

THE PHENOMENON OF CYBERNETICS AND THE DECIPHERING OF ITS APPEARANCE. CYBERNETICS WAS BORN IN ROMANIA (1938) – CONSONANTAL PSYCHOLOGY, THE FIRST CYBERNETICS IN THE UNIVERSAL SCIENTIFIC LITERATURE¹

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Abstract. The author's analysis after 40 years (1938–1978). The history of Cybernetics needs to be revised. Between Massachusetts Institute of Technology (MIT) and Mehedinți-Romania (Origins of Cybernetics). It is generally accepted that Cybernetics was born in Massachusetts–USA and appeared in 1948, when the homonym book by Norbert Wiener was published. I consider that, in reality, it was not born in Massachusetts, but in Mehedinți and appeared in 1938, when the book “Consonantal Psychology”, 2 vols 887 pages, was published by Librairie Maloine Publishing House, Paris – the work of a Romanian physician from the Mehedinți County. There are still too many paradoxical and inaccurate opinions about the origin and genesis of Cybernetics. We must be aware that these are not without negative consequences. This science was not born in unusual, extravagant and spectacular ways and means, but in normal and usual ways. It is not the result of alleged discussions or quarrels between scientists, but rather the product of sustained study, of complete self-analysis, of thorough documentation and, above all, of deep thinking about thinking.

Motto:

“Meetings led by Dr. W. Rosenblueth – a neurophysiologist, attended by engineers and mathematicians, physiologists and neurophysiologists, psychologists, communication and computing engineers, were held at Harvard in the United States from 1938–1946. Participants discussed aspects that were provided to the manufacturers of electronic computing machines, information, data, landmarks, models, principles and indications for the making of computing and thinking machines.” Dr. Ștefan Odobleja, 1978 Conference

“As for Cybernetics, Dr. Rosenblueth has undeniable ownership over the mathematician Wiener, and Harvard Medical School has priority over the Massachusetts Institute of Technology. The initiative belonged to the doctors, not to the engineers and even less so to the mathematicians, even though later the engineers and their assistants, the mathematicians took an important advance over the doctors, overcoming them and overshadowing them. In fact, Cybernetics had been expounded in 884 pages in “Consonantal Psychology” by Dr. Ștefan Odobleja, published in Paris, 1938–1939.” Dr. Ștefan Odobleja, 1978 Conference



“The History of Cybernetics Must Be Revised!” Dr. Ștefan Odobleja (1902–1978), creator of generalized cybernetics, post-mortem member of the Romanian Academy” Dr. Ștefan Odobleja, 1978.

¹ This article is edited by Marin Vlada, PhD Assoc. prof., University of Bucharest, full member of CRIFST – Romanian Academy. It is based on Odobleja, Ștefan. “Psihologia consonantistă” [Consonantal Psychology], 1978, Conference delivered in 1978 at the Teacher Training Centre from Drobeta-Turnu Severin, first broadcast on 20 December 1980, by Iulius Țundrea as part of the radio series entitled “Fonoteca de Aur – Oameni de știință” [Golden Sound Library – Scientists], in the Sound Archive of the The Romanian Radio Broadcasting Company. Excerpts from the Conference were published on the website of the “Ștefan Odobleja” Foundation, <https://odobleja.ro/category/evenimente/arhiva/>

INTRODUCTION: CONSONANTAL PSYCHOLOGY VS. CYBERNETICS

Today, the concepts studied by Cybernetics – Systems Science, include, but are not limited to: knowledge, thinking, learning, storage and memorization, inputs and outputs, adaptation, command and control, social control, operations and processing, regulation and processing, convergence, communication, optimization and efficiency, effectiveness and connectivity, etc. These concepts (objects of study in other disciplines, such as computers and automation, medicine, biology, engineering etc.) are extracted from the context and processes of the human body or specific organs. Between 1925 and 1938, Dr. Ștefan Odobleja – Romanian military doctor, began to study and research the processes in the human body that are coordinated by the human brain, based on psychology and living / real logics, eventually creating a new science, starting from the concepts of consonance and resonance: Cybernetics, which he coined Consonantal Psychology. Therefore, if Dr. Ștefan Odobleja had not elaborated the 2 volumes of *Consonantal Psychology* (Paris, 1938–1939) and if the American mathematician Norbert Wiener had not elaborated the book *Cybernetics: Or Control and Communication in the Animal and the Machine* (Paris, 1948), coining the name of Cybernetics, there would be no electronic computers (computer systems), the thinking machines (expert-intelligent systems) envisaged by Odobleja, nor Informatics or Artificial Intelligence.

“Ștefan Odobleja – post-mortem member, November 13, 1990. Through the work entitled *Consonantist Psychology*, published in 1938, he made public the first version of the generalized cybernetic conception and demonstrated its multi and interdisciplinary character” Romanian Academy – Division of Information Science and Technology².

Today, we have a duty to Ștefan Odobleja, to highlight the truth about science and the evolution of science (CYBERNETICS is a multi-interdisciplinary science – see transdisciplinarity, Jean Piaget, 1970; Basarab Nicolescu, 1996). In our opinion, we say that the mathematicians of yesterday or today (except for some – who attended other courses, eg neuroscience) have no way to understand Odobleja. Conceptually, Odobleja studied which processes and phenomena, and for this he used as tools consonance and resonance, but to model and find practical implementation solutions, it takes the work and results of mathematicians, computer scientists, physicists, chemists, etc., these are two successive stages. Therefore, Odobleja was not disadvantaged because he did not know higher mathematics (for mathematics and for all sciences, he described many objects, structures, mathematical operations in a separate chapter, in terms of consonance and resonance, – it is a pleasure how this description is conducted!). He did not need mathematics, because he was in another phase of reasoning on understanding processes. Mathematicians could not invent feedback as Odobleja did, because they did not participate in describing and understanding the processes.

Psychology was the starting point for the emergence of Cybernetics. Psychology offers the widest, most varied and most complete study material for a

² Academia Română/Romanian Academy, https://acad.ro/.../sectia14_informatica/sti/info_sectie.htm,

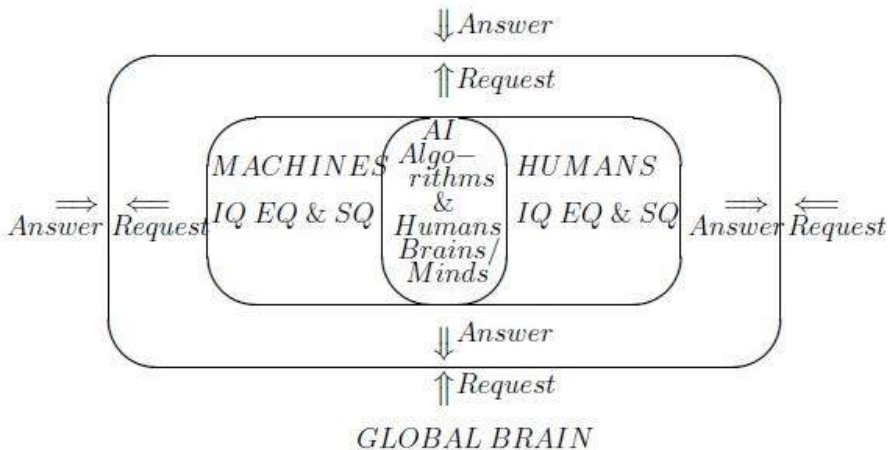
science of leadership – for cybernetics. The cybernetics tree has its deep roots in Psychology and Logics. All the fundamental ideas of cybernetics – including feedback and binary – come from Psychology. Among other evidence is the fact that, for its important chapters, Cybernetics has preserved the concepts and terminology of Psychology. Leadership, initially studied in humans under the name of Psychology, was extended and later researched in animals, giving birth to Animal Psychology. Cybernetics comes to extend it even further – first to machines and then to other sectors of knowledge and practice (Odobleja, 1978).

We give as examples two exceptional world achievements which specialists from almost all sciences have worked on:

- 15 years of research to complete the DNA sequencing (1995–2004), the Human Genome Project – <https://www.genome.gov/human-genome-project>. At least 3 Romanians worked on this project, one being Sorin Istrail – doctoral student of Solomon Marcus – https://www.brown.edu/Research/Istrail_Lab/sorin.php

- Also, since 2013, the Human Brain Project, <https://www.humanbrainproject.eu/en/>

Recently, in 2020, an article³ was published by Badea, Mocanu, Pasarescu, 1“Applications of Non-Standard Analysis in Topoi to Mathematical Neuroscience and Artificial Intelligence: Infons, Energons, Receptons (I)”, which includes reference to Odobleja's works, among others.



Machine (AI Algorithms) vs. Humans : a Global Brain Architecture

Figure 1. Global Brain Architecture (Badea, Mocanu, Pasarescu 2020)

“The Architecture of Global Brain generated by Machine (Artificial Intelligence Algorithms) – Human Beings interactions are inspired by Norbert Wiener’s Cybernetic Communication principles”⁴ ([45]), and have a possible graphical representation as below (M-Hemisphere, H-Hemisphere, corpus AIH,

³ <https://www.preprints.org/manuscript/202001.0102/v2>

⁴ N. Wiener, *Cybernetics: On Control and Communication in the Animal and the Machine*, Paris,(Hermann and Cie) and Camb.Mass. (MIT Press), 1948.

analogous to the left hemisphere, right hemisphere and corpus callosum of the human brain). Based on Ștefan Odobleja's vision⁵ ([27]) on analogy and models of mental psychology, a Global Brain should attain at least the psychological functions of the human brain. Therefore: Request-Answer is a Cybernetic model to create Bio-Technological Feedback between Global Brain entities at the Knowledge Frontier. In the figure above the membrane of the Global Brain is in fact an invisible Knowledge Frontier towards Global Consciousness, continuously in activity inside the System and above it.” (Badea, Mocanu, Pasarescu 2020).

The following text⁶ is authored by scientist Dr. Ștefan Odobleja, who fought a continuous struggle – after 1966, until September 1978 – when he deceased, for the international recognition of the fact that Cybernetics was born in Romania, between 1925–1939. The text contains references indicated by Odobleja in the form (p., no.), where “no” represents the number of pages from the original 884 page volumes printed in French in 1938–1939. These studies and research were carried out within the ROINFO project “Romanian Informatics” – Romanian Committee of History and Philosophy of Science and Technology, Romanian Academy, with the support of the “Ștefan Odobleja” Foundation, Drobeta-Turnu Severin.

CONSONANTAL PSYCHOLOGY, THE FIRST CYBERNETICS IN THE UNIVERSAL SCIENTIFIC LITERATURE

Consonantal Psychology is, through its conceptual content, the first cybernetics in the universal scientific literature. It is generally accepted that Cybernetics was born in Massachusetts in 1948 when the homonym book by Norbert Wiener was published. I consider that, in reality, it was not born in Massachusetts, but in Mehedinți, in 1938, when the book “*Consonantal Psychology*”, 2 vols., 884 pages, was published by Librairie Maloine Publishing House, Paris – the work of a Romanian doctor from the Mehedinți County (Romania).

The history of Cybernetics needs to be revised. There are still too many paradoxical and inaccurate opinions about the origin and genesis of Cybernetics. We must be aware that these are not without negative consequences. This science was not born in unusual, extravagant and spectacular ways and means, but in normal and usual ways. It is not the result of alleged discussions or quarrels between scientists, but rather the product of sustained study, of complete self-analysis, of thorough documentation and, above all of deep thinking about thinking. Once it is well established that Consonantist Psychology is undoubtedly a cybernetics, it necessarily follows that this is, through its conceptual content, the

⁵ S. Odobleja. *Introducere în logica rezonanței* [Introduction to the Logic of Resonance], București: Editura Scrisul Românesc, 1984 (in Romanian).

⁶ Liceul “Ștefan Odobleja”/ “Ștefan Odobleja” High School from Drobeta-Turnu Severin, *Centenar Ștefan Odobleja, O viață – un destin* [Ștefan Odobleja Centenary, A life – a destiny], Craiova: Editura Radical, 2002, cf also the website of the “Ștefan Odobleja” Foundation, <https://odobleja.ro/>.

first cybernetics in the universal scientific literature. Let us not forget that what justifies the existence of Cybernetics as a science in its own right are precisely the ideas that constitute its essence and not the flatus vocis term coined 10 years later for it.

According to the author, Cybernetics was born between 1925 and 1933, in Romania, as a result of an attempt to reform, on physical and mechanistic bases, followed by a vast extrapolation, combined with a great generalization, as well as a practical and theoretical application. The emergence of Cybernetics is due to the assimilation of Physics and technology by Psychology, followed by a reverse operation, the assimilation of Psychology by technology, by Physics and by Mathematics. Cybernetics preserves, even today, the rather distinctive mark of its logical-psychological origin. The change of optics proposed by the author was received by some with resistance (reserve) which is explainable. In order to defend the old positions, our opponents take advantage especially of the multitude of definitions of Cybernetics, which determined the author to undertake a more in-depth study that just appeared in Romanian at the “Scrisul Românesc” Publishing House, Craiova, Romania, entitled *Consonantal psychology and cybernetics* [in original: *Psihologia consonantistă și cibernetica*]. Whatever one may say, the truth is that the foundations of Cybernetics were laid in 1938 by a Romanian physician. And no matter how many evasions are undertaken, in the end, it will have to be acknowledged that Cybernetics was born in 1938, in Romania, not in 1948, in America.

In 1938 – and many years before this date – the Romanian author worked on Cybernetics without knowing it, just as Mr. Jourdain, from “The Gentleman Bourgeois”, had written prose all his life without knowing it. Those too attached to words could challenge Consonantist Psychology's right to be called and considered a cybernetics, on the grounds that it did not then give itself that name. They forget that Norbert Wiener himself worked on cybernetics for almost 10 years without knowing it, given that this word was coined by him only when he was writing his book for print. The Americans – Wiener in particular – have the priority of having noticed – before the Europeans busy with massacring one another – the value of this new science, which was not new until 1938, not in 1948, not in 1942, as the American mathematician Norbert Wiener stated, emphatically and with unfair bias towards oneself.

The Americans have the merit of having understood and of having observed the indisputable reality that was hidden beyond the screen of utopian and fantastic appearances. They were captivated by the theses of that Romanian psychology and, at the same time, contaminated by the optimism that radiated from it. These brave and inventive Americans have the merit of having immediately proceeded to the application in practice of the project of technicalization of thinking, one of the main preoccupations of Consonantal Psychology. Mathematician Norbert Wiener became the main disciple and propagandist of this new kind of psychology that broke the established barriers, spreading, beyond the borders of psychology, in the fields of all sciences, including that of technology. We also owe him the name

“Cybernetics”. Thanks to him, the ideas of Consonantal Psychology became universally known and unanimously accepted. The seed sown in 1938 bore rich fruit. Not only through the advent of computers (computing and thinking machines) and the invention of many other types of machines imitated by Psychology and Physiology. Not only in applied technique, but also in theory: information theory, communication theory, storage theory (memorization), command theory, decision theory, prediction theory, adjustment and self-regulation theory, automata theory, automation theory, goal (achievement) theory, optimization theory, efficiency theory, recognition and discrimination theory, detection theory, coding and decoding theory, composition theory, algorithm theory, programming theory and other theories springing from Psychology and whose roots are deeply embedded in Psychology in general and in Physiological Psychology in particular.

New sciences have emerged, such as psycho-cybernetics, neuro-cybernetics, cybernetic physiology, psychosomatics, resonance psychology. A “cybernetic” variant has appeared in almost all scientific disciplines. Multidisciplinary sciences and interdisciplinary sciences have emerged. Methods of interdisciplinary collaboration have emerged, the analogy and the modelling method. And, in spite of the assertions — otherwise sporadic and isolated — that Consonantal Psychology is now obsolete, we have a firm and well-grounded belief that a few more sciences of epoch-making importance will spring from this miraculous seed. We refrain from naming them, because we do not want to diminish the emotion and joy of surprise when they appear “soon”.

WHERE WAS CYBERNETICS BORN?

1. At the National Institute of Cardiology in Mexico?

It is true that Norbert Wiener's work, “Cybernetics,” was written in Mexico by his friend, advisor, and collaborator, neurophysiologist Dr. Arturo Rosenblueth (2.33). In the same place and at the same time, in the last half of 1947, the name “Cybernetics” appeared (2.19). And the collaboration between the two and a good part of their research in this field, between 1943 and 1948, after Dr. Rosenblueth left the USA, took place in Mexico, as well (2.33). We could also add that Mexico was the city of origin of Freymann, the publisher from Paris who proposed to Wiener to write his book (2.33) and who edited it as a topical edition, in French, in 1948. However, one must not mistake the book “Cybernetics” or the name “Cybernetics” for the “Science of Cybernetics”, which appeared before that the respective book and name appeared, a fact that was also pointed out by Norbert Wiener (2.19). Nor does he claim that this science originated in Mexico, nor that it arose from research conducted there.

2. At the Princeton Meeting from 1944?

Norbert Wiener considers that Cybernetics was born at Princeton at the end of the winter of 1943–1944. on the occasion of a meeting initiated there by himself and mathematician Dr. Joseph Neumann (2.22): “I consider this conference as the birthplace of a new science: Cybernetics or the theory of communication and

control in the machine and in the living organism”⁷ (4.25 The meeting had been initiated – we are told, after Wiener had come to look at the nervous system as a calculating machine (4,254) Is this a novelty indeed? Hadn’t the nervous system – the brain – been looked at as a machine at physicians’ meetings between 1938–1944? Hadn’t Dr. Rosenblueth had this idea since 1938, before Wiener? Hadn’t it been recorded in writing in the joint article dated 1943, authored by not only Wiener, but also Rosenblueth and Bigelow?⁸

Attendance at the meeting was mixed, as was the case with previous meetings (in 1938–1943) of Harvard physicians led by Dr. Rosenblueth: “engineers, psychologists, philosophers, acousticians, doctors, mathematicians, neurophysiologists, philosophers, and other interested people”⁹. Neurophysiologist Rosenblueth was absent, but two of America’s most illustrious neurophysiologists were present at the meeting: Dr. Mc. Culloch and Dr. Lorente. The stated goal was for specialists from different disciplines to arrive at unitary conceptions and a common language (2.23: 4.2.54) but the main goal, real and immediate, was to build such computing machines that could mimic the functioning of the brain (of mind and thinking) and to be genuine thinking machines. We must say that the decision to make this kind of machine – the future electronic computing machines, was not taken then, at Princeton: this initiative had been taken long before 1943. As such, at that time, people were already working on ENIAC and EDVAC machines at the University of Pennsylvania¹⁰ (2.22).

At the Princeton meeting: “The physiologists gave a joint presentation of cybernetic problems from their point of view, similarly, the computer-machine designers presented their methods and objectives”¹¹ (2:23). But beyond the appearance of equality and reciprocity, the truth is that at that meeting, as at the previous Rosenblueth meetings at Vandebilt-Hall (2.5), and moreover, as at the previous meetings in 1946 in New York (2.30), doctors, neurophysiologists and psychologists provided computer-machine builders with information, data, benchmarks, models, principles, and guidelines for making advanced computing and thinking machines. By claiming that Cybernetics was born in March 1944 at Princeton, Norbert Wiener diminished the role of the engineers (Aiken, Bush, Coldstine etc.) who had already been working to obtain Artificial Intelligence (2,22) characteristic of and defining for Cybernetics, especially in its early stages. He overlooks the crucial role of Harvard physicians’ meetings presided by neurophysiologist Dr. Rosenblueth.

⁷ Wiener, Norbert, *I Am A Mathematician: The Later Life of a Prodigy*, The MIT Press, Cambridge, Massachusetts, 1956, p. 269.

⁸ Rosenblueth, Arturo, Wiener, Robert, Bigelow, Julian, “Behaviour, Purpose and Teleology”, *Philosophy of Science*, 10 (1), 1943, pp. 18–24, https://courses.media.mit.edu/2004spring/mas966/rosenblueth_1943.pdf.

⁹ Jerison, David, Singer, I.M., Strook, Daniel W. (eds.), *The Legacy of Norbert Wiener: A Centennial Symposium*, Cambridge, Massachusetts, 1994, p. 19.

¹⁰ ENIAC – the Electronic Numerical Integrator and Computer, EDVAC – the Electronic Discrete Variable Automatic Computer.

¹¹ Wiener, Norbert. *Cybernetics: Or Control and Communication in the Animal and the Machine*, Paris, (Hermann and Cie) and Camb. Mass. (MIT Press), 1948. p. 23.

That the Princeton meeting was initiated by mathematicians is explicable, hence the augmentation of their contribution, to the detriment of that of other more fundamental categories for Cybernetics. It is also explicable that the mission of psychologists was revised and removed at the meetings from 1946, when the initiative no longer belonged to mathematician Wiener, but to some neurophysiologists (2.25–26). The attempt to remove his former advisor and somewhat guide Cybernetics is also explicable: the meeting at Princeton took place immediately after Dr. Rosenblueth left the United States and after the cessation of the monthly meetings he presided over. The meeting at Princeton was to continue and replace these meetings at Harvard, and Norbert Wiener was taking the lead, replacing Dr. Rosenblueth in his role as head of cybernetic work. As justification, Norbert Wiener invokes the reason that memory (living and non-living), binary and feedback were recognized at Princeton. However, memory and binary are also included in the recommendations to engineers in 1941, and by 1944 they had already been incorporated into electronic computing machines that were at an advanced stage, close to being put into practice. As for feedback, leaving aside the fact that it had been made public since 1938, we mention that Wiener (with Bigelow) had been acquainted with it since 1942, and in 1943 he had described it in the well-known article jointly signed by the three authors (Rosenblueth, Wiener & Bigelow). Making feedback debut at Princeton was tantamount to owning it as personal property, thus removing not only the 1938 initiator of this process (note: Stefan Odobleja), but also his two friends, members of his joint work triumvirate as has been the case with other triumvirates in human history).

He removes Dr. Rosenblueth, who indeed had not participated in Wiener's "discovery" of feedback, but had collaborated as the author of the 1943 article on feedback (2.14); he had also presented by himself those common ideas a year before the joint article (2.19); he had contributed to the verification and confirmation of the concept (2.14); and had given his endorsement as a neurophysiologist to the "Discovery" that Wiener had made in psychology – neurophysiology — without him, only with Bigelow — but, in his domain of specialization, which Rosenblueth could speak about without Wiener (2.19); however, Wiener could not have spoken at all or with great difficulty about these issues without Rosenblueth, without the coverage and endorsement of the neurophysiologist. What is more, we believe that it is more than likely that Dr. Rosenblueth, as a neurophysiologist and psychologist, knew the source and true origin of Wienian feedback, a source which, in our opinion, also inspired him when he became a methodologist, a logician and unifier of sciences, a mechanistic and mechanizing psychologist, etc., and even though he may not have noticed that value of feedback, even though Wiener has the merit of having noticed it before his master, it is no less true that Dr. Rosenblueth is the one who co-opted him to jointly and equally exploit this mine. The fact that Wiener discovered a vein as he could only read a book well was a merit of his, but a merit that could not justify forgetting and removing his partner in and predecessor to this deed and discovery. However, Wiener's gesture was rather reckless when he made a disputed acquisition.

Wiener removed not only Dr. Rosenblueth from Cybernetics, but also Julian Bigelow, the young man who had at least equal merit to his own. In fact, we believe that his merits are incomparably greater as he noticed the existence of feedback in 1942. Note that Dr. Rosenblueth had been working on Cybernetics since 1938, without about it; note that mathematician Wiener had also worked on Cybernetics, although disguised and still uncioned as such. So not only Wiener, but Dr. Rosenblueth as well (2.21) and they didn't give up until they monopolized it. Wiener emphasizes, however, the importance of the cyclical process in the discovery of which he considers to have had a meritorious contribution and a personal contribution made independently from Dr. Rosenblueth. He takes the moment of that discovery as the date of the birth of Cybernetics. In 1942 he discovered that process and at the same time he claims that "Cybernetics" was born. Starting approximately from the year 1942, Cybernetics started to develop in several directions (2.14). Therefore, Cybernetics was not born in 1944 at Princeton, but it was born before the fall of 1942 and more precisely in 1942, at the Massachusetts Institute of Technology (MIT), as the result of the research of a mathematician (Wiener) and an engineer, later proved to also be a mathematician (Bigelow). But as Wiener subsequently continued his research on his own or rather with the help of other collaborators, Bigelow's role in the founding of Cybernetics faded more and more. However, here we are interested in the birthplace of Cybernetics, which most people, together with Wiener, consider to have been at the Massachusetts Institute of Technology. Indeed, there Wiener developed a remarkable activity to impose his cybernetic ideas, which, however, did not belong exclusively to him, did not belong to him entirely, he did not issue them and he did not launch them, as he did he says verbatim: "... These ideas were floating in the air at the time and I do not want to claim my exclusive priority in formulating them" (2.4), and two lines below he states that "these ideas of his come from the study of the nervous system, therefore: from neurophysiology and psychology" as shown in his book¹².

3. Does it all start at Harvard Medical School – Harvard University?

It is unjustly admitted today that Cybernetics is the integral and pioneering work of mathematician Norbert Wiener of the Massachusetts Institute of Technology (MIT). This misconception must be rectified: on the one hand, in the sense that, quantitatively, the neurophysiologist Dr. Rosenblueth of Harvard Medical School – Harvard University had a large percentage of contribution to this work (in any case, greater than attributed to him today), on the other hand, in the sense that, chronologically, the neurophysiologist became a cybernetician before the mathematician and that he is in fact Wiener's initiator in this field. It turns out that in Cybernetics, Dr. Rosenblueth has undeniable priority over mathematician Wiener, and Harvard Medical School has priority over the Massachusetts Institute of Technology. The initiative belonged to the doctors, not to the engineers and even less so to the mathematicians, even though later the engineers and their assistants, the mathematicians, took an important advance over the doctors, overcoming them and overshadowing them.

¹² Wiener, Nobert, *Cibernetica sau știința comenzii*, Bucuresti, Editura Științifică, 1966.

“It all started at Harvard Medical School” (Mircea Grigorescu, p. 19). Indeed, the monthly meetings presided by Dr. Rosenblueth, a neurophysiologist, psychologist, and methodologist, inaugurated by him around 1943 and continued until his departure for Mexico (January 1944) were meetings on cybernetic issues. Those meetings acquired a cybernetic character only after mathematician Norbert Wiener began to participate in them, relatively late, and after the co-optation and acceptance of computer engineers or of physicist Vallarta, who did not attend them from the beginning, but who had come to these meetings before Wiener, which is very explicable, given the purpose pursued since the beginning: mechanical thinking and the mechanization of thinking. Those meetings had belonged to Cybernetics through their topics, ideas and trends ever since they had been initiated by neurophysiologist Dr. Arturo Rosenblueth, consequently from the very beginning, when the participants were only doctors, evidence of their preoccupations outside the medical field, the generally scientific, methodological and psychological interests of these physicians, (and we are not yet told everything and in fact the essential is eluded, as a result and continuation, by virtue of inertia, of the secret imposed during the war on everything related to the mechanization of thought).

From the very beginning of his book, Norbert Wiener informs us that his work “Cybernetics” “represents the outcome, after more than a decade, of a program of work undertaken jointly with Dr. Arturo Rosenblueth, then of the Harvard Medical School”¹³ (2.5). Hence, if Cybernetics is the fruit of that long collaboration between a doctor and a mathematician, it means that it was not born instantly, so to speak, in the few hours, or even days, during the Princeton meeting, rather it was born more painstakingly, after years and years of research and discussion. If research for Cybernetics began in 1938, then how can we say that Cybernetics was born only in 1942? Was Norbert Wiener not mistaken, we wonder, when he implied that Cybernetics was born in 1942, that is: at the Institute where he worked and due to his discovery?

His collaboration with the doctor had accomplished nothing in the four years of endeavor? But he himself tells us that before 1942 (some time in 1941), in collaboration with the neurophysiologist, recommendations were made to engineers (2.9), which aimed at a revolutionary improvement of computing machines with a thinking machine, which was the most cybernetic idea of all the ideas of Cybernetics. And this cybernetic idea, this cybernetic technical goal before being proposed to construction engineers had of course been thought about for a long time. And, probably thought about not only in secret, between the two of them, but also in the debates at the monthly doctors' meetings. Our belief is that this idea sprouted in doctors and was tackled by them, among themselves, before resorting to the opinions and contribution of Norbert Wiener, before deciding to expand the membership of their study circle to turn it into a mixed circle. Only after the doctors had exhausted their resources, only then did

¹³ Wiener, Norbert, *Cybernetics: Or Control and Communication in the Animal and the Machine*, Paris, (Hermann and Cie) and Camb. Mass. (MIT Press), 1948, p. 3.

they partially decline their competence, only then were they forced to resort to the help of Massachusetts engineers. In support of this view is the fact that a physiologist was also one of the first mechanizers of logic between 1938 and 1943, Dr. Mc Culloch (2.21), who at that time worked on authentic and efficient Cybernetics and did it independently of Norbert Wiener, independently of Dr. Rosenblueth and with less discursive but more palpable results, which makes us broaden the ranks of the beginners in the field and say that Cybernetics began at Harvard, and not only there, but simultaneously at other Faculties of Medicine from the USA and other countries.

Through the insight and dynamism of Dr. Rosenblueth, the Harvard Medical School was an important reception and amplifier station for Cybernetics. But Cybernetics was not born there and then, in 1938, when the neurophysiologist took over: it had been born for a long time, elsewhere, far from Harvard University and far from America. At Harvard everything was carried on, but it didn't start there in the first place. To give credit to the opinion that it began at Harvard, there should be evidence that it began there long before 1937. However, the existing evidence argues against Harvard's priority in the matter, not to say that it advocates even in favour of Harvard's taking over the matter. Numerous pieces of evidence attest to the fact that in 1938, at Harvard, Cybernetics appeared as a surprise and that in 1942 it was only at its first probing, at its first beginnings, with an obvious lag behind the stage of maturity that had been reached in another academic centre that we will talk about in what follows.

4. At the Faculty of Medicine of the University of Bucharest?

By the time Harvard doctors began discussing Cybernetics at their monthly meetings and banquets, Cybernetics had already appeared as “Consonantal Psychology” and had already been discussed in an 884–page book written in the most international language of the year 1938 and made available for the scientific world by a prestigious publishing house in Paris (Maloine). Thus, we emphasize the fact that, in the summer of 1937, when the book was being published, its author's research had been completed, and *Cybernetics* had been established. It had been emerging in Romania more than ten years before it began to become a topic for discussions among Harvard doctors. Consequently, until proven otherwise, we consider that it all started at the Faculty of Medicine of the University of Bucharest” not at that the Medical School of Harvard University. We refer, of course, to the general Cybernetics theory, which substantiated and preceded the appearance of other specialized branches, including the technical one. We refer to the initial and pioneering Cybernetics, to the Cybernetics of Harvard physicians between 1938 and 1944 – which also became Cybernetics for Harvard engineers, and for physicists, mathematicians and psychologists at the Massachusetts Institute of Technology. We are referring – not to forget – to the beginnings of Cybernetics and the beginnings of the cyber era. It is easy to understand that for the generation that moulded and completed its intellectual structure in support of the Wienerian version, with its legendary appeal, the proposed change in perspective is uncomfortable and difficult to achieve. They

cling to the argument of “unanimous recognition” to hold on to the old positions without taking into account the fact that the recognition has ceased to be unanimous in favor of their favorite.

It has been insinuated that in Romania there was a lack of modernly equipped laboratories; that such labs were only available at Harvard, Massachusetts, and in America in general, including Mexico; that only Norbert Wiener and Dr. Rosenblueth could benefit from these material endowments, and that only they could produce cybernetic science. The argument seems plausible: it is perfectly valid for the most superb and spectacular technical cybernetics among the daughters of general Cybernetics theory. However, this argument is worthless when it is applied to the initial Cybernetics, to Mother Cybernetics, General Cybernetics, generators of derived and specialized cybernetics. This was a theory about the brain and physics, about thinking and machines, about natural thinking and artificial thinking. It started from psychology, physiology and the physics of thought and, for this, the small portable brain laboratory, which analyzed itself, afterwards applying the conclusions obtained beyond it, was sufficient or, in any case, more useful and indispensable than the big and the luxurious laboratories run by billionaires.

It has been said, and it would have been better if hadn't been said, that the authorship of Cybernetics belongs to Robert Wiener because he experimented with Dr. Rosenblueth. But firstly we must say that those very questionable and insignificant experiments wanted to prove a predetermined conclusion, which they failed to prove. They can be classified as worthless, if not negative, pseudo-experiments. Secondly, those experiments were conducted in Mexico and their purpose was not scientific, but of personal interest, namely: to justify the vacation and study leave. Thirdly, and most importantly, those alleged experiments were performed in the summer of 1945 (2.24–25) and in the summer of 1946 (2.27–28), that is 3 and 4 years after Cybernetics was born (in 1942) at the Massachusetts Institute of Technology-MIT (2.19), 7 and 8 years, respectively, after Cybernetics was born at Harvard Medical School, 7 and 8 years respectively after Cybernetics was extensively described in the 884-page volume entitled “Consonantal Psychology” authored by Dr. Ștefan Odobleja and published in Paris. Those experiments were suggested and determined by Cybernetics 8 years after it was born, but it was not from those experiments that Cybernetics was born. Relying on them to establish Wiener's paternity in Cybernetics is at least colossal naivety.

It has also been insistently pointed out that Cybernetics was born in America and that the paternity belongs to Norbert Wiener, because only he, there, benefited from the existence of a large and select team, only he had at his disposal numerous collaborators and huge resources. It is true that Norbert Wiener took advantage of the role and expertise of his many collaborators (Rosenblueth, Bigelow, Pitts, Lewin, Shannon, etc.). The valuable study community also participated in the monthly meetings at Harvard, as well as in the meetings of 1944 and 1946, with their reports and discussions. Rosenblueth and Wiener exploited and used this important human capital with good and constructive results. They made an

important contribution to the development of Cybernetics, but not to its birth, because meetings and teamwork began only after 1938, that is, after Cybernetics was born and published in print. It is not just a simple coincidence that the history of Romanian cybernetics came to an end and put an end to research by publishing its research results in a book, between 1938 and 1939.

In fact, without denying the efficiency of research work in teams, we want to warn against its overestimation. Thus, the great physiologist Rosenblueth and the great child prodigy Norbert Wiener collaborated for 4 years and for 4 years studied the feedback book (bad for them if they did not know about it) without perceiving it, despite the 70 figures that stood before their eyes. They could not even read it, much less discover it, with all their team, with all their doctors at Harvard, with all their engineers at the Institute of Technology, with all their prolonged discussions, and the secret supper which ended their monthly meeting.

We consider, that in certain special cases, as, for example, in the work of synthesis and elaboration, which involved a great concentration of thought, quietly meditating by oneself is incomparably more fruitful than discussions and disputes in the noise and “stir” of team meetings. Theoretical Cybernetics, being a work of self-analysis and thinking, of synthesis and unification, was predestined to be born in quiet and isolation, as the work of a sole thinker, not as the work of teams in the hustle and bustle of a restaurant. We mention here that our opponents do not have the courage to attack us directly and head-on; they attack us indirectly, insidiously and from behind, publishing an avalanche of articles praising Norbert Wiener, in all magazines (which are welcoming and unhesitationantly at their disposal), taking care to praise him for what I did not have (scholarships, laboratories, libraries, teams, etc.). Overturning the argument of our opponents, we will say that, if – with all the laboratories, information, teams and their material resources, despite having on their desk an authentic and complete Cybernetics, despite having 10 more years (1938–1948) – they could only produce that failure of theoretical Cybernetics of 1948, then Norbert Wiener's cohorts of scientists fit the saying “*parturiunt montes, nascetur ridiculus mus*” only too well.

The tactics of our opponents is to unreservedly praise Norbert Wiener, with the adoration suitable for a demigod, while keeping complete silence on our contribution, and passing an encomium on him in a purely churchly style, avoiding predictions, cultivating vague and hermetic statements, just like their master, our camouflaged opponents skillfully resort to probabilism: only Wiener had (the means to do), only Wiener was (able to do), only Wiener could (do), with the implication that I could not do Cybernetics. All the better if I couldn't do it, but I still did it.

I have tried in the above to refute by logical arguments some of my opponents' insinuations, sophisms and probabilistic arguments. But, ultimately, the strongest argument is my book, factual evidence, more convincing than any other argument for those of good faith. As for the others... I wish them only well!

CONCLUSIONS

Cybernetics deals not only with the control of the being, but also with the control of the mind – with the “control of control”¹⁴. The mind is a specialized function in controlling the being. A function of the brain that controls not only the body of the being, but also controls itself; perfecting its activity, increasing its efficiency, researching itself, analyzing its functioning mechanisms, choosing and developing the most efficient methods of research, processing and making the most of past experience. The control of the mind, the control of thinking, the control of research, the control of knowledge, the control of science – all these are part of control in general and therefore of Cybernetics. In its capacity as the science of the control of the mind, Cybernetics acquires and incorporates the entire methodology. In a narrower sense, Cybernetics contains from the methodology only the part with which it has particularly contributed to – the part it has brought innovations and its own apparatus to, such as the following issues: the affinity between sciences, the multidisciplinary approach, the collaboration between and combination of sciences, the borrowings between them, the mutual influences, the extensions and generalizations, the analogies and modelling, the univocal and reciprocal proliferations, the mergers, the syntheses, the unifications, the interdisciplinary sciences.

- Cybernetics is not only the study of rudimentary control such as automatons or reflexes, rather, it is the study of specialized control – intelligent control. Unilaterally and exaggeratedly insisting on Regulatory Cybernetics, we are tempted to forget that Cybernetics is also a study of intelligence. On the other hand, Cybernetics is not only a study of artificial intelligence, but it is also a study of natural intelligence. Artificial intelligent control is closely linked to natural intelligent control, both genetically and structurally – as concerns their origin as well as their essence.
- It is important to point out that Cybernetics was not born from the study of lower rudimentary control, but it was born from the study of higher control – natural intelligence – in the pursuit of artificial intelligence. It was born at the level of intelligence, not at the level of feedback or regulation. It appeared at the highest level. It was not built on a bottom-up approach, but on a top-down approach. As paradoxical as it may seem, the truth is that, despite the fact that automatic regulation had appeared earlier in science, both in technology and in biology, nonetheless feedback came after the projects on organizing thinking; Regulatory Cybernetics came after Intelligence Cybernetics. Neither Watt’s regulator, nor homeostasis, nor the gyroscope, nor the psychology of behavior and reflexes could give rise to a generalized theory of control, to a cybernetics. They tried to claim it later, belatedly, post-factum.

¹⁴ See Von Foerster, Heinz. *Cybernetics of cybernetics: or, the control of control and the communication of communication*. 1974, Urbana-Champaign, IL: Biological Computer Laboratory.

- Cybernetics is not only a normative, applied science, but it is also a theoretical, fundamental, descriptive and explanatory science of control. The two distinct application sectors especially developed by Cybernetics so far are:
 - a) the *methodology – thinking technique* – to stimulate, develop, accelerate, improve knowledge, research and thinking, tokens of natural control,
 - b) the *control technology – artificial thinking technique* – to synthetically and artificially create new controls, anticipating and building self-controlling aggregates / machines, substitutes for natural control.
- The applicative character of Cybernetics prevails in what concerns its utilitarian importance and in any case it overshadows its complementary and obligatory character as a theoretical, fundamental science. There were many who sought to free themselves from the inherent “theoretical ballast”. In reality, Cybernetics is a unitary construction that cannot be deprived of its theoretical foundations.

Therefore, Cybernetics is the theoretical and applied science of simple and complex controls, in animals and humans, in beings and machines, in individuals and society, in the body and mind – with all the theoretical and practical conclusions that follow from this.

1 August 1978, Ștefan Odobleja, Romania, Drobeta-Turnu Severin

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