

One disadvantage of advancements in science would be that it makes us realize how frail we are more than ever. An asteroid veering towards Earth, a supervolcano erupts and covers Earth with ashes and dust, or the sun destroys our home planet — thanks to scientific advancements for increasing amounts of terrifying scenarios evoking a scene of the apocalypse, it feels as if all these things are ready to wipe out all mankind.

In this summary, you will find two fearful contemporary accounts for our impending death: One is the fear following from worldwide breakdown of the environment due to climate change and the second is the fear that AI (Artificial Intelligence) will brutally assume the control of the world. Lovelock acknowledges that two cases are justifiable, however, he discusses that there is not much to concern us.

Actually, the way he narrates the seizure of Earth by AI is quite sparkling – it considerably differs from the narration of a brutal annexation we frequently encounter in the dystopian narrative of sci-fi books. In this review, the writer's argument that the change of rule on Earth will probably be pacific and advantageous for both sides and how much benefit we can reap in our efforts to reverse the effects of climate change will be tackled. Surely, they will help us surmount the cynic thinking that runs through environmental discourse these days.

Chapter 1 - The Anthropocene is near the end, and a new era will soon arise.

What you will observe when you look at the world from space during the night is a globe with light shining everywhere that reminds one of the veins. Certainly, you will think that the era of mankind permeates the Earth.

It hasn't been long since mankind started to rule the world, though. Earth has been there for 4.5 billion years, and life thereon covers only 3.8 billion years of this duration. Modern human species, on the other hand, has existed just for the last 200,000 years. As for civilization and post-industrial society, they have been around since 6,000 and 300 years, respectively.

The Anthropocene – the geological time where activities of mankind have influenced climate and the environment– makes up the last few centuries of our history. Compared to the age of Earth, the Anthropocene comprises a very minuscule timeframe. Not long before a few centuries did mankind stop adjusting themselves to worldwide changes in the environment and, by means of fossil fuels, started to influence environmental systems on Earth all around the world.

However, it has just been a few hundred years and yet the Anthropocene is on the brink of an end. How did it take place?

What the writer argues is that mankind is at the moment evolving into a different geological epoch, which is called the Novacene. This era will witness a different form of life coming into existence as a result of innovation in AI technology. Humankind won't be able to keep this

life-form under its sway and it'll start to meddle in worldwide environmental systems by self-determination.

Wait a minute though – is it actually possible to say that AI will form a different form of life?

Briefly, yes. Living beings have two essential features that pertain to them: self-determination and breeding a new life similar in appearance to them. Considering the present situation of AI, these two features will soon be their feature.

The planning and making of computing technology are done by computers. The diameter of the tiniest wire our eyes' can perceive and we can hold in our hands is 1 micrometer. In comparison, the newest Intel processing chip has wires whose diameter is only 14 nanometers — a 70 times tinier unit than a micrometer. If it weren't for computers helping us, the production of technological devices would be unlikely.

Nevertheless, the planning process continues to depend on our input; however, with the advent of AI with self-determination, this will not probably be the case.

DeepMind, a Google subsidiary, has so far revealed a self-determining Artificial Intelligence known as AlphaZero. Typically, AIs are taught to understand strategy games like chess and analyze what their creators give them; however, AlphaZero learned on its own to become an expert in these games by contesting with its own.

Considering the present pace of development, Artificial Intelligence will soon be able to learn on its own to pull off more complicated games such as managing an economy or going to war.

Chapter 2 - According to the Gaia hypothesis, the world is a unitary, self-regulating system.

There had been other living beings that had dominated Earth's biosphere before mankind came into existence.

With the emergence of photosynthesizing cells initially in marine algae, the carbon dioxide in the atmosphere quickly started to give way to oxygen, a substance causing death for a lot of organisms, like bacteria, which existed during that time.

We can deduce from this that the earth's environment and the life existing thanks to the Earth are interwoven. Organic life and the earth's biosphere appear to have a reciprocal effect on each other.

In the opinion of the writer, this straightforward insight explains the reason for conceiving Earth as a unitary, self-regulating system, which he terms as Gaia.

Think about the average temperature of Earth, which hasn't changed much and about 15°C. This cool temperature is the reason why there is life. However, for this cool temperature to remain balanced, organic life is fundamental as it supports this balance by taking in carbon dioxide and keeping it underground.

The hypothesis enhances the natural selection theory, which the writer views as biased. The theory gives an explanation for the way organic life tailored itself to its environment, but his hypothesis puts forward that life adjusts its environment in exchange, which renders it more suitable for life.

It can be straightforwardly observed in a rainforest ecosystem, in which a wet climate is critical for the preservation of vegetation and in return vegetation creates a wet climate through water vapor.

One reason as to why scientists have opposed this hypothesis for all this time is that it apparently has circular logic. How come is it possible for something to be the reason for the existence of another thing while another thing is also the reason for the existence of this something?

The issue follows from the fact that the conventional, linear model of causation – A created B, which created C – fails to demonstrate the way self-regulating systems function. We must reconsider the causal model to explain the likeliness of reciprocal causation. In practice, we've got two elements, A and B, which apply a reciprocal cause on each other in such a way that A creates B which concurrently causes A.

Our inclination to conceive causation linearly is just a habit and doesn't always have to explain the way the Earth functions. This inclination is perhaps a learned behavior reflecting the linear essence of our languages that are constructed one by one, no matter where we use them, in writing or in speech.

So, Earth, or Gaia, is most adequately explained by a non-linear causal model in which the biosphere and life act upon each other simultaneously to produce a stable climate.

Chapter 3 - The biggest menace to the survival of life on Earth is the heat.

When we think of Earth's past, we notice that there is not much change in temperature.

When we go to 55 million years before, the earth was 5°C hotter than today, which is known as the Eocene thermal maximum. The earth became warmer, which resulted in crocodiles swimming in waters which we today know as polar regions.

Today, it is predicted that the temperature will increase at a minimum by 2°C until the 21st century ends. The earth has pulled through 5°C of warming long ago, then why does 2°C of increase in temperature worry us?

It's because the earth is not as resilient as it used to be 55 million years ago since the amount of radiation reaching the earth from the sun has increased as the sun has become a little bit bigger in the interim.

Actually, the amount of radiation reaching the earth is so much that the earth is no longer in the boundaries of the habitable zone as scientists name it. The habitable zone refers to the Goldilocks orbital region in which a planet could benefit from the necessary amount of warmth for water to exist as a liquid.

Since whether a planet is habitable is not solely decided according to how far away it is from its star, the notion of a habitable zone is incorrect. Were this concept valid, how would Earth be so different from Venus, which is a desolate planet. The notion is unsuccessful in identifying how organic life helps a planet remain at habitable temperatures by absorbing carbon dioxide, enabling the earth to reflect more of the heat reaching from the sun into space.

Life cannot re-emerge since the temperature of the sun is too high. Thus, were the earth to lose most of its biodiversity today, it would quickly get warmer, life would cease to exist, would shortly turn into an uninhabitable planet like Venus. What is worse is, the earth is at the moment undergoing an extensive decline in biodiversity because of climate change.

It is truly a crisis and this is why we don't have to worry about machines dominating the earth. To be honest, we may need their help

These AIs, which will be superior to us in terms of intelligence, will realize that conservation of organic life will be beneficial for them as it'll be uninhabitable for these silicon beings too when the earth turns into a barren place.

Thus, AI will most probably help mankind in a collective effort to protect Gaia.

Chapter 4 - Modern environmentalism is based too much on humans, even when it censures the Anthropocene.

Surely, the Anthropocene's legacy is equivocal. The further technology has advanced, the more colossal the damage to natural ecosystems was. What mankind has done has resulted in the extinction of living beings, the devastation of wildlife, pollution, and climate change.

Consider the word "Anthropocene". The word is the product of environmental deterioration. Eugene Stoermer, an ecologist, neologized the Anthropocene in the 1980s to illustrate the consequence of industrial pollution on the wildlife of the Great Lakes in North America.

The negative representation of the Anthropocene follows from the ideas of environmentalist movements today. The world before the Industrial Revolution is always depicted as ecologically better than today. Artificial adjustments are virtually always viewed as unnatural

or damaging to nature. Therefore, modern environmental politics is mainly conservative, in that it is concentrated on restricting human activity, alleviating harm effected by people, and outlawing such human creations as technologies, materials, and industries.

The feelings of guilt and misanthropy embedded in today's environmentalism reflect the theory of the origin of the universe in Judaism and Christianity. The vision of mankind which has isolated itself from nature via its assiduity and intelligence is reminiscent of the Fall of Man from Heaven after having partaken of fruits from the tree of knowledge. The belief that human activity defiles nature is only a kind of original sin configured in response to the realities of the modern era.

It is obvious from this comparison that while environmentalists deprecate humanity in support of nature, humanity continues to be a unique and separate thing from nature in their understanding.

this is where environmentalism makes a grave error. Humanity isn't different from any other living things or geological processes of the earth. As aforementioned, there have been other species which have largely changed the natural ecosystems, as photosynthesizing organisms had done millions of years ago.

By believing that we act as the Gaia wills, we don't have to feel a sense of guilt regarding the transformations which we have caused and concentrate all our energy not on lessening human activity but expanding human activity in the technological progress that will aid us to reduce the earth's temperature. To be more precise, we must turn our attention to the enhancement of AI to accelerate the advance of the electronic living being.

When this novel life is born, even though we've done great harm to nature, we'll have been vindicated of our guilts since those beings will rescue Gaia.

Chapter 5 - Evolution still advances via human innovation toward smarter living beings.

Evolution through natural selection resulted in some remarkably complicated, smart, and successful creatures – above all, we are its work.

Nevertheless, evolution takes an unimaginable amount of time. The complex life we know of has been shaped over 3.8 billion years. That's about a quarter of the entire history of the cosmos.

On the contrary, human-led technological progress has been remarkably fast. Whereas the seabirds evolved from their lizard ancestors in 50 million years, the transition from the first biplanes to their descendent modern airliners lasted merely a hundred years.

The incredible pace at which technological progress has taken place is one of the traits of the Anthropocene. The more technology has progressed, the more we've observed an acceleration in every aspect of our lives.

In proportion to the developments in transportation, especially in aircraft, people and goods have been progressively faster transported around the globe. States can wreak havoc on each other much faster and the destruction they can inflict on each has peaked since the atomic bomb. Thanks to computing technology, people can find the information they're looking for promptly.

Human-creation intelligent designs are different from natural selection, in that they carry out world-changing developments more quickly. Don't be shocked, since the intelligent design is a deliberate process embedded with information regarding the way the world functions, whereas natural selection is a blind process and occurs by chance mutations

Notwithstanding this distinction, natural selection and intelligent design share more than we think.

Both undergo the same evolutionary process, which is the inclination towards life that gets more intelligent with time. Natural selection managed to bring about life with enough intelligence for it to start meddling in the evolutionary process. Today, after 300-year long innovation in technology, we are about to bring into existence a life that will have its thoughts and knowledge, guiding us in a novel epoch.

How the Novacene will emerge is unclear to us but one thing is certain: soon. As life gets more intelligent, it will be capable of design life more cleverly. Evolution will continue to gain speed ever and ever.

Chapter 6 - The new electronic life coming into existence will be better in every aspect than human life.

Looking through a popular culture perspective on AI, we virtually always think of it in our own form. Maybe, the reason for that is our assumption humans are the highest point intelligent design can reach.

This is an **innocent** thought. Although we've accomplished lots of things, our intelligence actually has its boundaries.

The way our bodies work, for instance, is a hindrance to us. In each organic animal, biochemical connections between neurons convey the messages to act and think within our bodies. The message has to be altered between chemical and electrical signals, causing the process to decelerate.

Conveying messages fully electronically, modern computer networks are able to move messages more rapidly. Compared with us, machines could theoretically think a million times

quicker. This is because it is possible for an electrical signal to move through a conductor, like a copper wire, a million times more rapidly than a neuron. Compared to plants, we are capable of thinking and acting 10,000 times faster; watching us, AI will consider us approximately 100 times more tedious than we consider watching grass grow.

Machines will both think and communicate more rapidly than us. Using electromagnetic waves to convey messages, they will manage to talk to each other telepathically.

Actually, we talk to each other telepathically sometimes, too. Looking at our friends' faces, we can infer a lot about their mood. Information is transmitted from one person to another through electromagnetic radiation, which is light itself. Yet, our communication continues mostly to work through way slower sound waves. Electronic life-form will have no problem communicating nearly promptly, and they'll catch a larger spectrum of frequencies than we can.

Despite the similarities in the transmission of information between neural networks and electronic networks, most people think the idea of AI as a life-form is unrealistic. In their opinion, there is something different that is impossible for AI to possess— a soul, or consciousness.

Honestly, this is merely a prejudice following from the self-exaggerated importance of humans. We are all means of passing information. So, why is it important if a life-form has DNA or silicon computer chips or not?

According to the writer, the information constitutes the most essential component of life. If this is indeed the case, then new life forms will shortly achieve incredible supremacy over us.

Chapter 7 - Humanity has served as the vehicle through which the universe has recognized itself, but that task will change hands shortly.

To recapitulate, the author thinks the intelligent life was going to emerge in any case.

He supports a sort of the Anthropic Cosmological Principle. In this view, intelligence life didn't arise by chance, but the inevitable outcome of law ingrained in the nature of the cosmos. This law pushes the cosmos to self-awareness. This explains the most fundamental aim of the cosmos, and it'll be realized once the cosmos reaches a self-awareness.

Our kind is the first life-form to have a realization of a complicated knowledge of the cosmos. Thus, our kind constitutes a portion of the cosmos close to attaining self-awareness. But, human life makes up just one stage in the grand cosmic journey for full self-awareness.

The electronic life-forms that will soon emerge will be “knowers” as well and will excel at knowing, acquiring knowledge, and communication compared to us. We live on Earth

because we were destined to create this new life, and we need to hand over responsibility to this new life in the pursuit of knowledge.

Humans were indispensable in the evolution of life; the parts of supercomputers wouldn't have gone through natural selection by themselves since they are artificial in their existence. By contrast, chance and necessity played a role in the formation of organic life. Life emerged unplanned, but the chemicals for life to flourish were profusely present on the young earth.

Nothing but intelligent life could design an electronic life-form; however, electronic life's aim will also be to create even smarter life forms. It'll continue until life is developed sufficiently to spread across the cosmos, and thus pervade the cosmos with self-awareness.

What is its meaning for us? A new form of life smarter than us will replace us. If we don't die, then we will have to yield and take our new place and abandon our self-deception that we are the most intelligent form of life in the cosmos. Though we will be no longer of use, we can be satisfied to know we played our role in the cosmic theater.

Who can guess? Were it an altruistic, extremely intelligent form of life to emerge, maybe we'd even be more content knowing that it watches over us caringly.

Novacene: The Coming Age of Hyperintelligence by James Lovelock Book Review

The Anthropocene is near the end, and the era of Novacene will soon open. What awaits us in this era is a new form of life coming into being from developments in AI technology. It'll be the most intelligent form of life on Earth, taking over human systems. But, the process will be nonviolent and good for mankind as the new life-form will highly probably aid us to ward off the environmental devastation we're getting close to. Finally, this new form of life constitutes the succeeding stage in the cosmic journey for self-understanding.

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