

Part Two *Summa Technologiae* – Technology as Lifeworld

Of course, if I knew how to write analytically, starting with dictionaries, I would never have written a single book – everything was just mixing in this terrible brain of mine.

From a letter to Michael Kandel, May 8, 1972⁹⁰

90 The excerpt refers to *The Cyberiad*. All quotations from Lem's letters used in this chapter as motto-interludes are from: Stanisław Lem. *Listy albo opór materii*. Ed. and Introduction by Jerzy Jarzębski (Kraków: WL, 2002).

7 Kołakowski's Review

In the November 1964 issue of the monthly *Twórczość* (which was then the most important Polish literary journal), in the regular “Book of the Month” column, there appeared an extensive review of Stanisław Lem’s newest work. The work was *Summa Technologiae*,⁹¹ and the review was penned by Leszek Kołakowski.⁹² Kołakowski admits in it that he has not been able to evaluate the book properly. He not only emphasizes the remarkable intellectual qualities of the book, but also points out that Lem mixes up science and futurology so completely that

the work ... merges a huge amount of concrete information and observations with fantastic ideas about the future of the world of technology into an indistinguishable alloy; consequently these ideas become as realistic, as if they were merely plans to build a new bridge over the Vistula River, and certainly more realistic than new water filters for Warsaw. (116)

The bold visions for the future presented in ST must have seem grotesque and ill-suited for the realities of the Polish People’s Republic, which he ironically expressed in the following sentence:

I think ... that the observations about transgalactic transportation can be useful even in our world, where real technological dreams lead us to imagine that one day people will invent phones that connect between Warsaw and Pruszków [a suburb of Warsaw] without interruption; that one day there will be elevators working without errors for weeks at a time, or a glue that glues things and razor blades that actually shave beards. (117)

But the main target of his criticism was different. The author of what would later become *Horroris Metaphysicus* held it against the author of *Summa Technologiae* that he was excessively prone to reduce human metaphysical needs to physiology and cybernetics and he believed firmly in the rational progress of technology. He wrote:

His predictions are guarded with many “maybes” and “ifs”. Yet, I do not hesitate to call him a brilliant ideologist of scientist technocracy, that is a person who is convinced that there is no real human problem that cannot be solved with technological means, without assuming, of course, that people will effectively find solutions to everything. (117)

91 In order to avoid the stylistic difficulties of declension of a Latin title, from now on I will mostly abbreviate the title as ST.

92 Leszek Kołakowski, “Informacja i Utopia,” *Twórczość*, no. 11 (1964), 115–123.

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Stanisław Lem would never forget Leszek Kołakowski's this sentence.⁹³ In 1991, 27 years after this review, he published an article titled "Trzydzieści lat później"⁹⁴ [Thirty years later] in *Wiedza i Życie* journal, in which he was extensively showing that "the virtual reality," which was then the fresh and highly publicized achievement of technology, was a faithful fulfillment of his own predictions from ST about phantomatics.⁹⁵ This was exactly the part of ST that Kołakowski considered pure fiction. Lem responded:

Kołakowski censured completely the very core of the predictions contained in *Summa*, by stating that the reader would have difficulty distinguishing fairy tales from information in it. He did honey the author with some compliments but they went completely sour when he accused me in conclusion of "intending to liquidate" the real of philosophy, and most particularly he blamed me for presuming that one day in the future this realm could be invaded by products of technology. He then broke the camel's back by saying: "Hence one could answer Merleau-Ponty's question about what was left of philosophy after the results of modern science by simply repeating: everything that had been there before." (12)

He then added some quite straightforward allusions about the meanders of his adversary's intellectual development (Kołakowski was enthusiastic about the communist system in Poland in the 1950s) and accused him that he never made the effort to get acquainted with the effects of technological progress, and that "*infallibilitas philosophica* remained the corner stone of his position" (13). In

93 He produced a replica in a discussion about ST published in *Studia Filozoficzne* journal, where Lem wrote: "Does the book express a position that could be described as 'apologetic to technology'? I do not think so; I have too many reservations about the mighty forces we have ourselves set in motion. Am I the ideologist of a 'scientistic technocracy'? As much as a person in a dinghy in the middle of the sea can be an ideologist or an avid follower of a faith that states that if they do not make the best possible use of oars, sail and mast, this journey will not end well for them. If I kept repeating in the book that the only cure for technology (its terrible effects) is another technology, it was because I was convinced this is the actual state of affairs; not out of some enthusiasm" (*Studia Filozoficzne*, no. 2 [1991], 97).

94 Stanisław Lem, "Trzydzieści lat później," *Wiedza i Życie*, no. 6 (1991), 10–23.

95 A little later in one of the articles in *PC Magazine*, which were then collected in the volume *Tajemnica chińskiego pokoju*, he admitted that he had got carried away by the enthusiastic media reports: "I sinned with triumphalism, because my 'phantomatics' is to the technologies of *Virtual Reality* what perhaps a new Mercedes model is to a steam-engined three wheeler, built in 1769 by an engineer called N[icolas] J[oseph] Cugnot" (*Tajemnica chińskiego pokoju*, Kraków: Znak, 1996, 33).

conclusion of the text, half of which basically consists of excerpts from ST, Lem sums it up as follows:

What then does a philosopher do when preparing a selection of his essays from 30 years earlier? Following the title of the anthology of these reprints *Pochwała niekonsekwencji* ["Praise of inconsequence"] [which is the title of the collection in which the text about ST was reprinted – PM] he calmly repeats that everything Lem made up about phantomatics back in 1963/64 is sham. (23)

Kołodkowski responded in a letter to *Wiedza i Życie*,⁹⁶ in which he wrote, among other things:

Lem states with triumph that – as opposed to all other futurologists – he was the real prophet, because “phantomatics,” i.e. creating perfect illusions, came true, while he had been teased when 30 years earlier, rather than a year or two ahead of the time, he accurately predicted the future, and “fame and fortune” do not come to the early prophet, endowed with a special sense to scientifically look into the future, but to the poorer one, who comes on time; well, indeed, sad is the fate of minds too sharp ... (71)

What follows is a polemic with the charge of ignorance about the realm of virtual reality, but in nearly every sentence Kołodkowski suggests mockingly that Lem is suffering from an “omitted prophet syndrome.” Finally he writes simply:

Lem's resentment leads him even to an observation that “‘infallibilitas philosophica’ remained the corner stone of his [i.e. my] position” – the very absurd view that I have mocked so many times ... he claims that my 1964 review was a barely honeyed criticism; I thought the proportion was reverse; but who could measure that accurately! ... It seems, however, as an author of a review of his book in *Times Literary Supplement* remarked a few years ago, that he feels hurt that the humankind does not admire him as much as it should. ... *Vanitati creatura est subiecta*, as the Scripture puts it; vanity is common, but the art of vanity lies in not showing it; it is not difficult – all it takes is a sense of when one becomes absurd. (72)⁹⁷

Great people tend to have great memory and a sharp tongue. I daresay, however, that this conflict may seem pointless, as it is stems from a basic misunderstanding. Kołodkowski's review did not condemn Lem completely, and yet this is all Lem saw in it. The reviewer's torn position was not merely caused by ambivalent impressions, but had roots in the book's inherent qualities. What were they?

96 Leszek Kołodkowski, “Lemowi,” *Wiedza i Życie*, no. 12 (1991), 71–72.

97 An echo of the letter returns in Lem's article “Fantomatyka (II)”; cf. *Tajemnice chińskiego pokoju*..., 51.

8 What Is “Lem’s Essay”?

Lem’s four big discursive works: *Dialogues*, *Summa Technologiae*, *The Philosophy of Chance* and *Science Fiction ad Futurology* tend to be described by critics as “essays.” The term is not quite accurate in so far as a typical essay would not be more than a few dozen pages long, whereas all four of Lem’s “essays” are hundreds of pages long, with *Science Fiction and Futurology* nearing a thousand. They do however fulfill other criteria of essays in the Polish sense of the word: they follow a fairly liberal line of argument and include very limited academic references and tools (i.e., notes and references, bibliography). These features, however, which sometimes work perfectly for a “typical,” short essay, can have a very different effect in a text exceeding 700 pages, or even just 300. Such a huge essay, a hybrid form in size and text structure, becomes difficult to grasp and categorize, especially if the author had large aspirations, and the text subject touches on science – and both are definitely the case with Lem. Lem uses both the right that authors of informal essays have to construct his argument with a degree of liberty, and the right of a scholar to produce a synthesis of his subject matter. It is particularly troubling for someone trying to analyze ST and to grasp what theses the author is actually striving to prove. The richness of knowledge contained in it and the very peculiar structuring make ST a typical example of “an open text,” which can be subjected to divergent interpretations. That’s why Kołakowski could find in it a proof of “scientist technology” and Lem could feel offended by it.⁹⁸

Before I undertake my attempt at an analysis of ST, a few words about the title. Kołakowski wrote about it that: “if Aquinas’ *Summa Theologica* were to the heritage of theology what Lem’s *Summa* is to technology, it should contain hypotheses and information about quaternizing trinities, perspectives for cherubinizing humans and about pseudo-pandemonic mercy” (116). Jerzy Jarzębski believes that the title is a sign that God has been replaced by Reason as the principle

98 Another difficulty are the changes that Lem introduced in ST in subsequent editions. My interpretation is based on the 4th amended edition (Lublin: Wydawnictwo Lubelskie, 1984), 352. The quotations and references in English come from the translation by Joanna Zylińska (Minneapolis, London: University of Minnesota Press, 2013). It does not, however, include the afterword “Dwadzieścia lat później” [Twenty years later] which is included in the 4th edition in Polish. Neither includes the original first chapter “Sztuka i technologia” [“Art and technology”], which the author removed from it after the 1st edition. In the subsequent editions Lem would expand on certain chapters.

ordering the world, “as a power which had agency and is independent from biology, aiming in its evolution in its own uncharted directions.”⁹⁹ The problem is that for Aquinas God is the only and the absolute principle, and the entire gigantic intellectual structure of *Summa Theologica*, with its clockwork precision of questions, arguments and counterarguments, is unconditionally subordinate to this one principle. Meanwhile, in ST the Reason has a primary role, as it does throughout Lem’s philosophy, but it is not an Absolute and it cannot be in light of the views of the author, who always avoided seeing anything as an Absolute. And when it comes to the formal qualities of the two works: one would be hard pressed to find two texts as different as Aquinas’ *Summa Theologica* and Stanisław Lem’s *Summa Technologiae*, the reasons being the ones I have listed before (rigorous treaty vs. liberties of an informal essay). Therefore, I believe the choice of Lem’s title was really determined by aesthetics and ambition rather than any precise idea of analogy.

What is the subject matter of ST, how can it be defined? Or rather, what answer can be given to this question based on the context of the work and author’s intentions? If I wanted to outline the historical context for ST, as I did for the *Dialogues* before, I would need to write a history of the entire 20th-century science, with the history of its first half as the background of Lem’s book, and the history of the second – a verification of his predictions. Perhaps it is exactly when analyzing ST that a Lem scholar has the strongest sense of his or her incapacity to handle the task fully and of the task’s immense scope; when writing about Lem it is hard not to write about everything. And it is because he writes about everything.

But how does he do it? Only a naive reader could believe that Lem really mustered the entire human knowledge, more than any expert in any discipline. He has indeed exceeded most of them in creativity of his thought on science and the world in general, but his method of navigating the seas of scientific knowledge is somewhat different from the typical scientific methodology. It could not be otherwise, given that his ambition is to grasp those seas from shore to shore, sail high seas and not just stride along coastlines. In short, Lem’s method is to write scientific informal essays. He has amazing knowledge, certainly vaster than most of his contemporaries, but he juxtaposes different elements in a way that is neither scientific nor unscientific. It is something in-between, which translates into the convention of an informal essay causing not small a headache for someone

99 Jerzy Jarzębski, “*Summa technologiae* i jej potomstwo. Posłowie,” in: Stanisław Lem, *Summa Technologiae. Dzieła zebrane* (Kraków: WL, 2000), 494.

who strives to interpret him. The latter’s level of scientific immersion is usually very different still. Lem is the genius amateur, while a Lem scholar – just an amateur. These three levels of thought raise great problems in categorizing any “lemological” research: they are neither literary criticism, not science studies, but it should combine the best in both. If it could succeed, the interdisciplinary character of this three-level structure (science–Lem’s works–research on Lem’s works) would undoubtedly yield remarkable results.

The unscientific character of ST can be seen not only in the liberty of arguments (which still form a subtle structure), but also, it would seem, in its main objective. It is an elaborate prediction of how technology and science would develop; it is a type of futurology – but a very peculiar one, as I shall show soon. And predicting future on a scale undertaken by Lem in ST is very foreign to science, which does formulate predictions based on research into the current state of affairs and theory (and some threads of positivism and contemporary philosophy of science assume that this is its main goal), but certainly in a much more limited way.

This is enough at this point about the metaproblems with analyzing ST. It needs to be added that Lem was hardly ever interested in sociology of science and knowledge, or their social context. He was wholeheartedly a scientist, convinced about the absolute independence of science and technology from anything outside their realm. Małgorzata Szpakowska has laid out this quality of his thought very accurately.¹⁰⁰ Interestingly enough, however, he did see the social context of science in his literary works, especially in *His Master’s Voice*.

100 *Dyskusje ze Stanisławem Lemem...*, 73–74. There is a sentence about it in ST: “**Even though it may seem strange** [emphasis mine – PM], there are many contradictory viewpoints with regard to what a scientific theory actually is” (382). Lem put the sentence in one of the notes, not in the main body of text.

9 Prolegomena

I have always found human oscillation within the boundaries determined by elementary provisions of little intellectual interest and therefore I was more eager to deal with utterly extreme possibilities (as in S[umma] Techn[ologiae] for instance), without being concerned with how realistic they might be. But then I was never involved in futurology as it is conceived today, which is sort of descriptive, but I preferred being a normativist... and I never claimed otherwise, did I...

Letter to an unidentified addressee, September 29, 1972

Yet, *Summa Technologiae* is a work of futurology, albeit not a typical one. Without a doubt. This is how the author planned it and it can be read from its content and structure. It is sometimes considered to be a project in philosophy of science and technology, and such themes can be traced in it, whenever Lem is pondering on the ontological status of his observations and indulges in methodological digressions.¹⁰¹ However, treating ST as belonging entirely to philosophy of science and technology prevents an analysis of other aspects of it, which are much more significant in my view.

The spirit of cybernetics hovers over the entire ST. It needs to be remembered that the book was written at a time of unfading enthusiasm about science. It is particularly clear in chapter 4 (“Intelectronics”), containing predictions on the development of “artificial brains.” There, Lem employs conceptual tours and arguments that are close to the ones we saw in *Dialogues*, including the specter of “cybernetic sociology.” It seems that this part of ST stood the test of time the least, as the growth of computers – both technologically and socially – ended up going in a completely different direction, which we can see quite clearly today. But even this chapter contains important points that require some scrutiny.

“Futurology,” “philosophy of science and technology,” “cybernetics.” These are the key words in ST. Before I proceed to outlining the general principles of its structure, I need to point out that the first of these terms is particularly

101 Kołakowski identified ST as a work belonging to the field of philosophy of technology, which was, too, refuted by Lem in their dispute.

important in this chapter. And this is because if the author really intended this work as a prediction, as a set of visions for the future (and Lem states such intention explicitly in many places), then someone venturing to interpret the work has every right to compare this type of prognosis with the current state of affairs. And most of Part Two of my book will be devoted to such a comparison. Going through subsequent chapters of *ST*, I shall try to show in what ways the notions and predictions formulated by Lem relate to the contemporary state – not of science and technology, as I lack competence in that regard, but to the contemporary state of thought about them. And that seems to be an acceptable approach, as *ST* itself is a type of such thought, and not a handbook or a synthesis. Some of the books Lem published in the 1990s are his own responses to these predictions.¹⁰² However, he focuses only on the negative consequences of the dynamic progress of technology, discussing them with little interest though, which, one may assume, is a result of his feeling of disappointment that his main idea that should govern the progress of technology – that is, rationality and proportional growth of the potential of technology and ethical pragmatics of its use – did not come true at all.

The central subject that *ST* circles around, according to the author, is “a slogan which through its associations sounds rather amusing, that is the call to ‘catch up to and even overtake Nature.’”¹⁰³ Our species, according to Lem, should go beyond limitations imposed by evolution and physical conditions of growth, but Nature should help with that, suggesting the best solutions.¹⁰⁴ This is how one could summarize the book, which includes the following passage in one of the initial chapters:

The end of this road does not lie, as some claim, in the “duplication” of the human design or the design of some other living organisms, inside the electrical circuits of digital machines. For now, life’s technology is far ahead of us. We have to catch up with it – not to ape its results but to exceed its seemingly unmatched perfection. (25)

102 Cf. Jerzy Jarzębski, “*Summa Technologiae* i jej potomstwo.” This refers mostly to *Tajmnica chińskiego pokoju*, *Bomba megabitowa* and *Okamgnienie*. Numerous remarks about the accuracy of his predictions in *ST* are scattered throughout Lem’s writings starting with the early 1990s.

103 “Discussion [on *ST*]”, *Studia Filozoficzne*, no. 2 (1995), 95.

104 It is telling that Lem generally ignores one of the basic qualities of the Western culture – that people aim to go beyond Nature through Culture. Instead he proposes a paradox of “going beyond Nature through Nature,” the meaning of which will be thoroughly analyzed here.

It only becomes clear at the end of the book that this is where Lem states his intention according to which ST is to become not only a general prediction for the development of civilization, but also a **project of autoevolution of the humankind** – the central element of the civilization’s growth. **This is how – as a utopian project of autoevolution – I will treat ST throughout this book.** I am emphasizing it here in order to avoid misunderstandings in the parts that will follow, especially as the main subject of ST is built up with numerous preliminary studies, each requiring a separate analysis. My following chapters will then run parallel to the development of the text of ST, without merely summarizing it, but instead offering an extensive commentary, which will be concluded with an attempt to synthesize the meaning of this complex work. Then, in Part Three, I shall try to contextualize Lem’s project of autoevolution with broad reference to contemporary intellectual tendencies.

A peculiar quality of Lem’s style in ST needs to be pointed out here. Words such as “Nature,” “Machine,” “Reason,”¹⁰⁵ “Designer,” “Science,” “Culture” appear on nearly every page, usually capitalized. For Lem they are the fundamental notions around which he weaves his entire discourse, and not only in ST. But they are not explained anywhere. Lem does not provide precise definitions of them (with the exception of a relatively precise definition of “Machine” at the beginning of the fifth chapter), but he does often contextualize them. They are not scientific terms then, but metaphors rather, figures, which Lem uses to map out the scope of his thought. They are indefinable, probably partly because he sees them all as self-evident, and partly because these are his primary notions. It resembles some old philosophical systems with their fundamental concepts such as “God,” “being,” “spirit” – to the explanation of which a whole system would be devoted, while they themselves were to guarantee its coherence by marking the very core of reality, “the transcendental signified.” In that sense, Lem is closer to the tradition of the Western metaphysics than he is to “the ideology of scientist technocracy” – assuming we do not treat the latter as a type of metaphysics as well (and what would an absolutization of Reason and Nature be?).

105 In the English translation of ST, Joanna Zylinska chose to translate the Polish word “Rozum” as “Intelligence,” which has some merit, but it seems that the connotations related to the Enlightenment are more pertinent in this case, so the word “Reason” would be more accurate here. I leave Zylinska’s translations unchanged in that regard, but translate “Rozum” and “Reason” whenever the author references the term outside quotations (Olga Kaczmarek).

ST was not analyzed more often than *Dialogues* – hundreds of phrases such as “personoclastic cerebromatization,”¹⁰⁶ would scare off humanists, while scientists would be put off by the bold “fantastic” prediction and the “vagueness” of an informal essay. In the few interpretations that have been published, ST was mostly seen – if not simply as glorifying science and technology, then at least as an important stage in thinking about them.¹⁰⁷ The reviewers did notice that in ST Lem was in fact modifying the meaning of those notions as they were known before. It was only Małgorzata Szpakowska and Jerzy Jarzębski who, starting in the late 1980s, began to notice that Lem was in fact subverting the very distinction between what is scientific and what is not, and what is natural or artificial. However, these two most eminent Polish Lem scholars differ radically in their interpretation of the fact. In her *Dyskusje...*, Szpakowska wrote: “Lem is convinced about the continuity between the behavior of human as a biological creature and human technological efforts mediated through conscious actions” (66). And immediately after: “From the point of view of an individual human subject technoevolution is something external, independent and unavoidable, as bioevolution is for an individual creature, which at best is capable of looking for the best tactic in struggle for survival.” For Szpakowska, technoevolution, just as most other themes in Lem’s discursive works (as opposed to his fictions), has no metaphysical connotations. Jarzębski has a radically different approach and he devoted a lot more attention to neutralizing the Natural/Artificial distinction. In the article *Naturalne, sztuczne i dziura w kosmosie* [“The Natural, the Artificial and a Hole in the Universe”],¹⁰⁸ he claims obliterating this distinction in Lem’s thought correlates with the anxiety about the superior meaning of human existence in the Universe, and the notion of Reason is a factor that can help dispel this anxiety.

106 On page 217. It means a mechanical, invasive transformation of human brain, which irrevocably changes the personality of the person subjected to this procedure. The notion appears in the context of social engineering.

107 Kołakowski, “Lemowi,” *Studia Filozoficzne*, no. 2 (1965). Apart from that one, four Polish editions inspired altogether twelve press reviews (based on relevant volumes of the annual Polish Literary Bibliography). The 1st edition (Kraków: WL, 1964, 470) – 6 reviews; the 2nd amended edition (Kraków: WL, 1967, 97) – 2 reviews; 3rd edition (Kraków: WL, 1974, 505) – 2 reviews; 4th amended edition (Lublin: Wydawnictwo Lubelskie, 1984, 352) – 2 reviews. So far ST has been translated to Russian (1968), Hungarian (1972, 1977), Serbo-Croatian (1977), German (1974, reprinted in 1978, 1980, 1981, 1986), Latvian (1987), Czech (1995) and English (2013).

108 Jerzy Jarzębski, *Wszechświat Lema...*, 278–297.

Lem's writing shows that there is no way out of this dilemma [of desiring meaning in a meaningless world – PM]. Perhaps then there is faith in the existence of transcendence – not a religious one, but rather a philosophical one: as the space where the laws of our evolution are rooted (perhaps by some kind of superior consciousness) and hence their impersonal and unconditional character is redeemed. This is also where Reason can escape the trap of a closed universe with its antinomies. (297)

According to Jarzębski in Lem's works Reason:

becomes only something like a passenger, who temporarily settles inside the body of the evolving humankind in order to use this habitat to its biological limit and make a leap into another reality, move into the environment of increasingly complex machines. Once it mounts mechanisms, Reason will likely again exploit their potential to the limit in order to then move onto another horse – and so on.¹⁰⁹

This type of Hegelian vision of Reason seems to me to be too far-fetched a hypothesis, as Lem probably never accepted Reason as an entity with such a degree of ontological independence. I believe it would be too “metaphysical” a leap for an author who usually avoided any metaphysics. On the other hand though Jarzębski's view corresponds well with his interpretation of the title of ST.

Jarzębski also points to the themes in Lem's fiction that refer to lifting the opposition between the Natural and the Artificial. It is one of the subjects of *Observation on the Spot* – the lifting of this distinction surfaces there as the ethicosphere of Entia, permeated with microscopic particles, “quickies,” which make it impossible for Entians to commit acts that are forbidden by their law or harmful to others. Jarzębski writes: “It is about bringing the designer's work to a level where differentiating between the artificial and the natural would no longer be possible, and hence the very matter itself (to a certain degree) – ‘the laws of nature’ – would fall into the scope of engineer's skills. ... The very idea of obliterating the differences between the artificial and the natural becomes important here and it triumphs. As a result the entire universe becomes an arena of technological mechanisms and is (potentially) permeated by rational will.”¹¹⁰ Jarzębski also points out that countercultural movements in the second half of the 20th century opposed just such a model of the world: “A human surrounded with technological devices, enhanced through them and enriched by them, is no longer the same human as before. So this modification could be rejected.”¹¹¹ It

109 “Literackie przygody uniwersalnego Rozumu,” in: *Wszczęświat Lema...*, 143; see also further on page 144 and following.

110 “Kosmogonia i konsolacja”..., 97, 98.

111 “Literackie przygody uniwersalnego Rozumu”..., 164.

turns out, however, as I shall try to show, that in the context of Lem's thought on technology such arguments lose meaning.

Now, in the 21st century, this destruction of scientist and positivist oppositions becomes clearer and clearer. Let us read the author's words more closely:

We shall also, by way of speculation, consider the domains in which man's enhanced activity of this kind will match Nature's work. Even then will man remain subject to limitations, the material aspect of which – conditioned, as they will be by the technology of the future – we cannot predict, but the psychological effects of which we can at least partially grasp because we are ourselves human. The thread of such understanding will only be broken when man, in a thousand or a million years' time, gives up his entire animal heritage, his imperfect and impermanent body, for the sake of a more perfect design, and when he turns into a being so much higher than us that it will become alien to us. Our preview of the future will thus have to stop at sketching out the beginnings of this autoevolution of the species. (40)

Lem “outlines the beginnings of autoevolution of the species” on the hundreds of pages of ST that follow. The analysis leads again, as in *Dialogues*, on a high level of abstraction, carefully avoiding any specifics. Jerzy Jarzębski mentions that he was surprised by the lack of descriptions of everyday life of the people of the future.¹¹² Lem does not include them because he knows it is easier to predict the general progress of civilization than the details of it, and moreover one can presume he has little interest for the everyday of the future. He is interested in thorough transformations of human world, global or even cosmic changes – and not what we would eat and how we would spend our free time. He described it in his novels (most broadly in *Return from the Stars* – and he considered this the poorest of his novels). The everyday life of normal people seems repulsive to Lem, which can be confirmed by his disgust with contemporary technology, stemming to an extent from it having become “common,” from computers descending from the highs of science to business and pop culture, which started with the introduction of personal computers, and intensified with culture 2.0.

The “absence of the everyday,” which was so astonishing to Jarzębski, is a symptom of a more general “absence” or “lack” in ST. Lem is hardly interested with general social processes at all there – on any level. He almost does not mention the question of the influence of the great technological changes, which he describes passionately in the book, on the social, cultural and political life. There are only a few remarks about social cybernetics in ST, a faint echo of the subject extensively treated in *Dialogues*, and a very limited analysis of psychological and social consequences of phantomatics. ST is suspended in “social vacuum.” Here it is interestingly

112 “*Summa technologiae* i jej potomstwo”..., 483–494.

different from the contemporary philosophy of technology, which mostly focuses on rationality of the technological progress in the social context and on the human responsibility for this progress and its impact on the habitable zone and future generations.¹¹³ It is easy to explain Lem's perspective in *ST*. First, and that is an accidental reason, hoping to predict the social development, he would immediately end up in conflict with the contemporary political ideology, risking, at best, censorship, and in the worst case scenario – putting the entire *ST* to rest. Second, and this is a much sounder reason intellectually, Lem probably decided that predicting technological and scientific changes, while risky, can still be sensible, as the range of these changes is somehow conditioned by the laws of physics, mathematics and logic, whereas any prediction about social changes (even if they are related to the former) is completely random, as the development of society and culture cannot be contained by any rules or any theoretical model – so one can predict anything there.¹¹⁴ Omitting the domain of social communication has a huge unwarranted impact on the whole of Lem's project of future civilization, as it practically prevents any thought on culture – if culture is to be understood as a correlate and center of this communication. Therefore, the entire issue of human autoevolution, which is the subject of *ST*, is located beyond culture and beyond the sphere of the social.

In the interpretation of *Summa Technologiae*, which I present on the following pages, I describe “technology as life world” – *Lebenswelt*. This concept, derived from phenomenology, described well the function of technology in the future civilization, both according to Lem, and according to the numerous contemporary theoreticians, whose views will be discussed here. Technology and its products have been taking over the world of our experience since at least the beginning of the 20th century. Most of the contemporary cultural studies is focused on the consequences of the “real” world being mediated by its technological replicas and representations. *ST* is also analyzed here as an original attempt to grasp this process of takeover and its possible implications.

113 In the notes to *ST* following sentences: can be found “All of this does not, of course, amount to suggesting an equivalence between man and any material object to be constructed or any technical product to be improved. The aura of moral responsibility must envelop the field of bioconstructionism – which is an area of great risk (but also perhaps of equally great hope)” (321). These sentences remain unrelated to the whole of the book though.

114 If that supposition is correct, it means that while writing *ST*, Lem had to give up his conviction about the possibility of cybernetically regulating the social system, which he widely promoted in *Dialogues*. Hence, the sparsity of remarks on the subject in *ST*. See also the next note.

10 Evolutions

*Nihilism? In my books? There might be something to it,
you may be in on a secret here. I would call it – futility...
it is careful about the décor, which denies it on the surface.
Saying terrible things, quite innocently, as if in play...*

Letter to Michael Kandel, July 1, 1972

ST starts with a description of analogy between two evolutions: biological and technological.¹¹⁵ Listing similarities and differences between them, Lem suggests that the Designer – the symbolic figure personifying the human technological potential – should consciously replicate the solutions unconsciously applied by Evolution. In ST the differences stemming from the targeted character of conscious actions of a temporal Designer and the undirected, impersonal process of Evolution lasting billions of years are subjected to a very detailed analysis. I am interested in something else though. The 19th- and 20th-century science, affected by the myth of the omnipotent non-Natural Reason, separated so much from its capacity to adopt bioevolutionary solutions in technology that the occasional suppositions about, for example, the perfection of spider nets (perfection from the point of view of human technological needs) were formulated as surprising and remarkable. More or less when Lem was writing ST, the theme of “peeking on nature” appeared in scientific and popularizing discourse. Its initially modest impact was a result of prevalence of the type of thinking, which prevented forming any kind of connections between Technology and Nature.

115 Małgorzata Szpakowska adds another one – evolution of culture, discussed in *The Philosophy of Chance and Science Fiction and Futurology*. From the point of view of this work that juxtaposition is not coherent, as ST does not discuss culture at all. Culture is not a part of the concept of autoevolution as Lem understands it. But autoevolution can be interpreted in cultural terms and this is what I will be interested in. Szpakowska makes one important remark: “in Stanisław Lem’s views two notions play a key role: evolution and accident” (*Dyskusje...*, 54). *Dialogues* and ST – both devoted to technology and science – are governed by the former of the two concepts, while *The Philosophy of Chance and Science Fiction and Futurology* – devoted to culture – are subordinate to the latter. This would mean that in the later stage of his philosophical development, Lem decided statistics is the model of cultural reality that none of the other fields of mathematics and natural sciences could provide.

Cybernetics, the history of which was outlined in the previous part, was one of the first attempts at a methodological synthesis of Nature and Technology. Before that these were two separate worlds, between which there was Science, studying Nature, on the one hand, and providing theories as bases for growth of Technology, on the other.¹¹⁶ This would be called “stealing Nature’s secrets” – of course in order to discover the truth about the world and subject it to humans, but not to use the rules of Nature in the products of Technology. When the Wright brothers were designing the first airplane, they did not connect the design of wings with an analysis of the dynamics of bird flight. When radar was invented, it was not associated with bats in any way. Positivism and scientism contributed greatly to solidifying this distinction. Even though the same laws of physics and chemistry describe the functioning of living organisms and technical machines, since La Mettrie no one ever thought that these two worlds could be linked with ties other than theoretical. This is when a distinction between an invention and a discovery became popular – the distinction which, I should emphasize strongly, has nearly lost its meaning, at least within the domain of biotechnology, but also in sciences such as molecular physics, where the objects of observation and discoveries are mostly constructed theoretically. The emergence of this distinction was of course connected to the model of man, popularized by the Enlightenment, as a creature independent from Nature, and endowed with a Reason independent from Nature. The remains of the Christian view of Man as the lord of creation went even deeper. In the 19th century in the collective imagination, shaped by the early mass media, “a discovery” was associated with an image of a fearless white pioneer, fighting his way through a wild jungle or an ice desert, whereas “an invention” would convey an image of an engineer or a scholar, working in the quiet of his studio or in an orderly lab. In the late 19th and early 20th century such figures of collective imagination included Henry Morton Stanley, Edward Peary or Nils Nordenskjöld as discoverers, and Thomas Alva Edison and the Wright brothers as inventors.¹¹⁷ They were presented as heroes of civilization, inspired by the project of progress and growth, which determined the shape of collective imagination of the Western civilization between the end of the 18th century and the first half of the 20th century. The epoch preferred discoveries and inventions that would bring immediate benefits to the society at large or that would strengthen the

116 This generalization does not refer to the group of great discoverers and inventors without formal education (the most famous among them being Faraday and Edison).

117 Pasteur takes a middle position in such a typology as a discoverer working in a lab.

position of the European biggest political powers (the impact of the British imperialism on the dynamics of exploration in Africa cannot be overestimated). Perhaps this is the reason why the 19th-century discoverers of the fundamental laws of nature, such as Dmitri Mendeleev, never became great heroes of mass imagination. It was only changed by the discoveries made by Roentgen, and Skłodowska-Curie, who attracted large “media” attention. The fact that Albert Einstein became a pop icon has its roots in a completely different cultural context, and mostly in the processes of mass culture.

The revolutionary character of Lem’s thought is becoming more readily apparent, I believe. Despite the metaphorical vagueness of the analogy between two types of evolution, the heuristic potential of the juxtaposition was huge. It was nothing less than questioning the very distinction between the Natural and the Artificial, Nature and Technology, discovery and invention – and the questioning was coming just when these oppositions seemed completely undoubtable. Lem rejects them – and the entire *Summa Technologiae* is built on this refutation.¹¹⁸

The thesis that bioevolution and technoevolution run parallel may imply that Lem is continuing the old Spencerian evolutionism. This would be utterly wrong though. Lem never used this metaphor to describe the structure and functioning of the society, which, as we remember, he preferred to describe in terms of cybernetics. His terminology might be vague, but he never adopts narrowly defined biological terms to science. And above all evolutionary metaphors are not related to progress and teleological growth in his thought – neither in biology, nor in technology. He never claims that autoevolution is the most perfect form of being, but only that it is an inevitable consequence of how humankind has been developing so far. If one wanted to look for fathers of this type of thinking, creatively combining biology and science, one should point to Sir D’Arcy Wentworth Thompson (1860–1948). The British mathematician, biologist and classicist is the author of a monumental work *On Growth and Form* (1st edition 1917, 2nd edition 1942), where, in a nearly Pythagorean manner, he describes, how the laws of physics and mathematics determine the morphogenesis and ontogenesis of living creatures.¹¹⁹ He answers such questions as (and who does not ask

118 Jacques Monod also proposed rejecting the opposition between the natural and the artificial in his famous 1970 book *Le Hasard et la Nécessité* (Paris: Seuil, 1970, 17–18).

119 Thompson’s thought remains outside the mainstream evolutionary biology, but the most eminent representatives of the discipline speak about him with highest regard. In his foreword to an abbreviated edition of *On growth and Form* (Cambridge: Cambridge University Press, 1992, XXII+346), Stephen Jay Gould emphasizes the extraordinary erudition presented by Thompson, who quotes Leonardo da Vinci and Dante in the

themselves that?): why the spirals on snail shells are so precisely drawn or where does the shape of pelvic bone come from in mammals.¹²⁰ Lem never mentions Thompson's name, but there are many passages in ST that resemble his style, when Lem discusses the impact of the shape of our body, or – on a lower level – of the cell metabolism, on our life and technology; and all this, as Lem does not fail to emphasize, depends on external physical conditions. Both authors are not only characterized by interdisciplinary thinking and a certain intellectual gigantism, but also enjoyed little popularity with their contemporaries and for the same reasons: Oxford humanists thought Thompson was a renegade (as he occupied himself with the unworthy field of biology!), while biologists and mathematicians took him for an odd amateur (he was the author of *Glossary of Greek Birds*, which combined philology with ornithology). Thompson's intellectual biography could be an inspiration to think about the problem of “two cultures” – and we should remember both the term and all its consequences were originally born at British universities. Perhaps Lem's intellectual biography could be an incentive to understand changes within “the third culture” better.¹²¹

first sentence of his work. It is telling that Gould – shaped by the paradigm of specialized science – is amazed by the “renaissance” quality of Thompson's thought.

120 Turing's works on morphogenesis was in some ways inspired by Thompson's views. In the recent years Thompson's way of thinking about nature has been returning in the ideas of Stephen Wolfram or Adrian Bejan, who build general models of mechanisms structuring complex biological forms basing them on contemporary laws of mathematical physics.

121 This is the term used to describe the shift of culturally creative functions from the humanities to natural sciences, which has been popularized since the early 1990s, mostly by American scholars. Cf. *The Third Culture*, ed. by J. Brockman (New York: Simon & Schuster, 1995).

11 Taking UFO Seriously

The first problem Lem discusses in *ST* after the initial chapter about “two evolutions” is the existence of two civilizations in the universe. For a contemporary reader this may be somewhat surprising and an argument for a view that Lem is only a sci-fi author. However, beginning *ST* with this subject is a very conscious and justified move. It needs to be remembered that in the 1960s the question of extraterrestrial intelligent forms of life was raised by serious scholars.¹²² This is the time of the vast SETI program (Search for Extraterrestrial Intelligence), all of which that was left 20 years later was *E.T.* in Spielberg’s blockbuster. In Soviet Byurakan an international symposium on extraterrestrial life was held, and Lem was an active participant. A study of contemporary writings on the subject could help determine the borders between the scientific treatment of the issue and the popular media news about unidentified flying object (UFO).¹²³ In the 1970s the complete lack of positive results of the search for signals from other intelligent creatures (the so-called *Silencium Universi*) led to decreasing interest

122 Including especially Carl Sagan (1934–1996), Francis Crick (1916–2004) and Sir Fred Hoyle (1915–2001).

123 Ufology and the concept of ancient astronauts (i.e., that aliens were actively involved in the emergence of ancient cultures and civilizations) merit a careful analysis as parascientific discourses. Reading the writings in the field (especially the works of Erich von Däniken) shows complex functioning of elements of language and scientific methodology. In short it can be said that the authors of such works reject the authority of “the officially accepted science,” but they employ its tools (or, strictly speaking, their simplified copies) to build their own theses in order to paradoxically add to their authority, based on “scientific precision.” Such authors are usually unaware of the paradox and the fact that their arguments notoriously violate the most basic principles of scientific thinking (including the principle of reproducibility of experiments). Lem often emphasizes that science cannot deal with one-time phenomena (in *ST* he writes about it in the chapter “Extrasensory Phenomena,” 354–358). A more thorough analysis of ufological texts would require a separate study. Many have criticized ufology and the concept of ancient astronauts (cf., e.g.: Wiktor Stoczkowski, *Des hommes, des dieux et des extraterrestres. Ethnologie d’une croyance moderne* [Paris: Flammarion, 1999]). A psychoanalytic take on the UFO phenomenon can be found in Carl Gustav Jung’s essay *Flying Saucers: A Modern Myth of Things Seen in the Skies*. So far, however, there have been no analyses (at least not in Poland) of the language of the discourse on ufology and ancient aliens that would approach the subject in the way I suggest in this note.

in the issue among scientists and eventually its shift into the mass culture, where it has flourished ever since, for example, in the *X-Files* series.¹²⁴ The Silencium Universi is a serious problem in itself, but philosophical rather than scientific. It inspired Lem, both in ST and elsewhere, to think about whether potential intelligent aliens could be intentionally concealing their presence in the Universe.¹²⁵

This would be reason enough for Lem to treat the problem of extraterrestrial civilizations as a pertinent one. Moreover, the problem has its justified place within the structure of ST. Lem starts with a premise that if he is to predict the development of our civilization, he first has to compare it with other civilizations. Or it should be done – but we know no other. From this lack Lem derives conclusions about what he believes the hypothetical civilizations have to be like. Rejecting the famous hypothesis formulated by von Hoerner about common self-destructive tendencies among cosmic civilizations,¹²⁶ Lem points out that “the Intelligence we shall discover one day will possibly be so different from our ideas of it that we shall not even want to call it Intelligence” (68–69). This is a recurring theme of many of his novels, especially *Solaris*, *His Master’s Voice* and *The Invincible*: man is trapped in the solipsism of his own thinking and perception, and he can only feel it, when faced with an alien intelligence. Other forms of life may be too different for us to start a contact and understand their thinking – just as we cannot grasp how animals see the world¹²⁷ (although Lem fails to see the analogy), or even the details of other people’s consciousness, especially if they are removed from us in time and space, or belong to other cultures. Of course, when it comes to contact with Aliens these differences would have been much bigger and more intense.

This is the chapter when for the first time in ST there is a suggestion that intelligent forms of life may not only transform their environment to adopt it to their

124 The SETI program is still in operation though and it is dynamic, as can be seen on its rich website: <http://setiathome.ssl.berkeley.edu/>. Many personal computers connected to the Internet also analyze the radio data. In the 1990s both NASA and its European counterpart European Space Agency (ESA) renewed their interest in the subject, now as “astrobiology,” which does not look for intelligent forms of life but for bacteria.

125 Cf. especially *The New Cosmogony* in: *A Perfect Vacuum*.

126 It is the time of the most intense arms race. Von Hoerner’s hypothesis, which was formulated to explain Silencium Universi, assumes that every or nearly every civilization destroys itself once it reaches the technological stage – and therefore it never has enough time to broadcast signals of its existence into the universe.

127 Cf. Thomas Nagel, “What Is It Like To Be a Bat?,” in: *Mortal Questions* (Cambridge: Cambridge University Press, 1979).

needs, but they can also take up the task of transforming themselves through autoevolution (70–71). In such a case observing the traces of such creatures would be even more difficult for us, people. We are used to Reason, meaning “a heroic attack on surrounding matter” (70). But this, as I wrote before, is a positivist conviction. We can already see that autoevolution as conceived by Lem renders the opposition of the artificial and the natural meaningless. Looking for traces of intelligent life in the universe, we are looking for **the type of transformations in Nature, which could be seen as a result of intentional acts of Reason** (e.g., radio signals, which could not have been produced “naturally”). How are we convinced about such distinctions though, Lem asks? How do we know what is Nature and what is an effect of intentional action? Those distinctions are merely a result of the biological and later historical development of our species. Perhaps what we take to be nature is a product of some intelligent Designer. Such a view, once described as theism, known in modern physics in certain types of anthropic principle, and surfacing in ideological debates in the simplified form of “theory of intelligent design” is formulated by Lem in one of his fake reviews in *A Perfect Vacuum*, in *New Cosmogony*. Unconstrained by the seriousness of the essay form or a discursive text, he expresses a view that laws of physics are rules of a game played by great civilizations. Whether in its extreme form, or as old theism, or even the moderate versions to be found in ST – the thesis is clear: the distinction between Nature and Artificiality loses its meaning when we start asking for its criteria. If living creatures – humans or aliens – subject their own bodies to the kind of transformative practices to which they subject their environment, “the nature” and “the artificial” distinction becomes null. Why?

Once again I return to the distinction between “a discovery” and “an invention.” You can only “discover something” that existed before that, independently from its discoverer; “invention” is an act of creating something that did not exist in real life before. Uranus the planet certainly had existed before Herschel discovered it. A phonograph had certainly never existed before Edison built it. However, these common sense notions become more complicated in the discourse of the Natural and the Artificial. One could assume that the distinction has something to do with one of the fundamental qualities of the Western thought – its focus on the subject. The distinction between the subject – “I” – and the external world, which serves as the field of perception and activity of the subject but materially independent from it, has been in our thinking at least since Descartes. The body is the link between the “I” and the world – this will become very important for my analysis of posthumanism in the later part of the book. This sharp distinction is the reason why people of the West have had such trouble understanding Indian philosophical systems, for example, as they do not have a

concept of an individual subject cognizing the world as external to it. The impact of the post-Cartesian philosophy of the subject is significant but a detailed analysis would be unnecessarily subtle for the purpose of this work. Here it is enough to suggest that the post-Cartesian subjectivity became the foundation of distinctions that I am describing here: the artificial, creativity and invention have been located on the side of the “I,” whereas the natural, transformation and discovery are all on the side of the world.¹²⁸ It seems pertinent to remark that the philosophical romanticism strived to overcome these distinctions as early as the first half of the 19th century, but it had no practical impact on the hegemony of the enlightenment and positivism within the social *praxis*. Our time on the other hand really did bring a breakthrough in that regard. I want to show that ST is in fact a harbinger of this breakthrough, and in Part Three of this book I will try to prove that currently we are witnessing it actually happening, with utopian vision of further changes in that direction becoming intellectually available as well. “Autoevolution” is the key term here. The way Lem understands it means transplanting the category of “transformation” into the sphere of the subject. The subject (or, as Lem calls it, the Designer) **begins to apply strategies to itself – to its own body – that were only applied to the external world before.** And this, let me emphasize again, effectively obliterates the differences between the Natural and the Artificial, a discovery and an invention.

Of course, the concept of autoevolution needs to be thoroughly discussed and I shall do that in Part Three. Its understanding depends on technological solutions but largely also on the way the world is conceived of. It is closely linked with the notion of the body as well. That is why I will need to refer to phenomenology and gender studies, for example.

Writing about the question of extraterrestrial life as Lem saw it, one has to mention one more thing, or in fact one more fundamental philosophical problem related to progress in science and technology, which Lem writes about in ST. Up until the 20th century there had been no issue of the limits to human knowledge because human knowledge could grasp only the immediate human surroundings, a limited scope from the perspective of the universe: planet Earth, its solar system and what is contained within it. It could be said that the scope of scientific research was limited to the *Lebenswelt*. But in the 20th century it changed rapidly with the dynamic progress in physics and astronomy, which produced the theory of relativity and quantum mechanics and cosmology, leading to the

128 For a somewhat different approach to the same problem, cf. Jerzy Jarzębski, *Wszecławiat Lema...*, 279–280.

burning question of the relationship between the cognized world and the perceptive tools and capacities. Theories and disciplines mentioned in the previous sentence have become deeply unintuitive. History of science tells us that their authors were in fact astonished by the results they reached – as exemplified in the many years of discussion between Einstein and Bohr about interpreting quantum mechanics or Einstein's saying, repeated *ad nauseam* by scholars: *Raffiniert ist der Herrgott, aber boshaft ist Er nicht*. ["Subtle is the Lord, but He is not malicious"].¹²⁹ It means that even though the laws of Nature are extremely hard to grasp and discover for a human mind, the world is ultimately knowable. (This is exactly what Wiener claims when he writes about the "Augustinian" vision of the world.) The developments in science in the second half of the 20th century have put that claim into question.¹³⁰ Lem phrases the problem as follows: can people – as creatures shaped through evolutionary biology, so with a brain and senses which are primarily supposed to help them survive in the physical conditions of planet Earth – use the ultimately fairly random sensorium to really discover and understand all the laws of the world, both in micro- and macroscale? To put it both shortly and loftily: **can our brain encompass the universe?** Lem claims it cannot, as the biological and evolutionary heritage of our species limits us to a narrow scope of time and space. The fact that we can in no way represent sensually either the world of elementary particles, or the grand scale of the structure of the universe speaks in favor of that thesis. On the other hand though, the fact that we have been able to figure out the existence of these two levels of being based solely on abstract reasonings and that this knowledge is coherent, with slight incoherencies in its very basics (if "only" is the right word here) – this very fact shows that the human mind does have surprisingly large capacities. The knowledge we have about processes within the atomic nucleus or the dynamics of galaxy clusters is useless from the point of view of evolution (unless we treat building nuclear power plants as an element of a strategy of acquiring energy for the purpose of efficient survival, but even the most radical sociobiologists

129 The sentence appears in ST (173) in English as "God is sophisticated, but he is not malicious."

130 In *Dyskusje...*, Małgorzata Szpakowska quotes a sentence from Fritjof Capra: "in the 20th century for the first time the human capacity to understand the universe has been put into question;" and comments: "Lem does not draw such radical conclusions; the very thought that the world could turn out to be essentially un-understandable is completely foreign to him" (68). In this chapter I claim it is quite the opposite: in ST, Lem does admit such a possibility and this is the cause of one of the important *aporiae* in the structure of the work.

do not go that far). And yet – we reached it. It can be a sign of a huge excessive potential of our brains that the evolution gave us – and this is how it is generally interpreted, and Lem shares the view. Our main problem is we shall never be able to understand the limits of this knowledge. It is as if Pascal and Wittgenstein shook hands: the former with his sentence about the eternal silence of these infinite spaces; the latter with the thesis about the eye that cannot see itself. It is a paradox – one of many in Lem's thinking – that when the human brain reaches a level of abstraction so extreme, that the senses have long stayed behind, suddenly the biological heritage intervenes with great force to remind us that we did not appear in this world for the purpose of learning the First Principles.

We can certainly surprise ourselves. One of the last sentences Comte, the father of positivism, uttered before his death is a telling testimony to that: he said man would never learn the chemical structure of stars. How ironic that only two years later (1859) Bunsen and Kirchhoff built the first spectroscope. The very existence of culture, art, religion, philosophy and literature is undoubtedly a miracle of sorts in that context. Stanisław Lem was aware of that. But in his own thinking, both in ST and elsewhere, he always reminds us where we come from. Many would rather forget the inglorious roots. As we shall see soon, Stanisław Lem has something special to offer to them as well.

The universe does not help us in our musings on our future, but we can speculate using arguments *ex silentium* and *ex nihilo*. This is how chapter three of ST concludes. Then, Lem returns to Earth to deal with *Homo sapiens* as a species. It is pertinent to quote his own self-commentary in a discussion published in *Studia Filozoficzne*. There he speaks about some of the implicit anthropological premises made in ST:

it is possible to equate the products of man with products of Nature in their efficiency, reliability, durability, universality, etc. It is also possible to try and differentiate between stages of such rivalry; it would have to start with the stage of *regulation*, i.e. of optimizing stages of what *is*, or what *is given* (society, our brain, our body); the second stage would be that of *creation* (involving a transition from what *is given* to creating new solutions). (95)

The distinction is not kept everywhere in ST, but chapter four, which I will discuss shortly, does describe some improvements in the **external** reality of human life – the transition to the actual autoevolution will come later. Lem also expresses his view on human nature at that time, which is very important for our understanding of his intellectual route. Despite his self-proclaimed “skepticism” (*Studia Filozoficzne...*, 96), he is in fact still close to the unconditional optimism of *Dialogues*:

The book [ST] assumes a certain kind of human and a certain kind of culture – “maximally rational.” It is premised on a historical development that will make this kind of human and culture more prevalent, more and more universal. That is the optimism which can be found in *Summa*. Without that direction of cultural development there would be no optimization in actions, nor any rationality of efforts, nor the highest pace of growth or the best choice – to everyone’s benefit – among many possibilities. Those premises have not been explicitly articulated – they can be read between the lines. Societies and individuals, which we know from history behave so splendidly only very rarely. My book turns these exceptions into a norm. It is a bold move, but I believe it is not entirely utopian. (97–98)¹³¹

131 The utopian character of Lem’s predictions and projects will be analyzed in the next part of this book.

12 Turing Body

The title of the fourth chapter is “Intelectronics,” but one would be disappointed looking for the history of microprocessors (Intel company was established 4 years after the first edition of *ST*). Instead it is a compound of “intelligent electronics” (the founders of Intel were probably working with the same idea). This is the chapter that most clearly continues the themes from *Dialogues*. Lem writes a lot about “intelligence amplifiers” (e.g., 93–96; the idea comes from Ashby) and the projects of “a radical restructuring of science as a system that acquires and transmits information” (86). The restructuring is forced by the “megabyte bomb” (81–85), that is, the exponential increase of knowledge, which no one can grasp, not only as a whole (it is no point even dreaming about it anymore, as Lem points out often and with regret), but even within one discipline.

The restructuring of science is to be made possible by the creation of cybernetic systems (we would say computer systems today): systems of acquiring, selecting and distributing information. Such systems, which for Lem are the first stage of technology of “information farming,” have not been created yet, although the existing algorithms for searching information on the Internet, which are constantly being improved, are getting closer to this vision. The ideas of machines that are transformers of knowledge again include Lem’s utopian belief in the rationality of technology and its products. One can imagine how disappointed he must have been with the early Internet with its practically infinite space of chaotic information that did not become knowledge (i.e., an ordered structure). The increase in knowledge is gaining pace, and if Lem was anxious about the amount of it half a century ago, the situation is certainly far more dramatic now.¹³² The so-called Lem’s law is partially true then; he formulated it in one of his columns in the 1990s: (1) No one reads. (2) If someone reads, they do not understand anything. (3) If they understand, they forget immediately. I bring up this aphorism not as an element of my analysis of Lem’s discourse, but to demonstrate, how bitter and disillusioned he was at the end of his life.

132 In his later novel, *Wizja lokalna* [“Observation on the Spot”], there is an extensive description of “ignorantics” and “ariadnology” – disciplines devoted solely to determining the level of ignorance (stemming from excess of information, and not from epistemological limitations) and methods of finding information in a nearly infinite set. Even in the description of solaristics in *Solaris* there are similar themes.

The functioning of “intelligence amplifiers,” Lem says, will inevitably become incomprehensible for people from a certain level of complexity. It is a consequence of their purpose: to process the amounts of information that humans can no longer process. Lem uses the notion of “a black box” here, as known in behaviorist psychology. He points out that we should not be worried that we will not understand the rules and functioning of such a machine, because our brain is a similar “black box.” We do not know the precise mechanism behind it, as the “self-referentiality” of the brain would not have any use in the evolution process (99).¹³³ “The uniqueness of the cybernetic solution, whereby a machine is completely alienated from the domain of human knowledge, has actually already been used by Nature for a long time now” (99). We can now observe the “uniqueness” on everyday basis, working on our computers, tablets and smartphones – no one other than IT and electronics experts can ever understand the rules of how these devices work. They are nearly what Lem meant as “black boxes,” but they are not “intelligence amplifiers.”

At this point I find myself dangerously close to the old fear of “machines smarter than humans,” “breaking free” from our power and becoming unpredictable. Such a view is of little interest to Lem though, as he is too attached to humanism, to the motif of the sorcerer’s apprentice and such other ideas. (The motif itself is actually quite fascinating and I will return to it when discussing posthumanism.) That does not mean, however, that Lem never asks about the consequences of “the black box” for the social practice, only limiting himself to epistemological problems.

For Lem intelectronics is not primarily a way to build “smarter machines” or “artificial brains” – they are but an intermediary stage. Constantly drawing parallels between Technology and Nature, he writes:

... such a new technology will mean a completely new type of control man will gain over himself, that is, over his organism. This will in turn enable the fulfillment of some age-long dreams, such as the desire for immortality, or even perhaps the reversal of processes that are considered irreversible today (biological processes in particular, especially aging). Yet those goals may turn out to be a fantasy, just as the alchemists’ gold

133 Here and in other places Lem’s argument is only congruent with some varieties of contemporary evolutionism, that is, the ones which assume that the evolution process exhibits a preference for beneficial solutions only, and it rejects solutions that are not beneficial or that are neutral from the point of view of survival. However, elsewhere in Lem’s work we would find statements about the “excess” of evolutionary solutions, which would mean that he does not side entirely with any type of evolutionism and only draws from them depending on the needs of his own discourse.

was. Even if man is indeed capable of anything, he surely cannot achieve it in just *any* way. He will eventually achieve every goal if he so desires, but he will understand before that that the price he would have to pay for achieving such a goal would reduce this goal to absurdity.

It is because even if we ourselves choose the end point, our way of getting there is chosen by Nature. We can fly, but not by flapping our arms. We can walk on water, but not in the way it is depicted in the Bible. Perhaps we will eventually gain a kind of longevity that will practically amount to immortality, but to do this, we will have to give up on the bodily form that nature gave us. (91)

Intelectronics is the first step on the way to autoevolution. We need to remember that for Lem both computer and human brain are cybernetic systems. Equating them as a category allows him to believe that the growth of technology of constructing “thinking machines” will sooner or later translate into autoevolution technology – that there will occur a process that is reverse to what some artificial intelligence (AI) experts are predicting today, when they strive to build an artificial brain seeing it as the ultimate task of technology. One could say for Lem this is the penultimate task.

Before I proceed with a discussion of the social implications of intelectronics, I need to make one important digression. The whole chapter of ST I am discussing now is deeply related to a discipline now most commonly known as AI, even though Lem never uses the name. The term was first used by John McCarthy in 1956. Nowadays AI is really a separate discipline of science, combining computer technology, logic, neurophysiology and neuroscience, philosophy of language and mind, as well as cognitive and developmental psychology. Its object is “the capacity of a digital computer or computer-controlled robot to perform tasks commonly associated with intelligent beings. The term is frequently applied to the project of developing systems capable of intellectual processes characteristic of humans, such as the ability to reason, discover meaning, generalize, or learn from past experience.”¹³⁴ The main area of exploration in AI right now is building devices that could engage in logical games (especially chess), devices that could prove logical and mathematical theorems, recognize images and understand natural languages. Specialists in AI also write about constructing “artificial brain” (neuronal networks) and robots with advanced locomotory capacities. The discipline’s foundational text is an article by Alan Mathison Turing *Computing Machinery and Intelligence*, published in 1950 in a prestigious British journal

134 *Encyclopaedia Britannica*, ed. 1996, vol. 1, 605. The definition is based on the views of Marvin Minsky, who is generally seen as the most distinguished contemporary theoretician in the areas of AI.

Mind. The article contains a description and a discussion of “Turing test,” a procedure aiming to determine whether a machine subjected to it can imitate human intellectual processes. One would be hard pressed to find any description of the AI problematic today where the author would not be respectfully referring to this piece and Turing’s name in the very first words. AI is a hugely controversial field, provoking radically diverging philosophical views. I have no intention of recounting those arguments, instead hoping to point to some of the unobvious convergences in Turing’s and Lem’s thinking.

At the roots of all disputes around AI there is the problem of vagueness of two key terms. Turing’s question about whether “a machine can think” makes sense only if we know exactly what the terms “machine” and “think” mean. And this is not clear, especially with the latter word. Naturally, Turing realized these difficulties and took them into account, but the definitions he proposed are not obvious at all, and the never-ending discussion surrounding them is the main evidence of that. While the notion of “machine” is fairly clearly defined – at least in the strictly technical sense (there are precise definitions of “Turing machine” – the general technological model of a counting machine – and of “von Neumann machine” – the general technological model of a digital computer), we still cannot find agreement on what “thinking” means. Hence the numerous polemics with Turing test and his definition of thinking.¹³⁵ There are

135 The most famous among them is likely the “Chinese room argument” formulated by John Searle [John Searle, *Minds, Brains and Programs*, in: *Behavioral and Brain Sciences*, no. 3 (1980), 417–457]. Searle presents a situation in which an English person who does not know Chinese receives a set of Chinese ideograms with instructions in English on how to use them. The person then generates output of correctly formed Chinese phrases, even though he or she does not understand them. According to Searle it is a proof that there is no connection between correct use of linguistic signs and intentionality of using them, and hence that the notion of “thinking” cannot be correctly applied to digital machines. Lem refers to this thought experiment in the title essay of his volume *Tajemnica chińskiego pokoju* [“The Chinese Room Secret”] (1996), where he rejects Searle’s arguments against Turing test. Lem included his own version of the test in ST (130). In *The Magellan Nebula* there is a “Turing tale” (245–247, in the 1955 Polish edition; unavailable in English).

It is worth mentioning also Hilary Putnam’s essay *Brains in a Vat*. The essay contains evidence about conventional character of reference in linguistic signs and belongs mostly to philosophy of language. However, Putnam invokes Turing test in his argument, emphasizing that linguistic expressions used by a computer have no reference to the external world (which is a way of saying they are unintentional). From the point of view of my work it is interesting that the thought experiment on which Putnam

two ways to approach the problem. If thinking is defined as a process consisting of logical and mathematical operations (as “the strong AI” would assume), then machines do think. However, if thinking is defined as a process dependent on human sensorium, on the whole of sensual and mental experiences that make up our consciousness, then we cannot determine unequivocally whether machines can think, for the same reason why we do not have access to anyone else’s consciousness. The only difference is that when A says to B “I have a toothache” and both are people, then while B cannot feel the same pain as A, he can represent the pain to himself, using what he has stored in his own memory (unless he has never had a toothache before). But if A said to B “I am having a short circuit” and A were a machine, while B a human, then B would have no way of representing the content of that from A statement to himself. But then the question whether “a machine can think” no longer has meaning.¹³⁶

Turing knew perfectly well that the phenomenological and sensual approach to thinking makes the whole problem irrelevant and this is one of the reasons why he designed his test (which he himself called “an imitation game”) in such a way as to make it impossible to phrase the problem this way.¹³⁷ Hardly anyone

builds the main line of his argument (the “brains in a vat” from the title, isolated from the external, physical reality, but retaining an illusion of contact through a connection to a computer) is fully identical with the Lem’s short story about Professor Corcoran (*Further Reminiscences of Ijon Tichy Part One*) in *Memoirs of a Space Traveler: Further Reminiscences of Ijon Tichy* (1966, first published in English in 1991). The astonishing congruence has its sources in Berkeley’s philosophy of course, which both Lem and Putnam reinterpret.

136 It is a fundamentally lemological problem. This is yet another example of reaching the very limits of human mind’s ability to conceptualize, which according to Lem are the reason why any attempt at contact between people and other forms of intelligence fail. This case is unique though as this alien form is the product of human activity. This paradox is a source of anxiety, which, I believe, is at the roots of most emotionally biased views on AI.

137 The example I gave above takes into account only one variety of the thinking question within AI. Yet invoking pain is frequent in discussions about the relationship between intersubjective thinking and individual consciousness within the philosophy of mind in general; for example, cf. Wittgenstein’s *Philosophical Investigations*, par. 281–287. (I leave out here advanced discussions that take place within the contemporary philosophy of mind about the very existence, characteristics and cognitive availability of subjective psychic experiences.) Apart from “the strong version of AI” and the “phenomenological” approach I have just outlined, there is also “a weak version of AI,” according to which human thought processes are unpredictable (in a mathematical sense) or depend on factors unknown to science and therefore cannot be modeled

notices that Turing test actually precludes **presence** of the creature, which passes it. The communication happens solely **through text**. The only criterion is syntax and semantics of the enunciation. This makes the questions of the conditions that shaped it, of whether it is a result of “mathematical” or “phenomenological” thinking, or some other type still, in short the question of intentionality behind the enunciation, irrelevant. All that matters is an artifact of text.

The original version of the Turing test may seem rather surprising. It actually starts not with how to distinguish between a human and a machine but with distinguishing between a man (A) and a woman (B); and the man can intentionally mislead the interrogator by offering confusing answers, whereas for the woman “[t]he best strategy ... is probably to give truthful answers.”¹³⁸ Authors writing about AI usually omit this passage and proceed to the main argument. This bit is in fact incomprehensible unless we take into account Turing’s homosexuality, which implicitly dominated his life and led to his death at the early age of 42.¹³⁹

I suggest that this peculiar opening of the “imitation game” from Turing may be related to his personal life – or rather the lack thereof,¹⁴⁰ not in a sense that the whole issue of AI could be sensibly explained through the author’s personal issues, but they could be behind Turing’s thought, directing it toward machines as an alternative to people. But that is not all. Going deeper into Turing’s text (not merely the test) one can notice that it is highly emotional, and intellectually incredibly dense. Turing writes:

The new problem [introducing a machine into the test] has the advantage of drawing a fairly sharp line between the physical and the intellectual capacities of a man. No

in a machine. “Spiritualism” – a conviction that there is an immaterial soul – is an extreme variety of the weak AI.

138 Turing, “Computing Machines and Intelligence,” *Mind*, no. 236 (1950), 433–460.

139 Cf. Andrew Hodges, *Alan Turing: The Enigma* (London: Burnett Books, 1983). It is a huge biography with an extensive source base, a product of 7 years of research that the author started practically from scratch. Turing poisoned himself with cyanide as a result of serious depression caused by enforced hormonal treatment that he was sentenced to in court. He turned himself in to the police after a random sexual partner started stealing from him and blackmailing him. Homosexuality was punishable by law in the United Kingdom at that time.

140 Hodges makes similar suggestions: “He painted the pages of this journey into cyberspace with the awkward eroticism and encyclopaedic curiosity of his personality. Modern cultural critics have jumped with delight to psychoanalyse its surprises. ... the subtext is full of provocative references to his own person ...” Andrew Hodges, *Turing* (New York: Routledge, 1999), 38. It is an abbreviated version of the full biography. Unfortunately, Hodges does not provide specific examples of such analyses.

engineer or chemist claims to be able to produce a material which is indistinguishable from the human skin. It is possible that at some time this might be done, but even supposing this invention available we should feel there was little point in trying to make a “thinking machine” more human by dressing it up in such artificial flesh. The form in which we have set the problem reflects this fact in the condition which **prevents the interrogator from seeing or touching the other competitors, or hearing their voices.** (434; emphasis PM)

Clearly, Turing wants to make sure there is no possibility of physical contact between participants of the test. If this were only about making it harder to distinguish between a machine and a man (which up until today tend to have very different physiques), it would be pragmatically understandable. But Turing writes that “it would not make sense” to make a machine resemble a man externally (i.e., to produce an android). Apparently retaining the physical difference is better in his view for some reason. Right before this passage there are sentences that have been quoted here before:

The best strategy for her is probably to give truthful answers. She can add such things as “I am the woman, don’t listen to him!” to her answers, but it will avail nothing as the man can make similar remarks.

We now ask the question, “What will happen when a machine takes the part of A in this game?” (434)

A man can imitate a woman. He can also be replaced by a machine, which would not resemble a human at all, and then the machine would imitate either a man or a woman, but a human in general – regardless of gender. I believe Turing is striving to liberate the creature taking the test from all issues related to gender and sexuality. Some of the commentators wrote that a machine could replace a man, while others would see it as a mistake caused by “unfortunate” phrasing. In my view the phrasing is careful and purposeful. This is what follows:

The question and answer method seems to be suitable for introducing almost any one of the fields of human endeavour that we wish to include. We do not wish to penalise the machine for its inability to shine in beauty competitions, nor to penalise a man for losing in a race against an aeroplane. The conditions of our game make these disabilities irrelevant. The “witnesses” can brag as much as they please, if they consider it advisable, about their charms, strength or heroism, but the interrogator cannot demand practical demonstrations. (435)

Machine is to have nothing in common with human apart from intelligence that can be verified through text. It does not have to prove it has any other qualities; it does not need to “shine in beauty competitions.” It need not be penalized for not fulfilling such norms in a way some people were then penalized for not conforming to other norms.

A bit further on Turing discusses the definition of “a machine” and writes bitterly:

Finally, we wish to exclude from the machines men born in the usual manner. It is difficult to frame the definitions so as to satisfy these three conditions. One might for instance insist that the team of engineers should be all of one sex, but this would not really be satisfactory, for it is probably possible to rear a complete individual from a single cell of the skin (say) of a man. (435–436)

This is an extraordinary passage and, I need to add, very much in Lem’s spirit in how it speaks of the “nonmachine” people “born in the usual manner.” But something else is striking here: Turing’s argument and the way he carries out his reasoning are very different from the standard academic discourse. This was not how people wrote in the mid-20th century. (It is equally extraordinary that Turing predicts cloning in passing.) At this point again behind the scientific arguments there seems to lurk Turing’s exasperation with gender.

In the following part of the text there is a description of a digital computer and the famous discussion with arguments contradicting Turing’s theses. Let us look at the fifth argument (“from various disabilities”):

These arguments take the form, “I grant you that you can make machines do all the things you have mentioned but you will never be able to make one to do X.” Numerous features X are suggested in this connexion. I offer a selection: Be kind, resourceful, beautiful, friendly, have initiative, have a sense of humour, tell right from wrong, **make mistakes, fall in love, enjoy strawberries and cream, make someone fall in love with it**, learn from experience, use words properly, be the subject of its own thought, have as much diversity of behaviour as a man, do something really new. (447, emphasis PM)

This enumeration is food for thought here as well, especially the passage I have put in bold. Listing “strawberries and cream” between “fall in love” and “make someone fall in love with it” – and with all three preceded by “making mistakes” – is peculiar in itself. Moreover, further on Turing discusses some of these charges and writes:

There are, however, special remarks to be made about many of the disabilities that have been mentioned. The inability to enjoy strawberries and cream may have struck the reader as frivolous. **Possibly a machine might be made to enjoy this delicious dish, but any attempt to make one do so would be idiotic.** What is important about this disability is that it contributes to some of the other disabilities, e.g., to the difficulty of the same kind of friendliness occurring between man and machine as between white man and white man, or between black man and black man. (448, emphasis PM)

I believe that Turing’s commentary on the inability to enjoy strawberries and cream in truth refers to the two qualities listed before and after that one in the

enumeration above. For a psychoanalyst this would be completely obvious. Appreciating “delicious dish” by a machine is “idiotic.” A machine is meant to do something else. There is to be a different “kind of friendliness” between machine and man. Honestly, it is hard to not notice elements of personal engagement here.

There are a few other such passages in Turing’s text. I have only listed the most telling ones. A poem Turing included in his letter to Dr. N. A. Routledge after his arrest is another sign that he did connect his personal issues with his research: Turing believes machines think / Turing lies with men / Therefore machines do not think.”¹⁴¹ Irony turns into despair here, and the entire life work is being put into question.

This is enough when it comes to analyzing Turing’s article.¹⁴² Let us read this sentence again: “We now ask the question, ‘What will happen when a machine takes the part of A [i.e. man] in this game?’” This is when the actual Turing test begins, the one that has been described and analyzed too often for it to be sensibly repeated here. Instead I preferred focusing on the personal issues that Turing hid in his text. I am asking: **why did Turing want machine to replace man?** I repeat again: I am not suggesting that the objective, scientific meaning of his research is determined by his personal, individual disposition. I am not claiming that Turing test is the product of heteronormative oppression. I am trying to answer the question why of all the infinite aspect of the physical reality he chose to study this one – the swop of machine for man – and why he treated it the way he did? Why did he hide body? Why did he choose machine?

One could say I have answered the question myself writing about the “nonphenomenal” presence of machine, justified by the nonintentional character of the enunciation it produced. But such explanation (apart from being not necessarily satisfactory from the philosophical and scientific point of view) remains on the methodological level. Why should I not ask about the psychological reason? In fact the explicitly personal tones included, as I have shown, in Turing’s article actually provoke such a question. So why did Turing write the way he did?

Perhaps because he valued the peacefulness of machine higher than the anxiety of a homosexual body. Machine is predictable, it causes no surprises, it does not disappoint or fail the way man does – such statements can often be heard

141 Hodges, *Turing...*, 54.

142 Similar arguments can be found in N. Katherine Hayles’ introduction to *How We Became Posthuman* and Slavoj Žižek in his essay *Please, No Sex, We’re Posthuman* (2001).

from technocrats. They are theoretically true, but in practice any user of a personal computer would beg to differ. Perhaps, however, Turing meant something more. Machine has no sex; it has no lust, no desires; it does not yearn for anything the way man does.

For one reason or another Turing was clearly fascinated by the vision of machines replacing humans. It is time to ask: what does it all have to do with Lem? This is a fascination the two of them have in common. Again, to answer the question why would Lem share it (leaving aside the question of whether this question makes sense in the first place), one needs to engage in risky speculation,¹⁴³ but on a very different subject. No one suspects Lem of sexual inversion, even though there are texts about his misogyny.¹⁴⁴ But Lem has disgust for human body. He abhors physiology and sexuality, which he sees as connected with abject secretions more than with anything else. It is a persevering motif in his writings: disgust with human physiology. It is another paradox: the writer looking to deify man in Nature, evolution and biology describes his own species as “paleface” or “mucilids,” and composes insulting verses:

What Nature's charge
 Constitutes the fate of the unhappy Earthlings
 Who in the price of love
 The outlets of metabolism have,
 Taken with pity the whole Universe
 Extends its hands to you people
 Who locate the perfect feelings
 In the ugliest parts of the body
 ...
 Knowing where they hold their ideals
 With no way of escaping the trap,
 Taken with pity the whole Universe
 Wrings its tentacles in horror
 ...

143 It brings to mind a comparison with a passage from *The Magellan Nebula*. One of the characters, who has just been through a heartbreak, asks a robot to kill him. Machine does not understand the order and the misunderstanding provokes a fascinating dialogue between them. I believe the scene can be interpreted as a fictionalization of Turing's views on the difference between man and machine (it is unlikely this is what Lem had in mind, although it is not impossible Lem knew Turing's works by the time he was writing *The Magellan Nebula*).

144 There are quasi-homoerotic themes in his early works that usually come from an emphasis on the ethos of male friendship.

When in a hurry my girl I pollintae;
 I write verses full of dancing
 Bees, roses and butterflies
 But you, unhappy human nation,
 Which loving its females
 Have to mate obsessively
 Alas, with their plumbing,
 Dost you praise it – in verses?¹⁴⁵

Can anyone still doubt that for Lem body was disgusting?¹⁴⁶ The near-absence of love themes or scenes in his novels would seem to confirm this diagnosis.¹⁴⁷ On the other hand, one could list a catalogue of passages from Lem's grotesque short stories from *The Cyberiad* and *The Star Diaries* where the disgust with body and sexuality is ostentatious.¹⁴⁸ I am trying to offer an explanation of the lack that would situate Lem not only within the scope of the contemporary question of sexuality, but actually at the very center of it, albeit not overtly. The most important issues do not have to be shown in their closest anatomy. We saw that with Turing as well. In Lem's case the implicit reason pushing him away from the body may likely be his traumatic wartime experience.¹⁴⁹

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- 145 *Wizja lokalna*, ["Observation on the Spot"] (Kraków: WL, 1983), 118 (trans. by Olga Kaczmarek). Names such as "paleface," "mucilids," "sticky Albuminids" and similar come up many times in *The Cyberiad* – the volume of short stories that have robots as narrators and as inner audience.
- 146 Treating judgments formulated in a piece of fiction, and a grotesque one, as an expression of author's views can be seen as a sign of methodological naivety. But it is sensible to treat author's views as formulated in his fiction and in his discursive works as elements of one metadiscourse. Of course, I do not assume that the views of Lem the author are necessarily identical with the views of Lem the person.
- 147 It brings Harey from *Solaris* to mind. Harey is and is not human. Lem carefully emphasizes her superhuman qualities in the scene in which Kelvin is testing her blood and discovers that Harey is made of different particles than people. It is a strong manifestation of Harey's "bodily inhumanity," even though on the "macroscopic" level she seems human.
- 148 Lem's grotesque writings are a litmus test of his worldview: he articulated in them his most extreme opinions about the human nature and the future of man. In his autocommentaries from the 1990s, he often admitted that he had hoped these particular visions would remain fantasies, but they seemed to have been fulfilled most literally. *The Cyberiad* and *The Star Diaries* deserve an interpretation which would show that they hyperbolize "serious" discourses and fictions Lem wrote, and that they all make up a coherent whole.
- 149 I wrote about it in details in an article *Lem fantastyczny czy makabryczny? O możliwym źródle pisarstwa nie-realistycznego* ["Lem: Fantastic or Macabre? On the Possible

Instead Lem dives into the world of machines. Nearly all of his novels include extensive detailed descriptions of all sorts of mechanisms. Sometimes he pays more attention to screws, pegs and steering systems than to his character's psyche. In *Eden* an amazing description of "factory" becomes emblematic of this theme, in which machine and the organic combine very closely, with the organic element dominated by machine. Lem's machines are not lifeless, in a sense in which weird objects in *Locus Solus* by Raymond Roussel are, or in a sense in which the mechanisms Vern's characters use to order the world are lifeless. Lem's machines are not dead, despite the fact that Michael Kandel translated *The Cyberiad* as *Mortal Engines*. They are not dead, because for Lem, just as for Turing, machines are better than people. Both ethically and aesthetically better.

Let me return to chapter four of ST. After outlining the "black box" idea, Lem writes:

It is time to introduce moral issues into our cybernetic deliberations. But it is in fact the other way around: it is not we who are introducing questions of ethics into cybernetics; it is cybernetics that, as it expands, envelops with its consequences all that which we understand as morality, that is, a system of criteria that evaluate behavior in a way that, from a purely objective perspective, looks arbitrary. Morality is arbitrary just as mathematics is, because both are deduced from accepted axioms by means of logical reasoning. (99–100)

We know these views already from *Dialogues* and the consequences of promoting them further come with the same contradictions. As long as Lem writes about "electrocracy," that is, the possibility to delegate some of the decision processes within a society to "intelligence amplifiers," he himself sees the aporiae and admits that treating a society as homeostat or a predictable processing information system unavoidably leads to a collapse of the entire model (99–107). In short: the strict rationality of "the cybernetic ruler" combined with the irrationality of men and the practically infinite number of parameters affecting the system soon ends in disaster. Comparison with the centrally planned economy is hard to resist, but this time it does not seem to be intentional.

Later, however, Lem goes further and tries to refer the idea of "thinking machines" to problems of faith and metaphysics, which means taking up a challenge which AI experts usually avoid. This boldness is impressive, but the execution is controversial, to say the least. This part of ST (107–129) contains a mix of extreme epistemological reductionism and bold thought experiments, as

Source of Non-Realistic Writing"], *Przegląd Filozoficzno-Literacki*, no. 1 (2009). I wrote about it also in the third chapter of my book *The Speaking Lion*.

well as very complex attempts to bring together such issues as the possibility of grounding religious faith in rationality, the question of the contents of faith in terms of theory of information, hypotheses about the physiology of metaphysical experience, the cognitive status of revelation, the impact of religion on social life and “the ghost in the machine” (i.e., AI – this is where we can find Lem’s version of the Turing test). Of the whole ST this section is most like an informal essay, in a negative sense; to disentangle all the threads Lem combined on these pages would require a whole separate treaty. It includes statements such as:

No religion can do anything for humanity, because it is not an empirical knowledge. It does reduce the “existential pain” of individuals, but at the same time, it increases the sum total of calamities affecting whole populations precisely owing to its helplessness and idleness in the face of social problems. It cannot thus be defended as a useful tool, one that remains helpless in the face of the fundamental problems of the world. (122–123)

This is a moment when Lem becomes a real, ahistorical, scientific technocrat. If his entire work consisted of such statements, there would be no value in striving to analyze it.¹⁵⁰ Soon after, however, he describes a fascinating project of building “a believing machine,” one that would have metaphysical beliefs about, say, life after death programmed into it. He then elaborated on the project in *Non Serviam*, one of fake reviews in *A Perfect Vacuum*. It will also return later in ST.

This intellectual Gordian knot ends, as is often the case with Lem, in a statement about the impossibility of a conclusion. At the end of this part of ST, he proceeds directly to take up the problem of consciousness in a machine (which is the key issue for AI), comparing it to “the bald man paradox” (we do not know from which point we can speak of “consciousness” as correlate to the degree of complexity of mathematical processes carried out), and then eventually he repeats his thesis from *Dialogues*, that consciousness is “‘disseminated’ across the whole of the homeostat across its activity network. We cannot say anything else on this matter if we want to remain both sensible and cautious” (132). And this conclusion proved to be true – the contemporary neuroscience accepts similar positions.

Lem’s views on reducing faith to physiology and on the social function of religion certainly had the biggest impact on the tone of Kołakowski’s review. It

150 It needs to be pointed out that in other works Lem takes up the issues of religion with a lot more understanding. Szpakowska devotes a whole chapter in her monograph to it (*Lem i Pan Bóg*), and Jarzębski is even trying to present his oeuvre in general as a quasi-religious in a way.

needs to be added that they fell on a deaf ear as theoreticians and practitioners–constructors of AI are generally careful to avoid getting involved in such topics or simply are not aware of them; and even Lem himself did a much better job marrying religion with intelectronics in *The Cyberiad*, *The Star Diaries* and *A Perfect Vacuum*. The impact of technology on spiritual life was and still is being raised though, albeit on a different level. Suffice it to mention the notion of “cybernetic religion” proposed by Fromm,¹⁵¹ the powerful metaphor of “Turing man” offered by Bolter, or Henri Lefebvre’s “cybernanthrope.”¹⁵² Today many authors attempt to redefine basic philosophical categories due to the influence of technology (i.e., redefining the notion of “individual identity” in the context of cloning), but such discussions belong to a different field.

The last part of “Intelectronics” is “Doubts and Antinomies” (137–153). In it Lem sums up the unsolved conceptual problems related to AI in a way that remains useful today. He discusses the philosophical paradoxes of “thinking machines,” their “consciousness” and “personality,” their potential “wisdom” and so on clearly and precisely. The conclusion of the chapter is:

Those systems will not be trying to “dominate over humanity” in any anthropomorphic sense because, not being human, they will not manifest any signs of egoism or desire for power – which obviously can only be meaningfully ascribed to “persons.” Yet humans could personify those machines by ascribing to them intentions and sensations that are not in them, on the basis of a new mythology of an intelectric age. I am not trying to demonize those impersonal regulators; I am only presenting a surprising situation when, like in the cave of Polyphemus, *no one* is making a move on us – but this time for our own good. Final decision can remain in human hands forever, yet any attempts to exercise this freedom will show us that alternative decisions made by the machine (had they indeed been alternative) would have been more beneficial because they would have been taken from a more comprehensive perspective. After several painful lessons, humanity could turn into a well-behaved child, always ready to listen to (No One’s) good advice. In this version, the Regulator is much weaker than in the Ruler version because it never imposes anything; it only provides advice – yet does its weakness become our strength? (152–153)

Michel Foucault would certainly appreciate these sentences – Lem described Power without Subject, without Man. The impersonal power of machine.

151 Erich Fromm, *To Have or To Be?* (New York: Bloomsbury, 2013), 120–132, especially 131–132. “Man has made himself into a god because he has acquired the technical capacity for ‘a second creation’ . . . We can also formulate: We have made the machine into a god and have become godlike by serving the machine.”

152 Henri Lefebvre, *Vers le Cybernanthrope. Contres les technocrates* (Paris: Denoël-Gonthier, 1971). “It is a man who defines himself in terms of an artificial brain, lives in a symbiosis with machine, and discovers a double, schizoic reality.”

13 Metatheory

Of course, I belong to the Enlightenment and I am a rationalist, albeit a little desperate. A desperate rationalist can turn out to be closely related to a fool.

Letter to Michael Kandel, July 1, 1972

The fifth chapter of ST, “Prolegomena to Omnipotence,” serves as a metatheory for the entire work. It is located midway through the book and it divides it into two symmetrical parts. The first one is about issues of autoevolution unrelated to biology (the hypothetical reference to extraterrestrial civilization and intelectronics, that is, the capacity to build intelligent machines without organic components) – and this is the part that has been discussed here already. The other part of ST is devoted to those aspects of autoevolution that are directly connected with biology and Nature. Those include phantomology, information farming and autoevolution in a strict sense, that is, reconstruction of the human species. Before Lem discusses them though, he first outlines a sort of classification of autoevolution and tries to impose a conceptual order on his own reflections on the subject, which is necessary given how different his thought is from what was accepted earlier, as I have emphasized on many occasions.

At the beginning Lem writes:

It is only when we are eventually able to compete with Nature on the level of creation, when we have learned to copy it so that we can discover all of its limitations as a Designer, that we shall enter the realm of freedom, of being able to work out a creative strategy subordinated to our goals. ... we can turn Nature's infinity against it, so to speak, by working, as Technologists, on uncountable sets ... We can remove the difference between “the artificial” and “the natural” – which will happen once the “artificial” first becomes indistinguishable from the natural and then exceeds it. We shall discuss later on how this is going to happen. But how should we understand this moment of “exceeding” the natural? It stands for carrying out with Nature's help what it cannot do itself. (156)

Soon after he defines the notion of “Machine.” I will quote an extensive passage here, as it is one of the most important ones in ST and Lem's way of thinking about technology cannot be fully understood without it.

OK, then, someone will say, all these lofty phrases were just intended to elevate human artifacts, all those various machines that Nature does not create.

Everything depends on what we understand by a “machine.” It can, of course, refer just to what we have learned to construct so far. Yet if by “machine” we understand something that displays *regularity*, the situation will change. From such a broad perspective, it is not important anymore whether a “machine” has been constructed from existing matter, from those one hundred elements discovered by physics, or from air showers, or even from gravitational fields. It is also not important whether and how a “machine” uses, or even “creates” energy. It would, of course, be possible to construct a system consisting of intelligent beings and their environment in which our laws of thermodynamics would not apply. Someone will respond that this system would be “artificial” and that we would secretly have to provide it with energy from outside, in a way that would be unnoticeable to its inhabitants. Yet we do not know whether the Metagalaxy does not have any external energy sources that would be “connected” to this system from outside. Maybe it does; maybe its eternal supply of energy results from the infinity of the Universe. If that was the case, would this mean that the Metagalaxy was “artificial”? As we can see, everything depends on the scale of phenomena under discussion. A machine is thus a system that manifests some kind of regularity of behavior: statistical, probabilistic, or deterministic. From this point of view an atom, an apple tree, a star system, or a supernatural world is a machine. Everything we construct, and that behaves in a certain way, is a machine: everything that has inner states and outer states, while the relations between sets of those states are subject to certain laws. (156–157)

This is how Lem neutralizes the significance of distinguishing between the Natural and the Artificial. “Artificiality” for him does not imply intentionality of creation, and “naturalness” – a lack of such intentionality (this is roughly how the difference between the two notions could be described in their regular sense). It is not about that; it is about regularity in functioning. The thesis is: Designer can create **every** system (be it a computer, a tree, a cyborg or a galaxy – the technical capacity is of no bearing here) under the sole condition, that the structure and functioning of the system can be described with precision. The criterion is purely pragmatic then, but very different from the earlier one. Even something previously considered natural can in fact be an “artificial” product. The fact that we still distinguish between these two categories is merely a matter of how backward we are technologically. We make “artificial flowers” from the artificial material – plastic.¹⁵³ Once we learn to produce them from **the same material** that real flowers are made of, the distinction will no longer be applicable. When

153 That is from polymers that do not occur in living organisms. But the proteins we are largely made of are a type of polymers too, albeit with an incredibly complex structure. It means that on the level of molecular engineering we are dealing with the same class of substances, but the simple polymers are to proteins what a barrow is to a limousine – also when it comes to how difficult they are to build.

everything can be “artificial” in that sense, nothing is either artificial or natural, because a product of Nature is indistinguishable from something produced by Designer. Moreover, the broadening of human knowledge from the planet Earth to the Universe, which took place in the scope of the last hundred years, again deprives the opposition of Natural and Artificial of its meaning. It used to be possible to claim that the Amazon Jungle is natural, and the office of a dean at All Souls College – artificial. But a question of whether a star cluster is natural or artificial is just badly put.¹⁵⁴

Lem is certain those changes will happen; we just do not know when that will be. Speaking of “imitology” – this is the general term Lem coins for the problematic – he does not touch upon the question of “when.”¹⁵⁵

The condition of predictability of designed system is crucial for Lem, as he remains faithful to cybernetics and science in general, even this late in his intellectual journey. And it is not a symptom of some archaic scientism. The position that a Designer cannot build objects that could not be theoretically described stems from the assumption that any reality, not only the one we inhabit now, but also all the ones we could create ourselves, **needs** to have a set of laws that describe it. Otherwise we would not only be stepping into the realm of pure fantasy, where despite appearances Lem does not like being, but we would also be stepping beyond the realm of our cognition as a reality without laws of physics governing it is impossible to imagine for us, and impossible to figure out through abstract reasoning, and therefore we can say nothing meaningful about it, even though we can formulate any preposition about it (e.g., “kangaroos are made of exhausted cottage cheese”). This is not the type of writing Lem is interested in ST.

The statement about “regularity” as the essential feature of Machine is another element of an implicit “critique of the body” – Lem clearly suggests that human body is an irregular structure, subject to numerous aberrations in functioning and to many errors, one that cannot be described precisely and, hence, controlled. It is then another reason to reject it.

This is roughly Lem’s main metatheoretical position. One could ask now whether there is place for man at all within this model – after all, so far we have

154 The Natural/Artificial opposition in ST is not identical with the opposition Nature/Culture, and hence the difficulty in applying all these notions. As long as we stay on the planet Earth, “Artificial” is more or less the same as “Culture,” but in the lengthy passage I have quoted above Lem definitely goes beyond such limits.

155 Which, we should point out, makes him a utopist. I will discuss the utopian character of ST in the next part of this book.

not been able to describe ourselves with regular theories and to most of us it is highly doubtful that we ever will. But Lem does not ask that question and the very notion of autoevolution leads eventually, I believe, to making such a task impossible.

In the chapter “Chaos and Order” another very important question is posed though: does any of the models of reality devised by men describe it with absolute precision? This is one of the most fundamental questions for philosophy of science and it is usually answered in a negative – a theoretical model is never identical with the phenomena it describes, it exists in the realm of mediated symbols determined by the historically formed cultural communication – so it cannot render it with complete precision. Of course, in the contemporary science these questions become very complex, especially when the reality is only accessible through a mathematical model describing it or through very indirect observations (as is the case in particle physics and cosmology). Lem solves the problem in the most radical way imaginable:

What are we left with then? With considering *the phenomenon itself* its most perfect representation, and with replacing analytical with creative activity. In other words – with *imitological* practice. (164)

As the only perfect model of any phenomenon is the phenomenon itself, Lem in fact identifies theory with practice. The strategy he offers is both, as we shall see later when discussing information farming and autoevolution. Thus, Lem rejects another dogma of our thinking, separating scientific theory from engineering, or more generally, Science from Technology.

If we now ask how the Designer knows what he is to create if the theoretical model is identical with the practical object being designed, Lem responds:

I have said that restraint on the level of design will serve as a compass in our navigation between the abyss of knowledge and the chasm of stupidity. Such restraint stands for belief in the possibility of acting effectively and in the need to give up on certain things. It means first of all giving up on asking “definitive” questions. This is not a silence of someone pretending to be deaf but rather active silence. We know far more about the fact that it is possible to act than about how it happens. The designer is not a narrow pragmatist, like a builder who is constructing his house from bricks, uninterested in where these bricks came from and what they are, as long as the house gets built. The designer knows everything about his bricks – except for what they look like when no one is looking at them. (168)

It is a bit of an evasion, which stems from our uncertainty about the nature of the world. No one knows if the world we inhabit is fully cognizable, not only for us, which I have discussed earlier, but also “in general.” It is primarily a matter

of whether it can be described mathematically, whether every level and aspect of reality can be modeled mathematically. Lem and other authors writing on the subject are careful to not mention the problematic status of the humanities. The question can be reversed too: Does every mathematical theory describe some physical entity? Some scholars, such as James Jeans and Arthur Stanley Eddington would answer in affirmative, but today, even though many mathematical theories that used to be seen as absolutely “pure” found practical use, such view is generally described as “mathematical mysticism,” as there is no logical or scientific evidence for it – and this is where we return to the starting point. Lem offers an excellent metaphor here, which presents mathematician as

a mad tailor who makes all sorts of clothes. He does not know anything about people, birds, or plants. He is not interested in the world; he does not examine it. He makes clothes but does not know for whom. He does not think about it ... He takes the finished clothes to a massive warehouse. If we could enter it, we would discover that some of the clothes fit an octopus, others fit trees, butterflies, or people. We would find clothes for a centaur and a unicorn as well as for creatures that have not even been imagined yet. (171–172)

All these metatheoretical reasonings have an implicit meaning. Lem’s Designer has the utmost degree of liberty. **He is not limited by culture, politics, society, and history, not even by biology.** He is only limited by the laws of physics – hence the title of the chapter: “Prolegomena to Omnipotence.” The Designer’s main problem is the eternal question of “what to do?” which here carries the broadest possible meaning, as the Designer can do nearly anything. Lem is trying to outline a code, a set of rules, or a method. At the same time he himself, as the author of ST, enjoys a virtually unlimited theoretical field, which is, however, determined by the fairly strict perimeter of the laws of physics and his own assumptions, especially regarding the (un)knowability of the world. He at least sees himself as unrestricted by the constraints of the past, of culture and society, but somehow obliged to correspond with them, as he is writing for his contemporaries, and not for those about whom he is writing. His task is extremely difficult, which is where the complexity of the thought in ST comes from, especially in this particular chapter.

The section titled modestly “A New Linnaeus: About Systematics”¹⁵⁶ presents a set of notions that Lem uses referring to the main directions of development

156 Lem’s lofty diction in ST would itself merit some interest. Perhaps it is not so much a product of author’s (lack of) modesty, as of irony, which he then lost in the 1980s at the latest, when he also lost his anthropological optimism.

for future technology, which will grow from combining scientific theory, technology and bio- and technoevolution. Lem emphasizes many times that the terms describe something that does not exist yet, and will not for a long time, so they have to be somewhat vague. He writes:

“Pantocreatics” refers to everything man or another intelligent being can achieve. It refers to gathering information and using it with a particular goal in mind. Such separation also exists today to some extent; it can be seen in the differentiation between science and technology. In the future, the situation will change in that information gathering will have become automated ... The part of pantocreatics that deals with information use, and that has emerged from the combination of the general theory of physical and mathematical systems, can be divided into two fields. For the sake of brevity, and also to provide a kind of overview, we shall call the first of these Imitology and the second Phantomology. They overlap with each other to some extent. We could, of course, try to be more precise and say, for example, that imitology is a design theory based on the mathematics and algorithms that can be identified in Nature, while phantomology stands for actualizing in the real world mathematical structures that have no equivalent in Nature. Yet this would already mean assuming that Nature basically has a mathematical character – while we do not want to make such an assumption. This would also involve accepting algorithmic universalism – which is highly dubious in itself. It is therefore more sensible to leave our definitions partially open. (178)

The metaphorical style – difficult to avoid when writing about omnipotence – makes it hard to get a general understanding of the project. Lem constantly oscillates between Nature and Design, obliterating the borders between the two notions. Since he cannot produce precise descriptions of “pantocreatic technologies,” he finds recourse in an almost poetic strategy – he purposefully dissolves the semantics of his own discourse.

Lem’s view on the difference between imitology and phantomology is also significant here:

Imitology is an earlier stage of pantocreatics. It is derived from the modeling of real phenomena in scientific theories, digital machines, and so on, which is already practiced today. Imitology involves launching probable material processes (a star, a volcanic explosion) as well as improbable ones (a microfusion cell, a civilization). A perfect imitologist is someone who is capable of repeating any natural phenomenon, or a phenomenon whose emergence is enabled by Nature, even though it itself has not been created spontaneously by Nature ... There is no sharp boundary between imitology and phantomology. As a later, more advanced phase of imitology, phantomology involves constructing ever less likely processes, all the way to entirely impossible ones, that is, processes that cannot take place under any circumstances, because they contradict the laws of Nature. It seems to be an empty class because the unrealizable cannot be realized. We shall attempt to demonstrate, albeit only briefly and rather crudely, that such an “impossibility” does not have to be absolute. (178–179)

We can see that, again, phenomenon becomes identical with its model. And again, this identity happens in both types of scholastic suppositions, *de re* and *de dicto*. Lem employs a rhetorical device whereby he manipulates **notions** as if he were doing so on these notions' **referents**. There is a reason why Lem constantly uses the hypostases of Science, Technology, Nature and a few other entities. It would be unacceptable in a strictly academic text and they are usually the cause of some grotesque misunderstandings in postmodern texts. They are, however, necessary and justified in Lem's writings – how else could he speak of these issues, so removed from any past or present reality?

Lem's main aim is to show that Designer-Pantocreatic and Nature can be the same. To make such a possibility seem more likely, he quotes examples from genetic engineering, which were completely fantastic in 1964, but which are quite practical in 2017,¹⁵⁷ and he interprets that as a seamless transition from "plagiarism" from Nature to "creation." He writes:

As we can see, our actions blur the boundary between what is "natural" and what is "artificial." Modeling thus allows us to cross the boundary between plagiarism and creation because our comprehensive knowledge of the genetic code obviously allows us to introduce all kinds of changes into it ... Evidently, we do not need to be familiar with the entire evolutionary road that Nature has traveled to construct a human being. We do not need millions of bits of information about particular stages of development, about *Sinanthropus*, about Mustier or Aurignacian civilizations. On having produced a "model" of a sperm or an egg that "matches" the original, we will have obtained a genotype that is more perfect than all the originals (owing to the accumulation of valuable genetic traits) – thanks to which we will have opened a "side entrance" into the process of creating human organisms for ourselves. (185)

This is the essence of imitology: it is about repeating the best achievements of Nature **without** repeating the whole blind process that led Nature to such results. This, I believe, makes the sense of the model becoming the same as the modeled phenomenon clearer. Imitology is to be an "extension" of Nature steered by Reason – without the sharp cut that separated Science from Technology in modern science.

157 The contradiction with the preceding sentence is an illusion. The fact that some of Lem's project became real does not mean that we have got closer to "pantocreatics" or "autoevolution." We are still just as distant from reaching the point of identity between Technology and Nature as we were half a century ago. In light of the strategic plans laid out in ST our achievements are but early attempts. See more on this in Chapter 27 of this book.

In the passage quoted above there emerges also a theme that will return later – albeit implicitly – in a discussion about reconstruction of species in the last chapter of ST. In order to reconstruct human organism the Designer does not need the history of the development of our species. And similarly, he will not need the history of its culture in order to reshape it. I will discuss this conclusion, as sad as it might be for humanists, later.

To provide even stronger arguments in favor of his metatheoretical theses about the possibility of “pantocreatic modeling” of reality, Lem offers another fascinating metaphor:

Yet maybe it is only today that we need theories and models of phenomena? Maybe, on being asked such a question, a wise man from another planet would silently hand out a piece of an old shoe sole picked up from the ground to us, communicating in this way that the whole truth of the Universe can be read from this piece of matter? ... Does Matter by any chance not have all of its potential transformations “inscribed” in it ... Then, taking the basic building block of Nature, the hydrogen atom, we could “deduce” all those possibilities from it (modestly starting from the possibility of constructing systems that are a trillion times more spiritual than man). We could also deduce all that is *unrealizable* from it (sweet kitchen salt NaCl, stars whose diameter equals a quadrillion of miles, etc.). From this perspective, matter already entails as its foundational assumptions all those possibilities as well as impossibilities (or prohibitions); we are just unable to crack its “code.” ... What we have just said is nothing else than tautological ontology ... (182–183)

If it were indeed possible to deduce a description of the entire universe from an old shoe sole (the idea is somewhat like Zen *kōans* reflecting the most profound sense of the world in striking absurdities), the problem of setting rules of pantocreatics, as well as the problem of correspondence between a model and a phenomenon, between a word and a thing, between a notion and an object, would cease to exist. The matter itself – unmediated by any kind of conceptual arguments – would imply nearly infinite possibilities of shaping it. It is now clear that most of the difficulties in creating pantocreatics ensue from the problem of representation that troubles the entire Western thought. Lem is no pioneer in such approach. This passage of ST puts him in a long line of thinkers dreaming of discovering a Grand Principle in the reality itself, outside any conceptual systems. “Tautological ontology” is nothing else as Leibniz’s *mathesis universalis*. Leibniz wanted to create a language in which words–things would encompass all features of the objects they refer to. Lem wants objects themselves to determine their own features and relations – so the Designer would not have to use any words, any notions. Any humanists, trapped under the burden of forty centuries of interpretation would applaud such a dream of a thoughtless pinnacle of wisdom.

14 Phantomatics

Stanisław Lem's prophecies (or, simply, Lem's Visions) are characterized by the fact that he himself does not take them in the least bit seriously, but NEVERTHELESS they come true completely within about a year. Dangerous, right?

Letter to Szymon Kobyliński, March 14, 1974

Lem brings up chapter six in ST, “Phantomology,” whenever he wants to prove how sharp a prophet he is. The chapter contains a description of something that, perhaps somewhat hastily, came to be identified with the so-called virtual reality (VR). I do not intend to compare Lem’s prediction with the contemporary state of VR technology. It would be doubly pointless: because of my ignorance with regard to technological details of VR, and because Lem’s prediction is less about technological aspects of phantomology and more about its psychological and social consequences. And they should be the object of interest here, again, as was the case with cybernetics, considering the science and the technology from the point of view of their cultural significance.

Why did Lem come up with phantomatics in the first place? What is its place within the structure of ST? The chapter starts with the following statements:

We are faced with the following problem: how do we create realities for the intelligent beings that exist in them, realities that are absolutely indistinguishable from the standard reality but that are subject to different laws? ... We shall ask, Is it possible to create an artificial reality that is very similar to the actual one yet that cannot be distinguished from it in any way? The first topic focuses on the creation of worlds, the second on the creation of illusions. But we are talking about perfect illusions. I do not even know whether they can be called *just* illusions. Please, judge for yourselves. (191)

So for Lem phantomatics¹⁵⁸ is an introduction to “pantocreatics,” “a stepping-stone to creative engineering” (191), something of a training ground to study

158 A terminological remark: the text of ST suggests that “phantomology” is a theory, and “phantomatics” – a practice of creating “illusionary worlds.” The distinction is not sharp as the entire ST – as a prediction and a manifesto of autoevolution – is a piece of purely theoretical discourse about phenomena that do not exist yet, and, moreover, if they ever occur, they will make the distinction between theory discourse and practice irrelevant.

people's reactions to an "artificial–natural" reality. It is a rehearsal before the proper act of "second creation," a rehearsal of an illusion of a "new world." Lem describes the technical details of "phantomatic machine" and sensual experiences of a phantomatized person with utmost precision, and he introduces a distinction between peripheral and central phantomatics, as well as between teletaxy and phantoplication. We shall now look into the meaning of those terms.

Peripheral phantomatics involves stimulating senses externally – the contemporary VR is the closest to it, with its helmets and gloves sets. Central phantomatics involves stimulating directly the areas in the brain responsible for particular kinds of experiences. Interestingly, Lem, who is usually not keen to make excursions into the past, points to ecstatic shamanistic practices and strong intoxicants, such as drugs, as "prephantomatics" of the first type. The remark leads him to a conclusion, which he repeats a few times, that perhaps the real application of phantomatics will in fact be limited to pleasure. Given what an average Internet user and unprofessional user of VR technology is mostly interested in today, one has to admit that Lem was actually completely right in his predictions here, even though he was quite saddened by this particular achievement of his.¹⁵⁹

"Central phantomatics," with its capacity to provoke strong pleasure and pain by stimulating the brain directly, omitting the senses – something that has already been tested on animals – leads Lem to ask about the possibility of creating "artificial paradise and heaven." It is a question of significant philosophical and sociological weight, but in this case Lem only flags the problem.

Lem's dictionary includes also "cerebromatics," which means "changes to the dynamic structure of the brain's neural network," so all actions connected with central phantomatics, with far-reaching psychological implications. Lem considers the possibility of a transformation of an individual identity that would not be "illusionary" (e.g., by placing a person in a phantomata simulating the court of Bonaparte with the phantomatized person cast as "Napoleon"), but real, transforming a personality so deeply that the person subjected to it would in fact **become** Napoleon, with all his biographical experience and all the personality traits the emperor of the French had. By discussing this possibility, Lem is unusually careful about the historical and temporal aspect of human identity. Emphasizing that identity is determined not only by psychological processes, but also by external circumstances in a broad historical and social context, he

159 For an anthropologist, the identification of shamanistic practices with simple drug intoxication is a glaring simplification. It is a reflection of how little Lem cared about the past.

concludes that it is impossible to cerebromatically turn Mr. Smith into Napoleon. It is equally impossible in peripheral phantomatics as it only produces an illusion of surroundings, without the phantomatized person ever ceasing to be himself or herself. Lem rightly stresses that:

the more the character one wishes to impersonate differs in personality traits and historical period from his own, the more fictitious, naïve, or even primitive his behavior and the whole vision will be. Because, to be crowned a king or receive the Pope's emissaries, one has to be familiar with the whole court protocol. (209)

We are dealing with the issue of artificiality here, but not the one that we encounter in the project of autoevolution, but a regular, primitive artificiality of a badly defined situation.¹⁶⁰ It is the first argument supporting a thesis that phantomatics is actually incoherent. All these reflections resemble conversation between Hylas and Philonous about transmitting personal identity, except in *Dialogues* they referred to mechanical replication and teleportation of people, whereas here it is the issue of radical transformations of external reality. The continuity of this theme is a testimony not only to Lem's long-lasting interest in the problem, but also to the inevitable influence of technological changes on conceptual standards regarding individual identity.

Phantomatization is generally risky for Lem from the social perspective. There is the issue of "yearning for authenticity" – the phantomatized individual is always aware that even the most perfect illusion is merely an illusion. He is then torn between the phantomatic reality and the authentic one; this duplicity cannot be avoided, as there is no way for a copy to become the original, which is particularly striking in case of *Lebenswelt*. Lem suggests, however, just as the Wachowski brothers (now sisters) do later on, in *The Matrix*, that phantomatized people could be purposefully misled about the status of the world they are in. He designs something resembling a "VR Turing test" and claims the only way to verify the "reality of the real" is through presence of material correlates of the most intimate content of one's consciousness, such as damaged home appliances, which only the phantomatized person knows about – and he or she knows they are the only one who knows that. These complex and seemingly fantastic ideas actually resemble *The Matrix* plot, a film that became a manifesto of cyber-pop

160 *Gruppenfuhrer Louis XVI in A Perfect Vacuum* is a macabre version of this idea, in which Nazi refugees from Europe create a replica of Versailles in the Amazon Jungle. In light of these analyses, it seems ironical that Lem received an offer to film this story, which he mentions in his conversations with Stanisław Beres.

culture in 1999.¹⁶¹ Even here, however, Lem draws some very serious conclusions. A phantomatized person acts in isolation:

It is because any act of turning to other people for help is, or rather can actually be, *an act of feeding the machine with strategically valuable information* ... This is why the person undergoing the experience cannot trust *anyone* but himself – which severely narrows down his options. He acts defensively to an extent, as he is surrounded from all sides. This also means that a phantomatic world is a world of total solitude. There cannot be more than one person in it at any one time, just as it is impossible for two real persons to find themselves in the same dream.

No civilization can become “fully phantomatized.” If all its members were to start experiencing phantomatic visions from a certain point on, the real world of this civilization would come to a halt and die out. (202)

The diagnosis is clear: complete “artificiality” of the surrounding world, with the exception of the “natural” human body and mind amounts to a suicide of a civilization. A moment later Lem states the same even more strongly:

Of course, it is possible to envisage some kind of omniplanetary “Superphantomat,” to which the inhabitants of a given planet have been connected “forever,” that is for as long as they have been alive, while their bodies’ vegetative processes are being supported by automatic devices ... This civilization would only exist for the duration of one generation – the one that remains connected to the “Superphantomat.” This would thus be a peculiar form of euthanasia, a kind of pleasant suicide of a civilization. For this reason, we consider its implementation to be impossible. (202–203)

In the context of the project of autoevolution as it is presented in the whole of ST, the conclusion is as follows: phantomatics is but a half-measure, with harmful results, as it does not eliminate the Natural/Artificial dichotomy entirely, it only disrupts the ontology of *Lebenswelt*. Later in ST we shall see that only a reconstruction of the human species in its physicality, a shift in the category of transformation, which I discussed earlier, can in fact guarantee a coherent process of autoevolution.

This does not exhaust the subject matter of the chapter devoted to phantomatics, but before I proceed with that discussion, I want to briefly point to congruencies between phantomatics and some of the contemporary intellectual trends.

All things considered, phantomatics is flawed for Lem, as it either leads to cognitive dissonance or to extinction of the human species. Neither of these

161 In some ways the plot of *The Matrix* reflects Lem’s description of phantomatics quite faithfully. It is based on the idea of machines dominating people – something that will never happen according to Lem and most other artificial intelligence (AI) theoreticians.

threats discouraged people from it though, as in the last decade of the 20th century they not only accepted phantomatization as a possibility, but also actually started to desire it, although in a shape that is somewhat different from what Lem described in ST.

When in the 1990s Internet was rapidly popularized globally, it immediately became clear how many human dreams and phantasms find their expression in the digital cyberspace. In February 1996 John Perry Barlow, one of the gurus of the IT world, published *The Declaration of Independence of the Cyberspace* – on the Internet, naturally. Here is a passage from it:

Governments of the Industrial World, you weary giants of flesh and steel, I come from Cyberspace, the new home of Mind. On behalf of the future, I ask you of the past to leave us alone. You are not welcome among us. You have no sovereignty where we gather. ... Cyberspace ... is an act of nature and it grows itself through our collective actions ... Cyberspace consists of transactions, relationships, and thought itself, arrayed like a standing wave in the web of our communications. Ours is a world that is both everywhere and nowhere, but it is not where bodies live ... Your legal concepts of property, expression, identity, movement, and context do not apply to us. They are based on matter. There is no matter here.¹⁶²

The statement that cyberspace is an act of nature is of particular importance here – it fits perfectly in Lem’s project of autoevolution. Erik Davis, from whose book I quote Barlow, emphasizes rightly that the exuberant rhetoric of the text carries a clear ideological message: Internet is to become a sphere of unrestricted freedom. Such view fueled the “web anarchism” at the turn of the centuries and it still is a support for all those who react violently to any attempts at ordering or controlling the web, even after it became clear that the web functions, mostly thanks to big corporations and not selfless activists. Here, however, I’m interested not so much in analyzing social and political aspects of the cyberspace, but its role in the ideas of autoevolution.¹⁶³

In the early 1990s there emerged a group in Los Angeles, which came to be known as “extropians.” They were enthusiastic about new technologies and drew

162 Quoted from: Erik Davis, *TechGnosis: Myth, Magic and Mysticism in the Age of Information* (London: Serpents Tail, 2004), 132–133. This book, written by an IT specialist with some interest in the humanities, includes a lot of useful information about relationships between technology and magical or mystical thinking. However, it is extremely chaotic that makes it difficult to use it.

163 A vast, panoramic view of global transformations of the last decade of the 20th century, with particular emphasis on the role of Internet, can be found in Manuel Castells’s trilogy: *The Information Age: Economy, Society and Culture*, vol. 1: *The Rise of the Network Society*, vol. 2: *The Power of Identity*, vol. 3: *End of Millennium* (2nd ed;

bold visions of their further growth, which would help people acquire unlimited capacities. In their own, somewhat mystical way, they prophesied the same project of autoevolution and exceeding the limits of humanity that Lem presented in ST. It is particularly interesting that they also assumed that in the future people would move their brains from bodies to computer networks. Max More, the President of Extropy Institute, wrote:

Shrugging off the limits imposed on us by our natural heritage, we apply the evolutionary gift of our rational, empirical intelligence to surpass the confines of our humanity, crossing the threshold into the transhuman and posthuman stages that await us ... When technology allows us to reconstitute ourselves physiologically, genetically, and neurologically, we who have become transhuman will be primed to transform ourselves into posthumans – persons of unprecedented physical, intellectual, and psychological capacity, self-programming, potentially immortal, unlimited individuals. (Quoted from: Davis, 143–145)

Which is exactly what Lem prophesies in ST. Stepping ahead of myself here a little, I will add that the same views are developed in the last chapter of ST and then, more than a decade later, in *Golem XIV*. Moreover, we encounter here words that remained foreign to Lem: “transhumanism” and “posthumanism,” to which I shall return later. At this point I just want to show that the cyberspace, which Lem and his commentators associated mostly with phantomatics, comes close to his thinking in other areas as well – or perhaps above all elsewhere. The passage I have quoted is a good example of the functions of the Internet and cyberspace in the culture of the early years of the 21st century. The heights of technology overlap with heights of mysticism. Davis invokes Nietzsche and his thesis about *Übermensch* as a result of rejecting the earlier model of humanity. I believe in the context of autoevolutionary projects this is only an intellectual convergence, but in Part Three I will try to search for a line that would connect these areas of Western thought more directly.

Extropians accuse the human kind of the same things as Stanisław Lem and in the same way, with the same justifications. I will try to show that the solutions offered to human problems are also largely similar in these two cases.

The thesis about moving human brains to computer networks is not just a sci-fi idea. It is one of those elements of contemporary thought, in which it is hard to distinguish between what is scientifically and technologically viable and

Oxford: Blackwell, 2000, XXIX+594, XV+461, XV+448). However, the level of detail of the book, combined with the pace of developments since its publication led to the work losing a lot of its relevance very quickly.

what is but wishful thinking emerging from cultural anxieties. “The presence of myth” in science, which Leszek Kołakowski sought deep underneath the positivist paradigm is very clear now, and not only in computer technologies, but also in physics and biology, for example. Authors such as Marvin Minsky and Hans Moravec – widely respected in the area of AI and IT – were very interested in the idea, even though clearly it is completely unrealistic at this point.¹⁶⁴ (It is only different from Lem’s phantomatics in that Lem does not allow for rejecting the body, which by the way, as I have pointed out earlier, is an internal contradiction of phantomatics as part of the autoevolution project. This idea, however, highly resembles Lem’s “cosmogonic engineering,” which will be discussed later.) It is again a certain concept, less scientific or technological than resulting from many people’s state of mind at the beginning of the 21st century.

Another important cultural correlate of cyberspace would be cyberpunk. It is a literary genre inaugurated by a novel by a Canadian, William Gibson, titled *Neuromancer* (1984), which is often quoted and analyzed by media theorists. The novel is set largely in virtual space generated by computer systems. By now the motif has been largely exhausted, but taking into account that Gibson published *Neuromancer* when personal computers were still a technological novelty, one cannot help but admire his pioneering position. Cyberpunk is a literary genre in its own right now, with hundreds of works. Cyberpunk novels are usually set in environments dominated by computer systems, very much like the world outlined by Lem in *ST*, especially in the chapter I am currently discussing here. In Poland the most eminent representative of cyberpunk is certainly Jacek Dukaj (born in 1974). There are formal similarities between his works and Lem’s novels insofar as both contain numerous descriptions of alien (“inhuman”) worlds (such as VR or other planets), and those descriptions equal Lem’s best ones from *Eden* and *Solaris* in how vivid and powerful they are.¹⁶⁵

Taking into account the length and the subject matter of my book, I have to limit my discussion of the cultural role of the Internet and cyberspace to these few side notes. Let us return to Lem’s phantomatics now.

I have mentioned “teletaxy” and “phantoplication” earlier. Having discussed the psychological and social consequences of phantomatics, Lem then remarks:

164 Moravec, a professor in robotics at Carnegie Mellon University, presented an operational vision of moving human personality into a machine in his book *Mind Children* (1988).

165 On Dukaj, see more in Chapter 25.

The categorical statement with which we closed the previous section – that it is only possible to be either oneself or nobody – does not contravene phantomatics’ potential ... We mentioned earlier that this lack of authenticity in a phantomatic vision, the fact that it represents a biotechnologically executed escapism, is a big problem. Cybernetics offers two ways of overcoming such inauthenticity of experience ... we shall call them teletaxy and phantoplication. (217–218)

“Teletaxy” means “connecting someone to a machine that only functions as a link between him and the real world ... Teletaxy connects a person to a randomly chosen fragment of reality, as a result of which he experiences the reality as if he were really placed inside it” (218). The machine would be a “remote-I,” connected with the senses of the person steering it. Lem points to an astronomical telescope as a prototype of such a teletactor.

“Phantoplication” means something very similar, with the one difference that instead of a machine remote-I there is a real person. Specifically, it is about

connecting one person’s neural pathways to those of another person. Thanks to this procedure ... a thousand people can simultaneously “take part” in a marathon ... However, this method only involves a *unidirectional* information transfer, since those “connected” to the runner are not all able to command his movements. (219)

Lem only devotes one paragraph to each of these ideas, after which he again returns to the issue of personality in the context of phantomology, which, as we already know, he finds extremely fascinating.¹⁶⁶ Earlier, he described personality problems caused by phantomatics, and now, in the penultimate section of the chapter (“Personality and Information”) he focuses on paradoxes of “multiplied identities.”

Before I proceed to discuss them, I need to point to one more aspect of phantomatics, or, more precisely, a lack thereof. In his analyses Lem pays very little attention to phenomenological approaches to perception. He implicitly accepts that human consciousness and the external world are strictly separated,

166 In a letter to Michael Kandel on October 19, 1974, he wrote: “As to PHILOSOPHY now, I am quite rational and fairly clear in gnosiology, but it is not the same with ontology, because I think there is an inexplicable mystery there: the *Ego* (I) – physics, biology and other empirical sciences can sufficiently explain the emergence and existence of “others”, i.e. “third parties”, but we can NEVER count on them to explain where I come from. There is no clear link between “they” and “I” at all in the natural sciences, because “I” is existentially a unique point through its “unleaveability” (you cannot “leave” your I, you cannot go beyond it) and HEREIN FOR ME LIES THE GREATEST MYSTERY OF BEING, while the rest are merely the consequences of IT... (Hence, the “amazement with being”, etc.)” (*Listy...*, 218–219)

and the transfer of data *via* the body (or sensual impulses) is clear. Such approach is obviously reductive, but perhaps it was necessary to accept it in order to speak of phantomatics as a technology, and not just a vague idea.

In “Personality and Information” Lem takes up a theme of “multiplied identity,” which came up earlier in *Dialogues*; this time it is connected to the issue of teleportation. Lem is considering a possibility of framing human personality in terms of theory of information, and accepts implicitly that “personality” can be fully reduced to physiological and mathematical data. Such assumption is necessary in order to meaningfully discuss teleportation at all.¹⁶⁷ The attempts to explicate the notion of personality in terms of cybernetics again lead him into paradoxes we saw earlier in *Dialogues*, all the more complicated by the fact that in ST there is the additional element of genetics (identity as a derivate of phenotype). Here again from his complex argument Lem draws a conclusion that a “copied” or “telegraphed” individual would **not** be identical with the “original,” even if it had the same atomic structure (that disregarding the influence of quantum uncertainty). To explain this surprising lack of identity, Lem vaguely refers to extraphysical factors, while also stressing it has nothing to do with spiritualism.

I believe this issue could have been a bit clearer, if arguments about the historicity of our existence were used. Lem nearly always disregards history, cultural tradition and those ways of thinking about people, which take into account the past, such as hermeneutics. In light of his autoevolutionary projects in ST it is understandable, because autoevolution – to which I will return in Part Three – means, among other things, rejecting historicity. But there are points in Lem’s thinking that would benefit from including history in the view. This is one of such moments. In order to explain the nonidentity between the “copied” man (just as the nonidentity of a clone) and the “original,” it is enough to explain clearly that each human being is unique due to its own history and – in a broader context – due to how differently every human is affected by the history of culture. Even the “way of creation” of a human – be it conception, artificial insemination,

167 Teleportation is the means of transport of choice for the protagonists of the American sci-fi series *Star Trek*, which was one of the icons of the 1980s mass culture. It inspired a distinguished physicist Lawrence M. Krauss to write a book *The Physics of Star Trek* (1995), where he discusses the possibility of really implementing some of the “fantastic” technological solutions known from the series, including teleportation. However, as a physicist he pays little attention to the issue of personality and consciousness, which, apart from the technological issues, seems crucial to the question of human teleportation.

“copying” or cloning – is, of course, an element of one’s biography and as such it influences individual identity, shaping it in ways very different from any other individual. The “artificial” methods are perhaps not as different from the “natural” ones as Lem and contemporary commentators of the issue of cloning claim – and this is what leads them to engage in a heated discussion of the question of identity. Is the difference between a clone and a human born “naturally” bigger than between a Wall Street broker and an Indian pariah? (I need to point here again to Lem’s obliteration of the Natural/Artificial distinction.) **We are all equal in face of history in a sense that it shapes each of us differently than everyone else.** The problem of copying people, and cloning, is telling in a sense that it juxtaposes – and violently, too – **the presence of the historical dimension of culture and the absence of it in technology.** Perhaps the problem of the individual identity of clones can be reduced to that juxtaposition. Such a juxtaposition would also be a symptom of a major breakthrough in the history of our species, which ST describes, I believe. It describes a shift from history to autoevolution, transgressing the limits of humanity.

Lem would disapprove of such an approach to the issue mainly because it presents human identity as dependent not on eternal, or at least unambiguous laws of Nature, but on something as appallingly random and incoherent as history and culture. Given the mutual influence of culture and technology within “the technologies of producing people,” one could also ask whether **a human (a person) has a humanistic coefficient.** Florian Znaniecki applied the notion only to objects in human environment. But autoevolution, with its obliteration of the distinction between the Natural and the Artificial, allows us to ask it also about human – because for Lem we become our own products, and not in a “spiritual” sense, as it had been earlier, but in a material sense, as we produce and modify our bodies. It seems to me though that Lem would respond in a negative, assuming he would even see the question as valid. However, I would claim that at the current stage in our civilization’s development (before autoevolution) the only way to avoid the paradox of “multiplied identities” is by assuming that every member of our species, no matter how he or she was created, has an individual, unique humanistic coefficient – a set of meanings ascribed to him by others and him or herself. The incoherence of this solution within the project of autoevolution stems from the fact that “copying” people is just a half measure in light of this project, just as phantomatics is a half measure. Only a full autoevolution – a complete reconstruction of the human species, a full detachment from the form of humanity we have known so far – will allow us to avoid such incoherences or contradictions. Lem does not say that explicitly, but I believe it is a conclusion

that can be drawn from ST as a whole; ST contains a lot of implicit assumptions, which I am trying to bring to light here.

A curious reader, still remembering some of the more recent intellectual trends, might ask what is the relationship between phantomatics and Baudrillard's simulacra. The answer is: there is none. For a very simple reason: Lem's phantomatics is not only an element of the project of autoevolution, but it is also based on an intervention into the human sensorium. And Baudrillard's metaphor of simulacra refers only to the internal circuits of culture; it has no links with issues of biotechnology. However, it is true that Baudrillard's thought, whatever our judgment about its content and precision, does describe in its own way the same phenomenon that Lem focuses on in ST: the destruction of the Natural/Artificial opposition.¹⁶⁸

168 Baudrillard locates the opposition inside culture as opposition between original and copy. See especially his description of replicas of prehistoric cave paintings in *The Precession of Simulacra* essay and the entire argument presented there.

15 On How to Farm Information

Of course, I am always right, how exhausting!

Letter to Michael Kandel, [month unknown] 22, 1974

The penultimate chapter of ST is titled “The Creation of Worlds.” It contains an outline of a radical transformation of external reality of human life – but still only the external one. It is the penultimate stage of autoevolution.

To totally restructure reality, a total method is needed. In this chapter Lem seems to be taking a step back from his thesis about theory and practice being the same, which he stated in the fifth chapter, and returns to modeling a scientific theory. He is clearly irritated by the fact that science develops randomly and chaotically, not only because it is belittling to his vision of man, but also because it limits the Designer’s “omnipotence.” In short, there is a need for an “applied metascience”:

Human civilization is like a ship that has been built without any design plans. The construction process was extremely successful ... Yet this ship is still rudderless. Civilization lacks knowledge that would allow it to choose a path knowingly from the many possible ones, instead of drifting in random tides of discoveries ... Science is playing a game with Nature, and even though it wins every time, it allows itself to be drawn into the consequences of this victory and exploit it, as a result of which, instead of developing a strategy, it ends up just practicing tactics ... We have to learn how to regulate scientific progress too; otherwise the random character of any future developments will only increase. (235)

Had Lem had a chance to read Kuhn’s *The Structure of Scientific Revolutions*, published two years before ST, he would have likely agreed with his analysis of progress in science. But Kuhn only described the world of science – Lem wanted to change it.¹⁶⁹

The change would amount to so much as transforming the process of science’s evolution from a chaotic one into a strictly determined process. Just as pantocreatics is meant to be a “rational” replica of Nature, and autoevolution a rational replica of bioevolution, “information farming” is to give as full control

169 It might be worth noting here that in the passage I have quoted Lem repeats – intentionally or not – one of the oldest *topoi* of European literature, that is, the image of society as a ship on a rough sea, threatened by destruction.

over the increase of knowledge through science. And all this so that civilization gains “the freedom of strategic maneuvering to be able to control its path” (236).

What is information farming? In ST we read:

We are supposed to go all the way toward automatizing Science. This is a terrifying task ... We are to invent a device that will gather information, generalize it in the same way the scientist does, and present the results of this inquiry to experts ... Our device thus produces theories. (242)

Information farming is then something like a programmed metascience. On the following pages Lem discusses philosophy of science and links between information processing and biology (in human brain). This discussion remains unrelated to any “official” currents in philosophy of science and they do not include anything that would not have been said in the preceding chapter already. Generally, in his version of philosophy of science, Lem leans toward a conventionalist orientation. The main part of the chapter is devoted to the technology of information farming. The description includes elements of cybernetics, theory of information, biochemistry, embryology and genetics. The main idea is:

Could we not take up “information farming,” cross-breed bits of information with one another, and initiate their “growth” so that we eventually obtain a “mature organism” in the form of *scientific theory*? (251)

The procedure would as it were repeat the development of living organisms. Every complex living organism grows out of a very simple nucleus, for example, a spermatozoid and an egg cell. The transition from this simple stage to the phenomenally complex grown-up organisms is an object of amazement and fascination (and studies) for many scholars – and of Lem. He remarks that the process of ontogenesis, which enables such a vast multiplication of information in an organism, must be subjected to a set of some very precise laws. But if that is the case, then we could, Lem says, design a quasi-biological system, whose initial structure would have some scientific information built in, and a set of instructions of development. The system would then fulfill those instructions, just as a human embryo and fetus do, resulting in a “mature organism – scientific theory.”

This idea from Lem may seem completely fantastic. I will try, however, to treat it as a serious idea, with its own place in the project of autoevolution. The idea of inscribing information inside the molecular structure of matter, or even on a yet lower level, has particular intellectual bearing. We can immediately notice that it eliminates the problem of representation mentioned before.

The questions of adequacy of linguistic signs and the objects they describe simply disappear when the language of theory becomes a tool of practice – just as performatives work in magic. Lem believes here that the language of scientific theory could operationally be the same as genetic code. To prove it, he produces lengthy arguments about the essence of natural languages (section titled “Linguistic engineering,” 267–282). Lem’s philosophy of language is, so to say, just as “private” as his philosophy of science, that is, it has just as little connection with any known philosophical currents, and it is just as deeply permeated with imagery derived from biology. In short, his theses can be summarized as follows: the meaning of a genetic code is its performativity in the process of ontogenesis (so, eventually, a mature organism), and the veracity or falsity of its “statements” is determined by natural selection. It is assumed that the same model can be applied to the relationship between the language of theory and molecular structures, which makes “information farming” possible in a sense that the evolving system will eventually result in complexity of information that will exceed the initial set – as is the case in ontogenesis. Similar parallels between natural language and genetic code are drawn in a book *Das Spiel - Naturgesetze steuern den Zufall* by Manfred Eigen and Ruthild Winkler, which was published a decade after ST (Polish edition released in 1983).

I mentioned that Lem “seemingly” withdrew from the idea to identify theory with practice. The problem lies in a sort of conceptual split, which Lem apparently does not notice. “Information farming” is indeed an example of such identification, as logical and intellectual operations are replaced here with physical and chemical processes. However, – and that is the key problem – the processes result in another **theory**, albeit expressed not through a set of formulae and theorems, but rather as lumps of matter of complex molecular structure from which a theory can be deciphered. It is then a sort of intermediate stage between “pure theory” and “pure practice.” The author’s aim, as he emphasizes, is “automatizing Science,” thanks to which the Designer will know “what to do.” But “information farming” is not itself a **construction**, it is only a **building instruction**. Its advantage is that it eliminates the chaotic heuristics from the scientific process. However, the price is that even though theory becomes practice, the practice remains a theory. Lem, too, cannot see this contradiction or he glides over it on purpose.

We should remember that for Lem the project of “information farming” is merely a remedy to “megabyte bomb” and the chaotic increase in knowledge, so

it is only an intermediary step toward autoevolution, and not an element constituting autoevolution. As we can clearly see now, ST mostly consists of such “introductions,” and this is why it has to be very generic about the questions of the impact of technology on human life. Only the last chapter will show that technology is to change it through and through, all the way to its biological foundations.

Could these ideas from Lem be fulfilled in any way? The idea of coding linguistic meanings in material systems is of course fulfilled by every computer, in its integrated circuits or chips, memory and logic gates. But Lem’s project is much more advanced. Computers based on von Neumann’s classic architectural design operate only in a binary system, and all data they process have to be expressed in the binary code. Lem has something very different in mind: expressing a language of scientific theory in a representation of biological molecular structures, the way genetic code is represented in DNA sequences. Contemporary technologies are slowly getting closer to such options, or similar ones. I am speaking of quantum computers and biocomputers here.

In the late 1970s Richard Feynman was the first to put forward the idea of bringing mathematical processes to the lowest, quantum level of matter. He has been building such systems since the 1990s. In quantum computers information is inscribed and processed not as bits but quantum bits, that is, quantum states of individual atoms and their superpositions. It increases the computing power by many orders of magnitude and it is a tremendous qualitative change in comparison to digital computers. If quantum computers were popularized, it would probably get us closer to the idea of “information farming,” although it seems unlikely that even those machines would be able to add new data to their databases on their own. Biocomputers are much closer to Lem’s ideas, that is, machines that combine mechanical systems with living matter. Future research on these systems and a technology of inscribing data expressed in human natural languages into DNA sequences (DNA digital data storage) will allow us to see to what extent it is a fulfillment of the idea of information farming.

Apart from these technologies, there are also theories describing reality in a way that make “information farming” possible. These are self-organizing systems theories, which have been developed since the 1960s by Humberto Maturana, Francisco Varela and Niklas Luhmann – I have mentioned them in Part One as the late (and somewhat alienated) offspring of cybernetics. These theories often employ the notion of “autopoiesis,” which means the ability of complex systems (organic or inorganic) to transform their own structure and qualities. Such theories have a lot in common with emergentism, a view that a system as a whole has qualities that cannot be reduced to the sum of its parts and relations

between them. This position has been mostly shaped in opposition to contemporary reductionism in natural sciences. All these currents resemble the premises of Lem's project of "information farming" to some degree.¹⁷⁰

And what is the relationship between "information farming" and "the creation of worlds"? It seems that in this case it is quite simple. Again, Lem seamlessly oscillates between his "theory" and "practice." The project of automatized science is a "user manual" for the Designer, a set of practical tips. It was discussed in "Prolegomena to Omnipotence" as well, but there it was about something else: Lem focused on a set of general rules for the Designer to follow, something like a "constitution," setting the terms of "omnipotence."

The two final sections of "The Creation of Worlds" are "The Engineering of Transcendence" and "Cosmogonic Engineering." Lem reaches the limits of his own technological imagination here. The connection of these passages of ST with the rest of the book seems rather feeble, even though the author claims they are a description of "another possibility of taming the information deluge" (282). This is not so much about the "megabyte bomb" though, as it is about the human yearning for faith, for irrational metaphysics – which Lem sometimes notices, but does not approve (we have already seen, what he is capable of saying about religion) and tries to frame the issue in terms of technology. So it is like mixing fire with ice.

The way he does it is impressive. He begins by pointing out the futility of consumerism:

It is often said that the separation of the present reality from transcendence, so commonplace today, is pernicious in that it underlines the universe of fixed values. Because life on Earth is the only thing that exists, because it is only in this life that we can seek fulfillment, the only kind of happiness that can be offered to us is purely carnal. Heavens have not revealed anything to us; there are no signs that would indicate the need to devote ourselves to some higher, nonmaterial goals. We furnish our lives ever more comfortably; ... we invent more and more ephemeral trends, dances, one-season stars; ... Entertainment derived from a nineteenth-century funfair is today becoming

170 From here it is close to scientific mysticism of, for example, "the gnosis of Princeton," which has been the position of many scholars from Princeton since the 1970s (with the most eminent among them being Fritjof Capra). "The Gnosis of Princeton" involved a conviction, that every element of matter, all the way to atoms and elementary particles, is endowed with some kind of consciousness. This shows that Lem's thought does occasionally, against his will, get close to the border between scientific thinking and magical and mystical one. For more on "the gnosis of Princeton", see: Raymond Ruyer, *La Gnose de Princeton* (Paris: Fayard, 1974).

an industry underpinned by an ever more perfect technology ... At the same time, a feeling of emptiness, superficiality, and sham sets in, one that is particularly dominant in civilizations that have left the majority of primitive troubles, such as hunger and poverty, behind them. Surrounded by underwater-lit swimming pools and chrome and plastic surfaces, we are suddenly struck by the thought that the last remaining beggar, having accepted his fate willingly, thus turning it into an ascetic act, was incomparably richer than man is today, with his mind fed TV nonsense ... The beggar believed in eternal happiness ... looking as he did into the vast transcendence ahead of him. Free time is now becoming ... actually a vacuum, because dreams can be divided into those that can be realized immediately ... and those that cannot be realized by any means. Our own body, with its youth, is the last remaining god on the ever emptying altars; ... yet even those wonders of civilization turn out to be of no use. Nothing shows him what to do, what to aim for, what to dream about, what hope to have. (283–284)

It might be hard to believe this was written in Gomulka's Poland. The passage sounds more like a text by an American conservative commentator such as Allan Bloom, and written in the 1990s, or it could be a blurb for one of Houellebecq's novels. Again, it shows how perceptive Lem was about the role of technology in human life (which was increasing at a much lower pace then than it is now). In the last years of his life, he would also make similar statements, but in a much grumpier tone. This passage is actually quite unique in *ST*, because, as I have mentioned, Lem was not interested in the social aspects of technology. Perhaps because already then he saw more negatives than positives to it. Why then, we could ask, did he put so much emphasis on technology – so much so, that he was often accused of scientism? I will try to partially answer that question once I have looked into his response to “vacuum of transcendence.”

What is Lem's response to it? The same as extropians have today, even though they seem not to notice the vacuum. Lem describes “machine,” inside which there is a whole world, peopled with rational creatures – it is a product of the Designer, and it is made of electrical impulses. It is also a huge digital computer simulating a highly complex global physical reality. Part of the machine is “the Other World” – a place, where the residents go after their death. It can be programmed so that it can realize any type of transcendence that has ever appeared in human thought – from the Christian paradise and hell to Buddhist nirvana. Lem emphasizes – and it is an important methodological remark for him – that he is using the term “machine” only for the lack of a better one, which would be more fitting for the entity he has in mind. Today we could call it cyberspace. As Lem writes later, the designers of such world, suffering from “withering of transcendence” in their own reality, could at some point decide that it is possible and advisable to make an “Exodus” to the other, “artificial” world – as it does admit transcendence, which they know for sure, having programmed it that way.

We can see that from the technological point of view this is the same idea as the ones presented by extropians, which I have presented when discussing phantomology.¹⁷¹ But Lem, more attuned to philosophical questions, immediately renders it meaningless. In the sketch of a dialogue between a Designer and a skeptic (286–287), he proves that the contradiction does not lie in the “artificiality” of such a world (and we have already showed that the notion itself is meaningless in Lem’s thought), not in its “limits” (as it is no more limited to its inhabitants than ours is to us), but in the fact that for its inhabitants the transcendence it offers can be just a matter of faith, just as it is for us. Living inside such a world they cannot prove the existence of “afterlife,” without depriving it of its meaning. And it is also ontologically impossible, because the line between life and death is just as strict for them as it is for us – this is how the Designer programmed it, exactly so that they can only **believe** in their afterlife, and not **know** it. Only an external observer of such a world (i.e., the Designer) **knows** that the afterlife exists. The vast difference between faith and knowledge or science is absolutely clear for Lem here, despite his commitment to Reason. His Designer says:

Belief without after-death fulfillment means incomparably more to mortals than fulfillment or transcendence not preceded by belief... this is a highly interesting problem. It is real, that is, soluble, only for an observer who is positioned outside that world ... When it comes to ... suggestion that we introduce miracles into this “new world,” we have to reject it ... Miracles are not a confirmation of belief. They are a transformation of the latter into knowledge because knowledge is based on observable facts – which the “miracles” would then become. Scientists would make them part of physics ... to prove belief is to destroy it as it only exists in its full absurdity and groundlessness, in its rebellion against empiricism ... Put briefly, a world in possession of the current knowledge about transcendence and what it looks like is a world without belief. (287–288)

171 Perhaps it is worth mentioning here that the source of all ideas of transferring human minds to cyberspace can be traced back the notions of noosphere and Omega Point established by Pierre Teilhard de Chardin. The cyberspace itself, for example, the web, is sometimes seen as an incarnation of the noosphere, although one might doubt whether Teilhard would agree. An American cosmologist Frank Tipler is the author of an idea that the human kind, threatened by implosion of the universe (assuming the process will last long enough to be witnessed and that it will follow the scenario of expansion and then contraction) might make a “leap” into an artificially created dimension of time and space. Such concept is also akin to the ideas of Lem, Teilhard and the extropians.

This sums up one of the most important problems of the Western philosophy: the question of validity of unprovable statements about the world. There are many people who need a superior, outworldly justification for the world, but such a justification can only be effective according to Lem if it is arbitrary. *Credo, quia absurdum*, as Tertullian put it.¹⁷² This dilemma could only be eliminated if we could place ourselves outside this world and remain permanently “in-between worlds.”

Thus, a seemingly purely technological idea seems to become a center of purely philosophical thinking for Lem.¹⁷³ He finishes with the following sentences:

The conclusion is that the source of Great Anxiety, and of the equally dangerous mindlessness, lies not in the “amputation” of transcendence by materialism in man but rather in the present social dynamics. It is not a renaissance of transcendence that is needed but rather a renaissance of society. (288)

With this sentence Lem takes a step toward philosophy and social practice, but – faithful to his convictions – he does not go any further down that road. He is convinced that while technology can be a correlate of social issues (which can be clearly seen in all the social meanings ascribed to the web), but it almost certainly cannot be a remedy to them. Technoevolution progresses independently from the development of society. These are two separate currents. This view, which can be traced throughout ST, is one of the arguments in favor of the utopian character of Lem’s thinking, as it necessitates assuming that human kind will somehow “grow up on its own” to benefit from all the amazing technological possibilities described in ST. Lem knows about this utopianism, but he does not like admitting it (as in the already quoted passage from *Studia Filozoficzne*). So far, however, there is no reason to believe that the technological growth has anything to do with the ethical progress in users. This chasm is quite problematic

172 This is one of Lem’s favorite Latin quotes. His view on faith is quite different from contemporary theology. Lem seems to have especially valued Tertullian, Pseudo-Dionysius the Areopagite, Nicholas of Cusa or Pascal – so thinkers representing negative theology.

173 Again, I need to invoke the piece *Non Serviam* from *Perfect Vacuum*. Its “author” and protagonist, Professor Alfred Dobb, is giving an account of a discussion between two “personoids” he has created on a computer. They are discussing the genesis of their world, and they conclude with an accusation that its potential creator (i.e., Dobb) has entangled them in insolvable philosophical dilemmas (highly resembling ours). Ironically, Lem makes Dobb close the account with a statement that he feels responsible for the being of these creatures, so, as long as he can, he will not turn off the computer, despite appalling electricity bills.

for the project of the species' autoevolution, as I will show in the next part of this book.

The section "Cosmogonic Engineering" develops the idea of "creation of a world," but without the issue of transcendence. Lem simply (?) proves the technological possibility of such occurrence, again being a quarter of a century ahead of extropians and other authors who were only inspired to think this way by the rapid growth of IT in the 1980s and 1990s. Lem imagines such a world as a cosmic-sized computer system, powered by star energy and simulating all "natural" phenomena in its circuits. No need to add here that the terms "natural" and "artificial" lose all their meaning by now.¹⁷⁴

At this point, however, Lem get trapped in the paradox he has just thoroughly analyzed a moment earlier:

Equally, they [inhabitants of the world built by the Designer-Cosmogonist] are unable to establish whether someone created them and the cosmic habitat they freely roam, and, if so, who it was. Yet even though we have not been created by anyone (or at least by any personified being), there are plenty of philosophies that claim the contrary, declaring that our world is not all there is. But people who have pronounced such things have the same senses and brains that we do – sometimes rather sharp brains! (293–294)

This is somewhat surprising. One is tempted to ask where from the author draws his unshakable certitude that there is no creator of our world, given that on the preceding pages he has described nothing short of a creation of a world. How can we know that the building material of our universe – matter, energy and information – is not a "set of building blocks" available to the Designer in a higher-order world? The author himself admits that the sequence of such creations can be very long (292–293). This contradiction in Lem's thinking is an illustration of a fairly persistent conflict in his work between the scientist and empiricist conviction about the superiority of Reason and Science over other human ways of experiencing reality on one hand, and a strong "sense of mystery," a metaphysical yearning for a Great Dream to be hidden somewhere behind the facade of reality on the other. This clash of conviction actually has its own separate, thorough

174 Here we should invoke *New Cosmogony* from the *Perfect Vacuum* volume, which is a quasi-fiction developing the idea. Lem's apocryphs are usually read as intertextual games of the type Borges engaged in. However, they include a lot of autocomentaries on Lem's discursive texts. It would be advisable to write an analysis that would give a detailed idea of all such links, just as I suggested earlier for links between his discursive and grotesque writings. The thesis about close links between Lem's discursive works and his fictions is commonly accepted in Lemology, but it rarely produces thorough and precise analyses of the subject.

description within Lem's oeuvre. It is the narrator's words in *His Master's Voice*, which express the conflict between amazement at the impersonal absolute of the laws of science on the one hand – and the impact of cumulated individual life experience, the psychological capacity of a scholar, his private fears or obsessions. It all clashes inside Peter Hogarth's consciousness. While generally Lem remains insensitive to the relationship between science and society, he does seem to understand the relationship between science and the scholar's personality very deeply. Generalizing a little, one could say that he cares about the adventures of an individual and the universe – and nothing less, nothing in-between. It is nearly certain that his interests were shaped in this way by his early war and Holocaust trauma.¹⁷⁵

Later in the section “Cosmogonic Engineering” Lem points out that

The physicists from that world would only be able to discover the fact of creation (or rather of “having been created”) by *comparing* our real world with their own. It is only then that they would be able to see that our world is one level of Reality short when compared with theirs ... Figuratively speaking, a created world [by the Designer] is perhaps like a very stable, very long, and internally coherent dream that no one is dreaming but that rather “is dreaming itself” – inside a “digital machine.” (294–295)

“Cosmogonic engineering” would then be free of the contradictions that phantomatics is flawed with, and in this sense it would be the “correct” variant of autoevolution. It is, however, a variant, which exceeds the project contained in ST as a whole. Lem sees it as a “deviation” and concludes the chapter with the following:

Someone could ask whether I believe it is at least a little bit likely that humans will one day make such – or similar – plans ... I do not think so. Yet, if we take into account all those countless intelligent worlds revolving inside those enormous galaxies, while the number of those galaxies is incomparably higher than the number of ... the grains of sand in a desert, this very number makes any improbability possible ... Yet for no one in this whole abyss of stardust to arrive at an idea about such an undertaking, to try to bite more than it seems possible to chew – this indeed seems rather improbable to me. Before someone categorically disagrees, please, take a moment: July nights, during which the sky is so starry and beautiful, really encourage such contemplation. (296)

We already know what Lem thinks about a starry sky. In Part Three I will try to show what it entails for the moral law.

175 I try to prove this thesis in the article I have already invoked here, *Lem fantastyczny czy makabryczny?*

Since following Lem's thought has led me here to issues of utmost fantasy (although still rooted in science), I will quote one more passage from this chapter:

Pantocreatics does not thus create eternity because this is impossible. Fortunately, it is also unnecessary. We have nothing in common with a rather peculiar being who would want to exist for billions of years on an individual level and who would realize what such an existence means. (No human being is ever going to be able to imagine that.) (290)

It seems to be an accurate statement. But even this immeasurable difference has not prevented scholars from considering the existence of such forms. It was undertaken in the context of the "heat death" of the universe – a scenario of universe's development based on constant expansion until nearly all thermodynamic processes cease. Universe would then become a practically infinite, empty space, with rare individual elementary particles. (And the word "rare" is to be understood as broadly as possible. It has been calculated as one electron per a volume exceeding the universe observable today by many orders of magnitude.) There are people who dare to speculate about possible forms of life in such conditions. These would have to be forms with radically slow life processes (due to the lack of energy in their environment), and so their life span would be counted not even in billions of years, but in billions of billions of years (we find ourselves in the world of big numbers were the cumulated exponents deprive imagination of all its capacities). An article on the subject was once published by Freeman Dyson,¹⁷⁶ which was then taken up by Paul Davies in *The Last Three Minutes*,¹⁷⁷ and eventually found an exciting and well written rendition in a book of two American cosmologists Fred Adams and Greg Laughlin titled *The Five Ages of the Universe*.¹⁷⁸ It is one more evidence how far scientific deduction can take us, although in this case it is pure fiction, not a description or a prediction. Perhaps this is just the kind of sci-fi Lem dreamt about.¹⁷⁹

176 Freeman John Dyson, "Time Without End: Physics and Biology in an Open Universe," *Review of Modern Physics*, no. 51 (1979), 447. Dyson's main goal was a polemic with Steven Weinberg's statement in his famous book *The First Three Minutes: A Modern View of the Origin of the Universe*: "The more the universe seems comprehensible, the more it also seems pointless."

177 Paul Davies, *The Last Three Minutes: Conjectures about the Ultimate Fate of the Universe* (London: Weidenfeld & Nicolson, 1994).

178 Frank Adams, Greg Laughlin, *The Five Ages of the Universe: Inside the Physics of the Eternity* (New York: Free Press, 1999).

179 Fred Hoyle, who probably has similar intellectual leanings, wrote a novel about an intelligent form of life of extraplanetary size (*The Black Cloud*, 1957). Lem mentions

After this digression into the most remote domain still available to our mind's reach (although too distant for our imagination to grasp it), in the last chapter of ST Lem returns to the project of autoevolution of our species. The project – or its interpretation I am about to present – involves a number of ideas that have been circulating in the late 20th and early 21st century.

the novel in ST on page 318. Hoyle, however, is more interested in the links between science and politics than in the features of the entity.

16 Putting Pieces Together

The plethora of themes in ST may confuse – and it does confuse the general meaning of the work, which I wanted to bring out here. So I will now summarize it briefly.

Summa Technologiae develops the kind of thinking about the role of technology in the human world, which Lem started to work on in *Dialogues*. Just as in *Dialogues* his discourse can be accused of being somewhat chaotic – he put in it everything he was interested in at the time. Even if that is the case, it has no bearing on my analyses. I believe **ST is a global prediction of how our civilization will develop technologically, and it includes an elaborate project of autoevolution of our species, based on a set of assumptions pertinent to philosophy, anthropology and social practice.** Some of these assumptions have already been discussed in this part of my book. These are, above all: eliminating the opposition between the Natural and the Artificial and the conviction about the progressive character of autoevolution and about its independence from social processes running parallel to it.

I have been trying to show to what extent the stylistic and formal devices Lem used in ST affect the overall shape of his project, especially the fact he does not differentiate between a scientific text and an informal essay. Lem's thinking in ST develops as follows: first, he considers the possibility of existence of intelligent forms of life different from us, treating it as an initial point of departure for the autoevolutionary project. He then moves on to what is now known as Artificial Intelligence. Its potential can be a step in acquiring control over production and distribution of information and knowledge, and it has the side effect of making “mechanical social control” possible. In the fifth out of eight chapters, he presents a metatheoretical discussion of the scope and methods of the Designer's actions – in ST it is a symbolic figure representing the human technological potential, which can be used in autoevolution. He talks about “phantomology,” the “early version” of reality subjected to radical technological transformation. In the penultimate chapter, Lem offers a project of “information farming,” which is to be a response to chaotic increase in knowledge, allowing for practical fulfillment of far-reaching autoevolutionary plans presented in the last chapter, which shall be the subject of my analysis on the following pages.

As its final result autoevolution is to lead to rejecting the earlier form of human existence, both its spiritual and physical aspects. The totalizing character of the autoevolutionary projects and Lem's partially concealed meliorist anthropology

give utopian qualities to the whole idea. From a humanist's point of view, its most striking feature is complete rejection of human historicity and neglecting the impact of social processes on technological evolution and autoevolution. Yet those features are justified given other premises Lem accepts. In his vision, technology replaces culture in its function of a reservoir of symbolic meanings and values and thus technology interferes with every sphere of life, completely permeating human material environment – it becomes what philosophers used to call *Lebenswelt*.

This summary makes the structure of ST seem fairly clear, but Lem's argument is constantly interrupted with dozens of digressions and side notes, which may give an impression of the whole being quite chaotic, especially to a reader unaccustomed to this kind of broad intellectual gestures that are so typical for this particular author. Moreover, he himself is frequently skeptical about his arguments and interrupts himself with self-commentaries, doubts or methodological remarks. As a result ST is a very layered text that renders itself very easily to diverging interpretations. By no means am I claiming that the attempt at interpretation that I am presenting here is the final one.