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Analysis of today
Assessment of tomorrow

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Digital biology and global balance - who owns nature in the 21st century?

A revolutionary venture has recently started in London. The Natural History Museum, whose archives contain more than 80 million specimens of plants, animals and fossils, is opening up its collections for digital processing with the help of advanced algorithms.

Individual specimens that have been stored in drawers for decades or centuries, from the skins of exotic animals to plant samples from tropical rainforests, are now entering a new dimension - they are becoming part of a global database that uses artificial intelligence to give nature a digital memory.

At the same time, the biotech startup Basecamp Research (a London-based biotech startup specialising in the digitisation of genetic data from ecosystems) is developing a world-class genetic library in collaboration with Microsoft and Nvidia.

The idea is to create a kind of "digital twin" of the biosphere: a system in which DNA samples from the Amazon rainforest or the depths of the Indian Ocean are digitally processed in research centres in London, under the auspices of the Natural History Museum and the company Basecamp Research, while American technology giants such as Microsoft and Nvidia contribute from their development labs in Silicon Valley.

Scientists claim that such an endeavour could bring about a revolution in medicine, agriculture and nature conservation. However, critics are already warning of a new form of global imbalance – digital colonialism in biology.

Science that changes policy

The digitisation of biodiversity has undisputed scientific value. Algorithms can recognise patterns that the human eye would never notice – for example, genetic traces of disease resistance in plant species or potential new antibiotics in microorganisms in extreme environments.

This paves the way for a fresh wave of medical breakthroughs, especially as the efficacy of current antibiotics is diminishing.

However, every great leap in science also changes policy. When laboratories in London, Paris, Zurich, Berlin, or Boston gain access to digital copies of natural resources from Africa or Latin America, questions arise as to who controls the results and who has the right to benefit from them.

> Will Brazil, Congo, or Indonesia have property rights to the data that comes from their forests and seas?

Countries rich in biodiversity have been claiming for years that the West is using their resources, while the communities themselves receive almost nothing.

If this digitalisation model prevails, this question will become the focus of international negotiations: will Brazil, Congo, or Indonesia have property rights to the data that comes from their forests and seas, or will it all end up in the hands of a few multinational companies?

The digital twin of nature

The concept of a 'digital twin' of the biosphere could be the most ambitious scientific project since the mapping of the human genome in the early 2000s. But unlike the sequencing of human DNA, it involves almost infinite complexity – millions of species, most of which are still undiscovered, and ecosystems whose interactions are only partially understood.

Such an AI-powered database could predict the spread of disease, simulate the resilience of crops to climate change, and show how the disruption of one species can cause ripple effects throughout the ecosystem.

If successful, the world would, for the first time, have a tool that can predict the future of

nature and therefore its own future.

> The issue of regulation is just as important as the issue of scientific progress

But the power of such a tool can easily be reversed. The same algorithms that identify new drugs can also be used to develop biological agents.

Private companies that control databases can control access to knowledge and resources on which the health of billions of people depends. This is why the issue of regulation is just as important as the issue of scientific progress.

From scientific cooperation to international relations

At a time when the West and China are leading the race in the development of artificial intelligence, the emergence of digital biology opens up a new battleground.

China has already announced investments in "next-generation bioinformatics", and Beijing is known for immediately linking scientific projects to state strategy. Europe and the US are new to this field, but they must soon set the rules.

If the world does not agree on international standards, it is possible that biological data will become another resource over which trade wars will be fought, similar to oil or chips. There is a real danger that the major powers will use biodiversity as a strategic resource to blackmail one another.

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As the global system for protecting biodiversity (the Nagoya Protocol and the United Nations framework) did not anticipate the digitisation of genetic information, international law is lagging behind technological developments. This gap will become one of the most significant challenges for global governance in the coming years.

In the coming period, digital biology will produce results that will seem almost unreal. New medicines, faster detection of pandemics, conservation models for endangered species – all will show that technology can accelerate science and present nature a new dimension of survival.

But at the same time, the ownership and control of this knowledge is becoming a more important issue than the discoveries themselves. Countries with the most biodiversity will ask to be included in sharing the benefits, while corporations and industrialised nations will try to maintain monopolies.

It will be a new field of negotiation in which the interests of the Global South, the wealthy North and the power of multinational companies intersect.

What looks like scientific cooperation today may become a new dividing line tomorrow, because biological data, once converted into digital assets, will have the same status as energy sources or semiconductors. Control over them means control over the health,

nutrition and security of entire societies.

Therefore, the issue of regulation will become as important as the scientific discoveries themselves. The world will need to establish a framework that allows the free flow of knowledge but also the fair distribution of benefits and protection from abuse.

If this does not happen, there is a risk that digital biology will become another source of global imbalance. Instead of being a shared resource of humanity, it could become a weapon in the hands of a few, while the rest of the world remains a bystander to the process that determines its future.

The digitisation of nature is not only a scientific endeavour but also a new test for the international community. Nature itself is a common good, but when it is transformed into data and digital models, the question arises as to who will own and use it.

This battle between knowledge and power will not only determine scientific progress but also whether digital biology will serve humanity or the interests of a few.