

Looking into the Future – Stanisław Lem and Futurological Attempts

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Introduction

“We are going to speak of the future” – this is how Stanisław Lem begins *Summa technologiae* and how he defines the subject of one of his most important works. Futurological considerations are currently of interest to researchers in almost all scientific fields, which perhaps shows that the research task set out by Lem in *Summa* is becoming a universal directive of science. The variety of these considerations is on the rise, and constructions of the vision of the future are developing a perspective or methodology specific to a given field. There are more and more works dealing with the future in various fields of human functioning – from considerations on the possibilities of philosophical and scientific research,

to proposals in popular science and pop culture, where the sci-fi genre is experiencing a renaissance. A clear increase in the interest in futurology can be observed due to the modern need for planning and the relative human control of what will happen in the economy, politics or technology in a period far away from “today”. As a consequence, there is a change in approaches that reflect on the future – a short-term perspective is replaced by a long-term perspective, however, in this case serious methodological problems arise. Because of the number of factors that need to be considered, effective prediction becomes very difficult, if possible at all.

Stanisław Lem wrote a lot about the future in a variety of ways, in both prose and essay forms. Despite the some difficulties, he did not abandon his attempts to create a vision of future civilisation. To the contrary, he asked very important questions about futurology and experimented with ways of practicing it sensibly. This is particularly valuable in the context of today’s futurological reflections, which, despite methodological difficulties, still seem necessary. Although interest in predicting the future is growing, some forms of futurological philosophising may be unsatisfactory and, as a result, may not be taken seriously. Lem’s methods and his meticulous research make up a certain “set of tools” that allows for increasing awareness of futurological issues and understanding its possibilities. In an interesting way, his achievements also correspond with the methods chosen by 21st-century futurologists. In the works of authors such as Ray Kurzweil or Nick Bostrom we find methods that Lem also used, but his “metafuturological” sensitivity allowed him to be much more aware of problems and limitations.

The problems of futurology

In the last century it was, amongst other things, the hopes related to the development of computers and a promising new science – cybernetics – that prompted scientists to create bold visions of the future and announce, for example, the advent of “thinking” machines [Turing 299]. The computational support of machines and the enthusiasm with which people of science (as well as politicians with appropriate financing) approached new technologies, resulted in the flourishing of various types of initiatives (such as the “*Poland 2000*” *Research and Forecasting Committee* established in 1969) aimed at attempting to predict the future. However, technology turns out to be a futurological “pharmakon”¹ – on the one hand it provides supporting tools, and on the other it introduces serious complications, which researchers of the future are aware of. The development of technology has contributed to the escalation of some important problems: the changes initiated by the eighteenth-century industrial revolution generate difficulties not only in the present, but more importantly, complicate effective predicting of the future even today. The accelerated pace of change is one such obstacle. Since the revolution, the previous model of building social skills has been upturned, that is, the knowledge acquired in the bosom of the family or provided by educators at school and the like [Summa 8]. Numerous changes caused by the technology of today’s rapid “evolution”, which affects, among others, the requirements of the labour sector (e.g. being competent in

1 In the work of Jacques Derrida, the *Pharmakon* from the title represents a cure for oblivion and, by relieving the effort of remembering, it is the source of the disease itself – “forgetting”[39].

the fields of information processing methods or being able to function in the space of various social media or mobile applications is currently expected), leads to a gradual loss of the ability to adapt certain activities to a new situation by means of analogy, or one's own or older family members' experience. In the previous century, Georg Picht, a futurologist and philosopher, observed: "Today [...] neither experience nor customs are able to bear life. [...] Experience no longer provides any basis for orientation in the world: those who rely on it, fall astray"[55-56]. The intergenerational experience is outdated, which not only affects the existential instability of the individual, but above all, significantly hinders both predicting and designing the future, based on analogy. The effects of such technological development are strong arguments which undermine the possibility of creating a vision of the future that is legitimate and thus useful for civilisation. In turn, this deprives futurology of its sense. The limitations and growing criticism of the ventures of the so-called Future Institutes led to the discrediting of this new field at the end of the last century; it came to be called a pseudoscience (this is how the term "futurology" was described in, amongst others, the *The Oxford Dictionary of Philosophy*). Karl R. Popper and his criticism of historicism, along with allegations about the possibility of predicting the future state of knowledge, may have also contributed to the unflattering opinion about predicting as a venture, especially in the social sciences.

Lem himself was also very critical of futurology, but he did not give up some forms of practicing it. Following his work chronologically, however, makes it possible to notice

that his optimism about the possibilities that technology opens up for civilisation and futurology weakened year by year (starting with the early and enthusiastic *Dialogs*, then *Summa Technologiae*, to the novels such as *His Master's Voice*, the critical *Science Fiction and Futurology*, and Lem's departure from future management, towards the concept of randomness in *The Chain of Chance*, or the later *Fiasco*). In *Wycinek autobiografii: moja przygoda z futurologią* [transl. A fragment of an autobiography: my adventure with futurology] Lem wrote on the use of the latest technological products for "evil" or "extremely stupid" acts [34]. Lem lost faith in the possibility of futurological ventures due to the transformation of academic science, which was increasingly involved in the private interests of large companies and wasted gigantic financial outlays on military projects (presented in, for example, the above mentioned *His Master's Voice*, in which state-military supervision becomes a major problem for scientists). Although Lem devoted many pages to developing ways of futurological reflection that would allow him to overcome methodological limitations that he was well aware of, his attitude towards futurology remained ambivalent in some sense. On the one hand, for example in *Summa technologiae*, the author undertakes a comprehensive reflection on the future and indicates that in the human-technology relationship there is the issue of evolution of mutual interaction – in addition to the problem of the pace of change discussed earlier – and the subsequent outdating of experience: for example, certain technologies can be used to improve life, but they can also be used to hurt others or to benefit the few [33-34]. On the other hand, Lem remains sceptical and

reluctant to create such a vision of the future, where the lability of human-technology relations is ignored and obscured by spectacular announcements of future marvels of technology. In His Master's Voice he writes:

“But, yes, futurologists have been multiplying like flies since the day Hermann Kahn made Cassandra’s profession “scientific,” yet somehow not one of them has come out with the clear statement that we have wholly abandoned ourselves to the mercy of technological progress. [...] The reader of futurological papers has before him graphs [...] informing him as to when hydrogen-helium reactors will appear [...]. Such future discoveries are foreseen with the aid of mass pollings of the appropriate specialists—a dangerous precedent, in that it creates the fiction of knowledge where formerly it was generally conceded that there was complete—but complete—ignorance.” [153].

Such “ignorant” forms of practicing futurology are not only a source of false data, but above all, they give the impression of certainty and can lead to the elimination of other considerations, ones that are methodologically better, as Lem wrote in *Reflections for 1974*, where he drew attention to the problem of futurological fashion (Dior effect) or excessive admiration of Western science (Titanic effect) [chapter III]. What prevented him from giving up predicting was his conviction of the high risk of uncontrolled technological development and the unscientific visions of pseudofuturologists. “Thanks to science and technology, people have [...] the power to destroy life on

earth. In a negative sense, they gained the power to dispose of their own history” [Picht 51]. The potential use of, for example, the atomic bomb, can lead to not only the fall of the human species, but also to the destruction of all life on earth. Nuclear weapons are a symbol of current technological advancement, thanks to which it is possible to trigger a global chain of reactions in a very short time. The consequences of decisions that are made possible thanks to the development of the high-tech world imply responsibility. Taking responsibility for further development, in turn, implies human involvement in designing, directing or planning development, and thus makes abandoning futurology impossible.

Methods in futurological considerations

Lem’s “dynamic” approach to futurology and the awareness of threats from uncontrolled technological development resulted in a series of attempts to create a valuable forecast. The previously quoted *Summa*, which was written with great skill, and where we find reflection on forecasting itself, was one such attempt. Lem first reflects on the prospects of the future and the real possibilities of conducting useful predictions from the “meta” level. “Lem’s discourse transforms from futurological or political reflection into some «metafuturology» or «metapolitical science»; [...] raises issues of conditions and sense of forecasting, [...] the issue of futurological writing itself as an attempt at a new social mythology” [Jarzębski 19]. Lem presents various methodological difficulties related to creating long-term visions: the problem of surprising turns in history and technological “revelations”, as well as

the problem of thinking the future as part of a reflection on the structure of a closed scheme, in which there is a decisive and concrete solution to the situation (e.g. win or loss), when in reality we never deal with this type scheme. Paying attention to the defectiveness of the “intuitive” method of extrapolating contemporary trends to the future, turns out to be very important. In order to understand what the problem is, one has to “read” how the world of today was imagined by people from the past – from our perspective their visions are a huge “calculation” error [Summa 10-12]. In addition to his “metafuturological” reflection, Lem tests specific futurological techniques – for example, to overcome the above-mentioned extrapolation problem. In order to avoid this kind of problem, one can try to find a permanent, basic and necessary element for the development of civilisation, one that is independent of accidental trends or breakdowns. In its radical form – this would be some kind of law. Lem’s reflections on the energy crisis and megabyte bomb in Summa take this type of form. They are characterised by a certain linearity. Lem’s reasoning is as follows: the free development of science that allows for providing (or discovering) the right amount of energy is a necessary condition for the constant provision of basic goods such as food, drinking water, access to hygiene, medicine and the like. For civilisation to function, science must develop freely and adequate knowledge of beneficial energy sources must be acquired in time. Otherwise, science risks losing stability, and it is energy stability (homeostasis) that is the basic condition for civilisation’s continuance. Everything else, e.g. food, peace between nations and politics are secondary problems.

In *Summa* we can read: “The shift from the type of energy sources that are being depleted to their new type [...] requires obtaining the appropriate information in advance. It is only when the amount of such information has gone beyond a certain “critical point” that the new technology produced on the basis of such information will reveal some new reserves of energy and new domains of activity” [90].

Ray Kurzweil conducts his reflections in a similar way. His work on the development of technology, the human mind and artificial intelligence, which does not lack bold announcements of future discoveries, is largely based on the so-called law of accelerating returns. His law is not linear, but exponential, however a similarity to Lem’s proposal lies in its perspective – the law, or fundamental factor marks the path of development. For Lem, every civilisation deals with the problem of energy resources at certain critical points. Energy is a basic need for the functioning of civilisation and, most importantly, sets its purpose. What is more, every civilisation also deals with the problem of selecting the information needed to obtain knowledge about these energy sources [*Summa* 89-93]. For Kurzweil each change is subject to a fundamental and predictable developmental trajectory [How to create a mind 327], and the historical and exponential vision of technological progress is deeply embedded in the structure of the world. This is evident in his proposed division of the epochs of evolution (1. Physics and Chemistry, 2. Biology and DNA, 3. Brains, 4. Technology, 5. The merger of technology and human intelligence, and 6. The universe wakes up), which is headed to a specific point [The

singularity is near 25-35]. Both futurological proposals are grounded on some principle of functioning or law and are based on the assumption that there is a “core” of civilisational development that is independent of specific socio-historical events, tensions or trends.

Another futurological method also appears in *Summa*. Lem reflects on the problem of energy homeostasis and considers different variants of the development of civilisation. He presents three scenarios: Losing – civilisation does not overcome the basic problem of free access to energy sources and it is either headed towards destruction or manages to survive only by accident; Draw – civilisation alienates itself from the problem by creating a space in which this problem does not exist; Win – civilisation overcomes the problem of energy and information selection by radically changing the way knowledge is acquired, and thus also the way homeostasis is maintained [*Summa* 93-97]. These variants are quite general and they only outline some intuitions about possible changes without any firm conclusions. This approach contrasts with the activities of the futurologists criticised by Lem (such as those quoted in *His Master’s Voice*):

“The reason for this is that it is not my intention to catalog and enumerate some «future inventions» but rather to show some general possibilities [...] this is not a science fiction book but rather a set of variously substantiated hypotheses” [*Summa* 185]. Under these three scenarios: Losing, draw and win, further potential paths and solutions are hypothetically considered. Each variant has many development

opportunities, and Lem, in the most exhaustive way, tries to show which of them have a chance to be realised and to what extent these possibilities are satisfying for civilisation itself. In this case, the considerations are multidirectional and “tree-like”.

Nick Bostrom, a philosopher and transhumanist, chose such a multidirectional variant in his considerations. In his book *Superintelligence: Paths, dangers, strategies*, he tries to consider possible paths for the development of superintelligence (SSI)². His idea seems particularly interesting because it contains a comprehensive description of historical research projects related to computerisation and the development of advanced computational programmes, as well as a review of contemporary trends in research on artificial intelligence. The emergence of superintelligence, however, is the main topic. Bostrom assesses possible ways of “reaching” a mind beyond human abilities and indicates which of them may be beneficial for civilisation. He defines the possible conditions of coexistence with such a superintelligence, and also presents the potential threats associated with specific SSI versions. His considerations are an example of futurology, in which neither subsequent inventions, nor specific technological solutions are unequivocally preordained, but only possible paths are forwarded and evaluated because of their potential benefits or threats to the civilisation of the future. Some factors (such as the lack of cooperation between different research centres or the uncontrolled

2 Superintelligence is “any intellect that greatly exceeds the cognitive performance of humans in virtually all domains of interest” [Bostrom 45].

learning process of SSI) can contribute to the development of a superintelligence unfavourable to humanity. Thanks to Lem's and Bostrom's considerations, which exhaust the spectrum of probable technological transformations, we are able to gain intuition as to the need to monitor some sectors of scientific work and the possibility of correcting projects and activities, for example those related to SSI.

Futurology *demystified*

Lem is doubtlessly an exceptional futurologist. In addition to using the methods presented here, he also reaches for the potential of a literary building of non-existent worlds. The descriptions in Lem's books become an important "support" for scientific considerations. Leszek Nowak, a philosopher, emphasises the importance of properly constructed literary visions and how these can positively develop and test theoretical intuitions: "Here, for social theories [...], projecting literature [...] plays, or rather should play, a «piloting» role. It is an intuitive equivalent of constructions built in the theoretical natural sciences. One learns more from Lem's visions than from many other works, in which the lack of imagination is littered with a host of footnotes" [Nowak 16]. For Lem, a hypothetical situation created within a future setting is a solution that allows for the testing of ideas and concepts, which in turn makes it possible to reach certain real choices that are beyond the literary world. "Science fiction to me has become a way out: which was too gloomy, too black, I also described ... but in a grotesque and jesting manner" ["Wycinek autobiografii"]. In his science-fiction books he creates situations that allow him to assess beliefs and

verify goals. Andrzej Stoff notes: “His novels [...], within the possibilities offered by fiction, try to cross the border between human and natural science consciousness. [...] The model of non-existent science and the process of cognition, which never took place, shows the highways and byways, illusions and chances of real human actions” [17-18].

Books such as *Fiasco*, *Solaris* or *Observation on the Spot* can be considered as thought experiments allowing for significant re-evaluations, while avoiding a calculation error. Lem’s search for various techniques, his enumeration of methodological problems and his attempts to overcome them are a valuable lesson for those who today undertake the difficult task of forecasting. Futurology as a field dealing with society must look for useful methods, but must also be aware of their limitations. Its task is to effectively support the development of civilisation, which is why researchers cannot afford accidentally accurate predictions or unauthorised attribution of precision and certainty to their works, which in reality they do not possess.

Translated by Aleksandra Sokalska-Bennett

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