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An Unusual and Exceptionally Useful Scientific Book. An Interview with Dmitry Nikolaenko

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Abstract

In this interview, Dmitry Nikolaenko discusses the main ideas of his monograph Learning to Understand the Object: Scientific Recognition Architecture, devoted to the investigation of complex dynamic natural processes. The central theme is the limitations of fragmented scientific knowledge and the potential of a cognitive standard that allows researchers to keep the evolving object in focus and establish connections between findings from different specialisms. The interview addresses fundamental gaps in knowledge, the responsibility of experts and the need to assess scientific work on its merits, independently of bibliometric indicators. Particular attention is given to training international research teams, using participants' native languages and the potential of artificial intelligence for accurate translation of scientific texts and collaborative work. The educational structure of the monograph and prospects for developing specialised expert systems are also discussed. The practical significance of the proposed approach is illustrated through examples of dioxin contamination in Vietnam and New Zealand, changes in climate and sinkholes. The interview emphasises the need to account for the independent dynamics of natural processes and to examine them within a broad temporal context.

Keywords: Scientific Recognition Architecture; cognitive standard; object of research; dynamic natural processes; fragmentation of scientific knowledge; interdisciplinary research; artificial intelligence; scientific translation; researcher training; dioxin contamination; responsibility of experts.

Interview conducted by Lotte Visser. Vienna, 2 November 2026.

— In 2026, your monograph Learning to Understand the Object: Scientific Recognition Architecture was published [1, 2]. I also found reviews of the book [3, 4]. How long did you work on it?

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That is difficult to answer. Work on the book itself began in late winter 2026. One could say that it took a little over six months. But that answer is not entirely accurate: I was writing on this subject decades ago. The terminology was somewhat different, but the main ideas were similar. One example is the book The Dynamics of Images of Science [5]. It was written in 1989 but published only in 2002. It also addressed the question of how to avoid moving away from the object in the course of scientific inquiry.

We live in a world of complex natural processes. Processes, precisely. If you divide a single process into fragments and describe each of them “strictly scientifically”, within one narrow specialism, you may encounter something entirely unforeseen. The scientific community regularly encounters such “surprises” and rarely takes responsibility. I see one of the reasons in failures of the cognitive standard itself—the customary way of posing questions, selecting information and organising knowledge.

A characteristic of the dominant standard of scientific research is that the object is divided into many fragments. This happens spontaneously and somehow quite naturally. A separate expert community forms around each fragment. It may be highly professional and produce truly significant results. But we must not forget that we are dealing with only a fragment. Yet this is constantly forgotten.

It is difficult to say how genuine this forgetfulness is. What matters is that such fragmentation of the object facilitates the comfortable existence of a very narrow expert community. This is probably the main point. In other words, the reason is not so much cognitive as sociological.

The cognitive standard proposed in the book makes it possible to focus on investigating an evolving natural process. The accumulated knowledge about its individual components is retained, but the way connections between them are established changes. This is a radical difference.

— So you are not trying to abolish the existing fragmentation of scientific knowledge?

No. Setting such a task would be pointless. There is a system that consistently reproduces precisely this standard of specialist training. These are always experts in fragments. One book cannot change that system.

The book shows where this standard leaves fundamental gaps in knowledge. The proposed Scientific Recognition Architecture helps identify them and work towards filling them—at least within specific scientific projects. This makes it possible to obtain valuable and practically useful knowledge**.**

— The book appeared simultaneously in English and Russian. This seems to have been a deliberate step. What was its purpose?

Modern science involves interdisciplinary and international cooperation. A single project may involve specialists from different countries with different native languages. It is usually assumed in advance that they all know English. This is partly true.

But how well they know it, and whether they understand the concepts used in the same way—these questions often remain outside the discussion.

We should also note that knowledge of English is undoubtedly becoming more widespread around the world. This is a fact. But in most cases it is fairly superficial knowledge associated with direct communication. We must also note that the overwhelming majority of experts whose native language is English do not know any language other than English. There is no progress in this respect. In other words, we are facing a highly conservative situation.

I have communicated and written in English for many years, but my native language is Russian. This is a simple example of how the working language and the language in which understanding is most precise do not always coincide.

When embarking on a complex project involving a dynamic natural process, we must strive for complete mutual understanding among the members of the international team. Both proficiency in English and semantics matter here: what exactly does each of us understand by particular terms that we use repeatedly? The answer is not entirely obvious.

Modern artificial intelligence tools make it possible to prepare translations of scientific texts quickly. But the source text must be well prepared: concepts must be defined and the relationships between them clearly expressed. The translation, in turn, needs to be checked. In the Russian version of the book, I sought to combine natural language with the most accurate possible rendering of the content. Properly preparing a scientific text for translation using AI is a substantial task in its own right.

The preparation of a scientific text for rapid and accurate translation into many languages rests on what is designated as the “Specification” [6–8]. This is an extremely important work. It is not easy to read and is almost technical in character, but it is precisely this work that lays the foundations for rapid and accurate translation of scientific texts using AI.

This approach is particularly important for scientific texts. Literary translation has different objectives, and the same standard cannot be applied to it mechanically.

— What does this offer scientific projects?

It provides a deep understanding of what the international team is doing. It ensures effective work rather than an imitation of it. This is precisely what we must strive for when working on particularly complex subjects that also involve dangerous processes.

Let me give an example. Suppose a project is starting to investigate dioxin contamination associated with the Vietnam War. This is an extremely complex problem, and investigating it requires the full participation of Vietnamese specialists.

If the project's key texts are available in a native language that the participants understand, it is much easier to agree on aims, objectives and methodology. Knowledge of English then ceases to be the decisive criterion for selecting specialists. Why is it a criterion at all? Why is knowledge of Vietnamese on the part of the other project participants not a criterion? We should also remember that nature has no interest

whatsoever in human languages. There are many such languages. There is a problem, and it must be addressed effectively.

With the help of AI, and with checks on the semantic accuracy of translations, we can communicate and work together much more effectively. Our task is to investigate dioxin contamination and its long-term consequences, not to spend endless time disentangling confused wording or selecting either Vietnamese specialists with perfect English or all the other specialists with perfect Vietnamese for the project. Such people can be found, but to what extent are they needed specifically for investigating dioxin contamination?

— Who is the book intended for?

First and foremost, specialists investigating dynamic natural processes. These may be changes in climate or processes associated with contamination. Contamination is not reducible to a single impact: it can trigger processes that then develop according to their own dynamics.

The book is also intended for senior undergraduate and postgraduate students. It is important to develop a way of thinking in which a person understands both the possibilities and the limitations of specialised knowledge. The fragmentation of knowledge is largely inevitable, but it does not have advantages alone. We need to show that a different cognitive standard is possible, one that allows us to work with connections between fragments. We must not allow a situation in which a young specialist regards fragmentation as the only possible cognitive standard.

— The book is over 800 pages long. That is a great deal. What accounts for its length? How realistic is it to read that much?

This is not just a book to be read from beginning to end. It is not Leo Tolstoy's War and Peace. In scientific work, we often turn to a particular topic, return to a particular diagram or seek an answer to a specific question. The structure of the book takes this way of working into account.

It has three interconnected layers: the main text, graphical diagrams and learning materials, including materials for independent study. Roughly speaking, each accounts for about a third of the volume. This structure largely explains the number of pages.

In addition, the graphical materials are placed on separate pages. They could have been arranged more compactly, but that would have made them harder to work with later.

The book should also serve as a working tool: helping the reader understand a current question, find the relevant passage and compare it with others. Scientific texts are not only read—they are scanned, studied selectively and used to address a particular task. I took this feature of how information is perceived into account.

Had this been a monograph with a conventional layout, it would have been considerably shorter. The number of pages in itself should therefore not intimidate the reader.

This is a book to work with, not one that must necessarily be read from beginning to end. We live in the twenty-first century.

— Some complex ecological relationships remain poorly understood. Research is carried out, but a fundamental understanding of how these relationships work does not emerge. Dioxin contamination in Vietnam is one example. How does your book help address problems of this kind that have remained unresolved for decades?

Everything has to be learned. We learn throughout our lives, including how to work with fundamental gaps in knowledge that arise under the existing organisation of research. I see nothing strange about framing the question in this way.

I am 69 years old and have spent about 50 of those years doing scientific work. When necessary, I learn new computer programs and familiarise myself with research in fields I have not encountered before. I consider this normal.

When AI became part of everyday work, I welcomed it with full understanding and gratitude. A wonderful colleague had appeared, and its capabilities should be used to the full.

A substantial part of the book is devoted to learning. Its task is not only to convey particular knowledge but also to help develop the abilities and skills needed to work with information where gaps previously went unnoticed or were ignored.

If we succeed in launching a project on dioxin contamination in Vietnam, one of the first stages will be training the participants. It will be organised in English and Vietnamese. Using AI can make this work faster and more effective.

— Do you think experts will agree to these conditions for participating in the project?

If they do not agree, they will not participate. This raises a fundamental question about the meaning of scientific work. If participation in a project is seen primarily as additional income or a way of enhancing one's prestige, that is one position. If we truly want to investigate nature and processes that are dangerous to us, that is another.

This is a question of experts' responsibility. If you think only about your bibliometric indicators, academic career and money, there is no point in spending time mastering a new cognitive standard. If you are interested in the problem of dioxin contamination and seek a fundamental understanding of what is happening decades after the end of the war, then mastering a new cognitive standard makes sense. It is your choice. It is that simple.

I have no idealised view of the scientific community. But this does not mean that we should ignore fundamental gaps in knowledge or turn a blind eye to the imitation of research.

— In the materials from the recent conference in Prague, I saw your texts sharply criticising several publications on military contamination

[9–12]. People usually prefer to ignore weak work. Why do you consider such criticism necessary? Is it not a waste of time?

I gave specific examples and examined their shortcomings in detail. One of them was an article by O. Gordienko. In my view, this work has substantial shortcomings that cannot be left undiscussed.

The mere fact of publication in a journal indexed in Scopus does not replace a substantive assessment of an article. This applies both to publications for which fees are charged and to those published free of charge. When we are dealing with problems as significant as military contamination, we need to speak directly about the quality of the methods, arguments and conclusions. We must be absolutely clear in calling out blatantly shoddy work.

Unfortunately, far from everyone considers this important. Some colleagues recommended this article to me, pleased that the author had cited their work. What mattered to them was that the citation had appeared in a journal indexed in Scopus. This raised their standing in the hierarchy of the expert community. Meanwhile, the glaring shortcomings of the article itself remained outside the discussion.

It is precisely this substitution of criteria that concerns me. If a study that I consider blatantly shoddy work is judged primarily by where it was published, we cease to distinguish between works on their merits. Criticism is needed to bring the discussion back to the substance of scientific work.

— Will there be a continuation of the book? After more than 800 pages, one feels that it ends with an ellipsis rather than a full stop. Have I understood correctly?

Yes. It may seem curious: so many pages have been written, yet a continuation is still necessary. The reason is simple—we are dealing with evolving processes. They cannot be reduced to the literal repetition of the same state.

Nature plays “jazz”: there are repetitions, but they are not identical to one another. Where this “jazz” will lead is also unclear. In this sense, we can also speak of “dioxin jazz”. Once set in motion, a process of anthropogenic contamination continues to develop, while seemingly similar situations recur with significant variations.

Research on the subject of the book constantly produces new material. We must follow the object, learn to record incoming information correctly and use it to reduce harm to nature and people.

Besides, I would not pay so much attention to the number of pages. That takes us back to the past. The point is not the pages but navigation through the book. You can write a five-page article and make it confused and incomprehensible. What matters is the structure of the text and the ability to navigate it quickly.

— The book proposes a general approach to investigating complex dynamic natural processes, including those altered by human intervention. Can specialised expert systems be created on this basis?

Yes, of course. That is precisely why the general framework is being developed. The book proposes a general model for investigating a complex dynamic natural process. Let me return to dioxin contamination in Vietnam [13–16]. Decades ago, human activity set in motion a process that then developed in the natural environment. Its subsequent dynamics are no longer determined solely by the original human decisions.

Vietnam is not the only such case. Dioxin contamination also occurs in other parts of the world, including places where chemical products associated with its formation were manufactured. The scale and conditions differ, but questions arise that can be investigated within a common theoretical and methodological framework.

At the same time, a specific approach needs to be developed for each region. One of the main reasons is the combination of dioxin contamination with particular natural conditions. Even a similar initial impact can have very different consequences.

New Zealand is of particular interest to me: the history of dioxin contamination (American chemical companies operated there), the availability of information about it and the possible consequences for marine ecosystems. One of the questions I would like to investigate is the possible role of dioxin contamination in the poor state of local dolphin populations [17–20]. There is every reason to believe that dioxin contamination plays a very important role in the rapid decline of the populations of these dolphin species.

Such work requires a model that takes the full range of local conditions into account. It can be based on the general scientific and methodological framework presented in the book. But many details can be established only through the investigation of a specific case. There are many examples of this kind.

— Have I understood correctly that the book deals only with natural–anthropogenic processes: humans intervene in nature, and negative consequences follow? Is there such a limitation?

No, I would not say so. The study of changes in climate is one example. They began hundreds of millions of years before humans appeared on the planet as a biological species. Strictly speaking, the climate on planet Earth has never been stable; it has always changed.

My educational background is in geography. I studied in the USSR in 1974–1979 and remember certain features of the teaching well. During my studies, it was normal to treat the idea of continental drift as a “bourgeois theory”. We were told about Alfred Wegener's views in considerable detail, but the lecturer insisted that they were wrong.

We were taught that the climate had always changed and that the Earth was a dynamic system. But I saw a strange discontinuity in the way the history of nature was presented: the past was described as a time of large-scale changes, whereas, when it came to the period in which humans appeared, it seemed as though these dynamics lost their independent significance. It was as if the appearance of yet another primate species cancelled everything that had existed on the planet before. This position is

known as anthropocentrism and is encountered far more often than is generally acknowledged.

In Soviet ideology, anthropocentrism was combined with the idea of humans as capable of transforming nature and subordinating it to their purposes. In 1991, the USSR collapsed. The laws of nature did not change as a result—that strange state disappeared.

In my view, this perception of nature was not confined to the USSR. It is useful to reread older scientific literature from the perspective of what it regarded as established knowledge. A dynamic natural process is, as it were, brought to a halt when the scientific community fragments it. It ceases to exist in people's conceptions, but continues to exist in reality. The latter matters more.

The book helps us consistently take the dynamics of nature into account. Present-day changes need to be considered in a broader temporal context, without restricting ourselves to the past 50–100 years. Such a context is necessary both for understanding what is happening and for discussing the future. Adaptation to dynamic natural phenomena requires a reasoned approach.

— But does the book also help address practical tasks? Is it about more than a worldview?

Yes, it is also intended for specific research addressing current practical problems. Funding is often organised in such a way that it is harder to obtain without a clear practical focus.

But something else is important: the proposed cognitive standard helps formulate the practical task itself more precisely. Engineering geomorphology is one example. A large amount of information has been accumulated about the Earth's surface and the processes through which it changes. Different, sometimes highly specific problems arise depending on the territory and natural conditions. We need to be able to relate this information to a specific task.

Take sinkholes. The subject has become fashionable only in recent years. Sinkholes can be recorded as individual events. But to investigate the hazard, they need to be considered in a broader context: what processes lead to them, what conditions they are associated with and how those conditions change. Sinkholes are an example of a natural phenomenon that was long ignored by the expert community itself. There were only “strange cases”. The cognitive standard presented in the book helps organise effective work with information and discern a dynamic process behind these “strange cases”.

— In closing, I would like to wish you success. Your book leaves one with a sense of unease. It makes the reader uncomfortable.

Scientific works do not necessarily have to reassure readers and put them in an excellent mood. If we encounter gaps in knowledge and ineffective investigation of dangerous natural processes, we need to speak about this directly. The main thing is to seek effective cognitive standards for understanding processes of this kind.

Conflict of Interest

The authors declare no conflict of interest.

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References

1. Nikolaenko D. Learning to Understand the Object: Scientific Recognition Architecture. Prague: Pollution and Diseases Publisher; 2026. eISBN: 978-80-909865-7-2. URL: https://pdconference.org/shop/learning-to-understand-the-object-scientific-recognition-architecture-1

2. Nikolaenko D. Учиться понимать объект. Архитектура научного распознавания. Прага: Загрязнение и заболевания; 2026. eISBN: 978-80-909865-6-5. [Learning to Understand the Object: Scientific Recognition Architecture]. Prague: Pollution and Diseases Publisher; 2026. (In Russian). URL: https://pdconference.org/shop/uchitsya-ponimat-obuekt-arhitektura-nauchnogo-raspoznavaniya

3. Tymoshenko A. Learning to Understand Complex Processes: A Review of Dmitry Nikolaenko's Learning to Understand the Object. Pollution and Diseases. 2026. https://doi.org/10.66659/2z3r7198

4. Tymoshenko A. Learning to Investigate: A Book for Universities and Multilingual Research Teams. Pollution and Diseases. 2026. https://doi.org/10.66659/ywg27c91

5. Nikolaenko D. Динамика образов науки [The Dynamics of Images of Science]. Works. Vol. 5. St. Petersburg: Amadeus; 2002. 312 p. (In Russian).

6. Nikolaenko D. Scientific Recognition Architecture. Operational Specification — Version 1.0: Reference Language Implementation: English. Status: Initial Operational Specification. Pollution and Diseases. 2026;2:147–167. https://doi.org/10.66659/q52haz36

7. Laboratory of Military Ecotones. Scientific Recognition Architecture. Operational Specification — Version 1.0 (Report). Pollution and Diseases. 2026. https://doi.org/10.66659/s2eqk462

8. Nikolaenko D. From Scientific Recognition to Scientific Explanation: Organising Investigation of Long-Term Military Environmental Contamination. Pollution and Diseases. 2026. 19 c. https://doi.org/10.66659/db5ekw49

9. Nikolaenko D. War-Affected Soils and the Imitation of Knowledge: A Critical Analysis of O. A. Gordienko's 'Impact of War on Soils' in Eurasian Soil Science. Pollution and Diseases. 2026. https://doi.org/10.66659/gssn7d85

10. Laboratory of Information Systems. How a Citation Error Became Certified Knowledge. Pollution and Diseases. 2026. https://doi.org/10.66659/x54z0f84

11. Nikolaenko D. From the Formation of the Soviet Scientific System to the Involvement of Russian Academic Organizations in the War Against Ukraine. Pollution and Diseases. 2026. https://doi.org/10.66659/wxywk824

12. Nikolaenko D. Russian Academic Involvement in the War Against Ukraine. Super Normal Science and the Post Soviet Academic Community. Pollution and Diseases. 2026. https://doi.org/10.66659/0wes4184

13. Nikolaenko D. Vietnamese Archives and the Long-Term Consequences of War: An Interim Research Protocol on the Need for Problem-Oriented Information Systems. Pollution and Diseases. 2026;2:267–276. https://doi.org/10.66659/j6nh1t50

14. Vu Thi Phung, Vu Dinh Phong, Nguyen Van Ngoc. Archival Records at National Archives Center III on the Use of Chemical Agents During the Vietnam War: Value and Accessibility. Pollution and Diseases. 2026;2:199–230. https://doi.org/10.66659/xnkh0w22

15. Cu Thi Dung, Vu Dinh Phong. Archival Sources of the Government of the Republic of Vietnam at National Archives Center II on Chemical Defoliants During the Vietnam War. Pollution and Diseases. 2026;2:231–266. https://doi.org/10.66659/zdcj2c76

16. Laboratory of Information Systems. From Dioxin Source to Long-Term Biological Consequences: A New Information Framework for Reconstructing Wartime Contamination. Pollution and Diseases. 2026. https://doi.org/10.66659/62p3b908

17. Gibbs A., Nikolaenko D. Structural Falsification, Scientific Silence, and a New Research Strategy: A Critical Reconstruction of the Hector's and Māui Dolphin Case. Pollution and Diseases. 2026. 23 с. https://doi.org/10.66659/tms16797

18. Gibbs A., Nikolaenko D. Chemical Pollution and the Population Crisis of Hector's and Māui Dolphins. A Critical Research Bibliography, 1970–2026. Pollution and Diseases. 2026. 51 с. https://doi.org/10.66659/ybmw2c82

19. Gibbs A., Nikolaenko D. Competing Hypotheses and Scientific Non-Recognition: Investigating the Hector's and Māui Dolphin Decline in the Context of Wartime Chemical Legacies. Pollution and Diseases. 2026. https://doi.org/10.66659/10csws50

20. Gibbs A. Beyond the TCDD Lens in Paritutu New Plymouth, New Zealand: Invisible Phenoxy-Herbicide Co-Contaminants, Visible Developmental Signals, and Decision-Making under Incomplete Evidence. Pollution and Diseases. 2026. https://doi.org/10.66659/ar7fqk65