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THE PHILOSOPHY OF LIVING NATURE. INTRODUCTORY ESSAY

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We are witnessing a growth of modes of thought which challenge established knowledge about nature, evolution, our origins and our place in the universe [...] The arguments go well beyond intellectual debate [...] The Parliamentary Assembly therefore urges the member states, and especially their education authorities to strengthen the teaching of the foundations of science, its history, its epistemology and its methods.

Parliamentary Assembly — Council of Europe,
RESOLUTION 1580 (2007 r.)

“One of peculiarities of mental culture of our age is a characteristic antinomy between the facts and demands in recognizing the philosophy of nature. On the one hand the philosophy of nature exists in this culture *de facto*, as a component of various worldview options, on the other, however, many contemporary philosophers and scientists categorically deny its right to exist.”¹ This astute observation, made some time ago, should be borne in mind when we will address the remarks concerning recent events. It is worth repeating once more that the philosophy of nature (as defined here) is a component of *Weltanschauung* and “as such has always been linked with the philosophy of men and extra logical judgments brought to the *Weltanschauung* based on a certain system of assessments and norms of human activities in society.” This anthropological (respectively, social) aspect causes the situation where “even at the same level of developing natural sciences and in the same culture of logical thinking, different systems of the philosophy of nature are possible.” Yes, that is true that they are *possible*, but when it comes to their mutual *relationship*, it is convenient to examine them based on philosophical aspect of the double breakthrough: first of them connected with a new look at the nature and origins of life (so called “extending Darwinian theory to inanimate matter”) and the second—with the beginnings of the scientific studies on consciousness.

¹ A. Synowiecki, *Filozofia przyrody a filozofia nauk przyrodniczych* [Philosophy of Nature and Philosophy of Natural Sciences], *Studia Filozoficzne* [Philosophical Studies], 1972 (11–12), p. 171.

This issue is significant not only in a historical sense as it touches upon the very centre of today's controversy over evolution: both within scientific community and (far) beyond. Let us say it right away that although these disputes are articulated (by both sides) in *political* terms, the issue is more serious indeed (by order of magnitude): it is about confronting *Weltanschauungs*. Precisely, three; each of them refers to science, defines its aims and—on the strength of positive feedback—derives from its achievements. In order to avoid (at least a part of) potential misunderstandings about it we will provide an accurate opinion: "... it is not science that defines content, sense and value of the *Weltanschauung*, but it is the *Weltanschauung* that defines a sense and value of doing science, a way to use its results, including the illusion that it is possible to draw on these results exclusively to create the *Weltanschauung*. In fact, the illusion of scientism seems to be an integral part of a certain *Weltanschauung*, namely technocratic one."²

We agree also with the quoted author that the *Weltanschauung* is a structural unit higher by an order of magnitude than ideology as well as its characteristic of technocratic *Weltanschauung*,³ which is just "a challenge for the present." This last opinion, formulated some time ago, today, as we will see, requires a certain modification. For now, let us just say that when it comes to the nature of life—which is central to the construction of the worldview⁴—a rather peculiar alliance has recently emerged between the supporters of the technocratic option (which treats life as an improbable phenomenon (or, more carefully, "the scientific equivalent of the miracle") and the one to which refers the above-mentioned resolution—that is, fideistic.

Scientists working in institutes of natural sciences have been asking us recently several times about the reason why the events from "the great battlefield of ideas" have entered their secluded laboratories and sometimes affect them ("we deal with pure science"). In a nutshell, the question was: what is at stake? For their use (and as a teaching aid for all those who conduct classes in philosophy for doctoral students at institutes of natural sciences) we have prepared a kind of philosophical commentary for disputes about (actual or implied) consequences of evolutionism, disputes that became particularly intensive (in our country and beyond) several years ago.

It so happens that the (sub)title of the recently published work⁵ accurately reflects the general meaning of the enterprise, as a result of which over

² S. Rainko, *Kilka tez o światopoglądzie* [On the Concept of Worldview], in: idem, *Świadomość i historia. Studia nad społeczną rolą świadomości* [Consciousness and History. Studies of the Social Role of Consciousness], Czytelnik, Warszawa 1978, p. 49.

³ "He will be characterized by, among others, the fact that he has been *hiding* his real nature [of *Weltanschauung*], presenting himself under the cover of scientific statements, shielding with the authority of science etc.;" *ibidem*.

⁴ Let us refer here to the words of Józef Łukaszewicz (about him below): основной проблемой нашего мировоззрения является вопрос „что такое жизнь?;" it is just the title of his book: *Что такое жизнь. Биологический этюд*, СПб, 1909. And here is his second (metaphilosophical) thesis: the historical change in worldviews is mainly determined by the change in views on life.

⁵ A. Pross, *Toward a General Theory of Evolution: Extending Darwinian Theory to Inanimate Matter*, Journal of Systems Chemistry, 2011, 2 (1).

the past half a century has resulted in the development of over two hundred theoretical concepts of pre-biological chemical evolution. However, the philosophical dimension of this field of research—both in the ontological (concept of matter) and epistemological (ideals of science) aspects—is still to be developed. This is an important task from the point of view of every person who wants to understand the place of living beings (and their own) in the process of the evolution of the Universe. But—as it turns out—this is an important and urgent task also from the perspective of further development of science: many prominent natural scientists working in this field have recently extended invitations to cooperation to representatives of philosophy.

Moreover, in recent years, similar incentives have gained institutional support. The Parliamentary Assembly of the Council of Europe in Resolution 1580 and sixty-nine academies of science (national, regional and global)⁶ in the joint proclamation *Statement on the Teaching of Evolution* says in similar words about the need to disseminate “established knowledge about the nature and evolution of life and our origins and place in the universe,” in particular “theories about the origins and evolution of life on Earth.” This is accompanied by the following postulate: more attention should be paid to “the teaching of the foundations of science, its history, epistemology and its methods.”

Due to the above-mentioned appeals, it seems to be an important task to indicate the reasons for the huge gap between the scale of scientific research (and findings) in the field of evolutionary biochemistry and the reflection of the effects of this research in public awareness (even among scientists-naturalists themselves—let alone talk about laymen). There is much evidence that these reasons lie in the deepest assumptions, reaching back to the *raison d'être* of this discipline. As behind the very decision to introduce the issues of pre-biological (bio)chemical evolution and the genesis of life into the field of scientific research (contrary to the motto *ignoramus, ignorabimus*), there was a certain philosophical choice, and a groundbreaking one indeed. They were formed in this way, namely—to refer to the classic formula of C. H. Waddington—the basis of such a position, “that saw life as a natural and perhaps inevitable development from the non-living physical world.”⁷ It is highly probable—the author stated—that historians of ideas in the future will pay attention to this breakthrough and its philosophical roots—both closer and more distant. He was right: they did pay attention. However, the (natural and philosophical) sources of this breakthrough can (and should) be traced back to at least two hundred years earlier. Some geographical establishments will prove helpful. Here they are.

John Farley, a Canadian biologist and historian of biology, formulated the dilemma that scientists faced after 1859, when, on the one hand, *On the Origin of Species* was published, and on the other, Pasteur began to try to

⁶ A Global Network of Science Academies. The Inter Academy Panel on International Issues.

⁷ C. H. Waddington, *That's Life*, Review of Books, New York 1968, Feb. 29, p. 19.

undermine the theory of spontaneous generation. And this is where the dilemma arises: "... if one accepted that life evolved by natural causes than one must also, to be consistent, accept that life arose by natural causes, namely by a spontaneous generation."⁸ But while the theory of evolution continued to gain popularity, the possibility of *generatio spontanea* seemed increasingly remote. "How could one extricate oneself from such a dilemma?"—Farley asks and shows in his works⁹ that scholars in France, Germany and England of the time solved it in quite different ways, depending on the local "cultural climate." And it was this climate that meant that while French and German scientists of that period were consistent in their own way (the former, generally speaking, rejected both the theory of evolution and the possibility of spontaneous generation, while the latter tended to accept both), The British had no choice but to be "consistent otherwise." Farley sees the explanation mainly in the specific style of British science of those times (formed in the climate of empiricism and inductivism), which ordered all questions regarding "the origin of things" to be referred to the area of "pure speculation." Quoting the then motto: "we look to men of science rather for observation than for imagination," Farley comments that although such an attitude obviously expresses a certain philosophical position, "the British were more prone to consider their science as completely devoid of philosophical influences."

Farley therefore distinguished three zones and omitted the fourth. We will get to it below. But first, a word about the role of (academic) philosophers in zone three. It turns out that this (seemingly Victorian) dilemma is still valid (in this area) and *today* there are philosophers able to argue that one can (and even should) be "consistent differently." The philosopher, acting as an arbiter of elegance,¹⁰ reminds scholars that a gentleman should not deal with certain things (and if he must, at least he should not talk about them in salons). The point is that in a given knowledge structure certain prohibitions should apply—but in an implicit, tacit way. Just talking about them means violating the taboo zone. And even more so—crossing them. Our findings show that the introduction of problems of origin into the area of scientific research was a violation of this "structure of knowledge/power," in many aspects—including the basic one. As while Darwin's theory could be (and still is) interpreted in such a way that its philosophical basis remained *hidden*, this approach could not be successful in the case of the theory of biogenesis. Darwin's theory of evolution [besides, of course, being (simply) an important scientific theory], with a certain philosophical interpretation, provided (and continues to provide here and there to this day) valuable "legitimizing" ser-

⁸ J. Farley, *Philosophical and Historical Aspects of the Origin of Life*, Treballs de la Societat Catalana de Biologia, 1986, 39, p. 38.

⁹ Especially in the now classic monograph: *The Spontaneous Generation Controversy from Descartes to Oparin*, The John Hopkins University Press, Baltimore 1977.

¹⁰ M. Ruse, *The Origin of Life. Philosophical Perspectives*, Journal of Theoretical Biology, 187 (4), 1997, pp. 473–482.

vices, too valuable to “give up” on it (no matter how strong the pressure, and it is). This situation required (and still requires) maintaining a position that can be briefly expressed as follows: “evolution yes, biogenesis no.” In zone four (fortunately) it was (and is) different.

Well, in Poland (and the surrounding area), for over two hundred years, the issue of the relationship between the evolution of the living world and the nature and genesis of life has, indeed, been addressed and situated (consciously) on the basis of philosophy. It is just that the knowledge about these circumstances and their (far-reaching) consequences seems to be little. Even in our country (and in neighboring cultural areas). And although there are positive exceptions (both on our eastern and western borders), they do not add up to the overall picture. But let us start with a few elements of this picture: profiles of scientists who address the issue of the nature of life—from a natural-scientific and philosophical perspective.

The first of them is Jędrzej Śniadecki (1768–1839) and his work *The Theory of Organic Beings*, based on antiphlogiston chemistry and of great importance for biology. Let us start with earlier assessments of his person and activities. “Having a deeply philosophical and broad mind, he soon turned to more general biological problems [...] what is the life process, what is life of the organic world.”¹¹ “Since two such stars have shone with us, as Jędrzej Śniadecki at the beginning of the century, and Marcelli Nencki at the end of the century, we can indeed say without flattery that we have added some very valuable things to the general treasury of knowledge.”¹² Before we move on to the issue of this “general treasury of knowledge,” let us stop at the assessments of contemporary historians of biology historians: “he developed a theory of life creating the foundations for a modern biological worldview.”¹³ Maria Sarnecka-Keller [(1925–1984), biochemist, first female vice-rector of the Jagiellonian University (established 620 years ago)] writes: “On the basis of vast biological and chemical knowledge, Śniadecki’s mind, specially oriented to theoretical considerations, created a theory of life, the fundamental theses of which have not lost their relevance to this day.”¹⁴ The author also raises the issue of reception: *The Theory of Organic Beings* was published in two German editions (Królewiec [Königsberg] 810, Nuremberg 1821) and in a French edition (1825), “but the views contained in this book did not find the proper response among contemporary naturalists,” although an extremely positive review in the *Allgemeine Literatur-*

¹¹ J. Nusbaum-Hilarowicz, *Prof. Jędrzej Śniadecki*, in: *Życiorysy znakomitych biologów polskich 18-19 wieku* [Biographies of outstanding Polish biologists of the 18th and 19th centuries], J. Tur (ed.), Warszawa 1916.

¹² S. Łagowski, *Jędrzej Śniadecki i jego „Teoria jestestw organicznych”* [Jędrzej Śniadecki and His “Theory of Organic Beings”], Lwów 1904, p. 77.

¹³ A. Bednarczyk, *Jędrzeja Śniadeckiego „Teoria jestestw organicznych” (1804) w dwusetną rocznicę ogłoszenia dzieła* [Jędrzej Śniadecki’s “Theory of Organic Beings” (1804) on the Bicentenary of the Publication of the Work], Wydział Filozofii i Socjologii UW, Warszawa 2004.

¹⁴ M. Sarnecka-Keller, *Zasadnicze tezy biologicznego światopoglądu Jędrzeja Śniadeckiego* [Fundamental Theses of Jędrzej Śniadecki’s Biological Worldview], in: *Rzecz o Jędrzeju Śniadeckim* [The Story about Jędrzej Śniadecki], I. Stasiewicz (ed.), Warszawa 1970, p. 79.

zeitung 1812 (*“eine scharfsinnige Schrift”*) emphasized the importance of this work for physiology and called on German scientists to pay attention to it. And some did. The author writes about it extensively, citing statements by outstanding German physiologists and doctors of the 19th century. And nowadays: suffice it to say that in a comprehensive history of biology¹⁵ his name does not appear at all.¹⁶ And here: the most extensive work by Leon Szyfman, *Jędrzej Śniadecki*,¹⁷ received an extremely apt subtitle: “Naturalist-philosopher” (which could be used to characterize each of the characters discussed here). Szyfman places Śniadecki next to Lamarck as one of the founders of modern biology: “He was the one who, for the first time in the history of science, expressed this great truth that life is a specific form of movement of matter,¹⁸ and the basis of this specific movement of matter is the constant process of exchange of substance between the environment and organism, a continuous process of absorption (assimilation) and excretion (dissimilation).”¹⁹ He draws attention to the social dimension of the activities of Polish scientists at that time, “an element unknown in the West, namely the idea of fighting for national independence.” This, in the era of the Holy Alliance, was automatically classified as “socially subversive. And rightly so, because that’s what it was. Moreover, it was accompanied by the awareness that regaining independence was possible only through a people’s revolution on the European scale.

Benedykt Dybowski (1833–1930). A participant of the January Uprising; prisoner of the Warsaw Citadel; Siberian exile. In biology, he was an enthusiast of Darwinism (understood as a general vision of the natural world). He gave lectures on the theory of evolution at the Warsaw Main School as early as 1862 (three years after the publication of *On the Origin of Species*). In his research, he was primarily interested in the variability of animals under the influence of the environment. He took a similar position in the field of anthropology, emphasizing the variability of races and the non-existence of “pure races.” At the University of Lvov, in addition to the department of anthropology, he also took over the department of the philosophy of nature. In this field he published, among others, the work “On ancient and scientific

¹⁵ I. Jahn et al. (eds.), *Geschichte der Biologie. Theorien, Methoden, Institutionen und Kurzbiographien*, Fisher, Jena 1985.

¹⁶ As in Ernst Mayr’s, *Die Entwicklung der biologischen Gedankenwelt*, Springer, Berlin 1984.

¹⁷ KiW, Warszawa 1960.

¹⁸ J. Śniadecki, *Teoria jestestw organicznych* [Theory of Organic Beings], Wilno 1804–1811 (1838), § 13. In view of the matter which is part of all animate beings, and of their position, these beings are to be regarded as physical bodies; and since the nourishing bodies also undoubtedly belong to physical beings, life, in the most general sense, will be the result of certain physical relations which exist between dead and animate matter. It will be a certain way of existence of matter; only in its life can take place.”

¹⁹ “§ 33. For in living individuals an organic force must always exert itself, and every act of its action, every exertion of it, is a giving, or at least an attempt to give, an organic form to matter; therefore all living beings, while living, are constantly organizing themselves; that is, what is one, all life is a continuous and unceasing organic process; or never-ending perpetual assimilation. The most important truth which could be reached in the science of life, and which will be the whole principle of our present science,” *ibidem*.

worldviews" (Warsaw, ca. 1910). Let us pay attention to one more circumstance: while conducting research in Siberia, he had to be a topographer, climatologist, hydrographer, zoologist, botanist, anthropologist and ethnographer at the same time. As a researcher of Lake Baikal, he became the creator of limnology (combining elements of chemical, physical and biological sciences). As for the reception of his work (and the assessment of his activities), at least beyond our eastern border, it can be briefly said that he has a high reputation there (in 1928 he became a foreign member of The Academy of Sciences of the Soviet Union).

Edward Strasburger (1844–1912). He studied in Warsaw, Bonn and Jena. After receiving his doctorate (1866), he returned to Warsaw, where, after habilitation at the Main School in 1867, he began lecturing, including plant cytology. Due to the loss of the opportunity to continue working at the university (subject to russification), he took over the chair in Jena. After ten years, he moved to Bonn (1891–1892 he was a rector of the local university) where he created a center for anatomical and cytological research on a global scale. He studied the evolution of plant nutrition: from chemosynthesis to photosynthesis. As one of the founders of cell science, he gained worldwide fame ("He was one of the most outstanding botanists of the 19th century." "Almost all academies in the world have accepted him as their member." "His work on the formation and division of cells, in which, while examining the processes of fertilization, he described for the first time the details of meiotic division of the nucleus, became the foundation of modern cytology;" *Dictionary of Polish Biologists*). As for his views on the issue of the nature of life that interests us here, he expressed them most accurately (at the Warsaw Main School, i.e. where Dybowski lectured a few years earlier) in the speech "On the essence and task of the natural sciences:"²⁰ "The inorganic/organic boundary has broken, the vital force had to come from chemistry, but it found use in the animate world" (the problem remains protein); "The chemist artificially prepares most of the organic compounds, but he has not yet obtained artificial protein compounds, hence the mystery that hitherto covers life. But chemistry is progressing enormously, it will be able to break these barriers someday." The differences plants/animals fall: "This is how all the criteria fell; newer work has blurred old boundaries, and Darwin's theory has shed new light on the whole [living world]. If it is true that the higher beings developed from the lower, if it is true that they all took life in a common source, how can one look for boundaries between them?" When we look at this perspective, "the inner life of nature will present itself to us as one great harmonious whole."

And it is precisely in this perspective (with an extensive, let us add, reference to Hegel and also to Schelling) that a statement from the same year on

²⁰ *Prelekcja wstępna miana w Auli Szkoły Głównej przez Edwarda Strasburgera, Doktora Filozofii, dnia 29 kwietnia (11 maja) 1867 roku* [Introductory lecture given in the Main School Hall by Edward Strasburger, Doctor of Philosophy, on April 29 (May 11), 1867, Biblioteka Warszawska, 1867, 3, pp. 1–24.

the issue of (a)biogenesis²¹ is situated: (Pasteur's experiments were apparently) "a blow after which (according to the academy) science would not be able to recover."

"And yet the dispute over self-generation does not seem to be finally resolved [...] We are getting artificially large number of organic compounds today; a moment perhaps not too distant when we will receive them all; and when there is a substance given, who knows if a cell does not crystallize out of it, just as today a crystal is formed from inorganic solutions [...] Meanwhile, there is no fact that would speak firmly for *Generatio spontanea*, but there is also no fact that would strongly contradict it: the occurrence of self-generation is not decided."

As for the (conscious and open) connections between natural science and philosophy, in his monumental textbook²² (still used today!) philosophy appears already in the first sentence: "According to the views of the philosopher Mikołaj Hartmann, living beings—plants, animals and man—constitute a 'new category' in relation to inanimate matter. We must consider life as a new property of matter, occurring only in a precisely defined arrangement of the same particles, which individually or in simple chemical compounds would be considered a dead substance."

His philosophy teacher was Kuno Fischer²³ (1824–1907), a historian of philosophy, in Władysław Tatarkiewicz's opinion "one of the most famous historians of philosophy of the 19th century." To complete the description of the character, perhaps a word about his friend and biographer:²⁴ Bolesław Hryniewiecki (1875–1963), son of a January insurgent, relative of Ignacy, member of Narodna Wola, participant in the assassination attempt on Tsar Alexander II. Raised in the upraising traditions.

Marceli Nencki (1847–1901). In the article *On the Tasks of Biological Chemistry*, this goal is formulated as follows: revealing the difference between animate and inanimate matter. "The main task of biological chemistry is to explain the phenomenon of life [...] Is it possible for this goal to be achieved? or, as some say, *semper ignorabimus*? I can say in advance that everyone working in the field of biology, consciously or unconsciously, strives for this goal."²⁵ A little earlier (1897) he published an article about the similarity of the chemical structure of chlorophyll and blood pigment, and thus about the common roots of the world of animals and plants (we publish its translation), which was assessed by his contemporaries as a "call" to base research in the field of biochemistry on the foundation of the theory of evolution. The famous

²¹ E. Strasburger, *O bezpośrednim powstawaniu istot (Generatio spontanea)* [On the Direct Origin of Beings (*Generatio spontanea*)], *Pamiętnik Naukowy*, Warszawa 1867, pp. 492–512.

²² E. Strasburger et al., *Botanika* [Botany], PWRiL, Warszawa 1967 (1867). The first edition was published exactly one hundred years earlier.

²³ W. Windelband, *Kuno Fischer*, Heidelberg 1907.

²⁴ B. Hryniewiecki, *Prof. Dr. E. Strasburger (1844–1912). Jego życie i dzieła* [Prof. Dr. E. Strasburger (1844–1912). His Life and Works], Warszawa 1938 (Strasburger's bibliography is included there).

²⁵ *Przegląd Lekarski*, 1900 (31), p. 466.

Russian chemist, Mendeleev's successor, announced proudly: „призыв Ненцкого был услышан”²⁶ (“Nentsky's call was heard”). In other words: the idea of evolution just found its relation to pre-biological matter.

The pioneering importance of Nencki's work in the context of the twentieth-century program of research on chemical evolution (in general) and biogenesis (in particular) was brilliantly presented by Eduard N. Mirzozan (1931–2014) in the book *Развитие сравнительно-эволюционной биохимии в России*²⁷ [Development of Comparative Evolutionary Biochemistry in Russia]. Only one thing is missing: the statement that Nencki was a Pole. And one more thing, that he studied philosophy (we will come back to it). And that he took part in the January Uprising (1863). And that is why he had to leave the country.

It is therefore symbolic that the article praising Nencki's “appeal” and the revolution he made in natural science—*История вещества в живой и мёртвой природе* [On the History of Matter in the Living and Non-living Nature]—appeared (now) in the popular science magazine just in October 1917. And the title is visible on the cover—like on a banner (see the picture). One of the answers to “Nencki's call” was the theory of evolutionary catalysis (see Rudenko's text in the present volume).

Józef Łukasiewicz (1863–1928), participant of the revolutionary movement in the tsarist state, one of the organizers of the Narodnaya Volya Terrorist Faction and the assassination attempt on the tsar (March 1, 1887); judgment; fortress (until 1905). And in the fortress, his way of fighting was scientific work—it was there that he wrote the seven-volume work *Foundations of Scientific Philosophy*—and teaching to his fellow prisoners. (“When you listened to him in the walking yard lecturing to an audience of several people in the field of botany, zoology, crystallography or crystal-optics, or lecturing someone on analytical chemistry, histology, psychology or philosophy—you naturally thought with bitterness that his place was a professor's chair.”) After his release, director of the Geographical Institute of St. Petersburg AN; examined the mechanism of circulation of substances in the earth's crust;²⁸ in focus: the development of the earth and life on it; in his work on the nature of life,²⁹ he introduced the concept of живое вещество, later made famous by Vladimir I. Vernadsky.

In 1917 he published *Воспоминания о деле 1 марта 1887*, Былое, 23 (1), 24 (2). He writes there about his spiritual formation: “I also managed to read a lot of good books (in the field of the philosophy of nature). In the 8th grade (1882–1883) I became acquainted with illegal literature. It had a pow-

²⁶ Л.А. Чугаев, *История вещества в мёртвой и живой природе, Вступительная лекция, читанная в С.-Петербургском университете 11 сентября 1908 г.* [L.A. Chugaev, History of Matter in Dead and Living Nature, Introductory Lecture Given at St. Petersburg University on September 11, 1908], in: idem, *Избранные труды* [Selected Works], AN Soviet Union Publishers, Moscow 1962, pp. 28–39.

²⁷ Nauka, Moscow 1984.

²⁸ J. Loukaschewisch, *Sur le mécanisme de l'écorce terrestre et l'origine des continents* (s.f.).

²⁹ И. Д. Лукашевич, *Что такое жизнь. Биологический этюд*, СПб 1909.

erful influence on me, so I joined the liberation movement with all my soul. There was a good library of forbidden literature in Vilnius at that time.” So: the philosophy of nature and “forbidden literature” go hand in hand. (During the search: “I noticed that they were starting to put some of my books back in the trunk. These were all textbooks and books permitted by the censorship. When Lange’s *History of Materialism* was being put into this trunk, I asked what it meant.” To this the prystaw replied: “You see, I have a confidential order to take all the books on chemistry from you and that’s why I have to take Lange” [sic!]. All these books were confiscated.” Well, the tsarist authorities were perhaps not so wrong about the “subversive” books. At the beginning of 1890, when the regime in the fortress weakened slightly, Łukaszewicz, at the request of his fellow prisoners, wrote a report entitled *The Course of Events and the Creation of a New Program*. Here are the excerpts: 1. Parliament elected by universal suffrage, with full power. 2. Local government. 3. Independence of the rural commune. 4. Freedom of speech. 5. Nationalization of factories and land. 6. Free initial education. In the year of publication of his memoirs (1917), he became a member of the Petrograd Council of Workers’ and Soldiers’ Deputies. His program has been greenlit.

Władysław Natanson (1864–1937): one of the pioneers of research in the field of thermodynamics of irreversible processes [“one of the most outstanding and original thermodynamicists in the world” (Ilya Prigogine)]; his work “On the thermokinetic properties of thermodynamic potentials” laid the foundation for later research on chemical evolution.

Jan W. Zawidzki (1866–1928): initiated and developed research in the field of chemical kinetics in Poland, 1917 award for fundamental work in this field.³⁰ The concept of autocatalysis he introduced became crucial in research on chemical evolution. He had been interested in philosophy since his junior high school days (“an avid reader of Marx’s works”).

Maria Skłodowska-Curie (1867–1925); the year Nencki announced his “call” to base (bio)chemical research on the theory of evolution (1897) was also the moment she began her research on radioactivity. Well, in the opinion of historians of chemistry,³¹ her belief that the cause of this phenomenon must lie inside atoms had its source in the (philosophically grounded) idea of chemical evolution—or, as it is currently put, the extrapolation of Darwinism to the area of inanimate matter.

As for the “social context” of her spiritual formation (and also in the above-mentioned issue of “miracles”), fortunately we have the daughter’s account.³² “Because let us remember that all this is happening in 1872. That Poland is torn to shreds and still bleeding after the uprising (1863–1864). That Warsaw is in perhaps the worst, most difficult period of its history.

³⁰ *Studium zur chemischen Dynamik autokatalitischer Prozess: kinetische Theorie der Autokatalyse und ihre experimentelle Prüfung*, Cracovie 1916 Imprimerie de l’Université.

³¹ A. Dorabalska, *W dwudziestą rocznicę śmierci Marii Skłodowskiej-Curie* [On the Twentieth Anniversary of the Death of Maria Skłodowska-Curie], *Wiadomości Chemiczne*, 1954, (7), pp. 205–316.

³² E. Curie, *Maria Curie*, PWN, Warszawa 1967.

"The atmosphere of conspiracy can be felt in this classroom... Yes! because it is an illegal lesson. After all, Polish history cannot be taught in this Polish school. Especially—oh horror—in Polish!"

"The conversation of elders is too boring! ... police... tsar... Siberia... exile... Since birth, Mania has heard these sentences around her every day."

"The issues that concern her, fascinate her and move her deeply. These are matters related to the great ideological movement of our youth at that time. With its aspirations to improve at least the intellectual life of Poland, since for now, after the disaster of the January Uprising, it is impossible to undertake a new armed act, to fight for regaining independence. Let us work!—shouts these young people—let us educate ourselves and go to teach those whom the Russian government keeps in a state of wilful ignorance: workers, peasants, all the lower, poorer layers of Polish society [...] Young people rushed to study natural sciences. This was a common direction for all of Europe. In Warsaw, it stood out only in that even these seemingly innocent and completely legal studies were mostly carried out in secret, "underground."

Mania begins to attend lectures [from sociology to biology], of course secret; they took place in various private apartments, here and there (hence the name of this "university"—Flying). Behind every bell, every suspicious noise, a shiver of fear: the police?!"

As he recalls after forty years: "I still believe that the ideas that guided us then are the only basis on which significant social progress can be built." For one cannot hope to direct the world towards better paths unless individuals are directed towards the better. To this end, each of us should work on our own improvement, at the same time realizing our personal responsibility for all that is happening in the world.

"Therefore, the role of the Flying University was not limited to expanding the circle of knowledge of its young students. They were also obliged to teach others. Mania starts giving lessons to girls from a certain tailor's workshop; he collects books for them, compiles, work by work, a small Polish library. It's easy to imagine the enthusiasm that filled a seventeen-year-old girl with all this! We remember how, in the early years of her childhood, she was delighted with the 'treasures' from her father's office: those with a strange name: "physical instruments." It was still far from being 'fashionable' for exact sciences when she already had a secret, subconscious attraction to them—perhaps hereditary? And here, at the same time, apart from this world, another world opens up to her: next to the miracle of scientific work—the miracle of working on the reconstruction of social relations."

"Maria becomes—in the purest sense of the word—a socialist" (p. 67).

And in the notebook from those years—quotations from philosophical works (p. 68).

Pierre Curie, "a scientist, devoted with all his soul to his beloved science, cannot understand [when they met] why this girl, so extremely talented, does not want to devote all her thoughts to it [i.e. science], but intends to dissipate her energies, some of them wasting on the fight against the tsar's rule."

Leon Marchlewski (1869–1946). He wrote about the idea of chemical evolution as follows: “the idea of the common origin of the elements has become so deeply rooted that it must be taken into account, especially since the latest work on the so-called electrons and radium seem to give hope that one day this primeval matter will also enter the scope of positive research.”³³ On the cognitive perspectives in this area: “biological chemistry feels strong within itself to achieve even greater achievements, it firmly rejects the slogan of the faint-hearted *ignorabimus*.”³⁴ The philosophical synthesis of achievements in this respect is as follows: “Biochemistry does not submit to doctrines, it takes the world as it is, but when it allows itself to construct its own worldview, when it ranks the facts it has laboriously determined, when it sees the miraculous way in which a series of events come together, seemingly separated, into one beautiful whole, then involuntarily returns to the thought of evolution as the main law of nature.”³⁵ And finally—the question of the possibility of discovering the secret of life: “I cannot accept the judgment of the famous physicist Bohr, according to which the existence of life should be considered an elementary fact that cannot be explained, a sentence reminiscent of Du Bois Reymond’s famous *ignorabimus*” (ibidem, p. 22).

Marian Smoluchowski (1872–1917). His area of research was primarily the kinetic theory of matter and the theory of colloids, which resulted in strengthening the belief in the reality of atoms and molecules; in his philosophical works he criticized the phenomenalism of Mach and Duhem and Ostwald’s slogan “*einer hypothesenfreien Wissenschaft*.” He was appreciated in the West of our lands (Albert Einstein in the obituary (December 1917) in *Die Naturwissenschaften* named him “*einer der feinsinnigsten zeitgenössischen Theoretiker*”) and also in the East. The translation of his article on the occasion of the tenth anniversary of his death was published by the editors of the magazine “Under the Banner of Marxism” with the following comment: “Smoluchowski’s work is important not only for physics. Their methodological value is extremely high.”³⁶ In the *Bolshaja Encyclopaedia* (1976, vol. 23, p. 435) we read: “Smoluchowski laid the foundation for the kinetic theory of colloidal systems [...] colloidal chemistry forms the basis of the study of biological structures, the origin and development of life.”

³³ L. Marchlewski, *Rozwój historyczny pojęć chemicznych* [Historical development of chemical concepts], in: *Dzieje myśli. Historia rozwoju nauki* [The History of Thought. Development of Science], vol. 1 (1), Warszawa 1911, p. 3.

³⁴ L. Marchlewski, *Teorie i metody badania współczesnej chemii organicznej* [Theories and Research Methods of Modern Organic Chemistry], Lwów 1905.

³⁵ L. Marchlewski, *Cele i metody badania chemii biologicznej* [Objectives and Methods of Research in Biological Chemistry], Biologia Lekarska, 1936 (1), p. 17.

³⁶ *Über den Begriff des Zufalls und der Ursprung der Wahrscheinlichkeitsgesetze in der Physik*, *Die Naturwissenschaften*, 1918, H. 17, 26 IV; М. Смолуховский, *О понятии случайности и о происхождении законов вероятности в физике*, Под знаменем марксизма, 1927, 9, pp. 149–162. „Работы Смолуховского имеют значение не только для физики. Чрезвычайно высока их методологическая ценность”.

Antoni Bolesław Dobrowolski (1872–1954). A member of the Second Proletariat party; imprisoned in the Citadel; then in Siberia, from where he escaped. Main work *Natural History of Ice*, cryosphere. *My Scientific Biography* describes the path leading to the “mystery of life” (from philosophy to natural science): the difficulties in learning the nature of life result from the fact that we do not know enough about dead matter, hence the choice of specialization: geophysics. Philosophical motto: evolution “yes,” “positivist universal principles”—“no;” anti-*ignorabimus*. Elected to the Polish Academy of Sciences (1952).

Ryszard Krzymowski (1875–1960). He was also guided by the motto “anti-*ignorabimus*” and (like his predecessors) Darwinism understood as a philosophical program obliging us to approach nature as a whole in an evolutionary manner. Hence the decision to take up (at an early age) the issue of pre-biological chemical evolution and the origin of life. And this is where the appreciation comes from [es entspricht dem Still der (Landwirtschafts) wissenschaft vom Ende des 19. Jahrhunderts (als überwiegend “angewandter Biologie”), daß Krzymowski sich 1897, also 22 Jahre alt, in den Streit um eines der größten Probleme der Entwicklungslehre stürzte. Er schrieb “Das Wesen der Urzeugung”; “das Selektionsprinzip, eines der wichtigsten und fruchtbarsten aller philosophischen Prinzipien.”³⁷ He referred directly to philosophy in his natural science works.³⁸ His theory of biogenesis he presented rather modestly:³⁹ “Some points which I believe are important for the theory of spontaneous generation are mine. Namely, the conclusion that it is a necessary consequence of Darwinism to assume only the one function of assimilation for the spontaneously generating substance, if one assumes that all functional features have been acquired through selection. Furthermore, the explanation why selection cannot produce great functional features in inorganic nature.”⁴⁰ In fact, however, all the fundamental ideas of the 20th century research program in this field can be found there: the extrapolation of Darwinism into the area of chemical evolution, the influence of solar energy, the large “chemical possibilities” of carbon compounds, early heterotrophy, the gradual increase in “purposefulness” as a result of natural selection.

³⁷ H. Haushofer, *Richard Krzymowski (Obituary)*, *Zeitschrift für Agrargeschichte und Agrarsoziologie*, 1961, 9, pp. 98–99; G. Schröder-Lembke, *Richard Krzymowski zum 80. Geburtstag*, *Zeitschrift für Agrargeschichte und Agrarsoziologie*, 1955, 3, pp. 97–99.

³⁸ R. Krzymowski, *Philosophie der Landwirtschaftslehre*, Verlag Eugen Ulmer, Stuttgart 1919. Russian trans.: Moscow 1927; Japan trans.: 1932, 1954.

³⁹ In the self-comment attached to its reprint: R. Krzymowski, *Kleine Abhandlungen aus dem Gebiete der Landwirtschaft und Naturwissenschaft*, Ludwigsburg 1900, pp. 30–43.

⁴⁰ “Einige für die Urzeugungslehre, wie ich glaube, wichtige Punkte rühren von mir her. Nämlich der Schluß, daß es eine notwendige Konsequenz des Darwinismus ist, für die Urzeugungssubstanz nur die eine Funktion der Assimilation anzunehmen, wenn man nämlich voraussetzt, alle zweckmäßigen Einrichtungen seien durch Selektion erworben worden. Ferner die Erklärung, warum die Selektion in der anorganischen Natur keine großen Zweckmäßigkeiten hervorbringen kann.”

So Alexander I. Oparin had the ground ready. But recognizing this fact (and its circumstances) is not easy.

This was largely achieved by Alexander Vucinich (1914–2002, a Serb born in the USA, professor emeritus, University of Pennsylvania) in the book *Darwin in Russian Thought*:⁴¹ “Mention should be made of an influential group of scientists who were not biologists but who held Darwin in high esteem [...] Their basic task was to carry a generalized evolutionary view to as many sciences as possible [...] Vladimir Vernadskii, for example, made a serious effort to establish a genetic, or evolutionary, mineralogy; L. A. Chugaev argued in favor of an evolutionary chemistry concerned with the development of chemical elements from a single primordial substance; N. A. Morozov wrote a long essay on the evolution of heavenly bodies.” All three were under the influence of Polish naturalists.

And here we come to the point: “Darwinism [...] was not only a legitimate division of science but also a consistent and far-reaching philosophy [...] On philosophical grounds, it received strong support from current studies based on the ideas of the unity of the inorganic and organic worlds and of the superiority of the physicochemical analysis of biotic phenomena. This kind of orientation helped M. V. Nentskii, a Pole by origin, produce challenging data on the basic similarity between chlorophyll and hemoglobin. His theoretical stance combined two principles that received a clear and most dramatic expression in Darwin’s theory: the principle of the cosmic unity of nature and the principle of the universality of evolution.”

Excellent! Except that the title of this book should be (rather): *Darwin in Polish (and Russian) thought!*

That is what it was like in Farley’s “fourth zone.” It is worth dedicating this to, among others, J. William Schopf (president of ISSOL) who misleads his students and readers with the legend of the (straight) route “from Darwin through Timiriaziev to Oparin.”⁴²

So there was someone else along the way—or even a whole group: Polish Hegelians and Darwinists.

Let us be clear. Darwinism could have found fertile intellectual ground in our country (and bear the above-mentioned fruits) because this ground had already been philosophically fertilised: by Hegelianism in its left-handed version.

And a hundred years earlier, there was someone else: Hegel and Darwin had (at least) one common ancestor. From Poland. Namely George Forster (1754–1794). The problem is that few people know about it. His achievements are appreciated by specialists from very diverse fields, but it is difficult to find a comprehensive assessment.

⁴¹ University of California Press, Berkeley 1988.

⁴² J. W. Schopf, *Human History. From Darwin to my Students*, in: *Evolutionary Biochemistry and Related Areas of Physicochemical Biology*, B. F. Poglazov et al. (eds.), Bach Institute of Biochemistry, Moscow 1995, pp. 19–22.

Let us start with a representative work on the history of biology, the previously mentioned *Geschichte der Biologie*. Jerzy Forster appears many times in the main text, especially in the context of (1) a report from a trip around the world and a collection of fauna and flora specimens from various geographical regions (created with a certain guiding principle: unlike previous collections of this type—collected namely “scientifically and intentionally” (*wissenschaftlich und planmäßig*)); (2) collecting evidence of the ability of varieties to adapt to diverse geographical conditions [we can therefore talk here about the beginnings of plant geography; let us add that Alexander von Humboldt is considered its creator; the more important seems to be the circumstance recorded in *Geschichte*, namely (3) the fact of a joint (three-month) journey of these two naturalists; for Humboldt it was the first journey, and for Forster another one of many (after circumnavigating the world, after earlier research of the Volga basin and after many months of “mineralogical” journey through several countries of Central Europe, as if preparatory to the natural history course at the University of Vilnius); the difference in experience was colossal; it is also worth taking into account the age difference of both travelers, quite a large one, fifteen years: in 1790 Humboldt was 21, and Forster was 36. And he was already the author of a famous work about his journey around the world. The biography records scientific travels and university positions in Kassel and Vilnius (it also mentions the care of the botanical garden, which, as we know, was established as a result of his efforts (as well as the mineralogical cabinet and the natural history library). There is also a mention of the scientist’s social involvement in the Mainz period⁴³ but completely unreadable for the “layman.” Let us add: Forster established a commune in Mainz, like the one in Paris, a century later. And therefore he was condemned to “oblivion” (lasting many decades).

Literary historians⁴⁴ pay attention to this side of his activity (and writing). His *Pictures from the Lower Rhine* [*Ansichten vom Niederrhein*] are an account of his journey through the Netherlands, England and revolutionary France. “The novelty of the work lies in paying close attention to the political, economic and social relations of the visited countries and in emphasizing the progressive character of capitalist relations in England in comparison with German feudalism.” “At the same time, however, the author notices the growth of new contradictions in capitalist society.” “He sees the only way to achieve social justice in revolution.”

And now an assessment from the perspective of a historian of philosophy.⁴⁵ Constantin Ionescu Gulian devotes a separate paragraph to the figure

⁴³ 1792 Mitgl. d. rhein.-dtsch. Nationalkonvents in Mainz, 1793 als dessen Deputiert in Paris, wo er starb.

⁴⁴ E.g. *Dzieje literatur europejskich* [History of European Literatures], vol. 2, PWN, Warszawa 1982, pp. 84–85.

⁴⁵ C. I. Gulian, *Hegel sau filosofia crizei*, Editura Academiei R.S. România, București 1970.

of Foster (in the context of the possible influence of Jacobin writings on the young Hegel) (pp. 110–111). He was “the most progressive thinker and social activist in Germany of that time [the times of Hegel—16 years younger].” “Excellent orientation in German and Polish affairs” (as well as familiarity with the philosophy of the Enlightenment and humanism) made him gradually lose his illusions and faith in “enlightened monarch.” “The exploitation and oppression of the people, especially in Poland, made Forster a fierce enemy of absolutism and despotism.” The French Revolution showed him new perspectives and was, in his opinion, the surest means of showing people their rights and interests. In the years 1792–1794 he was conducting revolutionary activities in Mainz (instead of “Mainz” the word “Mayence” is used many times, so even the translators of the work (the translation was based on the French version) and the editor of PWN [State Scientific Publishers] have no idea what this is about) and Paris. During this time (as Gulian quite peculiarly puts it) “he got rid of the scruples of a progressive philosopher and sided—in word and deed—with the Jacobins (‘even though I know that they arouse universal hatred’). Forster returns (and again in the most ‘positive context’) in the chapter “The Genesis of Hegel’s Philosophy” (p. 194), and here we find a direct reference to the work *Der junge Hegel* (“it is Lukács’s achievement to present these youthful writings in a completely new light”), but the “naturalistic” trail indicated by the latter was not taken up. Perhaps this is because Gulian assesses the philosophy of nature, both Schelling’s and Hegel’s, (almost) unequivocally negatively.

From the perspective of the history of Freemasonry, Forster was described as “*ein Mann universeller Bildung*.”⁴⁶ In terms of lodge activities, (apart from the Parisian initiation in 1776 and several years of activity in the Rosicrucian circle in Kassel), his special connections with the Viennese lodge “Zur wahren Eintracht” (which, in the opinion of the historian of chemistry,⁴⁷ was a kind of society of nature researchers), were emphasized, where he was admitted “with the highest honors,” for which he also praised the progressive activity of Austrian Freemasonry in the field of education and social reforms (*lobt er die Aufklärungsarbeit und Reformtätigkeit der österreichischen Freimaurer*). Forster’s philosophy of nature is not mentioned here at all. Maybe it’s because it puts the whole lodge “transcendence” from her head on its feet.

György Lukács⁴⁸ writes extensively and in many threads about Forster’s influence on Hegel.⁴⁹ In fact, he even mentions attempts to cover up his

⁴⁶ E. Lennhoff, O. Posner, *Internationales Freimaurerlexikon*, E. Lennhoff, Amalthea-Verlag, Zürich 1932.

⁴⁷ I. Z. Siemion, *Chemiczne i alchemiczne próby Jerzego Forstera* [Chemical and Alchemical Attempts of Jerzy Forster], *Analecta*, 1995, 4 (1), pp. 73–104.

⁴⁸ Młody Hegel, PWN, Warszawa 1980; the German edition: *Der junge Hegel*, Europa-Verlag, Wien-Zürich 1948].

⁴⁹ See also: R. K. Hočevár, *Georg Forsters Bedeutung für Hegel*, *Georg-Forster-Studien*, 2001, 8, pp. 67–88.

traces, such as the fact that Hegel refers to Forster's views in *Ansichten vom Niederrhein* when it comes to the relationship between antiquity and the modern era. Moreover, he "made extensive extracts from this book." Equally characteristic are the "procedures of Hegel's contemporary publishers," e.g. Hermann Nohl, who "was forced to admit that such extracts existed" but did not reprint them in his collection in order to make it difficult to assess their importance for Hegel's development. Well, in the light of Lukács's findings, Forster's influence on Hegel seems beyond doubt. At least in matters of social philosophy. And in terms of natural philosophy? It's worth pursuing this trail. Because its consequences for today's debates around the theory of evolution in the broad sense may be significant.

According to the findings made earlier,⁵⁰ the philosophical foundation of contemporary evolutionism in the broad sense is process holism. Three basic aspects of this position have been distinguished: autodynamism, i.e. the concept of active matter; holism, i.e. viewing nature as a system with interconnected and interacting elements; historicism, i.e. a fully historical approach to the evolutionary process, taking into account the variability of factors and mechanisms of evolutionary changes. This last dimension of the breakthrough in twentieth-century historical natural science (i.e. taking into account the non-linear nature of the evolutionary process and the issue of variability of laws) is particularly associated with the name (and activities) of the British (and at the end of his life—Indian) scientist J. B. S. Haldane. The postulate of reconstructing the philosophical conditions and motivation for undertaking research in this direction is, as it turns out, not only of historical importance, but touches the very center of the latest controversies around evolutionism (and its place in the structure of knowledge), both within the scientific community and (far from) outside it.

A good starting point is the text (available in the Internet) by Stan Oakes *Encouraging Signs. Recent Events Indicate Significant Progress has been Made in the Effort to Win the Campus to Christ*. It gives (apart from a relatively clear definition of the goals) also a clear idea of how the field of confrontation was chosen. It is "those damned problems of origins:" "In the field of origins research—the origins of the universe, life, species, and the human race—there are several encouraging signs." The most important of these "encouraging signs" is the editorial (let us add: also readerly) success of the book by Charles Thaxton, Roger Olsen and Walter Bradley, *The Mystery of Life's Origin* (New York 1984), which was published in a non-confessional publishing house. (Why was this the choice of the publishing house (and how it related to the entire project) was established (at the very source) by Larry Witham, *Where Darwin Meets the Bible. Creationists and evolutionists in America*, New York 2002 Oxford University Press, where we

⁵⁰ W. Ługowski, *Philosophy and Biogenesis: 'Those Damned Problems' (of Origin)*, Arboretum, Wrocław 2008.

can read, at first, about the very idea: “The group (‘intelligent design’) impetus was a 1984 book *The Mystery of Life’s Origin* [...] it challenged the optimism about discovering how chemicals turned into living cells,” and then about the choice of publisher: “John Buell (Texas publisher) concluded that Christian needed first-rate intellectual products to match the worldviews of the big universities [...] After inquiries with 176 secular publishers, it was released by Philosophical Library. We were determined the book would not be published by the Christian publisher and therefore ignored, p. 220). Well, the main reason for success (a means of persuasion that effectively reaches the consciousness of naturalists) is the use of alternatives: either reductionism or finalism, and there are many successes.”⁵¹

Another case of great educational value is that of Christian Kummer, SJ, philosopher, professor at the Munich Hochschule für Philosophie, suggestively titled: *Ein neuer Kulturkampf? Evolutionsbiologen in der Auseinandersetzung mit dem “christlichen Schöpfungsmythos.”*⁵² Its most instructive part (and a reminder for naturalists who tend to forget whose prerogatives it is to “define the nature of knowledge”) is the reprimand given to not just anyone, but to the president of the Union of German Academies of Sciences—Union der Deutschen Akademien der Wissenschaften—Professor Gerhard Gottschalk, a microbiologist from Göttingen. What happened? Well, as we already mentioned at the beginning, the international organization of the academies of sciences—The Inter Academy Panel on International Issues. A Global Network of Science Academies—announced a position on the teaching of evolution. This was a significant event in itself, as this body only speaks on important global issues.⁵³ However, this announcement contained a statement—in our opinion—not very happy, namely: “Human understanding of value and purpose are outside of natural science’s scope. However, a number of components—scientific, social, philosophical, religious, cultural and political—contribute to it. These different fields owe each other mutual consideration, while being fully aware of their own areas of action and their limitations.” Well, this appeal can be read as a testimony of helplessness (or even misunderstanding of the essence of things and the

⁵¹ An example is provided by the volume: H. Margenau, R. A. Varghese (eds.), *Cosmos, Bios, Theos. Scientists Reflect on Science, God and the Origin of the Universe, Life and Homo Sapiens*, Open Court, La Salle IL 1992. In the chapter titled “How should science—and the scientist—approach origin questions,” the following comments are presented, among others: H. Margenau, J. Polinghorne, H. J. Bremermann, and the most concise answer to this question is provided by Ch. H. Townes (winner of the Nobel Prize in Physics): “The question of origin seems unanswered if we explore from a scientific view alone,” p. 122. Let us add: that is it! The issue: what does “scientific” mean to whom?

⁵² *Stimmen der Zeit*, 2008, (1), pp. 87–100.

⁵³ An explanation is in order here: “IAP is a global network of the world’s science academies [...] Its primary goal is to help member academies work together to advise citizens and public officials on the scientific aspects of critical global issues. IAP is particularly interested in assisting young and small academies and their influence among the policy makers.” But, as you can see, it is not only the “small and young” academies that need help.

nature of current events), because it does not specify what should actually be done in a situation when some (influential) representatives of (some of) the fields mentioned above do not intend to show “respect” for others and respect the “areas of action” designated for themselves. Well, President Gottschalk also (apparently) found this fragment a bit strange, because in his translation he gave it a slightly different (in our opinion, slightly better) meaning. It is as follows: “Die Evolution ist aber nicht allein Sache der Naturwissenschaften. Der menschliche Verständnis von Werten und der Sinnhaftigkeit des Lebens liegt außerhalb der Reichweite der Naturwissenschaften und eröffnet die Einbringung von sozialen, philosophischen, religiösen, kulturellen und politischen Aspekten in das Wissen über die Evolution” (p. 92).

Well, this (free, let us admit it) translation caused undisguised irritation (yes, exactly!: “wirkt eher irritierend”) Ch. Kummert (p. 92), who praised (sic!) the English original in the following words: “Diese Formulierung ist akzeptabel, weil sie den Anspruch naturwissenschaftlicher Erklärung nicht überzieht.”⁵⁴ However, as he said, it is difficult to find such “resignation” (or “reconciliation with fate”) in the German “interpretation:” Von solcher Selbstbescheidung ist in der deutsche Übersetzung (oder sollte man sagen: Interpretation? Nicht mehr viel zu spüren.“⁵⁵ Praise of this kind (and authorship) should make all those who signed the declaration formulated in this way think twice [on behalf of the remaining sixty-eight academies, because the honor of the academy of our western neighbors was (at least partially) saved by its president with his “free interpretation.”] We wonder, by the way, whether the then authorities of our academy consulted the Committee of Evolutionary and Theoretical Biology of the Polish Academy of Sciences regarding the text of this declaration before signing it? But well, maybe it would not have mattered, because the list of dates shows that at that time the chairmanship of the Committee was taken over by its later liquidator, by the way—the author of the following words: “Life is a miracle, even for a modern, well-educated biologist.” These words would not (maybe) be worth repeating if it were not for the importance of the journal in which they were published—(Nauka, 2005, no. 3; the title of the article is: *Theory of Evolution. Is the Conflict between Science and Faith Inevitable?*) and if it were not for the fact that they constitute an extremely accurate approach to the essence of this “worldview hybrid” [i.e. the synthesis of “techno-” (W-2) and “theo-” (W-1)] which we wrote about at the beginning.

Let us now return to the review article by Waddington mentioned at the beginning,⁵⁶ in which the words were uttered, often (with disapproval, of

⁵⁴ “This formulation is acceptable because it does not exceed the claim of scientific explanation.”

⁵⁵ “There is no longer much of such self-restraint in the German translation (or should we say interpretation?)”

⁵⁶ See footnote 7; these are reflections on the margins of the book: J. D. Bernal, *The Origin of Life*, London 1967.

course, quoted since the early 1990s): “historians of ideas will probably point out that this position on the origin of life—meaning a revolution in man’s philosophical understanding of his place in the world—was developed by the communists. As we wrote extensively earlier, a number of scientists-naturalists active in this area of research (Christian de Duve, Christopher Wills and Jeffrey Bada, Antonio Lazcano, Noam Lahav, Stanley L. Miller, J. William Schopf) were put in the state of indictment. Our (shortest) comment here is that attempts to introduce the founders of this field of research to the “scientific salons” by separating their (after all, undisputed) research achievements from (alleged, “wrongful” beliefs in social issues) constitute a tribute (today) definitely too low. Dear colleagues: we will tell you a secret. Well, your “paradigm” is not any “Darwin’s pond,” but a philosophical thesis: life is a natural, emergent property of matter, which implies a belief (as Ilya Prigogine puts it) in the activity of matter, or its ability to self-organize. Based on this thesis, you co-create a worldview—let us call it the Third—alternative to Techno and Theo. There is no way, you will not be able to deny it. So you better remember: the unit of knowledge is a worldview. The quantum of knowledge is the academy (sometimes, until recently, it was a one-person academy, as in the case of Bernal or Haldane).

Well, reading Waddington’s text may contribute to self-awareness in this respect, but not the fragment that is most often quoted—rather the continuation concerning Bernal:

“Bernal has been one of the most important intellectual influences in science ever since the days when this topic was first being considered [...] He acquired the nickname ‘Sage,’ and anyone who doubts its appropriateness should look at this and other major books [his books from 1939 (on the foundations of science), 1949 (on the foundations of science policy) and 1954 (history of science)]. I have written in some length about Bernal’s position in the intellectual world, because this is very relevant to an assessment of *The Origin of Life*. The importance of this book lies not so much in its account of the particular biochemical processes which, he suggests, may have been involved in the origin of life. The book is valuable because [...] it puts beyond argument the major point that life could indeed have originated spontaneously from the non-living. There are in fact a number of other possible pathways that can be suggested, and it may be some considerable time before we can decide which of these was the path actually followed on this earth, and some time longer before we discover whether any of the others have been followed elsewhere in the Universe. But that life is a natural phenomenon, developing out of the non-living world through processes which can, in principle, be understood, is no longer to be doubted and we have to adjust our thinking to this condition.”

So we have (in the above paragraph) a concise and accurate description of the “paradigm” of research in this area, as well as—in the characterization

of Bernal's position in the intellectual world—a “psychological portrait of the perpetrator” of the described breakthrough. More precisely: one of the “(co)perpetrators,” namely the one who (as we wrote earlier) made, next to Haldane, probably the greatest contribution to understanding the philosophical dimension of the ongoing changes.

So, in the context of the origin of life the apparent (seeming) choice would be between the two conjectures, as the fore-mentioned Waddington put: “We are left with nothing more to say than that life is some sort of freak—possibly one produced by God, which we might dignify with the name ‘special creation,’ or possibly just the result of some excessively improbable concatenation of natural events.” The choice would be between, on the one hand, the conviction that we have to do with a freak, a miracle, which natural sciences cannot explain neither now or ever (*ignorabimus*) and, on the other hand *the conviction that although we do not know now, in principle we can get to know and eventually we will get to know (sciemus)*. In the context of the origin of mental life and of consciousness we seem to be in the analogous choice: either explicable by scientific, natural, biological mechanisms or unknown, unscientific, miraculous.

A reason for which until the 17th century there was no science of the consciousness and of the mental life is the Cartesian way we understand the ideal of science is perhaps. “Cartesian” is synonymous to “scientific,” “down to earth” (in French: *terre à terre*), explicable by mechanical, natural causes. This understanding of science somehow obscures that Descartes left a whole domain as unattainable to science and not any domain, but precisely the one for which humans would be unique: in having “soul,” subjective experience, phenomenal consciousness. Was it deliberate? “*larvatus prode*” he wrote, which means “I come forward, masked”—although Descartes was French, he spent several years in Netherlands in Amsterdam, where waters were relatively safe for philosophers, but it is possible that Descartes wanted to disguise or silence some theses which were dangerous at the time. Descartes, Galileo, did recognize that all events in nature are governed by causal relationships that science can understand. But there is an exception for these philosophers and scientists: it is man himself, who is assumed to be endowed with soul (Descartes used the Latin word “*mens*” or “*res cogitans*”). The soul is given by God, has no beginning and no end (exists beyond time and space), is eternal, substantially different and irreducible to matter (which exists in time and space). In this way the soul of the men would escape universal determinism, that is: science of natural phenomena. Therefore: 1) no science of soul was then possible, like e.g. psychology (psyche stands for the soul and logos stands for science) or psychiatry and 2) there exists humans and animals and there is an unfillable gap between them (given that only humans are given souls which makes them superior). In opposition to Descartes, Spinoza's aim was to extend universal determinism to man.

Spinoza was one generation younger than Descartes, born in Amsterdam, and Jewish. In first few lines of *Ethics* Spinoza writes “By God I understand ...” and then he extensively explains that he means nature (*Deus sive natura*). In the third part of *Ethics* “Concerning the origin and nature of the emotions” he wrote, that man, including Descartes, “seem to have dealt not with natural things which follow the universal laws of nature, but with things which are outside the sphere of nature: they seem to have conceived man in nature as a kingdom within a kingdom. For they believe that man disturbs rather than follows the order of nature, and that he has absolute power over his actions, and is not determined by anything else than himself.” Therefore, emotions result from natural causes as other things in nature: “And so I shall treat of the nature and force of the emotions, and the power of the mind over them, in the same manner as I treated of God and the mind in the previous parts, and I shall regard human actions and appetites exactly as if I were dealing with lines, planes, and bodies.” There exists human animals and non-human animals and all are production of nature and there is no longer an unfillable gap between them.

Spinoza criticizes the (cartesian) notion of freedom, where the latter would mean “free from universal determinism,” that is, free from natural causes. For Spinoza, it is because men are ignorant of what determines them that they imagine themselves capable of starting actions or thoughts from nothing. But that is an illusion that Spinozism destroys in order to oppose another conception of freedom which is compatible with the universal determinism and which is the very object and subject of 17th century science. For Spinoza man is a production of nature, that is, of God (where *Deus sive natura*) and as such, he is not to be distinguished from other animals. In the end of his life in the letter to his friend Schuller (from 1674⁵⁷), Spinoza points out that men are victims of this illusion of free will and he adds that man do not free themselves from the illusion easily—but if he thinks, then he has the capacity to free himself from the illusion. And that is true freedom.

That is perhaps a reason for which psychiatry has a particular status among other medical disciplines. In its beginnings psychiatrists were referred to as “alienists,” where *alienus* in Latin means foreign, strange, averse. During its history psychiatry has sometimes been characterised as “the Cinderella of general medicine,”⁵⁸ “the stepchild of medicine,” and “the orphan of medicine.”⁵⁹ This is when psychiatry was on the side of the unknown: “Historically, once etiology is known, a disease stops being ‘psychi-

⁵⁷ Letter no. 58, B., Spinoza, *Correspondence*, Jonathan Bennett, 2017; <https://www.earlymoderntexts.com/assets/pdfs/spinoza1661.pdf> accessed 15 July 2024

⁵⁸ C. Bond, *The Position of Psychiatry and the Role of the General Hospitals in Its Improvement*, “The Lancet,” 1914, 184, p. 935.

⁵⁹ B. Hall, *Early Development of the Psychiatrist*, Journal of the American Medical Association, 1953, p. 153.

atric’.”⁶⁰ That is why psychiatry wants to be on the other side, on the side of the scientific. And this despite the price of reductionism: What does not refer to “organic” causes, denotes what is unknown and should be avoided: “Terms like ‘functional’ and ‘psychogenic’ and ‘situational reaction’ are sometimes invoked by physicians to explain the unexplained. They usually mean ‘I don’t know,’ and we try to avoid them.”⁶¹

The side of scientificity is in psychiatry desperately hold by the medical model. For instance, Arnold Ludwig expresses it his commentary meaningfully entitled *The Psychiatrist as Physician* published in 1975 for the “Journal of the American Medical Association.” Ludwig writes that medical model is the only “sound” foundation for psychiatry. What he understands by it is not that the medical model is based on “established facts.” On the contrary, he acknowledges that psychiatry often lacks biological evidence: “Medicine, as practiced both past and present, represents a blend of empirical observations, scientific knowledge, unproved assumptions, and other folklore.”⁶² Nevertheless this lack of biological evidence does not seem to discourage him from considering psychiatry scientific, because what makes psychiatry scientific in his view is the philosophical perspective, according to which the domain of natural causes extends to the mental, to the psychic. Therefore Ludwig continues: “What distinguished the medical model from nonmedical models, then, is not so much its reliance on scientific method, but rather a philosophical orientation toward dealing with symptoms and sign of patients, ie, that sufficient deviation from normal represents a disease, that the disease is due to known or unknown *natural causes*, and that elimination of that causes will result in cure or improvement in individual patients. Psychiatric diagnoses, like all medical diagnoses, represents hypotheses based on some underlying theory or set of assumptions which may or may not be of scientific nature ...” “Scientific” for Ludwig does not mean “already explained,” but “explainable (in principle),” would it be in the future, and would it come with a price of reductionism: “Although most of psychiatric diagnoses have a lower level of confirmation that most medical diagnoses, they do not have to be qualitatively different provided that the mental disease is assumed to arise from ‘natural’ rather than metaphysical, interpersonal, or societal causes.”

At the time Ludwig published the text a serious problem was recognized in psychiatry, namely the problem of the low diagnostic reliability. The most famous study regarding the poor validity of psychiatric diagnosis was the one arranged by psychologist David Rosenhan, a Stanford University profes-

⁶⁰ D. Goodwin, *Preface to the First Edition*, in: C. North, S. Yutzy, Goodwin and Guze's psychiatric diagnosis (7th edition), Oxford University Press, 2019, p. XIX.

⁶¹ Ibidem, p. XVIII.

⁶² A. Ludwig, *The Psychiatrist as Physician*, Journal of American Medical Association, 1975, 234, p. 603.

sor. In the study, participants (pseudopatients) submitted themselves for evaluation at various psychiatric hospitals. They feigned hallucinations during admission but behaved normally from then onward. It turned out that each and every participant was diagnosed with a psychiatric disorder and was given a medication. The results were published in the journal *Science* in 1973 under the meaningful title *On Being Sane in Insane Places* where Rosenhan writes in the first sentence: "It is clear that we cannot distinguish the sane from the insane in psychiatric hospitals." Another study by Schmidt and Fonda from 1956⁶³ involved 426 state hospital patients who were diagnosed independently by a pair of psychiatrists. It turned out that agreement with respect to diagnosis occurred only in half of the cases. Other studies of the time showed as well that the reliability of psychiatric diagnosis among practicing clinicians was poor (e.g. Beck et al. 1962,⁶⁴ examined 153 patients and found 54-percent agreement for specific diagnoses, Kreitman et al.,⁶⁵ found 63-percent agreement on 90 patients examined independently at approximately three-day intervals. Some reviews of the chart of inpatient admissions of a single patient revealed multiple different diagnoses for the same patient. A review of six studies between 1956 and 1972 by Spitzer and Fleiss from 1974⁶⁶ showed again that the reliability of psychiatric diagnoses was a major problem). What is more, this happens despite the fact that for the study psychiatrists were selected for being highly trained and there were few time constraints on the diagnostic process. At the time Ludwig published the text the DSM-III was about to appear (in 1980) in which diagnostic categories and criteria were supposed to be empirically based and more objective. Since the third edition DSM became "psychiatry's bible."⁶⁷

However, the problem of the low diagnostic reliability did not fade over next decades⁶⁸ and even the fifth and last edition of the DSM (from 2013) did not change that either.⁶⁹ At the same time, the language which suggests a biological objectivity and evokes scientificity flourishes. In the preface to the first edition of Goodwin and Guze's psychiatric diagnosis⁷⁰ Don Goodwin puts as an epigraph: "A rose is a rose is a rose," which the sentence written by Gertrude Stein as part of the 1913 poem *Sacred Emily*. The sentence

⁶³ H. Schmidt, C. Fonda, *The Reliability of Psychiatric Diagnosis: A New Look*, *Journal of Abnormal Psychology*, 1956, p. 52.

⁶⁴ A. Beck et al., *Reliability of Psychiatric Diagnosis. 2. A Study of Consistency of Clinical Judgments and Ratings*, *American Journal of Psychiatry*, 1962, p. 119.

⁶⁵ N. Kreitman et al. *The Reliability of Psychiatric Assessment: An Analysis*. *Journal of Mental Science*, 1961, p. 107.

⁶⁶ R. Spitzer, J. Fleiss, *A Re-analysis of the Reliability of Psychiatric Diagnosis*, *British Journal of Psychiatry*, 1974, p. 125.

⁶⁷ A. Horwitz, M. Baltimore, *DSM: A History of Psychiatry's Bible*, Johns Hopkins University Press, 2021.

⁶⁸ A. Aboraya et al. *The Reliability of Psychiatric Diagnosis Revisited*. *Psychiatry*, 2006, p. 3.

⁶⁹ R. Freedman et al., *The Initial Field Trials of DSM-5: New Blooms and Old Thorns*, *American Journal of Psychiatry*, 2013, p. 170.

⁷⁰ *Ibidem*.

is often interpreted as meaning “things are what they are.” By referring to that Goodwin does what most authors of modern medical classifications did: suggests that psychiatric classifications are based directly on the system of biological taxonomy, and that psychiatry is evidence-based, i.e., is based on empirically validated criteria for the recognizable signs and symptoms of disorders.

Goodwin says that classification in medicine is called “diagnosis” and expresses a firm belief that although classification in psychiatry is still at a primitive stage, and there are reasonable grounds for questioning our choice of categories, psychiatry must have a scientific base and that mental disorders can only be grasped scientifically as disorders of brain circuitry. He writes that “‘Etiology unknown’ is the hallmark of psychiatry” and that “for most psychiatric conditions there are no explanations.” But for him psychiatry remains “scientific” not because we know biological mechanisms for psychiatric disorders, but because we assume that they are biological.

We pinpointed, that like in the context of the origin of life, in the context of the origin of mental life and consciousness there would be a choice between the two conjectures, either explicable by scientific, natural, biological mechanisms or unknown, unscientific, miraculous. A science of mental life became possible once we started to free ourselves from the alternative and psychiatry is its flagship example. This falls on the time when the modern theory of evolution emerged and with it, progressively, the conviction that nature is explainable in terms of natural laws and life is not an exception and mental life is not an exception either. One last bastion of “*ignorabimus*” seems to fall: the question of consciousness. And precisely “the hard problem of consciousness,”⁷¹ which is to explain why and how humans have phenomenal consciousness, or subjective experience or qualia and whether other animals than human can have it.

That the latter is or was a scientific equivalent of the miracle was worked out by Daniel Dennett. In *Explaining the Magic of Consciousness* from 2003, published in the *Journal of Cultural and Evolutionary Psychology*⁷² Dennett goes against the conviction that consciousness is a mysterious, i.e. unexplainable phenomenon and cannot succumb to the methods of (cognitive) science. Just as the aforementioned Spinoza pointed out that men are victims of the illusion of free will, where it meant free from natural causes, centuries later Dennett points out that man are victims of the illusion of “real consciousness” which would be real only if it was unexplained. Once it becomes explained, it is not considered “real” consciousness anymore, because “real consciousness” means ... mysterious—as we inherited it from Cartesianism. In 2012, a prominent group of scientists signed the *Cam-*

⁷¹ D. Chalmers, *Facing up to the Problem of Consciousness*, *Journal of Consciousness*, 1995, p. 2.

⁷² D. Dennett, *Explaining the “Magic” of Consciousness*, *Journal of Cultural and Evolutionary Psychology*, 2003, p. 1.

bridge Declaration on Consciousness. This declaration stated that humans are not unique in possessing consciousness and there is an evolutionary continuity between human and non-human animals.

We have witnessed the extrapolation of natural science into the area of organic and prebiotic evolution, we saw the basic similarity between chlorophyll and hemoglobin, and finally we witness the extrapolation of natural science into the area of mental life and consciousness. All life, with no exception, is understood as a continuous and unceasing natural process.