

## **Fiction Propels the World, from Artificial Intelligence, Genetic Engineering to Augmented Society – on Some Aspects of Stanisław Lem’s Works**

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### **Abstract**

The aim of this paper is to analyse the influence of Stanisław Lem’s works, an outstanding representative of Polish science fiction, philosopher and futurologist, on the shape of reality in which we currently function. Undoubtedly, Lem’s writings are a collection of predictions that describe, with unprecedented accuracy, the technologies of virtual reality, nanotechnology, biotechnology or robotics long before they were created. Are we living in a world that was described by one man many years ago? The research method used in this study is the content analysis of the selected novels by Stanisław Lem and the analysis of available secondary data. Let us therefore examine, on the one hand, the predictions of the Polish writer related to the development of the latest technologies, the advent of which he forecasted many years before they were created, and, on the other hand, let us consider what social consequences resulting from such a rapid progress in the field of technology the Polish futurologist warns us about.

**Key words:** *technological advances, social problems, science fiction, Lem*

### **Introduction**

In contemporary humanistic reflection, the analysis of reality means, among other things, the examination of the effects that popular culture has on societies, being a source of thought and behaviour patterns, entering almost every sphere of

human activity. Its universal appeal does not bypass the world of technology and invention. A perfect illustration of this phenomenon, namely the extent to which pop culture influences technological reality, is provided by historians working in *The International Spy Museum*, in Washington. They mention that not only the average viewers of films about Agent 007, but also specialists in the technical industry were deeply convinced that spy gadgets and the latest technical wonders used by the infallible spy of the British Secret Service were authentic. In their opinion, the KGB tried to keep pace by working on new gadgets like, for instance, a lipstick gun. The Museum also reveals that the director of the CIA in the 1960s often watched *Mission Impossible* film. After each episode, the director would call those in charge of spying gadgets and tactics and ask: “Can we do that?” (“KGB thought James Bond’s weapons were real”, 2001)

Yet, science fiction literature also has a similar effect on its “common” readers and specialists. Palmer Luckey, one of the founders of the virtual reality company Oculus, admits that he owes his visionary ideas to science fiction novelists. In this context, he cites Ernest Cline’s novel *Player One*, which became the inspiration for his company’s VR goggles. The Oculus founder’s deep fascination with the science-fiction genre is also evidenced by the fact that the company’s headquarters conference rooms are given the names of virtual worlds such as *Martix* and *OASIS* (Wingfield, 2016). However, *Player One* is not the only novel in which the concept of a virtual world appears. A twin project is featured in the film *Matrix* and in the novels by Russian writer Sergei Lukyanenko, *False Mirrors* and *Labyrinth of Reflections*. It is worth mentioning at this point that also the HoloLens goggles, a device created by Microsoft, owes its name to the holodeck well known to fans of the *Star Trek* series. A room called a holodeck enables the creation of a simulated reality on the basis of previously entered data.

## **Stanisław Lem – a writer not from this world**

In November 2020 The Polish Parliament adopted a resolution to make 2021 the Year of Stanisław Lem. September marks the 100<sup>th</sup> birth anniversary of the outstanding representative of Polish science fiction, philosopher, futurologist and essayist. A writer who, according to Philip K. Dick, could not really have existed (as cited in Davis, 2015). The author of *Man of the High Castle* sent a denunciation to the FBI in 1974, proving that no one in the world could boast of such a multitude of styles and ideas: “He is probably a composite committee rather than an individual” (as cited in Davies, 2015). John Updike calls Lem a poet of “scientific

terminology” and argues that his books are thrilling “especially for those whose hearts beat faster when *Scientific American* comes out every month” (as cited in Davis, 2015).

It is this extraordinary synthesis of science and fiction, scientific facts and writing styles that made Lem one of the most widely read and admired writers of all time. As Dagmar Barnouw states: “The Polish SF writer and theoretician of science Stanisław Lem, is one of the most sophisticated and effective commentators on the difficulties faced by the vastly complex vulnerable social systems in an age dominated by science and technology” (1979, p.153). Peter Swirski commenting on the astuteness of Lem’s prognoses on the subject of future technological advances rightly acknowledges: “Although Lem’s fictions are always formidable instruments of cognition, they are more than mere fictional illustrations of scientific and epistemological dilemmas. Their value owes as much to their artistic and aesthetic qualities as to their success in defining the forefront of our technology-driven culture” (1997, p.6).

Lem’s works are widely recognised not only by the literary world, but also by scientists. Among the faithful readers of the Polish futurologist’s works are Nobel Prize winners in physics Prof. Piotr Leonidowicz Kapica and Prof. Ija Mikhailovich Frank, as well as Prof. Sergei Korolev who used to be called the “father” of Soviet cosmonautics (Grob, 2011). Lem is read by cosmonauts, physicists, astronomers and astrophysicists. His novels inspire many research initiatives, just to mention the project of the Polish Industrial Development Agency (Logical Nano L.E.M Possibilities Extractor), the aim of which is to implement selected applications of graphene and predict commercial applications in the field of high technologies, or a series of conferences organised by the Digital cultures platform, “We need mirrors”, focusing on the problems of 3D techniques and photogrammetry. When a new asteroid from the main belt of asteroids orbiting the sun was discovered at the Crimean Astrophysical Observatory in 1979, it was named after the Polish writer (3836) Lem.

Andrew Pickering notes that the organizing question of Lem’s writing is as follows: “Given what we know today, what could we imagine in the future?” (2014, p.245). The Polish futurologist is said to have foreseen the future – why? Without a doubt, Lem’s writing is a set of predictions that describe, with unprecedented accuracy, the technologies of virtual reality, nanotechnology, biotechnology and robotics, long before they were created. So are we living in a world that was described by one man many years ago?

## **Method**

The research method used in this study is the content analysis of the selected novels by Stanisław Lem and the analysis of available secondary data. Earl Bebbie defines research that makes use of secondary data as non-reactive study, i.e. research in which the researcher does not interfere with the actual object of analysis or the nature of the analysed phenomenon (Babbie 2005, p. 304). The concept of secondary data denotes here a wide range of sources resulting from the processes of documenting many areas of public life such as statements made by experts, company websites, scientific articles, internet forums. (Hox, Boeije 2005, p. 596).

## **Stanisław Lem – technological and social forecasts**

Lem's rich literary heritage includes both fantasy novels, which fit well into the intertextual space of the genre, and futurological essays. Let us analyze, on the one hand, the predictions of the Polish writer related to the development of the latest technologies, the advent of which he had forecasted many years before they were created, and, on the other hand, let us consider what social consequences resulting from such rapid progress in the field of technology Lem, who often referred to himself as a visionary-conservative (Lem, 1995, p. 91) warns us about.

*Return from the Stars*, a novel published in 1961, begins at the point where stories of space adventures usually end: the main character, an astronaut, having overcome countless dangers in his expedition, lands on Earth. As a result of Einstein's famous time paradox, Hal Bregg has become only a few years older, while on Earth as many as 127 years have passed. The Earth is now a completely different world, much has changed in the surrounding reality. Hal Bregg is surprised, for example, by what he sees in a bookshop: "There were no books in it. None had been printed for nearly half a century. And how I have looked forward to them, after the micro films that made up the library of the Prometheus! No such luck. No longer was it possible to browse among shelves, to weigh volumes in hand, to feel their heft, the promise of ponderous reading. The bookstore resembled, instead, an electronic laboratory. The books were crystals with recorded contents. They can be read by the aid of an opton, which was similar to a book but had only one page between the covers. At a touch, successive pages of the text appeared on it. But optons were little used, the sales-robot told me. The public preferred lectons – like lectons read out loud, they could be set to any voice, tempo, and modulation" (Lem, 1980, p.79).

This description is deceptively similar to that of a contemporary e-book, although we should remember that the first attempts to use e-paper appeared forty years after the publication of Lem's novel, and the prototype of an e-book reader with an e-ink screen was produced forty three years after the premiere of *Return from the Stars*, in 2004. The writer imagines e-books as crystals on which content is stored and played back on a special device, which may rightly be associated with contemporary tablets. He calls this device the opton, although today most of us refer to it as Kindle. In the same novel we also find an advent of audiobooks called lectons in *Return from the Stars*. And although they have not become popular in the shape described in the passage above, this form is now possible to be recreated with the use of a speech synthesizer.

*The Magellan Nebula*, in turn, presents a vision of the future in which people have immediate and universal access to a huge virtual database called the "Trion Library". Trions are small devices made of quartz that enable connection to a virtual data set. In function, they resemble modern flash drives or smartphones. Lem describes the principle of trions operation as follows: "Trion can store not only luminescent images, reduced to a change in their crystal structure, that is images of a book's pages, but all kinds of photographs, maps, images, graphs and tables – in other words, anything that can be observed by sight. Just as easily! Trion can store sounds, the human voice as well as music, there is also a way to record scents" (Lem, 43). In the same novel, Lem presents an extremely interesting vision of goods production resembling modern 3D printing technology. Trions function as information carriers and contain the production recipe which is then sent to the machines producing the items needed by the recipient.

In the extensive philosophical essay *Summa technologiae*, the title of which refers to the fundamental for philosophical discourse thirteenth-century theological *Summa* of St. Thomas Aquinas, the futurologist: "(...) develops a series of wide-ranging prognoses on the social, cultural, and technological destiny of our civilization. Virtual reality, information breeding, cosmic expansion, or teleporting are just a few hypotheses with which Lem bridges the discussion of the technology of today with supertechnology of the future." (Lem, Swirski 1997, p. 6). Lem considers the possibility of creating a virtual reality and other world-creating techniques under the name of phantomatics, he wonders: "(...) 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?" (Lem, 1964, p.197). Lem analyses both the practical aspects and the psychological implications of implementing such technology. He realises that phantomatics creates unlimited cognitive and developmental possibilities and is a real civilisational leap for a man, who con-

nected to the generator can do anything: climb Alpine walls, wander around the moon without an oxygen mask, conquer medieval castles or the North Pole at the head of a dedicated team, but also recognises the other, darker side of this phenomenon: “Phantomatics can also, of course, become a real menace, a social plague, but this possibility applies to all products of technology, although not to the same degree. We know that consequences of the misuse of steam and electrical technology are far less dangerous than consequences of the misuse of atomic technology” (Lem, 1964, p. 215). Lem’s ambivalent attitude to progress, civilisational development and, above all, the use that a man is willing to make of the latest technological achievements, can also be found in his essay *Independent Variable*: “All technology is double-edged. Of course, progress leads to problems, such as the fact that if you break, say, a few spokes in a carriage wheel, you can only fall into a ditch, but if you break a few spokes in a turbo jet, all the passengers are likely to die. As technology increases, the risk increases enormously” (Lem, 1995, pp. 91-92 [translation – author]). Similar scepticism is expressed in the essay *The Unity of Opposites*: “A review of the various fields of human activity – toolmaking, construction, communication technology, the transformation of some kinds of energy into others – shows us a similar phenomenon of the »dark sides of progress«” (Lem, 1962, p. 164 [translation – author]). Virtual reality can be a superb entertainment and can make everyday life easier, but due to its essential feature – the illusion of reality – it carries a great risk and the danger of blurring the boundary between what is real and what is fictional.

In the light of these observations, serious questions arise about the ethical issues of such a constructed phantom reality. The generated vision is deceptively similar to the real world. An immersed person can freely test his or her behaviour and cross boundaries that are not crossed in the real world because crossing involves serious consequences. Here everything is possible, because nobody dies when, for example, causing a car accident or recklessly jumping under a speeding vehicle. An artificially created world, easier and more perfect, can become a real trap for a man who will not have the will to get out of the creation. Moreover, one can imagine a situation when the vision will have several levels and it will not be possible to distinguish it from reality. It is then very easy to make a mistake and to adopt imprudent attitudes in the real world, having already abandoned it for fantasy.

In *Eden* (1959) Lem describes other technological solutions, this time in the field of biotechnology. When as a result of miscalculations a rocket with a group of cosmonauts forcefully lands on an unknown planet, the participants of the expedition start exploring the planet inhabited, as it turns out, by intelligent beings. While exploring the new environment, the astronauts discover things and phenomena

that are unknown to them. They also learn about the groundbreaking technology used there to produce a new human being. The method of bioengineering, as it is referred to, although highly advanced, is not devoid of errors and individuals created as a result of unsuccessful genetic manipulations are ruthlessly exterminated. This pessimistic picture presented by the writer is a warning against man's unrestrained desire to improve human nature through genetic manipulation, which will always remain just a technical method interfering with the living individual's organism.

However, one of the most vividly debated issues related to the dark side of technological progress remains the problem of artificial intelligence in the mechanical body of a robot. A key question is the possibility of competent conflicts between different automated management systems and between them and human controllers. In *Summa technologiae* Lem predicts that: (...) machinic control centers that will manage the production and exchange of goods, their distribution as well as research (...) will emerge and grow. Such local coordinators will require some superior ones—at the scale of the country, at least, or even the continent. Is it possible that some conflicting situations will arise between them? Yes, absolutely” (Lem, 1964/2013, p.158). This raises the question of who will profit from a particular decision made by a machine, what is the guarantee that in a contentious situation the machine will choose a solution favourable to man? The writer expresses real concern about the shape of reality in which intelligent machines will work for humanity.

The issue of identity inscribed in a human body subjected to the power of technology, especially transplantology, is taken up by a futurologist in the story *Are You There, Mr Jones?* (1968) Lem reflects on a hypothetical problem of the legal status of a man who, as a result of a number of transplantation operations, has almost no organs left. All of them, including the brain, have been replaced by artificial prostheses. The man is then being sued by the company funding the operations which claims that the man is its property. The story touches on issues that only now, in the age of robotics development, are becoming relevant. The dispute concerns the existential basis on which Mr Johns can live, but not as an autonomous individual, but as the property of the manufacturer who produces the organs placed in his body.

The intensification of research in the field of nanotechnology is also the key element in Lem's vision of the technological world. Although the futurologist was not the creator of this field, he developed it significantly, and motifs connected with human nanotechnological improvements often appeared in his writing, as well as the use of nano-sized devices.

Another astute prognosis of Lem's concerns the progress in robotics. In the writer's opinion, the civilisational leap associated with the development of automation in the coming years is a foregone conclusion. And the risk of losing autonomy to automation in a technological paradise is by all means real. This issue is addressed in *Dialogues* published in 1957, at a time when cybernetics seemed to open unlimited possibilities for people. Philonous and Hylas discuss the problem of the original and the copy, the question of self-awareness in relation to cybernetic experiments with recreating human personality by means of a machine. Hylas, under the pressure of Philonous's arguments, concludes: "This man can and will bear an infinite resemblance to me, everyone will take him for me, he will have the same feelings, inclinations, passions as I do, even work that I have undertaken will be completed by him in my spirit, but it will not be me! It will be a doppelganger, a kind of twin, and I shall die for ever!" (Lem, 1957, p. 15[translation – author].) Thus, there is a recurring question about the shape of reality in which thinking machines will be able to replace humanity, whether they will accept the subordinate place assigned to them, or whether they will strive to remove humans as an unnecessary link in the evolution of reason. In the *Dialogues* (1957), there also appears the motif of a network comprising many machines working together and thus increasing their efficiency. This visionary concept brings to mind the contemporary Internet. Let us remember that Lem presented it at the end of the fifties of the twentieth century and the beginnings of the network date back to the end of the sixties.

## **Conclusions**

When making predictions about the development of civilisation, the writer emphasises that both technocracy, of which Leszek Kołakowski accused him years ago, and technophobia, are completely unknown to him: "I am not a technocrat, I only realise how things are", argues the author of *Solaris* (Lem, 1995, pp.91-92[translation – author]). Although at a time when visions of future worlds were created, they seemed so distant and abstract that they were classified as purely fictional possibilities, modern times clearly show how true the writer's insightful predictions have become. It is no longer just a creative fantasy, but above all science, in the form of automation, cybernetics and augmented reality, that shape everyday life in the 21<sup>st</sup> century, and with this direction of change, the writer's concerns about the social consequences of such a civilisational leap echo ever more strongly. As Peter Haffner states: "Stanisław Lem has never had the illusion



that technological innovations could be suppressed: they will be implemented sooner or later, for good or for ill” (2001, p. 149). A critically realistic view of inevitable progress leads Lem to formulate, in the volume *The Secret of Chinese Room*, the concept of the technological trap, which aptly sums up all his views on the profound changes taking place in the world of science: “I propose the following definition of a technological trap: it is the social and living result of the widespread implementation of such technogenic operations, which in the initial phase was invisible, socially unpredictable and in the growth phase already irreversible, turning the presumed benefits of its spread into one or a multiform catastrophe, more and more clearly recognisable and more and more difficult to stop by those powerful decision-makers, to whom it owes its proliferative proportions and its overwhelming harmfulness” (Lem, 1996, p. 115 [translation – author]).

The degree of technological acceleration as well as the civilization leap connected with this trend strengthen the falsely created feeling of man’s enormous domination over the world of machines. Lem, however, seems to warn against this illusory conviction of controllability and encourages us to remember about maintaining sovereignty in the face of irreversible technicization of our own environment and to set boundaries between the automaton and ourselves. After all, what is at stake here is a battle for the human condition and existence, as well as the preservation of individuality in a cybernetically dominated world.

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