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THE CASSANDRA SYNDROME, OR HOW NOT TO BE A PROPHET

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ABSTRACT

The central question of the article is should Stanisław Lem be read as a futurologist? The main thesis is that more than in predicting the future Lem always has been more interested in exploration the conceptual limits of science and its technological offshoots.

Keywords: Stanisław Lem, Hugo Gernsbacher, Herbert George Wells, futurology, conceptual limits of science.

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Have you ever played the game of polo? If you have, you are one of the few people who might actually know what the game is about. This former Olympic discipline (dropped after the 1936 Berlin games) is played by mounted teams of four who try to smack a ball with long-handled mallets into a goal. Crucially, the outcomes hinge not only on the skill of the riders but also of the horses, which can be forbiddingly expensive to buy and no less expensive to train.

Enter Crestview Genetics, a company in Buenos Aires, Argentina, co-owned by Adolfo Cambiaso, the world's arguably best and unarguably best-known polo player (chances are you haven't heard of *him* either). Having identified a golden opportunity presented by the equestrian elite's love of polo, and armed with the latest technological breakthroughs, Cambiaso co-founded Crestview Genetics to clone polo riding horses.

That is right—not to raise them, like on a regular stud farm, but to *clone* them.

The price tag for a cloned pedigreed mount can be steep, well in excess of half a million dollars, but by all reports the business is brisk. To date this one-of-a-kind steed farm has cloned some fifty mounts—fifty exact copies of the horses that have proved their mettle in the game. Altogether a not too shabby return on the high costs of mounting a space-age technological ven-

ture that copies living beings like so many supermarket cans of Campbell tomato soup.

Cloning has been, of course, a staple of all manner of futuristic fictions and futurological predictions for a very long time. But, as my example demonstrates, that future is already today, although it is a future unanticipated by even the most pedigreed futurologists. Do not believe me? Take a walk through the libraries filled with forecasts from would-be prophets of the things to come. Try as you might, you will not find a single word about the cutthroat world of professional polo, the lifestyles of moneyed elites, and a ground-breaking Latin American business enterprise.

If there is a lesson in all this—and I think there is—it is that futurology in general and science fiction in particular are not the best places to look for enlightenment about the future. And, given that Stanislaw Lem is revered internationally not only as a writer of science fiction but also futurologist, the lesson should apply to him as well as to other forecasters of the marvels of future science and technology. Not to pick on Lem, however, let's begin with a brief look at two of the equally famous examples—not least because both can lay claim to being fathers of modern science fiction and futurologists in their own right.

In September 1927, at the height of Jazz Age prosperity, Hugo Gernsbacher—better known as Hugo Gernsback—penned an unusual editorial for his popular magazine *Science and Invention*. Titled "Twenty Years Hence," it was an attempt to foretell the future twenty years ahead. Among others, Gernsback prophesied that by the end of the 1940s planes would zoom from New York to Paris in twelve hours, that television would revolutionize life and culture as much as the telephone did on the way to the 1920s, that the average human lifespan would reach seventy years (it was below fifty at the time of his editorial), and that all homes and building would be air-conditioned.

Sounds pretty impressive, does not it? Who said you cannot predict the future? Except the truth looks altogether different when, instead of cherry-picking, you take the time to read the piece in its entirety. Gernsback's accurate guesses—few and far between to begin with—are embedded in a sea of wild misses. He is sure, to take just two examples, that by 1947 cancer will have been eliminated and that electric power will be transmitted wirelessly. And when it comes to those seemingly prophetic transatlantic planes, well, he is no less sure they will be touching down in a slow spiral and settle on a dot, eliminating the need for runways. Oh, and nary a word about Black Monday, the looming Great Depression, or that cataclysmic paroxysm of bloodletting we call the Second World War.

You can draw your own conclusions as to whether Gernsback was a predictive genius or not. Either way, however, his sporadic hits are clearly the result of luck intrinsic to his method, the essence of which is no different

than the one behind a rapid-fire machine gun. Suppose you are an extremely poor shot but want to nail the bull's eye from a distance of two hundred yards. Not to worry. All you need is an AK-47 (aka Kalashnikov), a notoriously *inaccurate* assault rifle, and an inexhaustible supply of bullets. Slap the infinitely large magazine in, aim in the general direction of the target, press the trigger, and keep spraying it with a hail of projectiles, one of which is bound to hit the mark sooner or later.

This is the essence of Gernsback-style clairvoyance. Pepper the future with predictions and, since some are bound to come close or even true, with hindsight play up the hits while suppressing the misses and you can stake your claim to being a visionary. It is not unlike watching the roundup of football goals at the end of the day on a sports channel. It seems these guys cannot miss! But watch the game itself and the truth looks, well, much more prosaic.

So much for nonfiction, which is to say futurology. But what about predictions in science fiction? Gernsback wrote all of two sci-fi novels, of which by far the more successful was *Ralph 124C 41+: A Romance of the Year 2660* (originally serialized in 1911 in his first science magazine *Modern Electrics*). I use the word "successful" loosely. Over the years *Ralph* has achieved the dubious status of a cult piece on the order of *Plan 9 from Outer Space*, being regarded by many as the worst piece of science fiction ever published. Okay, so you should not expect too much from the style and the plot—we are talking sci-fi, after all—but what about its vision of the future?

Interestingly, once again many of Gernsback's forecasts about the year 2660 appear to be amazingly accurate. For starters, *Ralph* predicts radar and even provides a schematic illustration of the principle on which it's based. In short order the novel also describes what most of us would recognize as plastics, synthetic fibers, aluminium foil, fluorescent lights, microfilm, stainless steel, tape recorders, juke boxes, liquid fertilizer, colour photography, miniature television, and cryogenics. Other times *Ralph* appears to talk about 3D-TV (holography), cableless elevators powered by magnetism (vertical maglev), crops warmed up by geothermal technology, cities with total weather control, and instant language translation. That latter list, topped by lifespans of a century-and-a-half, has not come to pass but neither is it outside the realm of possibility.

Except that once again the lucky hits drown in a sea of misses, some of which look more like voodoo than science. My favourite are antigravity screens, which operate on the same principle as H.G. Wells's "cavorite," a mystical substance from *The First Men in the Moon* that somehow neutralizes gravity (making you wonder why it does not float away into space). Come to think of it, even the hits are bound to raise heckles. *Ralph* may have anticipated tape recorders, juke boxes, and colour photography alright, but placing them in the year 2660 is about as laughable as you can get.

Lest I am accused of flogging a dead donkey, let us move on to Herbert George Wells and his aptly named *Anticipations of the Reaction of Mechanical and Scientific Progress upon Human Life and Thought* (1901). Better known as just *Anticipations*, it is one of the numerous nonfiction books of futurology he published in his lifetime. Alas, this signature book of prophecy doesn't take long to dish out such duds as his doubts that air travel, or as he calls it aeronautics, "will ever come into play as a serious modification of transport."[1] On the subject of submarine warfare, Wells is no less emphatic: "I must confess that my imagination, in spite even of spurring, refuses to see any sort of submarine doing anything but suffocate its crew and founder at sea." Come again, George?

Apologists may say it is unfair to go back so far into the past to test his predictions against the future and, besides, was not science-infused fiction *really* H.G.'s medium? Although this sounds suspiciously like a retreat from claims about his futurological prowess, let us give them the benefit of a doubt and jump to 1932 and "The Queer Story of Brownlow's Newspaper." This fictional story is built around a sustained effort at scenario forecasting of the type favoured by futurology. First published in 1932, it takes place in 1931 and hinges on the protagonist being delivered a copy of a newspaper from 1971, which dazzles the reader with an array of colourful predictions.

Let us start with the hits. Forty years hence, Wells predicts the harnessing of geothermal energy, wide coverage of scientific developments, widespread use of colour in newspapers, simplification and reduction of the body clothing, lower birthrates, and not least the dissolution of the Soviet Empire (although it did not take place by 1971, as he claims, let us give him credit anyway). Altogether brilliant, is not it?

Except, once again, the cherry-picked parade of hits obscures a reality that is far more mundane. To wit, geothermal energy has not—as Wells claims—even now replaced fossil fuels. Men and women do not walk around bare-chested and bare-breasted. Nationalist ideology and nation-based states flourish. There is no hint of world government, no letup in crime and no sight of police forces able to stop it, English spelling is not formally and universally simplified, stock markets are far from a thing of the past, gorillas are not extinct, 13-month calendar is not in use, and newspapers are not printed on aluminium-alloy paper.

Even worse for Wells and his apologists, his predictions contain no mention of such things as television, atomic fission, space flights, computers, DNA and genetic research, and a million of other scientific developments without which any picture of the world from 1971 would be grossly incomplete, not to say grossly inaccurate. When it comes to political and cultural

[1] H. G. Wells, *Anticipations of the Reaction of Mechanical and Scientific Progress upon Human Life and Thought*, Chapman and Hall, London 1901, Chapter 1; http://www.gutenberg.org/files/19229/19229-h/19229-h.htm. Same paragraph, next quote, Chapter 6.

developments, the story fares even worse, failing to detail any of the things we have come to associate with the war-torn Forties, consumerist and conformist Fifties, and counterculture Sixties.

Of course, at the end of the day "Brownlow" *is* nothing but a work of fiction and as such ontologically exempt from the rigours of professional futurology. To be fair, Wells takes full advantage of this ontological bracket by supplying a wink-wink ending which suggests that in writing these signature prophecies he was only kidding, folks (he says that he is as convinced of the story's accuracy as he is that his name is *Hubert* G. Wells).

The best you can say about this ploy is that the author of "Brownlow," like virtually all other writers of science fiction, wants both to have his futurological cake and eat it. The worst is that fiction in general and science fiction in particular provide only an illusion of futurological accuracy—a literary *trompe l'oeil* that asks to be taken in earnest only when it gets things right which, on a closer inspection, if far from often at all.

2

Why, then, the continuing interest among fans in science fiction as a prognostic tool?

Note that all predictions, much like all literary fictions, are ontologically-speaking underdetermined. Unlike the real world, fictional storyworlds are full of gaps that are open to interpretation. This means, in turn, that readers must plug these holes in the background to the story. The process—highlighted by Wolfgang Iser in *The Act of Reading* and analyzed at length in my *Literature, Analytically Speaking*—is for the most part automatic.[2] When we read fiction, we never read just what's on the page. We bring in a myriad of assumptions and background details from our own experience and, trimming them to fit the story in question, use them to make interpretive sense of what's going on the story.

It is this common fact that allows fans of science fiction writers to claim that their favourite novelist, be it Gernsback, Wells, or Lem, is the author of amazing futurological predictions. For example, because Lem raises the subject of cloning in *The Star Diaries* and *The Cyberiad*—arguably even *Solaris* with its multiple copies of neutrino-based Harey fits the bill—the story goes that he predicted the future. The absence of any mention of Adolfo Cambiaso and Crestview Genetics in any of Lem's writings shows, I think, the absurdity of any such claims. Moreover, such attributions are patently anachronistic. Already the 1935 Nobel Prize in Physiology or Medicine honoured the discovery of embryonic induction, not to mention Aldous Huxley's

[2] W. Iser, *The Act of Reading: A Theory of Aesthetic Response. Baltimore: Johns Hopkins University Press 1978; P. Swirski, Literature, Analytically Speaking: Explorations in the Theory of Interpretation, Analytic Aesthetics, and Evolution (Cognitive Approaches to Literature and Culture),* University of Texas Press, Austin, TX 2010.

even earlier *Brave New World* (1931), which deals extensively with the concept of fertilizing human eggs in vitro and splitting them into identical copies of the original (under the name of Bokanovsky's Process).

All this is to say that I am deeply skeptical about fiction as a futurological tool in general and about Lem's fiction in particular. Note that, were we for a moment to take Lem's fictions *as a whole* as prognosticating scenarios, his stock—much like that of any science-fiction writer—would have fallen through the floor. There are thousands of things Lem put in his novels that are not true and never will be, starting with the existence of planets Solaris, Regis III, or Quinta as described in *Solaris, The Invincible*, or *Fiasco*. It is only the willingness of aficionados to cherry-pick stories in search of what we know to be true—while overlooking everything else—that creates an illusion of prescience.

This is not to deny, of course, that Lem liked to think of himself as a scientifically informed and accurate prognosticator. His letters, for one, provide ample evidence that he avidly followed developments in science, technology, and economics with a view to whether they corresponded to the things he hypothesized about in his fiction. Whenever he thought he found such correspondence, he would proudly point it out as a proof of his predictive prowess ("some chief economist at the UN writes word for word what I wrote six years ago").[3]

Interestingly, however, more often than not he would immediately execute the Wellsian gambit, pooh-poohing the idea of seeking fame for his predictive accuracy, being, after all, only a writer of fiction. After which he would triumphantly underscore another instance in which he had seemingly anticipated the course of the future, only to play it down again, this time with a remark that it would take too long to convince the world about his prophetic prowess. And then he would do it again—and again.

Pointedly, none of this flip-flopping makes any difference to those who prefer to see Lem as a futurological oracle. But it should. After all, if you are genuinely committed to establishing your prognostic veracity, all you need to do is to publish a unequivocally formulated series of *concrete predictions and reasonable timelines* during which your predictions are supposed to come to pass. At the end of that timeline it is going to be clear whether you have succeeded in predicting the future, and whether that prediction included the rise of Crestview Genetics or not.

Barring that simple stratagem, let me teach you how become the Greatest Futurologist in History. Here is my own set of predictions for the year 1,002,022. By that time, which is to say a million years from now, I predict that the human race will have explored all the planets of our solar system, by and large exhausted the fossil fuels on our planet, sorted out the principles

[3] P. Swirski, *Stanislaw Lem—Selected Letters to Michael Kandel*, Liverpool, Liverpool University Press 2014, p. 84; see also p. 112.

of human cloning, and continued the domestication of household pets. Guess what? Given my ridiculous timeline and the open-ended nature of my claims—exploration, exhaustion, sorting out, and continuation are all open to interpretation—it is a pretty safe bet that all these futuristic wonders will have come to pass. And just in case they do not, no one will be around to give my claims the lie anyway.

Heads I win, tails you lose.

Of course, Lem is more than just a writer of fiction and among his numerous volumes of nonfiction there is a volume of futurological speculations *par excellence*, the legendary *Summa Technologiae*. Given the farsightedness of Lem's futuristic scenarios, over the years more than one commentator has succumbed to the temptation of likening him to a latterday Nostradamus and *Summa* as a book of prophecies. In this they have followed in the footsteps of Lem himself who regularly returned to his predictions to evaluate their accuracy.[4]

This is not to deny that *Summa* is remarkably savvy in some of its deliberations. On the margins of his discussion of autoevolution, for example, Lem appears to suggest the theory of punctuated equilibrium a full eight years before it entered the contemporary evolutionary lexicon via Eldredge and Gould. He also appears to anticipate—albeit under different names—artificial emotion, virtual reality, search engines, nanobots, bionics, and not least the failure of Frank Drake's SETI to unearth evidence of intelligence elsewhere in the cosmos. Some fans even keep score cards, with check marks next to the fulfilled prognoses and question marks next to the perceived flops. "How come he did not foresee the Internet?" runs one common complaint. Well, he did, answer the apologists, only not in *Summa* but in a 1961 novel *Return from the Stars* (in the guise of a global Infor network).

Lem himself assessed the predictive accuracy of his futurological *opus magnum* in three later collections of essays: *The Mystery of the Chinese Room* (1996), *The Megabit Bomb* (1999), and *The Blink of an Eye* (2000). As he scrupulously and sometimes smugly pointed out, among his successful predictions from the early 1960s were also the adaptive morphology of the human brain, biocomputing, and autonomous search engines (Lem refers to the latter as ariadnology: the science of threads).

Needless to say, Lem's cognitive ambitions were never confined to nonfiction. In his early novel *The Magellan Nebula* (1955), for example, he actually took an unusual step of appending a Pocket Lexicon of Scientific Terms to guide his readers through the thicket of science in the novel. Lem glossed no less than thirty two terms, chiefly from astrophysics—including Cefeids, radio stars, white dwarf, ecliptic, electroencephalograph, galaxy,

[4] See P. Swirski, *A Stanislaw Lem Reader (Rethinking Theory)*, Northwestern University Press, Evanston, IL, 1997.

astronomical unit, and spectroscope—that were likely to stump readers then and perhaps even now.

Lem's lexicon of scientific terms is just one sign of the earnestness with which he tries to portray the scientific developments of the thirty-second century. Another is the curious fact that, more than four decades later, he discusses this portrayal among other essays on science and futurology in *The Megabit Bomb*. With unmistakable satisfaction he highlights two of his predictions from *The Magellan Nebula* that have since come to pass. In the novel they go by the name of trions and videoplastics—crystals that act as random-access information storage and virtual reality.

On the other hand, much like Gernsback and Wells, Lem glosses over the fact that in the novel trions are invented in the twenty-seventh century. In reality, of course, it took less than thirty years after *The Magellan Nebula* for the first CDs to appear on the market. To his credit, Lem would confess to being completely taken aback by the speed of development of computers and related technologies. His admission of failure, however, does not change the fact that he is not above cherry-picking his fiction for predictive hits that supposedly shore up his clairvoyance.

But among this patchwork of hits and misses, some of the misses are so egregious as to raise a big question mark over Lem's scientific credibility. An instructive example comes from his signature book of fictional futurology, *The Futurological Congress* (1971). In our own world of the year 2022, with half of the world living in cities and many global megalopolises exploding past the twenty-million mark, the most viable solution to housing all these city-zens is to build up. Not surprisingly, with the invention of the tubular design in the 1960s, skyscrapers have grown taller and taller (new generations of lightweight elevator cables will soon allow them to be built more than a *mile* high).

Anticipating something of these developments, *The Futurological Congress* tries to convey the scale of such mega-towers of the future. In the novel, a Japanese delegate to the congress unveils plans for one such futuristic colossus. As Lem has it, the 800-storey skyscraper will rise from the seabed to the stratosphere, making it over 10,000 metres tall, seeing as the stratosphere begins on average more than ten kilometres from the earth's surface. Simple division shows that, at ten kilometres and eight hundred storeys, floor to ceiling each storey is 12.5 metre high, an absurdity in the world of today and even more so in Lem's resource-strapped world of tomorrow. Worldwide ceilings are about 2.5 metres high, revealing Lem's numbers, where each storey is actually five storeys high, to be an egregious error.

Conceptual howlers of this nature crop up time and time in Lem's fictions, going all the way back to the beginning of his career.[5] Here are a cou-

[5] See P. Swirski, "The Unknown Lem: *Man From Mars, The Astronauts,* and *The Magellan Nebula*" *Lemography: Stanislaw Lem in the Eyes of the World*, Liverpool University Press, Liverpool; Oxford University Press, Oxford 2014, pp. 17–42.

ple more. In *Tales of Pirx the Pilot*, Lem has his protagonist give his age in binary notation as a hundred and eleven.[6] Not so by a long shot. 111 in binary translates into 7 (1+2+4) in decimal, an error of more than an order of magnitude.[7] In *Return from the Stars* Lem represents the number 5,000 in decimal as 11001000 in binary. To anyone even remotely familiar with the binary system this is immediately identifiable as wrong by, again, more than an order of magnitude. The number Lem claims to be 5,000 is in fact is 200 (128+64+8). For the record, 5,000 in binary is 1001110001000—not even close to the dud in the novel.

Interestingly, when I brought this misstep to Lem's attention during our extensive talks in 1992, he shrugged it off as the typesetter's error, a rather nonchalant take for a writer who seldom passed on a chance to skewer other writers—and scientists—for *their* errors. And even though I've been after him to rectify—and thus acknowledge—this error for the next quarter century, it was not corrected until only after his death, and only in the Polish edition of *Powrót z gwiazd*.

3

At this point, seeing as his case is turning against him, a counsel for the defense might raise a familiar objection. Futurological speculation is one thing, but is it not a mistake to look for truth in fiction? Is it not a category error to read novels with a view to what they say about the real world?

Note that this has never stopped Lem from dousing professional futurologists with buckets of scorn for *their* inaccuracies. But whether Lem fits in the category of writers who wish to be exempted from such scrutiny is an open question. Perhaps the strongest argument to the contrary comes from Lem himself who, in a letter from 18 October, 1974, had no qualms mapping his fiction onto real science:

> "I see an uncanny similarity between a deliberately loony and absurd cosmogonic theory I worked into Tichy's 19th voyage and a wholly serious theory published in *Nature* by a certain American astrophysicist three years after I had finished my story. ('Is the Universe a vacuum-fluctuation zero'—*Science News*, Dec. 22, 1973, contains a summary of this author's work: Edward P. Tryon, *Nature*, Dec. 1973—whereas my story was created in

[6] S. Lem, *Tales of Pirx the Pilot*, Bard–Avon, New York 1981, p. 64.

[7] In *Tales of Pirx the Pilot*, Lem has his protagonist give his age in binary notation as a hundred and eleven (S. Lem, *Tales of Pirx the Pilot* New York, Bard–Avon, 1981, p. 64). Of course, in the English edition of *Tales the Pirx the Pilot* there is an error here. The same sentence we can find in other polish editions of the *Tales of Pirx the Pilot* [Opowieści o pilocie Pirxie]: "a hundred and eleven" (sto jedenaście) – *Opowieści o pilocie Pirxie*, Wydawnictwo Literackie, Kraków–Wrocław 1968, p. 165; "a hundred and eleven" (sto jedenaście) *Opowieści o pilocie Pixie*, Krakow 2012, p. 170. But in other Polish edition (S. Lem, *Opowieści o pilocie Pirxie,* "Odruch warunkowy," in: Dzieła, t. V, Biblioteka Gazety Wyborczej, Warszawa 2008, p. 130) we can read: "spytał, ile Pirx ma lat. – Dziesięć tysięcy sto jedenaście (ten thousand one hundred and eleven)" (editorial note).

1970 which is established by the date of the relevant edition of *The Star Diaries*.)"[8]

Combined with a long list of predictive misses and scientific errors in Lem's fiction, this statement bring us to back to the central question. Should Lem be read, not to say revered, as a futurologist? On balance evidence suggests that in any proper—which is to say scientific—understanding of the term, the answer has to be No. This is not, however, as damning as it might seem. As Lem himself told me during our extensive 1992 interviews, more than in predicting the future he has always been more interested in mapping the conceptual limits of science and its technological offshoots. Next to his stunning visionary imagination, his specific forecasts—whether in *Summa* or in his science-driven fiction—could never amount to more than provisional signposts on the road to our technologically turbocharged future.

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[8] P. Swirski, *Stanislaw Lem—Selected Letters to Michael Kandel*, Liverpool University Press, Liverpool 2014, pp. 78–79.