn aside from it in the slightest degree means to strengthen bourgeois ideology.” (Lenin, What is to be done?)

The revisionists gleefully accepted “pragmatic” technocratic solutions very similar to right-deviators of the past, such as Bukharin and his use of Bogdanov’s “universal organizing science”:

“In the 1960s, “optimal planning and control” became a motto of the cybernetic movement. Soviet cyberneticians assumed that the main problem of the Soviet economy lay in the inefficient mechanisms of data collection, information processing, and control, and offered a solution based on mathematical modeling and computer-aided decision making. They believed that computers produced a politically neutral, “optimal” solution” (Gerovitch, Newspeak to Cyberspeak, p. 256)

“In the late 1960s, cybernetic ideas were incorporated into the

writings of a leading Party theoretician,
the philosopher Viktor Afanas'ev… Adopting terms from cyberspeak, Afanas'ev began talking of "social information" and "the scientific management [upravlenie] of society."… During the early anti-cybernetics campaign, Soviet critics had attacked cybernetics for being a "technocratic theory." Now the ideological attitude toward technocratic aspirations of cyberneticians was completely reversed. In 1967 the authors of the fifth volume of Cybernetics—in the Service of Communism wrote with pride that "the view of society as a complex cybernetic system with a multi-dimensional network of direct and feedback links and a mechanism of optimization, functioning towards a set goal, is increasingly gaining prestige as the main theoretical idea of the 'technology' of managing society."… Berg's Council on Cybernetics played a crucial role in the ideological rehabilitation of the legacy of Aleksei Gastev and other Soviet pioneers of the [bourgeois anti-communist theory of] "scientific management" movement of the 1920s." (Gerovitch, Newspeak to Cyberspeak, p. 285)

As Lenin had said, belittling Marxism would of course lead to it being replaced by bourgeois ideology more and more.

RE-WRITING OF MARXISM TO SERVE CYBERNETICS

First in the Khrushchev era cybernetics was fully rehabilitated:

Under A. Berg's leadership a philosophical section was created "to reconcile cybernetics with dialectical materialism **by adapting dialectical materialism to cybernetics.** Philosophers loyal to cybernetics duly accomplished this task.

First, **they managed to incorporate the concept of information into the canonical list of categories** of dialectical materialism." (Gerovitch, Newspeak to Cyberspeak, p. 258)

"Cybernetics occupied a prominent place in the fundamental five-volume Philosophical Encyclopedia, published in 1960–1970. The philosopher Aleksandr Spirkin, head of the Philosophical Section, served as Deputy Editor-in-Chief of the encyclopedia, and he secured the publication of an 11-page article on cybernetics. (The article on mathematics was only 6 pages long.) The encyclopedia also included as separate entries such terms as **control systems, information theory… thus turning them into philosophical categories**. The encyclopedia article on cybernetics fully reflected the new domination of cybernetic discourse over the old philosophical clichés [i.e. over marxism]. The first draft, written by Ernest Kolman, was mildly critical of cybernetic claims, but after a discussion at the Philosophical Section of the Council on Cybernetics it was forcefully rejected. Kolman emphasized the "qualitative differences" between humans and machines, and argued that cybernetic devices did not have consciousness and therefore could not think. Cybernetics supporters brushed such formulations aside… The new version, which was eventually published, placed no philosophical limits on cybernetics" (Gerovitch, Newspeak to Cyberspeak, p. 259)

In the Brezhnev era this went even further:

"Afanas'ev quickly translated the basic principles of operation of the Soviet government into cyberspeak… The government,

the Communist Party, and other political and public organizations constituted the controlling subsystem, while the economy, science, and other social activities made up the controlled subsystem. The Party, “the most important element of the scientific control of socialist society,” played, of course, the role of the chief controller” (Gerovitch, Newspeak to Cyberspeak, p. 285)

Thus the brezhnevites reduced even Marxism to cybernetics, the Marxist theory of the party and state was now being replaced by bourgeois pseudo-science!

“the Party principle of “democratic centralism,” for example, could easily be interpreted as control by means of feedback.” (Gerovitch, Newspeak to Cyberspeak, p. 286)

ECONOMIC CYBERNETICS Naturally, Western imperialist economic theories were also studied by the revisionists, and they experimented with market mechanisms. Revisionist theories were also rehabilitated. Khrushchev had created the system of de-centralized regional planning. The Kosygin-Liebermann reforms of 1965 introduced profitability or the profit-principle as the guide for enterprises (which had explicitly been condemned by Stalin in his “Economic Problems of Socialism in the USSR). Cyberneticists also suggested de-centralized planning.”The idea of indirect centralization, introduced by [cyberneticist] Viktor Novozhilov, was based on a mathematical theorem stating that the equilibrium point in a many-person non-coalition game would be an optimum. Applying the results of game theory to the Soviet economy, economic cyberneticians argued that the

central government did not need to impose specific output quotas on individual enterprises; instead, it could set “optimal” prices and investment efficiency norms, then allow individual enterprises to make their own decisions. If the criteria of economic performance were properly formulated, the independent activity of individual enterprises should lead to the fulfillment of the national plan. In contrast to the accepted view, economic cyberneticians argued that the ideal of “optimal planning” could be achieved by a radical decentralization of economic decision making and a regulated use of the market mechanism:

“The finding of an optimum may take place in a decentralized way, i.e. the equilibrium point, or optimum, can be found as a result of an exchange of information between economic organs, each of which independently solves the problem of optimization guided by its own individual (local) criterion of optimality. . . . **In this way, it is possible to use the market mechanism** for organizing the process of the decentralized working out of the optimal plan.”” (Gerovitch, Newspeak to Cyberspeak, p. 274)

“Describing the Soviet economy in quintessential cybernetic terms, Novozhilov argued that the market mechanism was equivalent to the feedback principle:

“**By now it is already widely known that cybernetics justifies khozraschet** [the profit-principle] as the compensator of randomness in a planned economy. A socialist economy is a very complicated system subject to the activity of a multiplicity of random factors and not lending itself to

description in full detail. The control of such systems is possible **only on the condition that there exists a self-regulator with feedback… the market mechanism is such a regulatory mechanism**… The detailing, correction and fulfillment of the plan must be regulated by khozraschet.”” (Gerovitch, Newspeak to Cyberspeak, p. 275)

Novozhilov argued that rational planning was impossible and that a socialist economy was impossible without a mindless “self-regulator” and that this regulator must be the market.

The cyberneticians tried to refute Marxism and considered value to be entirely irrelevant when it comes to prices. That is an anti-marxist statement in line with unscientific vulgar economics.

“Economic cyberneticians strongly emphasized their reliance on “objective” computation and “objective” valuations. Contrasting their approach with the traditional discourse of Soviet political economy, which was loaded with ideological formulas borrowed from the Marxist theory of value, they strongly asserted the discursive autonomy of economic cybernetics from political economy: “[The Marxist concept of] value and objective valuations are two completely different and incommensurable things. Value is a category of political economy and objective valuations are an algorithmic formula for the calculation of equilibrium prices in an optimal plan. [footnote 82, chapter 6”]” (Gerovitch, Newspeak to Cyberspeak, p. 275)

The arrogance of the revisionists was shown by the fact that they assumed cybernetics must be correct, and since political

economy doesn’t fit with cybernetics – so much the worse for political economy, it must be thrown into the trash. Keep in mind that this was being argued by Kantorovich, who himself was not an economist at all, but an engineer. Glushkov was not an economics expert either, but a mathematician:

“Sharply criticizing orthodox economists at a 1959 session of the Academy of Sciences, Kantorovich argued that the impossibility to translate their theories into cyberspeak made the shallowness of these theories self-evident” (Gerovitch, Newspeak to Cyberspeak, p. 276)

FEW REMARKS ON OGAS – A NATIONWIDE COMPUTER NETWORK

In the 1960s cyberneticists advocated building a nationwide network of computers, which could be used to plan the economy. Of course, this would’ve meant their distorted view of planning with market mechanisms. This project was supported by all cyberneticists, but its main architect was Glushkov.

The computer network (known as OGAS) was supposed to link each production facility, each warehouse and each shop to a network which would connect them to computer centers. These centers would track the amounts of products and resources and carry out necessary calculations. The plan eventually failed because of its impracticality. It would’ve been astronomically expensive. There were also bureaucratic problems, as different government organs, both civilian and military, would’ve had to share information and even share the

same computers.

In principle a computer network for economic planning is not a bad idea, but its also not a universal panacea, or a magic fix, like the cyberneticians claimed. They believed that the only problems in the revisionist Soviet society were problems of optimal organization. They believed that all problems could be solved through technology, which is deeply misguided. The truth is that 1) problems of the revisionist Soviet society could have been solved even without such a computer network, and 2) such a computer network on its own would not have solved the problems.

Let's discuss what exactly the computer network was intended to achieve.

"Glushkov indeed admitted that his project for a nationwide network of computation centers would cost more than the space program and the atomic project put together." (Gerovitch, Newspeak to Cyberspeak, p. 278)

Yet, how much more could be achieved if these massive funds were put into other projects? The cost of the project strongly hindered it from being completed, but we must also ask if the project itself even made any sense. The idea of a fully computerized planning system, where every factory, enterprise, warehouse and shop are connected to computer networks sounds very good. It would improve efficiency because people wouldn't need to write as many reports, wouldn't need to make calculations in their head, and the computer would tell people how to organize scheduling of shipments, organize construction etc. more efficiently.

But we must ask, if there is an industrial plant which uses technology of the 1930s, 1940s or 1950s, is adding computers to the plant really the best use of resources? Doubling the budget could massively improve the technology used in heavy industry. Hydraulics were being improved, coal boilers were used but gradually diesel generators became more prevalent. Electronics replaced mechanics. These kinds of improvements helped the Soviet economy grow massively in the post-WWII era, and also allowed for growth of the productive forces in the West. Computers would have improved production much less, but their cost would have been astronomical. It simply wouldn't make sense. Imagine for the sake of argument that a computer improves efficiency by 10% so that we need 9 people to do what previously required 10. By giving every collective farm new better tractors, repairing old tractors, or by giving miners new drills, construction workers new excavators, would "free up" much more labor, much more cheaply.

Buying a computer in the 1960s, just so that a warehouse – let alone a simple shop – could track its inventory, would be madness, when the computer would cost so much that we could hire the necessary personnel to check the inventory 100 times over. Nowadays the situation is different. Computers and networks are cheap, wages are high, and it is more difficult to improve production through inventions in heavy machinery. But we shouldn't impose our modern context back to the 1960s.

"Several pilot projects aimed at the development of small-scale computerized systems for production control and

information management at individual factories had little success. “Optimal” control yielded poor results when the technology of production was old and obsolete, as was often the case at Soviet factories. At a metallurgical plant in Dneprodzerzhinsk, the use of computers to control a technological process saved minutes, while hours were wasted because of inefficient technology, faulty sensors, and lack of coordination among the stages of production. Glushkov admitted that any potential profit from management-information systems was also lost because of constant interruptions in supply and the inefficient organization of the industry as a whole. “Optimal planning and control” turned into a pure mathematical abstraction.” (Gerovitch, Newspeak to Cyberspeak, p. 278)

It is quite funny to hear anti-communists like Gerovitch, and revisionists like Glushkov lament the supposedly bad state of the Soviet economy. They talk about “old machines”, meaning machines less then 20 years old. In heavy industry it is common and often even rational to use machines for 15 years. They were talking about interruptions in supply etc. and blamed it all on “communism”. But these problems were never unique to the USSR. The same exact issues are part of production, a fact of life, even today in the most high-tech capitalist countries. Their complaints simply show how out of touch with the reality of production these cybernetic utopians were.

In the factory where I work, there is constant massive inefficiency due to “human errors”, due to shipments of raw materials not arriving on time, due to bottlenecks because of

bad planning or due to mistakes, due to unpredictable breakdowns of machines, due to repair staff being too busy, due to constant problems with faulty raw materials etc. etc. And yet, all the inventories are tracked by computers automatically. A custom-built computer system is used for calling repair crews (often times they don't respond to the computer system, so workers have to walk to their office physically, or call them on the phone). At best, the computer automatically tells us if we are running out of materials – but that wouldn't be very difficult for a human to do. The computer tracks how many orders still need to be fulfilled, it tracks the production quotas of workers etc. which is a legitimate help, but not something revolutionary. Perhaps the most innovative thing is that the computers automatically track error messages from machines in the production process, which can alert managers that there is a problem in production. But often times these systems don't work – or it is entirely redundant, because the workers themselves always immediately recognize the problem themselves.

This is not to detract from the usefulness of computers. Computers serve useful functions, and they should also be used to aid economic planning.

So what would've been the appropriate use for computers in the 1950s and 1960s in the USSR? Computers should've been used as massive calculators, to calculate the most difficult problems which humans practically could not do. They should've been used in science and in every field where mathematics is needed. Military and scientific computers should be allocated based on the needs of various institutes, so

that smaller institutes might get their own smaller computers, or many institutes would share one big computer. This, in fact, is exactly what was done in the late Stalin-era.

Eventually, automatic information collection and processing, and telecommunication could be used, when it became economically viable i.e. cheaper and more useful. Instead of trying to spread computers everywhere, they should be centralized because they were so expensive and scarce. There was also a lot of room for the economy to grow even without computers. In the late Stalin-era the USSR was attempting to massively increase agricultural yield through mechanization and agricultural practices, to massively increase industrial production by building new plants, equipping them with new machines etc., and trying to improve education through numerous ambitious projects. To accomplish these necessary and extremely rewarding tasks (which the revisionists never fulfilled) computers had only very limited applicability, but they were put to good use for scientific problems, military ballistic calculations, weather forecasting etc.

“Glushkov argued that, unless the processing of economic information was automated, by the mid 1980s nearly the entire adult population of the Soviet Union would be engaged in planning, accounting, and management.” (Gerovitch, Newspeak to Cyberspeak, p. 281)

This is simply a gross exaggeration. It also assumes that the cybernetic de-centralized planning system was not an economic plan at all. In reality the cybernetic “plan” included increased market mechanisms.

THE FAILURE OF CYBERNETICISTS TO DEFINE WHAT THEIR "SCIENCE" EVEN IS*"Cybernetician, who aspired to make other scientific disciplines more objective by "cybernetizing" them, could hardly agree, however, on exactly what cybernetics meant." (Newspeak to Cyberspeak, p. 246)*

Cyberneticists couldn't even agree on what cybernetics is. It was becoming very evident that this "science" was sterile and had reached a dead end. Years went by, and the task of explaining what this new "science" was, remained unfulfilled:

"the internal discord among mathematical cyberneticists swelled, suggesting anything but a unified front. Leading Soviet cyberneticists defined the field in dramatically different terms: Kolmogorov fought to claim information as the base of cybernetics, whereas Markov preferred probabilistic causal networks, Lyapunov set theory, and Iablonskii algebraic logic. In 1958, only three years after their initial article, Kitov, Lyapunov, and Sobolev published an article outlining four more definitions of cybernetics in the Soviet Union, emphasizing the dominant study of "control systems," Wiener's interest in "governance and control in machines, living organisms, and human society," Kolmogorov's "processes of transmission, processing, and storing information," and Lyapunov's methods for manipulating the "structure of algorithms."" (Benjamin Peters, "Normalizing Soviet Cybernetics", p. 166)

Like true cosmopolitans they romanticized the American founder of cybernetics and appealed to him as some kind of

mythic authority. All these claims about the efficacy and clearness of cybernetics were totally fictitious. Just as fictional was the status of Wiener as an authority:

“Igor Poletaev, a leading Soviet information theorist… argued in 1964 against the then-plastic understanding of cybernetics. He legitimated his call for disciplinary coherence by invoking the iconic and mythically clear foreign founder, Norbert Wiener, claiming that “‘terminological inaccuracy’ is unacceptable, for it leads (and has already led) to a departure from Wiener’s original vision…” (Benjamin Peters, “Normalizing Soviet Cybernetics”, p. 166)

“Poletaev continued, “the specificity of the cybernetic subject matter completely disappears, and cybernetics turns into an ‘all-encompassing science of sciences,’ which is against its true nature.”” (Benjamin Peters, “Normalizing Soviet Cybernetics”, p. 166) However, in reality, this confusion precisely is the true nature of cybernetics.

“The mathematician Nikolai Timofeef-Ressovsky, a practicing cyberneticist, once put the same sentiment in lighter terms… he replaced the Russian word for “confusion” or “mess” with the term “cybernetics,”” (Benjamin Peters, “Normalizing Soviet Cybernetics”, p. 166)”In 1961, a Soviet philosopher concluded from a survey of the methodological problems of cybernetics that… cybernetics is connected with dialectical materialist philosophy as its natural and necessary world-view basis.”, Even in 1961, and certainly in the late 1950s, **this was little more than a pious hope**, and it was not until some years later that serious philosophical analysis of cybernetics was

under way. Moreover, the initial arguments about cybernetics had shown great differences of view about its relationship to dialectical materialism." (David Holloway, Innovation in Science-The Case of Cybernetics in the Soviet Union, p. 329)

Computers and automatic information processing had never been criticized and had always been supported in Stalin's USSR. However, the revisionists now falsely gave all credit for computer technology to cybernetics, even though it had had nothing to do with it. By doing this they dishonestly gave cybernetics a veneer of being practically useful and having some contributions to science.

But at the same time they actually demonstrated that cybernetics is not a scientific discipline at all. Although the cyberneticists could never define what exactly cybernetics is, it was agreed that it was supposed to be some kind of universal theory dealing with information, and not merely a theory of computer automation. By equating it with computer automation they totally undermined the claim that cybernetics was a new independent discipline with its own subject-matter:

"What is most interesting about the use of the term cybernetics is the way in which it now came to embrace computers and automatic control systems, which had been excluded from the attacks on cybernetics. This usage undoubtedly created some difficulties for the advocates of cybernetics by drawing attention away from the general theory of control processes and focusing it on computers. But it was also of the utmost importance in helping to legitimate cybernetics. For the practical usefulness of computers was being more clearly

realized in the Soviet Union, and military and space successes were claimed by the advocates of cybernetics as evidence of the practical value of their science." (David Holloway, Innovation in Science-The Case of Cybernetics in the Soviet Union, p. 318)

"Undoubtedly many Soviet scientists saw in cybernetics and the traditional theory of control and communication a duplication of effort since the traditional theory was well established **before Wiener's entrance into this area**… Soviet philosophers have not as yet established to their own satisfaction any clear relationship between Wiener's theory and the other sciences, nor have they sharply delineated the area of operation for cybernetics." (Maxim W. Mikulak, Cybernetics and Marxism-Leninism, pp. 457-458)

"The Rumanian scholar I. N. Belenescu pinpointed the following characteristics of matter in motion: (1) all motion exists in time and space; (2) all forms of motion involve the interactions of things and events; and (3) all forms of motion contain within themselves contradictions and a unity of contradictions, and a unity of continuity and noncontinuity. In his estimation Wiener's cybernetics did not possess any particular form of motion of its own; therefore, it could not be treated as a science in the same sense as physics, chemistry, or biology. Pursuing Belenescu's thinking to its logical conclusion, Ukraintsev, in 1961, did not anticipate that cybernetics would make any new discoveries or establish any new laws of moving matter." (Maxim W. Mikulak, Cybernetics and Marxism-Leninism, p. 458)

By the 1970s the emperor had absolutely no clothes left. Nobody could explain what cybernetics even is, but somehow it included absolutely everything and absolutely nothing:

“cybernetics had grown to a nearly all-encompassing size… By the 1970s seemingly little more than a name (kibernetika) and a common interest in computer modeling held together this loose patchwork of institutions, disciplines, fields, and topics.” (Benjamin Peters, “Normalizing Soviet Cybernetics”, p. 167)

By the 1980s cybernetics, a term which nobody can define, and which not many people remember today, was discarded:

“By the 1980s the term “cybernetics,” which, although no longer new, had failed to mobilize consensus, diffused in relevance to the point that it gave way to the rise of its replacement, “informatics.”” (Benjamin Peters, “Normalizing Soviet Cybernetics”, p. 167)

Cyberneticists claimed they would make everything precise but in reality their own system was incredibly confused and meaningless:

“The computer came to symbolize a new spirit of rigorous thinking, logical clarity, and quantitative precision, contrasting sharply with the vague and manipulative language of Stalinist ideological discourse [sic]… Soviet cyberneticians sought a new foundation of scientific objectivity in the rigor of mathematical formulas and computer algorithms and in the “precise” concepts of cybernetics… they put forward a computer-based cybernetic criterion of objectivity as overtly

non-ideological, non-philosophical, non-class-oriented, and non-Partyminded. The cyberneticians aspired to bring computer-based objectivity to the entire family of the life sciences and the social sciences by translating these sciences into cyberspeak." (Gerovitch, Newspeak to Cyberspeak, p. 8)

And how did the cybernetic project fulfill its goals and promises? It turned out to be an utter failure.

HOW DID IT ALL END?

Kolman defected to the West, but things did not necessarily go any better there—quite the opposite. Norbert Wiener himself had become disgusted with American militarism and how his ideas were used. He became more and more pessimistic over time. As a stupid liberal he hoped for some kind of "third way" between capitalism and socialism.

The other leading American cybernetics pioneer Claude Shannon wrote already in 1956:

"[Information theory] has perhaps been ballooned to an importance beyond its actual accomplishments. Our fellow scientists in many different fields, attracted by the fanfare and by the new avenues opened to scientific analysis, are using these ideas in their own problems. . . . It will be all too easy for our somewhat **artificial prosperity to collapse overnight when it is realized that the use of a few exciting words like information, entropy, redundancy, do not solve all our problems.**" (Claude Shannon, "The Bandwagon", quoted in Gerovitch, Newspeak to Cyberspeak, p. 98)

“Eventually, Shannon withdrew from the public eye and refused to speak about his “information theory.”” **(**Gerovitch, Newspeak to Cyberspeak, p. 98)
Many of the founders of Soviet cybernetics themselves were totally disappointed. Liapunov abandoned his position already in the 1960s:

“Liapunov began to distance himself from the fussy activity of [Berg’s cybernetics] council… Liapunov, the accepted “father of Soviet cybernetics,” declined to write for the series Cybernetics—in the Service of Communism… As one memoirist put it, after Liapunov’s departure “the center that had unified cybernetics disappeared” (Gerovitch, Newspeak to Cyberspeak, p. 263)

In the 70s the long time linguistic cyberneticist, structural linguist “Mel’cuk… no longer wanted to play the cybernetics game. He even called one of his own articles on the connection between cybernetics and linguistics “showy and shallow.”” (Gerovitch, Newspeak to Cyberspeak, p. 281)

“Igor’ Poletaev (a close associate of Liapunov and the author of the first Soviet book on cybernetics), who had once fought to legitimize cybernetic research, bitterly told his friends in the 1970s: “**Now it is I who will say that cybernetics is a pseudo-science.**”” (Gerovitch, Newspeak to Cyberspeak, p. 289)