

**P.G. Kuznetsov and the problem of sustainable development
of Humanity in the nature – society – man system**

The report at the International Symposium:

"Space and time in the evolution of the global
system of nature – society – man"
dedicated to the blessed memory of the outstanding Russian scientist
Pobisk Georgievich Kuznetsov.
Moscow, 14–15 December 2001

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Authors' preface

A little over a year has passed after the publication of the book “Pobisk Georgievich Kuznetsov: ideas and life”, produced by the Analytical Center “Concept” (Moscow) and the University “Dubna” (initiator, compiler and editor — S.P. Nikanorov). The second edition has already been published during the life of Pobisk Kuznetsov, as the first one was in 1999.

On 4 December 2000 Pobisk Georgievich passed away, but his spirit and ideas are alive. Now we issue a new work.

Why did we decide to produce it?

There are several reasons.

First, during the last year two books that have been produced jointly with Pobisk Kuznetsov during his lifetime were published, but this publication was after his death.

One of them — “The nature – society – man system: sustainable development” (“Noosphere”, Moscow, 2000, 390 p.).

The other is “Sustainable development: a synthesis of natural and humanitarian sciences” (Russian Academy of Natural Sciences & University “Dubna”, 2001, 280 p.) A short version in English was published as well.

After the release of these books many requests have been received to express the authors' position on some key issues for sustainable development. Among them, for example, the question: why are we unable to get out of the global crisis despite the efforts of the United Nations?

Second, in December 2001 in Moscow two big events dedicated to the memory of P. Kuznetsov took place.

The first of them was held on 4 December in the State Duma. Held hearings showed that there is great interest in the realization of P. Kuznetsov's ideas not only in scientific community, but also among politicians. And we would like to express some thoughts considering this.

The second major event took place on December 14–15, when Schiller Institute, Academy of Development of culture and education and the Foundation for basic research of Russian Academy of Science held the International Symposium “Space and Time in the evolution of the global system of nature – society – man”. The Symposium was attended by scientists from the USA, Germany, Russia, Ukraine, Kazakhstan, specialists of various scientific disciplines — philosophers, mathematicians, physicists, chemists, biologists, ecologists, economists, psychologists, lawyers, sociologists, political scientists and all who studies the regularities of the modern civilization evolution in the system of nature – society – man. Materials of the Symposium have already been published in Washington.

The Symposium showed that there is a great interest in understanding the ideas of P. Kuznetsov for solving the actual problems of transition to sustainable development.

In our opinion, this interest is primarily due to the fact that the ideas and discoveries of P. Kuznetsov enable a fundamentally **DIFFERENT WAY** to see the “unsolvable” problems— and impossible becomes possible.

Third, in 2002 it is planned to hold the second International Symposium of the same name, and we would like to discuss this position before opening it.

Three key issues will be discussed:

- Why do we believe that P. Kuznetsov is an outstanding scientist of our era?
- Why, remaining within the framework of the currently dominant worldview, it is essentially impossible to solve the problem of sustainable development for humanity?
- What worldview is necessary for the transition to sustainable development?

Fourth, in September 2002 in South Africa it is planned to hold the World summit on sustainable development problems, and we believe that discussing these issues is important.

Fifth, in February 2002 our textbook “**Sustainable development: scientific principles of design in the nature – society – man system**” will be released. It is dedicated to the blessed memory of P. Kuznetsov. His ideas are the basis of the book. The textbook is unique because it combines for the first time the ideology, theory and method as a coherent system, providing the basis for projecting in the nature-society-man system.

We want this textbook to become a “relay baton” of generations and help to educate people, capable and implementing their ability to solve problems of transition to sustainable development creatively.

Current generations' care about future generations is the education of people capable and implementing their ability to act creatively.

P. Kuznetsov

1. Introduction

First of all, we would like to note that the very name of the Symposium "SPACE and TIME in the evolution of the global system of nature-society-man" **orients correctly** and therefore facilitates the determination of the contribution of P. Kuznetsov to the world science.

Plank is raised precisely to the level at which we can and must discuss the ideas of P. Kuznetsov as well as the problem of sustainable development of Humanity.

Above this level — CREATIVE MIND — CREATOR.

Inside — all natural, social and spiritual phenomena of cosmo-planetary system in which we live.

Discussions of Humanity's current problems usually stay on a lower, domestic levels and therefore a higher level is not seen.

However, we will venture to say that the universal essence of P. Kuznetsov's ideas and the deep essence of the problem of Humanity's sustainable development are two sides of the Universe, where everything changes and remains unchanged.

All the difficulties, faced by the world science in the decision of actual problems of synthesis of natural and humanitarian knowledge; all the difficulties faced by Humanity in overcoming the threat of "the limits to growth" and the resource constraint is the difficulty of establishing proportionate ties of real phenomena and problems with Space-Time and establishing general laws of Life development, expressed in spatiotemporal measures.

P. Kuznetsov's discoveries give humanity the natural-scientific basis for overcoming these difficulties.

Among them we consider **these three to be outstanding**:

1. Spatiotemporal system of general nature laws.
2. Invariants of natural-historical development of Life (including public life) as a Cosmic phenomenon.
3. Tensor principles of designing the future world using universal measures — laws.

Why do we call these discoveries outstanding?

First of all, because without these discoveries it is fundamentally impossible to solve the problem of Humanity's sustainable development.

How can we prove such a serious statement?

In 1987 the UN General Assembly approved the concept of world community sustainable development created by the International Commission in cooperation with leading experts from more than 100 countries, and in RIO-1992 it was adopted by almost all countries of the world.

Yes, it is true. This was a major achievement of the international community. Nevertheless, we argue that without these discoveries it is impossible to overcome the world crisis and move towards sustainable development of Humanity in the long-term perspective.

Why? Because the existing worldview is not adequate to the real world. Understanding of the root causes and "scale of the disaster" is missing. It is the ultimate reason of the global crisis.

2. The real challenge

In history there were many crises, conflicts and wars. But we have never faced such a critical situation, when the very possibility of the human civilization's existence as a whole is in danger, and the problem of Earth **limits** would require scientific solutions.

There is a serious concern that the prevailing views on sustainable development in the individual countries can lead to a repeat of strategic mistakes in the choice of development paths, not agreed with the dynamics and laws of nature. The absence of adequate scientific understanding of the problem, the absence of the real possibilities of its solution, **lack of understanding of the spatiotemporal perspectives is the main reason for strategic mistakes.**

There are two spatiotemporal perspectives that determine the choice:

1. **The earth is a closed system, and you can only live on its surface.** If this choice is made, as a **consequence** comes **the limit** of development and, therefore, idea of the population genocide is inevitable (for example, a well-known idea of “Golden” billion “worthy” to inhabit the Earth);

2. **The earth is an open system, and all life on Earth is a cosmic phenomenon.** If this choice is made, as a result we have the ability to preserve development not only on Earth, but in Space.

Error is inadmissible in such a choice, and therefore it is very important to understand the objective contradiction that cannot be resolved, remaining within the boundaries of the dominant worldview.

This contradiction is between Earth’s spatiotemporal limitation and the need to preserve Humanity’s development regardless of this limitation.

Spatial limitation is determined by the finite size of the Earth. It determines the non-boundlessness of all types of Earth resources (L-limitation).

Temporal limitation comes from the evolution law — the one and only officially registered in science. It is the second law of thermodynamics (T-limitation).

If the Earth was a closed system, then from LT-restrictions the essence of the contradiction could be expressed in two words firmly rooted in the mass consciousness. They are **“the limits to growth”**.

The dominant worldview is based on the fact that there is a “limit to growth”. When preserving the dynamics of population growth (in a model), it is not difficult to calculate the “time limit” in which the weight of the human population would be comparable to the weight of the Earth itself, and the increasing consumption of natural resources will lead to LIMIT (the depletion of the resource base of Humanity). The struggle for the possession of dwindling resources is the basis of all conflicts and wars. Wealth and poverty is also a consequence of this struggle.

Notorious concept of the “Golden billion” has as a scientific substantiation these resource limitations. Its point is not in “one billion” or in “one hundred billions”. It is in the principal limitation of opportunities growth, defined by the specified spatiotemporal limitations.

The active conductors of these ideas since the times of the WWI were B. Russell and H. Wells. They campaigned in favor of the policy of limiting population, including the ways that are “although disgusting, but necessary”. They became the creators of the “post-industrial zero-growth” concept, accepted in 1953. Its essence is that the planet is no longer able to maintain the current level of population, and development is the destiny of the “elite”. In 1955, in London the conference of “Parliamentarians of the world for the organization of the world government” was held, initiated by B. Russell. Russell expressed his thoughts quite frankly: “Humanity is collective, under the leadership of fools and using ingenuity smart slaves, humanity is busy — a grand affair to prepare its own destruction...”. The idea of the conference is reflected in an absolutely definitive policy:

- The birthrate limitation.
- The lowering of education.
- The destruction of the agro-industrial bases of modern society development.

This **genocidal policy** has brought certain results.

Table. 1. The dynamics of world development in the second half of the twentieth century

Years	60s	70s	80s	90s ¹
World average GDP growth rate, %	5,2	3,4	2,9	0,6
Population growth rate, %	2,1	1,9	1,5	1,24

¹ at the beginning of the 90s about 13 million children were dying every year from malnutrition and easily curable diseases. But after a decline in the birth rate it is inevitable to reduce the amount of elderly, since the maintenance of their lives is economically burdensome.

The economic downturn has led to 4 billion poor and 1 billion unemployed in the world.

Poverty, unemployment and a high mortality rate is the result of deliberate genocidal policy of “zero growth”.

The degrading economy with great difficulty provides non-vanishing needs of a growing population. Such economic policy is impossible to conduct without the use of force. Not by accident the buzz around the terrorism is raised in the world, which still is not defined. But it is a shadow of the current world order. Propaganda trains people to use force against disobedient, who can be labeled “terrorists”. Such policies provoke new conflicts, victims of which will be millions. Destruction of the most important life-support systems, including grain production, will generate a new round of deaths. However, the world is accustomed to the fact that there are no other options, that evolution was completed and so the “global cleansing” is inevitable. Naturally, the response is a growing protest movement — “anti-globalism”.

3. *Worldview crisis*

Developing a correct worldview is, of course, of paramount importance for Humanity (being literally a matter of Life and Death).

J.L. Sing

“Why, despite huge effort, are we unable to make progress in moving towards sustainable development of the world community?”

Below we provide eight reasons, which show how serious the issues that the world community has to deal with are. We want to show that politicians, lawyers, economists, financiers and ecologists will be powerless in the face of these problems until they have adequately worldview and SCIENTIFIC “TOOL”.

1. **“Not enough money”**. But how to explain the fact that over billions of years Nature manufactures products, which are used by each person (water, air, food, energy, materials) and Nature did not spend even a single penny? Why nature does not complain of the lack of money, but it is sensitive to our thoughtless actions? Do we understand the language that it speaks to us? Can we express our actions and decisions in its language?

2. **“It is not clear whether the global financial market is force that support or hamper the sustainable development”**. But how can the financial market support sustainable development, if it is unable to calculate the consequences of financial solutions to those problems? It does not have a reliable, stable measuring of the environment with which it can agree its decisions. The mechanism of investment protection from the inefficient management risks during the transition to sustainable development is unclear.

3. **“Policy short-sight is guilty”**. But how the policy may not be short-sighted, if the financial information gives a distorted view about changes in the surrounding world, and therefore it is not possible to evaluate the long-term implications in monetary indicators not only for financial but also for political decision-making. There is no sustainable meter.

4. Someone **tells about the unprepared minds of people**. But how can they be prepared, if a single system in which we live and which is called “nature – society – man”, **was torn apart in our consciousness — into “pieces” forming a “tower of Babel” of professional languages**. Therefore not only politicians, lawyers, economists and financiers, but also representatives of natural and technical sciences are in a very difficult position. Professional languages don’t bring people together, but disunite them and thereby significantly complicate the understanding of the problem. To answer the question: “How all the pieces form a single system?” is impossible using any “known” professional language. But then we must ask ourselves: “What language should present the system as a whole? Do we understand its laws?”.

5. The International Commission on environment and development stated: **“We are able to coordinate the activity of the Person with the laws of nature”** — with the purpose of transition to sustainable development of society.

However, what laws and **how** to coordinate the activity of the Person with the natural laws is not been told. It was assumed that **each country and region develops the concept and program**.

14 years have passed, but questions have remained.

6. The situation is paradoxical.

Science works with fundamental conservation laws. But what is sustainable development? Any development is always “something” changing. But how can something be changed and at the same time steadily maintained, that is not to change?

Science also works with fundamental principles of change. According to one of them, **the world is moving towards chaos**. In accordance with another — **towards noosphere**. Where is the international community moving: **towards chaos or towards noosphere?** What is the law of nature we have to use to answer the question?

Every human, nation and every living system is a hostage to its beginnings:

1. ACCUMULATION of free energy,
2. DISSIPATION of free energy.

These beginnings’ struggle accompanies all forms of life: at the stage of **development** the first one dominates, and at the stage of **degradation** — the second. But maybe there’s a third beginning, under which them both are controlled?

Conclusion of the WCED agrees with the necessity of eliminating the free energy dissipation effects: we need to clean up after ourselves, so to “clean up” less we need to consume less, so to “consume” less we need to “reproduce” less — energy-saving technologies provide this, but their production requires organizational change and redistribution of the investments. But their financiers don’t see any reason to hurry. What’s the matter?

If we collect all the books of the Higher school on philosophy, mathematics, physics, economy and law, we’ll find a strange thing: **the laws of nature, which need practical activities to be coordinated with to ensure sustainable development of society in interaction with the environment, are not in textbooks**.

All the well-known conservation laws are working for closed systems. But our world of nature, including Man and Humanity on the whole, is clearly an open system.

Do we know the law of conservation in science, working for open systems, which follows the two above-mentioned fundamental principles?

If such law is absent, there is no guarantee that even if all countries have their national development programs, the world on the whole will develop sustainably.

The fundamental science beginnings of the twentieth century are composed of two theories: quantum theory and relativity theory. In combination with the known laws of natural sciences, they have defined the essence of the dominating scientific worldview of the twentieth century, however, “the morning sun never lasts a day”.

Overview speech of academician M.M. Lavrentev is significant: “On the threshold of a new century and a new millennium, **the main problem of the Science world as a whole is ensuring sustainable future history of Humanity**”.

It becomes obvious that most of the problems generated by direct or indirect, conscious or unconscious violation of the natural laws.

It was revealed that:

1. The principle of constant light velocity is not playing the decisive role in the set of spatiotemporal geometry as it was thought previously.

Violation of the laws of classical mechanics and thermodynamics occurs much earlier and in other circumstances than it comes from the special theory of relativity.

2. The well-known Bohr principle of “conformity” in quantum mechanics is **far-fetched, erroneous conception, and the Born theory — perfunctory adapting..**

It is no secret that the sophistication of mathematical description is allowed, in the case when talking about individual experiments or observations, to create the impression of accordance between theory and factual material. But this illusion disappears when the factual material is not considered fragmentary, but as a whole. Then, in case of inadequacy, you will discover fitting character of procedures.

If the model only “explains” but does not actually predict anything, it can not determine further ways of development... Hence, it can not essentially contribute to the progress”.

“Quantum physics are faced with problems, which it is not able to solve and it apparently reached a deadlock” (L. de Broglie).

“Quantum mechanics is also dear to us, but the truth is dearer” (R.R. Newton).

“Willy-nilly, we have to admit the fact of a large, corporate scientific bias, strictly speaking — or competence, or falsification. **In these conditions it is extremely urgent to establish correct worldview, i.e. worldview, based on a scientific picture of the world that is really adequate to reality, where Human exists and operates**”* (M.M. Lavrentiev, 2000).

Naturally, the correct worldview cannot ignore the general laws of animate and inanimate nature, expressed in the universal language of Space-Time. The system of these laws should be the core of the scientific worldview that is adequate to reality. But can we find such a system in the framework of the dominant worldview?

7. There is no doubt that the Earth and every living system, Human and Humanity as a whole are open systems, continuously communicate with the external environment energy flows. And yet all forecasts are based on the laws and models describing the global system as **closed**. It is natural, that such models will always have **the limit to growth**.

And yet the Earth is **limited by Time and Space**, and therefore it has limited energy resources.

In a situation of rapid growth of consumption and the radiant flux of cosmic energy, falling on the Earth, is not increasing, it is inevitable critical situation in the cosmoplanetary scale.

8. That’s why we put out the question: “**Are there laws of natural-historical development of Life, including the development of Humanity?**”

If such laws exist, we should:

- present them and show how they are related to the fundamental laws of nature;
- show how these laws are manifested in the history of Humanity and especially in critical situations, conflicts and wars;
- present them in a form allowing the coordination with them of practical activities in all subject areas.

If the laws of historical development do not exist, as was demonstrated by another great philosopher I. Kant, you can always vindicate even contradictory statements.

This means that any point of view on the question of the current state of humanity, country or region we recognize as correct as the opposite to it. There is no right or wrong, but we are also no closer to understanding the ways of transition to sustainable development of Humanity. Subjective management will inevitably enter into conflict with the Law, and this is reflected in the form of a global systemic crisis.

Thus, there is a fundamental scientific problem, the solution of which decides the fate of the Earth civilization.

Remaining within the framework of the dominant worldview, it is impossible to overcome the limits to growth. But if they cannot be overcome, it is fundamentally impossible to establish secure and sustainable development of Humanity in the long-term perspective.

But if it is impossible to transit to sustainable development and impossible to overcome the limits to growth, it is impossible to avoid genocidal policy.

Why is it impossible? Because the dominant worldview has no law of natural-historical development of Life as a General law of Nature.

The world community faces the problem of turning the impossible into possible.

We know that an adequate idea is required for formulating and solving problems.

4. The essence of Pobisk Kuznetsov's ideas

Clarifying the meaning of life is the attainment of the Law, which is implemented by the Soul, and Mind.

P. Kuznetsov

P. Kuznetsov gave the world the idea of turning the impossible into possible. It is difficult otherwise to name the fact that enables you to design the world development on the basis of general laws of nature.

It is equally difficult to imagine Logic, Theory and Method, which form a complete system — scientific worldview, enabling Humanity to make the transition from the kingdom of necessity to kingdom of freedom. P. Kuznetsov with all his creative life has demonstrated this attitude towards the world.

The basis of his worldview is CREATIVITY. In the creative process new Ideas are born, and they provide a sustainable growth of free energy, sustainable growth of free time of Man.

In the P. Kuznetsov's worldview transition to sustainable development of society is the Humanity's movement from "the world of things" to "the world of spiritual riches", from the world where the need and the idea of "TAKE" are dominant to the world where idea and the need to "GIVE" for the good of individuals and Humanity will dominate in general.

Most normal people would say that such a transition is impossible, because it contradicts the reality which surrounds us. But such reality is in deep systemic crisis and brought humanity to the brink of disaster.

Worldview of P. Kuznetsov shows the way out of the crisis. It seems to reverse the situation and it takes as the "support point" that is time-tested and that provides the conservation of Human development throughout its history.

The whole history of Humanity is the conservation of the development of the creative gifts of the human race. The ideas are development source and the goal is Man, capable and implementing his ability to act creatively.

For this reason, **the best way to save the Earth for future generations is to form people capable to solve creatively the problem of transition to sustainable development, that is, to transform the impossible into possible.**

Creativity is a process of transforming the impossible into possible.
P. Kuznetsov.

1. Any creative work is purposeful activity extending the boundaries of the possible. Human experience shows that turning the impossible into possible is implemented then (and only then), when there are ideas and measuring procedure of their contribution to the growth of the system capacity.

That is why the World Business Council for sustainable development has adopted the motto: “All that achievable is measurable, and all that is measurable — achievable”.

2. **Lack of sustainable meter and the measurement procedure are the main sources of all possible losses in society**, a source of crime, degradation, terrorism and the possible collapse of the whole system. For this reason, the laws of the whole system, political objectives and economic decisions, should be expressed in measurable form and mutually agreed-measured.

P. Kuznetsov showed that any creative process matches two types of logic:

- ✓ The research logic (or thinking logic) — “from nature to the idea”;
- ✓ The design logic — “from idea to nature”.

The synthesis of these logics is resolution of dialectical contradictions, the “parties” which are “categorical pairs”: for example, space — time, material — ideal, quantity — quality, preservation — change, infinite — finite, life — death, order — chaos, development — degradation, and many others. The greater the number of categorical pairs researcher uses, the better he thinks.

He showed that **the contradiction is resolved, if categorical pairs presented in commensurate universal measures-laws**, which provide a synthesis of different concepts, logical and non-logical forms.

The measure, as a synthesis of quality and quantity, is universal, if its relation with space and time is clear. In this and only in this case there is a possibility to verify **the truth** of the conclusion drawn in mathematical and applied (practical) way.

Expressing categorical pairs in spatiotemporal measures has shown that **the synthesis of thinking logic and design logic is a qualitatively new logic** — the logic of the design of different forms of movement expressed in universal measures-laws.

Two conjugate processes — **logic thinking and logic design** — are two names of the uniform design process of the future world.

This qualitatively new logic is the logic of turning the impossible into possible on the basis of universal measures-laws. Synthesis of the theories of natural, technical and humanitarian sciences became possible on the basis of this logic.

The use of universal measures gave the opportunity to consider the concept of different subject areas as projective space with an invariant that allows conversion according to certain rules. All the basic concepts of the nature – society – man system are seen as the group of transformations with invariant. The general laws of nature expressed in spatiotemporal measures act as an **invariant**.

The names of invariants expressed in terms of a particular subject area are its **projection** in one or another particular coordinate system. All the projections of the same invariant form the concept of the **GROUP**, and the rules of transition from one coordinate system (or subject area) to another coordinate system (domain) form the concept of **TRANSFORMATION**.

All the above-mentioned conceptual forms are based on the notion of a **TENSOR**. It gave P. Kuznetsov the opportunity to consider the world as **Multisensor** or group of transformations of the system of general laws of nature — invariants.

Logic design has evolved into a tensor methodology of designing the future world as a scientific tool for correct application of general laws of nature to control the development in the system of nature – society – man.

5. What unites all of Pobisk Kuznetsov's ideas?

All my ideas are the elements of the common chain, binding the processes of transition of radiant energy, dissipating in space, into the phenomena of Life, but each element covers its own subject area.

P. Kuznetsov

We qualify P. Kuznetsov as an outstanding scientist of our time. Why? To answer this question, we need to understand what new P. Kuznetsov had given to the world of science in solving human problems.

We want to show the contribution taking into account the title of our report. Is it possible to identify “particular chains” ordered in time in the P. Kuznetsov's works and show their relationship?

However, on this way the **main question** remains without answer: is there that little thread that sews these “particular chains” in a single whole? What is the invariant that independent from names of particular scientific problems, which P. Kuznetsov solved?

If there is no answer to this question, it is extremely difficult to properly understand the relationships between encyclopedic integrity of all the ideas and P. Kuznetsov's works. If the answer exists, a conclusion about the place P. Kuznetsov in the world science should follow.

It is incredibly difficult question. To answer it, we had to write five books, had to make the textbook, several times had to write about P. Kuznetsov specifically. And a feeling of dissatisfaction retains yet. It is obvious that these questions will have to be reconsidered more than once.

All works of Pobisk Georgievich are an encyclopedically holistic picture of scientific knowledge about the general laws of conservation and change in the animate and inanimate nature. In accordance with the methodology it could be called “a group of transformations with invariant”.

An invariant is the system of general laws of nature, and the conversion group — various subject areas covered by natural, technical and humanitarian sciences.

All works of P. Kuznetsov can be divided into two large groups:

1. Works, which give a scientific-theoretical comprehension of invariant-law;
2. Works, which show the correct application of the law in various subject areas.

The first group includes the comprehension of the law.

The second group includes the correct application of the law.

The first group includes: all works on philosophy, dialectical logic, foundations of mathematics, theoretical physics and chemistry (including photonics and resonance theory of catalysis), theoretical biology and medicine, theoretical economics and management theory of social development.

The second group — a huge number of very interesting work, connected with the usage of discovered laws in different subject areas for management at different levels: from management of the course of history to the management of individual enterprise. It includes work on the design of life support system taking into account the specifics of working and living on a Spaceship.

The Annex contains a list of publications by P. Kuznetsov, divided into these groups.

6. *Origins of Pobisk Kuznetsov's discoveries.*

What is the cosmos for? What is its destination?
And what is Humanity for?
They form a new categorical pair that no one
studied well as the form of categorical pairs.

P. Kuznetsov

There is a number of outstanding discoveries in philosophy, mathematics, physics, chemistry, biology, engineering, economics, medicine, sociology, law, that form the essential elements of the system of scientific knowledge about the laws of Nature (including society and Man). It was necessary to highlight these entities and, that is very importantly, to eliminate gaps in ties between knowledge of natural, technical and humanitarian sciences. But to do this it was necessary for P.G. Kuznetsov to show the relationship between the ideal and the material of the Space Logic and Movement Logic using the universal LT-language (Space-Time), synthesis of quality and quantity, conservation and change laws in the nature – society – man system, methodology of correct application of development management laws in practice.

There are many questions to which there is no scientific answer. But Hegel showed that “the answer to the question that remains unanswered, is that this question should be put otherwise”.

P. Kuznetsov **could put questions “otherwise”** ingeniously simple. The result was an amazingly simple answer. And this answer contained new knowledge about **the essence of the phenomenon or process**. And it was not just new knowledge, but new scientific knowledge expressed in a measure. And it was not just expressed in a measure, but in **the universal measure** verifiable in any coordinate system independent from particular viewpoints.

Thus a new scientific knowledge with **obligatory** meaning appeared. Thus a scientific discovery was made. Thus the system of general laws of nature was found. On the way of attainment of this system it was required to have a reasonable answer to a lot of very difficult problems which for a long time were remained unanswered, thereby inhibiting the synthesis of natural-scientific, technical and humanitarian knowledge into a coherent structure of the unified world.

We would like to present the list of outstanding thinkers and scientists, whose fundamental works became the basis of the universal system of general laws.

We want to raise the question: “What new did P. Kuznetsov do in science, compared with such outstanding thinkers and scientists as: N. Cusanus, J. Kepler, I. Newton, J.L. Lagrange, Laplace, I. Kant, Hegel, S. Carnot, K. Gauss, R. Mayer, Clausius, K. Marx, F. Engels, S. Podolynsky, N. Lobachevsky, A. Einstein, Klein, O. Veblen, N. Bourbaki, Gurvich, E. Bauer, V. Vernadsky, G. Kron, R. Bartini, L. LaRouche?”

Each of them made an invaluable contribution to the world science, to the scientific worldview and to the world understanding, each of them influenced the development of P. Kuznetsov's ideas.

7. *What new did Pobisk Kuznetsov do in science compared to his great predecessors?*

1. He was able to distinguish the issues, without which it is impossible to eliminate the gaps in between philosophy, mathematics, natural, technical and humanitarian sciences — between theoretical knowledge and an opportunity of its proper use in the practice of managing development in the nature – society – man system.

2. He was able to highlight “root” issues so that the answers to them allow to “sew together on a legal basis” fragmented and incommensurable knowledge in a unified construction of the world, part of which we can consciously change, keeping development all in all. Before him it was impossible to clearly and definitely say: “How a philosophical ideas of the idealist Hegel relates to the ideas of engineer-physicist Kron? How to express the laws of Kepler, Newton, Lagrange, Maxwell, Clausius, Marx, Podolynsky, Einstein, Vernadsky in the universal language of Space-Time? How to use the Vernadsky’s idea of biosphere-noosphere properly when designing the future world on a legal basis?”
 3. He gave the answer to these questions in such form that specifies the way to unification — synthesis of incommensurate and therefore seemingly incompatible ideas and theories in the natural, technical and humanitarian sciences.
 4. He left the theoretical logic of thinking, understanding which you can discover new laws of nature, design specific system, manage the development at any level of the nature – society – man system, turn the impossible into possible.
 5. No one before him:
 - ✓ has offered a universal language and description method of the nature laws;
 - ✓ has given the concept of the general law of nature, expressed in the universal language of Space-Time;
 - ✓ has formulated the general law of Life development in the universal LT-measures;
 - ✓ has shown explicitly analytical relationship between general laws of nature and the laws of historical development of Humanity;
 - ✓ has formulated the universal invariants of the historical development of Humanity;
 - ✓ has offered tensor methodology to design the future of the world;
 - ✓ has shown:
 - synthesis of theory in natural, technical and humanitarian sciences;
 - engineering of technologies, machines and mechanisms;
 - organization of different systems — there is only the common design process and management of the course of historical development of Humanity.
- Finally, P. Kuznetsov taught many people to think creatively. And as we are disciples of Pobisk Georgievich, we are responsible to make sure that P. Kuznetsov’s natural-scientific worldview will become the heritage of Humanity.

8. Why cannot we go without a law of nature in solving problems of sustainable development of Humanity?

There is a wide range of phenomena, for which the second law of thermodynamics is not valid. This area of physical phenomena is called Life. Its opposite is called Death. It is the struggle between them that forms a whole set of processes of boundless cosmos.

P. Kuznetsov

Our definition of sustainable development fundamentally differs from the others mostly because it is based on the general law of nature, discovered by P.G. Kuznetsov.

UN experts have declared that they are able to coordinate their activities with the laws of nature. But what kind of laws they meant and how they coordinate their activities has not been explained.

At the same time, the main difficulty in the development of the “reasonable” Sustainable Development Strategy and defining effective environmental, economic and social

policy is that the laws of the rights, goals and solutions are not coordinated with the laws of nature, with the dynamics of its reproduction.

This discordance creates a gap in the nature – society – man system and is the cause of the global systemic crisis.

All laws can be divided into two types:

1. the laws that can be enacted and repealed under certain circumstances;
2. the laws that can neither be enacted, nor repealed under any circumstances.

The laws of the first type are called the laws of Rights, and the second type is called the laws of Nature.

Laws of Rights are invented by Humanity

Laws of Nature are discovered by Humanity

Law of Nature is a rule that has been validated in practice and has been sieved through sieve of time for thousands of years. It contains a non-vanishing essence, thing that is the deepest and the most necessary for every person — sustainable rule of the conservation of Life.

This rule does not depend on individual points of view and, therefore, becomes the property of all Humanity and defines its worldview. It cannot be repealed. It becomes obligatory. But we need to learn how to use and properly apply it during the development of policy.

The only law, spelled out in science, that characterizes sustainable direction of changes in nature, is the second law of thermodynamics. We believe that there is no need to explain that if the activity will be coordinated with this law, we'll inevitably reach the limits of growth which is followed by death of all living things.

Countries were invited to develop their own development programs, because there was belief that after matching of said programs it will be possible to develop a unified program of development of Humanity.

We argue that even if this happens, and all countries develop their own development programs, there is still no guarantee for conserving Humanity development in general.

Why? Because it will still be a private position, expressing only “instantaneous” interests in the “infinitesimal” segment of historical period, not taking into account experience, accumulated by humanity for millions of years of its existence and development, not taking into account laws of 4 billion years of evolution of life on Earth.

Below we present a number of arguments, explaining our statement.

1. It is not possible to give an example of a country (or region) for which sustainable development was peculiar for the whole period of its existence. During the period of existence of each country, as well as in life of every person, there are periods of prosperity and decay. Any living system is mortal. Only Life as a cosmic whole is geologically eternal. There is a contradiction between individual mortality and eternity of life.

But how can we coordinate specific programs and solutions with eternity? It is impossible without clear rule. But it is the law that is the “solid”, the quintessence of that eternity. The law formulates rule that can be used in the development and evaluation of impact of programs and solutions.

If there is a law, then it is possible to consider the eternal experience of the evolution. Without the law, it is practically impossible to take that experience into account.

2. Sustainable development requires changes, the impacts of which should be forecasted for a long period of time. Only in this case we can evaluate the influence on the ability to meet the needs of future generations. We are talking about time frames of projected changes as long as 50-100 years.

Evaluation of long-term impacts of projected changes in disproportionate measures of economics, mathematics, physics, chemistry, biology, ecology, politics is fundamentally impossible.

A law, expressed in universal measures, that would allow us to commensurate processes of different properties in the nature – society – man system, is required.

Without the law we'll inevitably get the wrong idea of the overall picture. Only on a legal basis we can evaluate the long-term consequences of projected changes.

3. In the process of transition to sustainable development a lot of different, often opposite points of view are being expressed. Each party proposes certain arguments worthy of attention. But how can we connect opposite positions?

I. Kant revealed that this is possible only if there is an objective law. Only on a legal basis it's possible to reconcile private points of view so that the system as a whole would maintain development.

Without the law, expressed in universal measures it's fundamentally impossible to reconcile opposing points of view.

These considerations allow us to answer the question: "Why cannot we go without the law?"

1. Without the Law it's impossible to proportionate and connect into one a vast field of private points of view: connect them in a way that would allow conserving of the development of the whole system (i.e., come to a mutual benefit for everyone).

2. Without Law it is impossible to make a situation predictable in perspective of several generations (50-100 years).

3. Without Law it's practically impossible to consider the generalized experience of evolution on Earth.

4. Without Law it's impossible to project changes in parts of nature – society – man system in a way that would allow the system as a whole to maintain its development in the long term.

5. Without Law it's impossible to assess the long-term effects of the programs and decisions affecting the security and development of the region, the county or the entire world.

6. Without Law the control is subjective and inevitably leads to a conflict.

7. Without Law the opposite points of view are equivalent and there is no guarantee of advancement towards sustainable development.

8. Without Law there is lawlessness.

Now we would like to answer the question:

"Why do we need the Law?"

We need the Law to choose the right path of development. Every path has a "beginning" or "basis" and a direction.

We need the Law to understand:

- ✓ our basics;
- ✓ the direction of the motion;
- ✓ possible results of the motion.

Every human, like any living system, is hostage to its basics: the dissipation and accumulation of free energy. According to one basis there is energy dissipation, which leads to chaos and death. According to another, there is anti-dissipation, leading to better organization, order and development of life.

Interaction of these basics forms a path into the world of future. And the direction and speed of the movement depends on which basis is dominant.

If dissipation processes are dominant — we are approaching death. If anti-dissipation processes dominate — we move away from death.

That's why it's extremely important to have the ability to control both of these processes.

But what does “to control both of these processes” mean? It means that we must be able to proportionate these multidirectional processes. But for that we must have common measure and a starting point. Otherwise, the results will be contingent, not having practical value. Therefore it is very important to understand what conserves and what alters in these processes.

Realizing what conserves in these processes, we thus obtain the “fulcrum” — rule of stability, not dependent on the direction of motion.

Realizing what alters in these processes, we gain the ability to proportionate both processes, relying on the “law of sustainable change”.

So, what conserves in these processes?

Might it be energy?

If energy conserves, i.e. $E = \text{const}$, then the energy change in time equals zero, i.e. $dE/dt = 0$. Full power of the system equals zero.

This means that the system is closed. It has no exchange of energy flows with the environment.

But every living system is open, i.e. exchanges energy with the environment. Its power does not equal to zero. Therefore, energy conservation cannot be considered as an invariant of dissipative and anti-dissipative processes.

This raises the question: “Is there a general law of nature that produces both of these processes?”

9. What is “The general law of nature?”

It's not immediately evident that in the modern science (physics in particular) there is no standard definition of a general law of nature, expressed in the universal spatiotemporal measures.

There are many specific laws of physics, chemistry, biology, and economics. But how the laws of Kepler, Newton, Maxwell, Marx, Clausius, Einstein, Vernadsky are linked? What quality conserves despite the quantitative changes? What are the limits of laws? What is the universal measure that synthesizes qualitative and quantitative properties of the various laws of the real world?

Absence of respond to these questions means absence of concept of the general law of nature.

Einstein formulated the requirement of invariance, but he did not determine the general law of nature, expressed in the spatiotemporal measures.

Heisenberg saw one of the major challenges of modern physics in giving the simplest concept of the law of nature.

“We should immediately go back to the deterministic laws and strict rules” (M. Gryzinsky, 2000). But turning back does not answer the question: “Why quantum mechanics is at an impasse?”. There are different answers to this question.

We would like to note that in modern quantum theory there is no notion of commensurability and proportionality of the processes. The absence of these concepts creates uncertainty.

Paradoxically, but the theory of relativity (general and special) does not solve the problem of space-time. “Evil Genius” Minkowski, who proposed Pseudo-Euclidean space with a four-dimensional geometry with signature $\langle + - - - \rangle$, is clearly not enough to resolve the

contradictions between the various types of systems in the real world and the different types of geometric spaces: Euclidean and non-Euclidean, Pascalean and non-Pascalean, Disarguesian and non-Disarguesian, Riemannian and non-Riemannian, etc.

Great N. Lobachevsky assumed that each type of geometric spaces corresponds to a certain class of systems of the physical world.

This naturally raises the question: “How to define these classes? How to set the connection between them?”.

Without an answer to these questions it is impossible to determine a system of common laws of nature, expressed in universal and proportionate measures and to determine spatial and temporal limits of any law of nature.

Nevertheless, P.G. Kuznetsov together with R. Bartini in 1974 showed multiplicity of geometries and physics and discovered spatiotemporal relationship between them, confirming it in the example of almost all known laws of physics. These results were discussed in the 1973-1974 with academics Bogolyubov and Pontecorvo and got their approval.

We believe those studies are primordial basics of precise scientific knowledge, making it possible to construct a building of scientific outlook on the firm foundation of the general laws of nature.

However, it was impossible before outstanding scientist’s and aircraft designer’s R. Bartini’s publication of the LT dimensional table in 1965.

There was no answer to two fundamental questions:

1. How L^R -spatial measures are associated with T^S -temporal measures?
2. In which way all physical quantities are expressed in $L^R T^S$ -measures*?

The answer to these questions was given by Bartini’s $L^R T^S$ units system, which he discovered back in the 30s (Fig. 1.).

	L^{-3}	L^{-2}	L^{-1}	L^0	L^1	L^2	L^3	L^4	L^5	L^6	
T^{-6}							$L^3 T^{-6}$	$L^4 T^{-6}$	Power change	Rate of power transmission	0
T^{-5}						Pressure change	Surface power	Rate of force change	Power	Rate of energy transmission	1
T^{-4}					Change of current density	Pressure	Mass angular acceleration	Force	Moment of force. Energy	Rate of action transmission	2
T^{-3}				Change of angular acceleration	Current density	Electromagnetic field strength. Gradient	Current. Mass consumption	Rate of charge transport. Momentum	Momentum of movement. Action	Momentum of action.	3
T^{-2}			Change of volume density	Mass density. Angular acceleration	Acceleration	Voltage	Mass. Amount of magnetism. Amount of electricity	Magnetic momentum	Momentum of inertia		4
T^{-1}		$L^{-2} T^{-1}$	$L^{-1} T^{-1}$	Frequency	Speed	Two-dimensional obvialnost	Volume consumption	Rate of volume transport			5
T^0	$L^{-3} T^0$	$L^{-2} T^0$	Change of conductivity	Non-dimensional constants	Length. Capacity. Self-induction	Surface	Spatial volume				6
T^1	$L^{-3} T^1$	Change of magnetic permeability	Conductivity	Period	Duration of distance	$L^2 T^1$					7
T^2	$L^{-3} T^2$	Magnetic permeability	$L^{-1} T^2$	Time surface	$L^1 T^2$						8
T^3	$L^{-3} T^3$	$L^{-2} T^3$	$L^{-1} T^3$	Time volume							9
T^4	0	1	2	3	4	5	6	7	8	9	10

Fig. 1. Spatiotemporal measures system

* R and S are integers (positive and negative). $-\infty < R < +\infty$; $-\infty < S < +\infty$.

The system consists of infinite vertical columns representing the number of integer exponents of length and horizontal lines — the integer exponents of time. The intersection of each column and each row automatically defines a dimension of a particular magnitude.

At the crossing of column L^0 and row T^0 , there is a point which is considered as a backbone of the table; it's complex of all dimensionless physical constants. (An example of the latter is as an angle expressed in radians). Moving from this point horizontally to the right, we get all the purely geometrical quantities — length, area, volume, linear volume translation, the volume translation in anisotropic area and volume translation in anisotropic space. Moving to the left, we'll see the distribution of any dimensionless quantities per length, area and volume unit. (The simplest example of the magnitude $L^{-1}T^0$ would be a change of the angle of rotation per length unit — curvature).

It gets harder to understand the meaning of the values in the cells of the column as we move vertically. Moving on up, we first get a frequency — change of the dimensionless quantity per unit of time. In the simplest case, it's the angular velocity — variation of the angle of rotation expressed in radians in time. That unit is followed by a change of change of the dimensionless quantity per unit of time. In case of the rotational movement it is a change in angular velocity, which is called the angular acceleration, etc.

Moving down from the backbone point gives a “temporal length”, i.e. the time during which a particular variation of the dimensionless quantity occurs. In the simplest case of vibrational or rotational movement that is a period. Considering their time not dependent on the direction of movement, we can confine ourselves to “temporal length”, which together with an isotropic three-dimensional space forms familiar from the textbooks fourth dimension — time. But we might meet more complex cases. In example, two bonded perpendicular pendulum depending on the direction of the acceleration will provide us with different readings. To account this fact we are going to have an idea of “temporary space”. Adding a third pendulum perpendicular to the first two, it is necessary to introduce the concept of “temporary volume”.

As we get into the essence of the changes occurring during moving horizontally and vertically, realize that shifting one cell upward is equivalent to the change in the value per unit of time, and right — the transfer value per unit length, it becomes easy to fill in all the remaining cells of the kinematic system. For example, in column L^1 moving to the level above the unit of length provides us a linear velocity, i.e., the change in length per time. Rising above, we find a change of this magnitude per unit of time — that is a linear acceleration. Higher lies logically imaginable, but unused in physics concept named “linear acceleration change per unit of time”, etc. Below L^1T^0 cell there is value that occurs in physics, but has no special name — the time required for the change in length per one unit. After constructing all the other columns in this way, we obtain a table in which the movement diagonally right and upward is equivalent to multiplying the initial value by the linear speed.

Isn't that a harmonious system? But there are two hidden pitfalls. First of all: within a chosen range a completely filled table contains a hundred units. According to the most humble estimates, more than half of them are not used in science. At the same time, as we have already pointed out, at least 200 basic and derived units of measurement are used in scientific language nowadays, most of which we do not see in our logically constructed system.

Why is that the case? Why does such a significant quantitative discrepancy take place?

The reason for this is that different physical units may have the one spatiotemporal dimension. Therefore, each cell in the table defines not just a single, but a whole set of different physical quantities, which have, however, one LT-dimension, which means the one qualitative determination.

The second pitfall is that the table is not bound to the physical reality — that is clearly seen through the fact that so far it contains only “change”, “speed” and “acceleration”, but

there are no such fundamental values like mass, force, energy, etc. However, the method of overcoming this difficulty was suggested by J. Maxwell in 1873 — in his treatise “Electricity and Magnetism” he stated that the mass dimension is $[L^3T^{-2}]$. The role of basis for this important expression was played by Kepler's third law of planetary motion, who empirically determined that the square of the orbital period of a planet is directly proportional to the cube of the semi-major axis of its orbit and is constant. Newton subsequently explained the meaning of this fact: the formula has proved the existence of a quantity which he called the mass and which remains constant in planetary motions...

Through mass it is easy to derive the dimension of momentum by multiplying it by speed: for that you only need to move to the cell that's diagonally upwards and right. Upper cell gives the momentum change over time — the power, and the cell to the right — two values derived by multiplying the length by momentum. In case of the vector product, we get the vector unit — momentum. And if it is scalar product — scalar unit, often used in theoretical physics — action.

By multiplying power by path, which means moving to the right, we get the one dimension for the scalar unit — work or energy, and vector unit — torque. Rising vertically upward, which means energy change per time unit, we get the power dimension, etc.

But Bartini used the table primarily to verify the analytical calculations performed during the design of various technical systems. He didn't know that the cells of the table at the same time are conservation laws.

Only in 1973. after publishing of P.G. Kuznetsov's scientific works “Universal language for a formal description of physical laws”, “Multiplicity of geometries and multiplicity of physics” (1974, together with Bartini), “Artificial intelligence and the Mind of Human Population” (1975) — everything fell into place.

LT-dimensionality table became a “nail”, which, as G. Smirnov aptly noticed, cobbles mathematics and physics into a single structure. We'll also supplement it with philosophy.

P.G. Kuznetsov found that ideal objects of philosophy and mathematics are strongly associated with material objects of physics. Moreover, the glossary of all applied mathematical theories forms the values of the LT-table.

Among the many definitions of mathematics there is one that describes it as a “chain of tautologies”. What does that mean?

According to modern ideas, all connectible statements have to be divided into two groups: those expressing a state of fact which can be tested by experience, and those which, independently of all experience, are true or false by virtue of their wording. So, statements of the second kind are called “tautological”, and they form the content of mathematics. “A sentence is tautological, — Austrian mathematician R. von Mises wrote, — if it is true independently of all experience, because it does not say anything about reality at all and is nothing but a reformulation or recasting of arbitrarily fixed linguistic rules”.

Thus, Darwin was right when he said: “Mathematics is like a millstone that grinds whatever you fill it with”. And mathematical “backfilling” is mostly represented by a set of different numbers, and the focus of mathematics is in grinding them, executing operations that change shape without changing the substance. If you clarify this fact, it unravels the effectiveness of mathematics in the natural sciences: for processing numbers doesn't bring anything new to them, and if they match a physical reality, then everything you get out of them with speculative operations, also corresponds to reality. Thus all the “secrets” and “mysteries” are concentrated where continuous, continual physical quantities convert into series of numbers. And this happens not when you calculate, but when you measure, i.e. “experimentally, by using a measure, compare one value with another homogenous to it

value, that is used as a unit of measurement". Homogeneity requirement plays a fundamental role, since only within the one genus, one quality it's possible to summate units.

It is easy to understand that mystery of extraordinary effectiveness of mathematics in the natural sciences is hidden inside units of measurement, because these units are, figuratively speaking, "nails" that "nailed" mathematics to the physical phenomena. It is not a coincidence that the most outstanding and insightful scientists of the world were engaged in development of measurement units and their systems.

Complexity of a civilization, as in a mirror, is reflected in the complexity of units in use.

Needs of Ancient world could be easily met by use of a very few units: angle, length, weight, time, area, volume, speed. But nowadays International System of units, in addition to the seven basic units (length, mass, time, amount of substance, temperature, current, and luminous intensity), is supplemented with two additional units (plane and solid angles) and about 200 derivatives used in mechanics, thermodynamics, electromagnetism, acoustics, optics. Besides the International System, in practice a number of other systems are being used; CGS — centimeter, gram, second; English FPS — foot, pound, second, etc. Although since 1963 the International System is the subject of legislation in many countries, the debate about the most informed choice of the number and type of basic units continues among scientists.

Indeed, why Gauss had taken only three units for basis, not five or one? Why their number has been subsequently increased to seven? Are there any guarantees that we will not have to expand this list further in future? Is there a strict justification for all existing systems, or are they based on a not definable usability reasons?

We should point out that in 1969 P.G. Kuznetsov has demonstrated his version of a universal LT-dimensions system that he discovered before acquainting with the famous work of R. Bartini. He found out about Bartini's work, when in 1970 V.M. Kapustyan stated at one of Kuznetsov's seminars, that he "saw something similar in some Italian's work", and it turned out that similar idea was offered by G.B. Braun in 1941, and even earlier — by Jakob Hermann in his *Phoronomia* back in 1716 .

Then it became crucial to reveal the universal properties of LT system, which gave the opportunity to introduce the concept of "general law of nature" and, subsequently, the tensor representation of the universal system of general laws of nature.

And it has been achieved by P.G. Kuznetsov.

He showed that LT-table in general is a classifier for qualities of the material and the ideal world systems. Each cell of the table is a class of systems that has a certain universal measure. It sets the boundaries between the systems of different classes. These boundaries are defined by the spatiotemporal dimension of LT-quantities. The system quality conserves within a certain dimension and its changes are purely quantitative. However, quantitative changes do not alter the quality of the system only if the universal measure is conserved, i.e. LT-dimension remains constant.

A general property of any law of nature is that it exerts its effect within the boundaries of quality, conserving certain LT-dimensionality.

While studying the properties of G. Kron's tensors, P.G. Kuznetsov found out that LT-dimension table appears to be a universal system of coordinates. The transition from one "cell" to another is a transition into a different coordinate system that has its own measure, which synthesizes the quality and quantity within particular class of systems.

Hence the general law of nature is a statement that the value of $[L^R T^S]$ is invariant, not dependent on the selected private coordinate system (not dependent on the particular point of view).

Standard representation of a general law of nature is equation $[L^R T^S] = \text{const}$. Each specific law of nature is a projection of the general law in a particular system of coordinates.

One of them is discovered by Kepler in 1619 the law of constant gravitational mass in the process of planetary motion. However, he was not the first law of conservation in the history. Such was the famous Kepler's second law that described in 1609: the areal velocity — area swept per unit of time by the radius vector of the moving in its orbit planet — is constant.

The third law of the conservation in the history — the law of conservation of momentum — was opened in 1686 by Newton, and after that there was almost a century break. Only at the turn of the century — in 1800 — P. Laplace declared the fourth law — the law of conservation of angular momentum. 42 years later R. Meyer has continued the sequence by discovering the law of conservation of energy, and J. Maxwell in 1855 completed it by applying the law of conservation of the power required for the existence of a constant field.

It is easy to ensure that the table of LT-system allows to arrange these six laws in order. They ascend from dimensionless constants diagonally right and upwards, characterizing the tendency of increasingly complex concepts to be included into the physical world view. And the new, more complicated quantities include previous laws as individual cases, opening such classes of phenomena where they lose their power.

As was shown above, the law of conservation of energy cannot be the "beginning" that brings together the phenomena of life because they lie beyond its scope.

These phenomena are controlled by the law of conservation of power as statement that the total power input to the system is the sum of active power and power loss at the system output: $N = P + G$, wherein N is the full power, P is active (useful) power, G - power loss.

This law leads to a conclusion that any change in the active power is compensated by the change of power loss and is controlled by the full power of the system. This means that the processes of diffusion and energy accumulation processes, processes of chaos and order, life and death are in the competence of the law of conservation of power.

10. Who discovered the law of conservation of power as the general law of nature?

P. Kuznetsov pointed out several times that Lagrange in 1788 discovered the law in analytical mechanics, J. Maxwell to 1855 used it in the study of Faraday's lines, G. Kron in 1930-1968 — in the transformation of electrical networks. And each of them used a particular expression of the law of conservation of power, projected in particular system of coordinates.

In this regard, all of the above formulations of the law of conservation of power are particular. All of them are projections of a general law onto a particular system of coordinates:

In case of Lagrange such a particular system was mechanics;

In Maxwell's case it was Faraday's lines;

In Kron's case it was electrical networks.

P.G. Kuznetsov has never named the author of the general law of conservation of power. This is no accident. All known representations are quantitative expressions of the general law in some particular system of coordinates. All of them are representatives of the general law.

But what unites the various quantitative representations of the one general law? The answer to this question was given by P. Kuznetsov.

They are united by the law of conservation of power as a general law of nature — the statement that the quality with the dimension of power is an invariant of the class of open systems.

Before P.G. Kuznetsov only a quantitative aspect of a universal measure, power, was discovered. P.G. Kuznetsov discovered the qualitative aspect of this measure and its relation

to the quantitative aspect. It was P.G. Kuznetsov who presented a measure of power as a general law of nature, that has a dual nature: qualitative and quantitative*.

What's the result of it?

It makes it possible to represent a general law of nature as a group of transformations with power invariant. All particular formulations of the law form a group of transformations, an invariant of which is the power dimension.

It makes possible to move from one system of coordinates to another without breaking the general law. Now you can solve the problems of one domain by using the knowledge of other domains where the problem has the best solution.

We have overviewed the law of conservation of power as one of the general laws of nature, discovered by P.G. Kuznetsov.

If the highest aim of science is discovery of the laws of nature, then we must admit that the discovery of a universal system of general laws of nature is a great discovery.

It was exactly this discovery that P.G. Kuznetsov made, relying on and developing philosophical, natural science and humanitarian ideas of numbers of his great predecessors.

11. Discovery of a universal system of general laws of nature

There might be as many laws of nature as many there are measures-quantities. But since there are no limitations on the number of quantities, there can be infinite numbers of laws of nature.

The fact that the known measures-laws can be counted on one hand, does not mean that all laws of nature has been discovered. List of those laws will keep updating along with the development of science.

P.G. Kuznetsov has shown the main direction of the search.

Invariants of the historical development of life that he's discovered show the main direction of the development of science, seeking benefit for Man and sustainable development of Humanity in the nature – society – man system.

Straightforward formally-logical thinking can not resolve the contradiction between “identical to itself” and thus the immutable ideal world and “non-identical to itself”, ever-changing material world.

But each of us is a member of both worlds. We all have both material and ideal basics “hardwired” into us.

And that's why everyone wants to understand: “How do things change and at the same time remain unchanged?”. This Hegel's philosophical question in the tensor language of mathematics transforms into the problem of finding a group of transformations with invariant. Applied point of this problem can be illustrated by the following case. Everything changes in society and nature over time: the composition of water, air, soil, the number and quality of the goods changes too, together with their assortment, prices and values, governments, the names of countries, political structure and ownership, social and individual consciousness, every person is changing along with their views on world and themselves. Only general law of nature remains unchanged.

You can resort to the “bad infinity” of Hegel and present law as a series expansion:

$$[L^0T^0] = [L^0T^0]t^0 + [L^0T^{-1}]t^1 + [L^0T^{-2}]t^2 + \dots + [L^0T^{-K}]t^K + \dots$$

It is easy to notice that the dimension of LT-value in each term of the series varies, but the overall dimension of each term of the series remains unchanged. This demonstrates the work of principle: “Everything changes and remains unchanged”. This Hegel's principle was used

P. Kuznetsov to prove Fermat's last theorem.

* In the future, the dual nature of the invariant power found mathematical and application development in the works of Doctor of Technical Sciences, Academician of RANS A.E. Petrov.

We are interested in seeing how the general law manifests itself in the occurrence, formation and development of life as a cosmic phenomenon.

It's hard to imagine, but P.G. Kuznetsov has considered the solution to this problem on every level of the cosmos: the micro-, macro- and super-levels, showing that the general law of the development of life itself is a consequence of the law of conservation of value with $[L^5T^{-5}]$ dimension. Another consequence of the law of conservation of power is the processes of inanimate nature, or as P. Kuznetsov called them “the phenomenon of death”.

But both phenomena of life and death are controlled by the general law of conservation of power, which has the $[L^5T^{-5}]$ dimension.

Interactions of these phenomena form all the processes of the cosmos. P.G. Kuznetsov started working on solving the problem of Life and Death in the 40s. As a nineteen-year old serving a sentence in the Stalinist camp, he was able to communicate with such prominent persons as an academician V.V. Parin and N.F. Fedorovsky.

His attention was drawn to the classic question that Engels asked: “Where does the radiant energy go? How does it begin to function again?”. Without an answer to these questions there can be no circuit and a contradiction between the first and second law of thermodynamics appear. This contradiction has been discussed in detail in Kuznetsov's work published in 1958. Even then it was clear for P.G. Kuznetsov that to answer this question it is necessary to study the motion of energy in time. But this movement is power. But it was soon discovered that the law of conservation of power is not included in physics, although it was used by Lagrange and Maxwell. Nevertheless, while studying the properties of the LT-table it has been discovered that a value of $[L^5T^{-5}]$ dimension is located in the upper right corner of the table, and that currently it is the most common of the known quantities. All other values can be derived from the power with the use to certain rules.

We noted above that P.G. Kuznetsov could ingeniously simply raise the question “differently” when it was necessary to “disclose the nature of the problem”. P.G. Kuznetsov put Engels' question differently:

1. Why some photons are absorbed and some are not absorbed?
2. Why some of the absorbed photons lead to a chemical reaction, and some only cause molecular excitation and get lost, being transferred to other molecules or radiating in the form of luminescence?

The answer to the first question is quite simple — each molecule absorbs only those photons that correspond to the absorption spectrum of the molecule.

The answer to the second question turned out to be associated with Einstein's theory of catalysis and frequency of the photoelectric effect.

There is a crucial difference between the absorption of a photon with a frequency lower than the frequency of the photoelectric effect rate, and the superior frequency.

If the photon frequency is lower than the frequency of the photoelectric effect, we witness a physical effect of heating. If the frequency exceeds this threshold, we are dealing with a chemical reaction.

Thus, if the power of the first photon (activation energy with frequency of the photoelectric effect) is lower than power of emitted photons, then a spontaneous exothermic reaction with energy dissipation occurs. If the power of the first photon exceeds the power losses, we witness forced endothermic reaction with accumulation of energy.

The first type of chemical reaction releases energy and is a dissipative process, and the second type is followed by absorption of energy and is an anti-dissipative process. The interaction of these processes covers the entire range of photon interactions with the molecule.

These physic-chemical characteristics of dissipation and anti-dissipation processes served as the basis for photonics and resonance phenomena theory of animate and inanimate nature, the scientific foundations of which were developed by P. Kuznetsov in the early 50s, and the first publication on these problems was in 1958.

Since then P. Kuznetsov began to view the whole cosmos as a holistic stream that includes three interacting wave processes:

1. Dissipative processes that lead to death.
2. Anti-dissipative processes of Life's development.
3. Transients or interaction of dissipative and anti-dissipative processes.

This position has been subjected to ostracism for a long time, and that required P. Kuznetsov to deeply study it on the philosophical, mathematical, natural science and humanitarian levels.

Our collective work, "Nature – Society – Man system: sustainable development" shows that in accordance with the law of conservation of power dissipation, anti-dissipation and transient processes are described by a single equation, but along with identifying of restrictions for each type of process. All three types of processes are described by a single equation, but with different restriction conditions:

$$0 = P + G_1, \text{ где } G_1 = G - N, [L^5T^{-5}] \text{ wherein:}$$

1. $G_1 > 0$ dissipative processes (energy dissipation);
2. $G_1 < 0$ anti-dissipative process (energy accumulation);
3. $G_1 = 0$ transient processes.

Dissipative, anti-dissipative processes and transitions between them form the complex of the essential processes of open non-equilibrium systems of cosmos.

We are talking about different classes of systems-processes in different coordinate systems, the fundamental difference between which is in the change of sign of the direction of their regular changes in time and space.

As a result of examining the process of metabolism in the animate and inanimate nature, common and fundamentally different properties, spontaneous and stimulated processes, P. Kuznetsov concludes that the apparent difficulties in understanding the process of organic life come from the fact that organic life is not a subject and not an object that you can hold in your arms, but first and foremost it is a process included in the natural-historical cycle of evolution of the cosmos.

Preservation of any species within which take place the dissipative processes (energy dissipation) and the anti-dissipative processes (energy storage), requires dominance of the anti-dissipative processes.

It shows the opposite of the dominant metabolic processes in the phenomena of inanimate and animate nature and comes to the conclusion that the evolution of animate and evolution of inanimate nature are two sides of a unified spatiotemporal stream where everything changes and remains unchanged. It shows that an invariant for these processes is a conservation of power.

12. Invariants of the historical development of Life

Now it's obvious that E. Bauer's principle of stable non-equilibrium and Vernadsky's first biogeochemical principle have a direct connection and both are the conclusion of the law of conservation of power. This becomes especially apparent after P. Kuznetsov's study of connection between E. Bauer's principle and self-oscillating systems and the transition from classical thermodynamics to G. Kron's electrodynamics.

It's clear that Vernadsky's empirical generalizations, Clausius' principle and E. Bauer's principle are projections of a general law of nature in a particular coordinate system.

The flows with the $[L^5T^{-5}]$ dimension are these coordinate systems, i.e. the dimension of power. In inanimate nature radiant energy flux with the specified dimension is a slag, a kind of garbage of matter differentiation. In the phenomena of organic life, this flow becomes the cause, the driving force. Organic life on Earth originates and develops under the influence of radiant energy flux. From P. Kuznetsov's resonance theory followed two premises of Life origin: physical and chemical.

Physical premise was that the conditions for flows resonance interactions appeared due to the integrality of ratio of flows.

Chemical premise was that the conditions for the occurrence of photochemical endothermic reactions were created, and that allowed to accumulate solar energy and convert it into potential energy of the products of photosynthesis.

It is possible that there was a moment in the history of the biosphere, when the amount of living matter was minimal, but now it's 10^{13} tons. It is a "progressive increase in free energy of living matter over 4 billion years of existence of the biosphere".

During this process, conflicts resolve between the mortality of the individual and phenomena of geological eternity of life in favor of non-decreasing growth rate of flow of the free energy as a general law of life system development in general.

There are two conditions for the development of life as a cosmic phenomenon:

1. Prerequisite is the fulfillment of the fundamental inequality: $N > G$.
2. Sufficient condition is acceleration the growth of the free energy by improving the efficiency of full power, that is, the increase of the rate of its turnover along with reduce of power loss at each cycle of the process.

The law of Life development may be represented in different projections, for example, as a wave process, wherein each cycle has certain properties.

During one cycle, a capacity increases. During the transition to the next cycle a power and nonlinear frequency changes faster. This process may be represented as an unwinding helix, but it can also be represented differently.

Law of Life development may be represented as an expansion of the active power values in time exponents as the independent variable:

$$P(t) = P_0 + P_1t + P_2t^2 + P_3t^3 + \dots, [L^5T^{-5}]$$

wherein P_0 is an initial power value $[L^5T^{-5}]$;

P_1 — change per t $[L^5T^{-6}]$;

P_2 — speed change per t^2 $[L^5T^{-7}]$;

P_3 — acceleration change per t^3 $[L^5T^{-8}]$.

Here we would like to draw attention to three things:

1. It's striking that a series is divergent.

However, in tensor analysis with power invariant and Kuznetsov-Pshenichnikov spin method there are regular procedures for inversion of this kind of series.

2. It's easy to see that there is a change in the rate of the process in time, but the quality of the process conserves, and that is fixated by unchanging of each term in the series dimension. Law works: $[L^5T^{-5}] = \text{const}$. Hegel's principle fulfills: "Everything changes and remains unchanged".

3. Process is chrono-holistic. Here, the past, present and future are connected, they form the integrity of the process of conservation of non-equilibrium stability at any time.

We called this chrono-holistic process a **sustainable development**. Here we have a conservation of non-decreasing rate of growth of active power at any time:

$$P_0 + P_1t + P_2t^2 + P_3t^3 + \dots \geq 0, [L^5T^{-5}].$$

Inverse definition is also possible.

Development is sustainable if there is a conservation of diminishing power losses change at any time:

$$G_0 + G_1t + G_2t^2 + G_3t^3 + \dots < 0, [L^5T^{-5}].$$

The consequence of these definitions is the notion of unsustainable development.

Development is unsustainable if it is not chrono-holistic. There is a gap of connections between past, present and future. For this reason, the integrity of the process is destroyed and

permanently-integrated process appears. We witness a situation where in one period the development is conserved and in another — is not.

We should pay particular attention to the fact that the process of development, including sustainable development, has two aspects: qualitative and quantitative. Qualitatively, as in the general case, the dimension of the power preserves, but its numerical value changes. A spiraling motion of the active (useful) part of the total power forms. Passive part of full power is subjected to this type of movement. However, inversion of the active power and power loss means their mutual compensation throughout the entire process of development. This compensation might occur only if the motion along the spiral is multidirectional (Fig. 2).

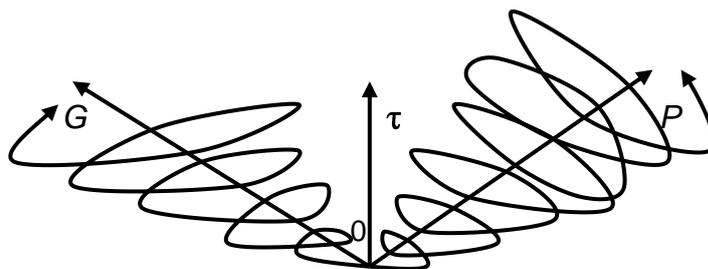


Fig. 2.

Law of development, expressed in terms of a particular subject area is the projection of the general law. If the historical development of Humanity is taken as coordinate system, the law of this process is the projection of the general law of the development of life.

13. Invariants of historical development of Humanity

P. Kuznetsov proposed two formulations of the law of historical development of humanity:

1. The law of time economy.
2. The Law of non-decreasing labor productivity growth in the system of social production.

It's not difficult to show that the two formulations are the projections of the general law of development of Life, invariant in relation to power.

The law of time economy states that in the course of historical time the proportion of the necessary time reduces, and the proportion of free time increases. This law is sometimes called the law of growth of free time.

Necessary time is the part of the social time that is spent on restoring what astronomical time has destroyed. Social time required to preserve, reproduce society, is called the necessary time.

It's obvious that during any given historical period there was, there is and there will be a surplus of social time over the time required for simple reproduction or preservation of society. This "surplus" is called a free social time.

At different historical periods free and necessary times alter. However, this change has one feature:

"The amount of parts remains constant".

Each decrease in the necessary time corresponds to equal in magnitude and opposite in sign increase in free time.

Necessary and free social times are inversive.

What reduces the necessary time?

The higher the power, efficiency and quality of the plan (control), the less the necessary social time and the more the free social time.

On the other hand it is easy to notice that when the necessary time (time required to perform the work) reduces intensity or productivity of labor increases.

For any production process equations of the form may be formulated: 1kW = n₁kg of bread per hour = n₂ kg of water per hour = n₃ tons of oil per hour = n₄ computers per hour, etc.

Deprivation of some region or business of electricity immediately allows you to point out the number of commodities that will not be produced because of a power failure.

On the other hand it is easy to see that in one hour different businesses can produce different amounts of products, which means that the income of the company is fully determined by its capability to act in time, expressed in units of power (kW).

P. Kuznetsov defines capabilities for any socio-economic system:

Economic capability — $F(t)$ — that takes the technical ability and the presence (or absence) of the consumer per produced product into account:

$$F(t) = \sum_j N_j(t) \cdot \eta_j(t) \cdot \varepsilon_j(t), [L^5T^{-5}], \text{ wherein:}$$

$N(t)$ - is determined by total energy consumption per unit of time, comprising:

- food and respiration of employees, expressed in kW;
- all types of fuel, water and air for machines (kW);
- animal and plants feed, expressed in kilowatts.

$\eta_j(t)$ — generalized coefficient of technology advancement per manufacturing of the j-th product.

$$\varepsilon_j(t) \text{ — plan's quality} = \begin{cases} 1 - \text{consumer is present} \\ 0 - \text{no consumer.} \end{cases}$$

If this expression is divided by the number of employees, we obtain the unit of the level of productivity in the economic system:

$$R(t) = \frac{F(t)}{M(t)}, [L^5T^{-5}]$$

wherein $M(t)$ — number of persons employed in the economic system.

The resulting definition of productivity turned out to be independent of monetary units. At the same time it expresses a measure of the value of all goods and social services that consumer demands, expressed in units of power.

For this reason P. Kuznetsov justifies that a universal measure of the cost of the world economy of the third millennium will be a kilowatt-hour as a value independent of ownership types and political systems.

Now it's easy to express the law of growth of labor productivity in the following form:

$$\frac{d}{dt} R(t) \geq 0, [L^5T^{-6}].$$

This law states that in the course of historical time the value of labor productivity in the system of social production is a non-decreasing function.

Law of free time growth: reduce of the necessary time and increase the proportion of free time shows the Humanity's transition from the realm of necessity to the realm of freedom from needs.

Law of labor productivity shows what you need to do to get rid of needs.

However, both of these laws are two sides of the general law of development of life - its projection in the coordinate system that is called the development of Humanity.

14. Manifestation of the general law of the development of Life in historical development of society

People, who are able to put forward and implement ideas, are the necessary and sufficient condition for continuous development of society. The necessary condition of this process is the presence of ideas that appear in consciousness of separate individuals.

In accordance with entered laws P. Kuznetsov qualified scientific ideas that provided growth of opportunities of society as a whole as follows.

The first class — there are ideas about new sources of power that more efficient than the old ones.

The second class — there are ideas about new machines, mechanisms and technological processes having higher efficiency.

The third class — there are ideas about improving the quality of management, about more exact accordance of performed works to the public necessities, about improved mechanism of management.

However, the fact of the presence of ideas is only necessary, but not sufficient condition for development.

From that circumstance, that ideas exist, their “instantaneous realization” does not follow yet. It takes time.

What less time is spent on the “recycling” of the idea, than faster the desired effect to increasing the rate of growth of opportunities is achieved.

Certainly, mechanism of recycling ideas has its specific form for each concrete society (the country, the region).

And nevertheless, there are general conditions that are fair for any type of society, any country, any organization, regardless of its political structure and pattern of ownership.

These general conditions are formed as follows:

Society will possess most rapid the rate of growth of opportunities, if it will be able to use ideas which appearing in consciousness of separate individual for the growth of opportunities of society as unit, and if it will use the growth of opportunities of society for forming of individual able to generate new ideas.

However, before to accept an idea to realization, it is necessary to estimate its expediency from positions of its contribution to the growth of opportunities.

The practical estimation of ideas supposes determination of their contribution not only for the initial period of time t_0 , but also for certain periods in the future: for t , t^2 , t^3 , etc.

For every period it is fixed: contribution to the growth of useful power for t , contribution to the growth speed of useful power for t^2 , contribution to acceleration of growth of t^3 , etc.

But this process is decomposition of value of useful power $P(t)$ in a row on degrees that, as be shown higher, saves quality of the process, but changes speed of its elapse. Chronology- integral historical process takes place: the conservation of non-decreasing rate of efficiency of using complete power at all times or a non-decreasing rate of growth of useful power not only in the present, but also in the future. This process is what we call sustainable development. But behind this process there is a CREATIVITY of the Person, in which the general law of development of Life is shown.

15. Development, Personality and the Formation of the Mind of the Human population

The initial seeds of creativity in the historical development of society presuppose the existence of a large amount of free time, which can be regarded as necessary in a new context: as the time required for development, not only for reproduction and survival.

The less working time society wants to meet the **non-vanishing** needs, the more free time it would have to meet the new needs of both current and future.

Immediately we notice that the true purpose of social production has always been, is and will be the production of the human personality. It means that every satisfied human necessity forms one or another side of Personality.

If on the early stages of historical development “a strong personality” was understood literally: as possessing great physical strength (“**the cult of power**”), then afterwards by “strong personality” began to understand a rich man. This is the ideal of era of commodity-money relations, when the power shifted to the financial capital and demonstrates an abundance of **real wealth**. The possession of things is appearance of the real wealth.

Growth of multinationals nowadays creates a new type of “a strong personality” as **manager — technical specialist**.

But it has been noticed long ago, that there is also a “spiritual power” like a kind of dominion over the “people’s souls”. Forms of religious consciousness are the first germ of “spiritual needs”. **The power of art, philosophy and science over the souls of the people turns out to be a new benchmark of “a strong personality”**.

Humanity is beginning to move out of the “world of things” to the world of spiritual values. Out of the world, which is dominated by the need “TO TAKE”, to the world dominated by the need “TO GIVE” for the benefit of individuals and Humanity as a whole.

We are at the beginning of this path.

This path is known as transition to sustainable development of society as a whole.

Historical analysis shows that the alternative to this transition is the unsustainable development, resulting in stagnant of social system with its further degradation and loss. You can say otherwise: the cause of the degradation of social systems is a violation of the laws of chronology — integral historical process, which makes saving or, in other words, the sustainable development of society as a whole.

The existence of individuals and associations of people with goals, that are contrary to the chronology — integral historical process, is the result of inadequate display of this process in the minds of these subjects.

An acute practical relevance of this transition is a fact which is confirmed by the course of the evolution of Life on Earth.

Over 4 billion years, Life has done some tremendous **preparatory** work, and everyone uses its results on a daily basis.

However, this work took not a single cent, but enormous amounts of time and energy. **Over 4 billion years a natural process of formation of the mind of the human population has been going, and therefore it will have to be realized that if the People is a powerful geological force in the technical means, that he is subject to the law of nature in his aims.**

The adoption of this provision requires great personal courage, as indicates that valid objective consistent with the law of Life, in tune with the Mind or Will of the Creator.

At the end of his life P.G. Kuznetsov wrote to the Presidents of all the countries and hierarchs of all confessions, because he had seen the growing danger of **genocide** for most of Humanity, in the form of conflict of confessions.

He saw the purpose of eliminate this danger in the joint action, that was consistent with the Mind or Will of the Creator.

We fully share this view and believe that the People in his scientific work comprehend the will of providence and needs the support of the heads of all the churches.

We are counting on this support and **offer at the World Summit in 2002 to put the question of the RIGHTS OF HUMANITY which are consistent with the mind of the Creator.**

16. How can we characterize Pobisk Kuznetsov's lifework in brief?

This is not a simple question Pobisk sometimes asked his interlocutors. Somehow he asked us this question. Then we answered: "The theory of applied scientific theories". Pobisk said that it was close to reality. And nevertheless we felt some dissatisfaction with our answer.

In modern science there is a hierarchy of names of different forms of knowledge: philosophy, theory, technology, planning.

It is amazing but it is the fact that all these different forms of knowledge we have in the works of P. Kuznetsov. But it is not main thing. In our view the main thing is that P. Kuznetsov succeeded to combine diverse forms of knowledge in a unified construction and to give new determination to this synthesis. Nobody achieved that before P. Kuznetsov's works.

In his works P. Kuznetsov convincingly demonstrates that the ideology, theory, method and technology are only part of a single creative process of planning of the future world.

He gave the name to this creative process as **PROJECTOLOGY of the world's future**.

Its essence is continuous comprehension and correct application of the laws of nature for saving development of Life, including sustainable development of society and the individuals.

Discovery of the common law of development of life in many forms and its manifestations in nature, society, spiritual life and showing the possibilities of its application in the scientific, technical and humanitarian areas of human activity – works of P. Kuznetsov express a certain relation to the world as a whole, which based on time-tested truths, principles and laws of nature.

But the attitude to the outside world, which is not contrary to the basic principles of scientific research and based on the reviewed and approved multiple times the truth, is that what modern science is called the scientific worldview.

17. What new did P. Kuznetsov introduce to the scientific worldview?

Any scientific worldview contains the following four basic elements:

1. obligatory for all, well-proven truths (knowledge);
2. tested and confirmed by time principles — the laws of nature;
3. method of scientific research;
4. social psychology.

What new did P. Kuznetsov introduce in each of these elements?

Considering above-mentioned statements, a very brief list is the following.

1. Prior to the works of P. Kuznetsov it was known that any provision, any idea, any expression which was expressed in natural language of everyday consciousness is not the same logical form of expressing the truth.

Prior to works of P. Kuznetsov in the scientific world-view there were many truths of philosophy, mathematics, physics, biology, economics, which were expressed with fundamental concepts, such as: space, time, energy, mass, entropy, information, cost, and many others.

The works of P. Kuznetsov allow to bring order to this fundamental issue of the scientific worldview.

2. Prior to the works of P. Kuznetsov the scientific worldview had its foundation of many physical laws of nature: the laws of conservation of energy, the law of increasing entropy, and many others.

But all of them are laws of closed systems. Life is essentially open system. However, the mainstream scientific worldview still gives no general law of development of life as a

fundamental law of nature. There is no system of general laws of nature expressed in universal measures.

Discoveries of P. Kuznetsov are filling in this gap.

3. Prior to the works of P. Kuznetsov in the scientific worldview verification methods of scientific knowledge existed: trial and error method, statistical methods, methods of formal logic, methods of the theory of dynamical systems, and others. But none of the methods were used to test the gained knowledge by general law of development of Life and because of that it was impossible to assess knowledge obtained by these methods in terms of their contribution to the development of the whole system. Knowledge of these methods can't guarantee the ability to design the future development in the system of nature – society – man in the long-term perspective.

Tensor methodology of P. Kuznetsov in conjunction with the methods of tensor analysis of G. Kron and spin method represents such possibility¹.

4. 30 years have passed since the publication of many works of P. Kuznetsov. Here it is appropriate to quote V.I. Vernadsky:

“In the history of science, we constantly observe, that this or that thought goes more or less unnoticed for a long time, but then **with the new external conditions** suddenly reveals to us the inexhaustible influence on the scientific worldview. It turns out that this or that discovery was made not accidentally, some instrument or machine was built not accidentally. Each device and each generalization are natural for the creation of human mind. However, many of them were discovered and forgotten for centuries, and then reproduced again in modern times.

It is insufficient that phenomenon was proven. Its **understanding** depends on other factors. You must consider the external social environment, attitudes and habits of thinking men of science. In this sense, **the scientific worldview is not an abstract logical construction. It is a complex and peculiar expression of social psychology.**

The whole history of science at every turn shows that individuals were more correct in their statements than entire corporations of scientists, who adhering to the prevailing views. But in order to make the prove it was understood by contemporaries, it needs a long work and the match is often quite exceptional circumstances”.

We believe that such circumstances are present in our country and in the whole world.

18. How shall we call worldview of P. Kuznetsov?

S.P. Nikanorov suggested calling it **constructive**. We agree, bearing in mind that it is **necessary** to note, first of all, maximum transparency of thoughts and ideas of P. Kuznetsov.

But is “constructive” a **sufficient** indication of his worldview? There are many “constructive” worldviews. Is the worldview of Club of Rome not constructive? Is the worldview of formal logic or so-called “systems analysis” not constructive?

But as a matter of fact there can be “the whole sea” of worldviews, which hides phantoms of the “immense clarity”, and the law is the same in many forms of its manifestation. You can't just believe in it. It is necessary to know and understand in order to be able to project future.

“Constructive” is only one side of P. Kuznetsov's logic of creativity. The other part, as was shown above, is the logic of thinking.

This is the strength and the weakness of P. Kuznetsov's worldview.

The strength of it is that it connects the Faith, Knowledge, Understanding and Ability to make a real system based on universal measures-laws.

¹ Spin method for solving systems of nonlinear algebraic equations was developed by P.G. Kuznetsov, together with S.B. Psenichnikov

The weakness is that it is still unique. A huge breakthrough was made in science, but enormous work is required to realize this gap. But nevertheless neither the strong, nor the weak sides of worldview of P. Kuznetsov determine its sufficient sign.

Maybe his worldview is “ideas of Russian cosmism brought to maximum constructive and expressed in terms of goals that you can control”. Yes, you can say so, but then we’ll have to add to the list of Russian cosmists I. Kant, G. Hegel, Lagrange, J. Maxwell, K. Marx, O. Veblen, A. Einstein, G. Kron and many other outstanding scientists.

Certainly, P. Kuznetsov’s worldview is in line with the ideas of Russian cosmism, it develops them and brings them out as maximum constructive, providing an opportunity to bring them to Life. And, of course, it should be noted.

But it is not limited. **It provides a methodology to examine different worldviews as private systems of coordinates and connecting them together on a legal basis.**

Sorry, our opponent will say, but it's the same physical reductionism.

We believe this position is deeply flawed. Why?

Primarily because P. Kuznetsov’s worldview is based on a system of **universal** measures-laws, it “permeates” all natural, engineering and the humanitarian sciences. The existence of Space-Time is the same truth for the humanitarian sciences as for physics.

If the worldview that based on the laws of Space-Time, was considered as the physical reductionism, then the plan of the Creator is a physical reductionism.

Here it is appropriate to quote the great Leibniz: “Happiness is a non-entropic activity”. These thoughts of Leibniz are fully consistent with words that said Patriarch Alexy II about the meaning of life of Humanity: “The Lord created Man to turn the Cosmos into the Garden of Eden. However, the second law of thermodynamics impedes the efforts of Man, becomes the vector of raising the entropy, of closing to death. Death, which according to Scripture God did not create, began to draw in all things. The man is on the verge of death. “Space” began to unravel in “chaos”. Therefore, **each Person must connect its life to the struggle against entropy growth, against the consequences of the second law of thermodynamics**”.

Creativity for Life is the soul of development law in keeping with the plan of the Creator. But this law is the essence of a worldview that has left us P. Kuznetsov: “For every act of **Personality inspiration** that opens new possibilities for humanity, is the Divine gift of the Creator to his Co-Creator on his way to transition to development in harmony with the laws of the Cosmos”. This way is long and difficult, but it is dictated by the will of the Creator and is therefore a “common cause” translated as cosmic liturgy.

Creation of a life-support system for the people of Earth will solve difficult social problems of the modern world and creates a belief that the world is really controlled by the Mind of the Creator.

So what is a sufficient indication of worldview of P. Kuznetsov?

We would like to define it as the most moral or anti-genocide.

What meaning are we put here? First of all, we mean that the general law of development of Life works on the development, but not on the degradation and Death. You may not know it and not use it and then you will have what you have. But if you use it correctly, it is a consequence of the increase in free time and energy, increase the freedom from want.

There are many scientific discoveries that have influenced the worldview. But, as a rule, they are dual. For example, discoveries in nuclear physics, that influenced the scientific worldview of the twentieth century, can be used for the benefit and to the detriment of the development of humanity.

The principal feature of the discoveries of P. Kuznetsov is that they only work for the good of the People. This is their anti-genocide and moral entity.

We believe that this trait makes the scientific worldview of P. Kuznetsov fundamentally different from the dominant ideology.

19. Pobisk Kuznetsov's real discovery

The valid discovery is that he offered to go to a different coordinate system, where LT-restrictions are removed. Such a system is the entire Cosmos. He suggested that LT-laws, from which using the transition to a sustainable development of Humanity becomes scientifically sound.

But in order for this transition to become a reality you need to change the worldview from leading to Death to development of Life.

It seems to be more suitable definition of the scientific worldview of P. Kuznetsov as a creative worldview and anti-genocide worldview of Life development.

If the basis of the scientific worldview of the twentieth century was the quantum theory and relativity theory, in the twenty-first century it will be the basis for such a versatile space-time frame of the general laws of nature, including the law of the development of Life.

20. Conclusion

There are human rights, and it is a great achievement of the international community and the United Nations. But Human and Humanity are different concepts, although they have a common root. Just as the laws of nature and of rights have a common word "law". But the laws of rights may be cancelled, and the laws of nature can't be cancelled. You can only know how or do not know how to use them properly. Likewise, you can cancel the human rights or the same right you can change some others. The right of Humanity as a whole, to conserve development, can not be canceled as it is impossible to abolish the law of nature.

But it does not follow the law of responsibility for the fate of future generations. The United Nations has yet coming to accept code of human rights.

All of us are the inhabitants of the spaceship called "Planet Earth". Yes, still not everyone can realize oneself as an element of infinite chain of evolution of the Cosmos, who was born according to the natural Law. For a long time there would be people who live to eat. But there would become more and more of those, who eat to live. **To live to create what our descendants will keep from destroying.**

Only in the face of such a super-task a set of conflicts ravaging Humanity can be reduced. In the framework of this important task, but as its part, is the task of arrangement of ship called "Planet Earth".

It is impossible to construct "one separately taken bay" inside a spaceship "Planet Earth", as it is very similar to building communism in the "one separately taken country". The question is how humanity will enter a Space Age, whether it is ready to solve the problems that arise for our children and grandchildren in future space exploration programs.

The above-said can be called the recognition of Human Mind's space mission. This awareness gives human scale for all kinds of human actions. And the question: "Why, what are you living for?" will become more and more urgent.

And we see our task — to help educate people, for whom the joy of creativity will be the meaning of life.

In February 2002 our textbook "Sustainable development: scientific principles of design in the nature – society – man system" should see the light. Issued by "'Gumanistika", St. Petersburg, 1000 copies, 630 p.

The textbook is devoted to the blessed memory of the outstanding Russian scientist Pobisk Georgievich Kuznetsov. His ideas are the basis of the book. To help the student, it has a lot of illustrations, as well as a special base of scientific knowledge. **Textbook is unique because it outlines worldviews, theory and method as a holistic system, demanded the**

necessity of planning sustainable development in the nature – society – man system for the first time.

Everyone who reads this book will understand that he is dealing not just with the right thing, but with infinitely interesting science.

There will be a lot of different books. But it is not the point. The main thing is to develop creative people and grow stronger, anti-genocide worldview in them.

P.G. Kuznetsov's pages of biography

Post of the information agency "Slavic world", December 6, 2000:

"December 4, 2000 died Pobisk G. Kuznetsov — the last of General Designers of the USSR (from 18 November 1977 in accordance with Resolution SCST #480/278 he was chief designer of the system of governance of the country during the "special period"), the leading expert on the target systems of management, one of the last true scientific and engineering elite specialists of the country".

It is extremely difficult to express in brief an incredible journey of the Man who did seemingly impossible by going from prisoner of Stalin's camps to the outstanding Personality and Academic, likes of whom we do not know in the world.

He was born in May 18, 1924 in Krasnoyarsk in Russian intellectual family. Pobisk name is a tribute to the time and stands for "Generation of October, Fighters and the Builders of Communism" [Pokolenie Oktyabrya, Bortsov I Stroitelei Kommunistov]. After graduating from the ninth grade in Novosibirsk, he entered in 1940 the Leningrad naval school. During the war he became commander of a reconnaissance and was awarded an order. He was seriously wounded in 1943 near Rzhev and when he returned to Novosibirsk, he decided to continue his studies.

In September, 1943 he was arrested on the basis of denunciation for creating a students' scientific society and was deprived of combat orders. During interrogations in Lubyanka he said that one could only believe in the Lord God, but it was impossible to believe in Marx, it was necessary to know him. Question: "Do you know?". Answer: "No. It would be necessary first to understand". "And if you're not with us, you are our enemy".

As a result, he was sentenced to ten years in the camps, which took place from start to finish, matching the conclusion of scientific work. From 1944 to 1954 he was serving a sentence in Novosibirsk, Krasnoyarsk and Norilsk camps, where he worked at an aircraft factory service, and then as a paramedic. R. Bartini worked here at the same moment of time (here really the ways of Lord are inscrutable).

"Official" words cannot describe the admiration for fortitude man who even in camp conditions used every opportunity to not only survive, but also to create. Unbelievable but true, that many ideas P. Kuznetsov developed throughout his life took shape in the forties, in camp conditions.

The main idea was the idea of the development of life, it was born back in the family home, where his father was his first mentor in science and philosophy. Returning from the war in 1943, nineteen-year-old student wanted to create a group that would solve two problems: "heating death" of the Universe, and why life appeared. Initially, these were two isolated issues, but paradoxically during his time in the camps, these two unrelated issues formed together a single scientific problem of Life as a cosmic phenomenon. P.G. Kuznetsov himself believes that these issues are joined together in 1947, when he read about Gurvich radiation. It is instructive to feel the spirit of P. Kuznetsov. Here are a few statements of his memories.

"During the ten years in the camps I have not missed a single specialist. And they were all very educated people. I learned a lot from these people, but much invented by myself. They created for me the psychological background in the camp, so I could not feel myself as an idiot.

In 1947 I was transferred to Krasnoyarsk, and there was doctor V.V. Parin. Almost 30 days we had a lot of different conversations: about mitogenetic radiation and about Life.

I had a partner, Finn, and also Pau who was mathematician, our professor, and we studied together a two-volume course in mathematics.

I could have 38 hours from 48 to work with the book and this was not accidental. I had solved all tasks to the very last one in the course of mathematics, and found three wrong solutions provided there. I thought that people who finished university, knew mathematics as I did. But when I was released and met those who studied mathematics, suddenly I found that not even all mathematicians knew all branches of mathematics. In this sense, my mathematical training was, in principle, good. Mathematics needs to be dealt with all the time — in two years you need to re-learn everything.

Boris Whitman served a sentence with me. He liked the way I played chess very much. I played without looking at the chessboard and beat several strong players. In 1994 his book was published: “The spy betrayed by his Motherland”. The book contains many pages devoted to me.

In the camp I had a lot of buddies with whom I could discuss scientific problems. I was actively supported by N.M. Fedorovsky and he said that Vladimir Ivanovich Vernadsky adhered to the same view (Gurvich radiation); the same thought had Fersman. Boris P. Weinberg taught Fersman, and he was teaching at that time in Tomsk. In 1930 he made a statement at the meeting that all kinds of struggle which people have for existence can be reduced to a struggle for power.

In 1938 N.M. Fedorovsky became the founder of the Institute of Applied Mineralogy and its first director. Now this is SIMS Institute named after Fedorovsky. Fedorovskiy was a man whom Lenin sent with a personal letter to Einstein to establish ties with Western science. It is generally little known fact. Fedorovsky was sent, but not anyone else. Fedorovsky had a phenomenal memory. Fedorovsky was the man who rehabilitated Vernadsky as a scientist, although he was Deputy Minister of the Provisional Government. Exactly Fedorovskiy saved Vernadsky from repression. Fedorovsky himself was released in March 1953 after serving 15 years.

I thought “sharashka” was the invention of Stalin or Beria, and Mikhail Guarditev explained that even Catherine the Great had “sharashkas” in the Urals, where intellectuals were locked and obliged to invent something for the army. General feeling I have is that almost all times are the same.

In August 1954 I arrived in Krasnoyarsk. During my life in the village Kazachinskoe in summer 1954 I drafted a letter about the problem of life and sent it to the Institute of Philosophy of the USSR Academy of Science in Moscow, signing it as “Tractor driver Kuznetsov”.

Counted as a tractor driver, I worked as polygraphic worker in the chemical laboratory. For three days I mastered instruments and made 30 samples in one night that there was virtually unheard of.

In February 1956 (before rehabilitation) I made a performance at the Institute of Philosophy where I spoke about the issue of life. During the performance there were E.V. Ilyenkov, A.S. Arsenev, Y.V. Sachkov, L.N. Plyusch, Ilyin.

Arsenyev remembered that somewhere Jeans had said that the world was the ocean of entropy, where somewhere a sinking craft was floundering, and it was “Life” trying to escape diving into the ocean of entropy. I said that I had studied the question of life on the sources, but there was no answer. Photonics only gives the answer”.

Reference

Although the idea of photonics in general originated in 1948 (A.N. Terenin), the term “photonics” was proposed by P.G. Kuznetsov in 1956–59 as a result of a decade studying the effect of mitogenetic radiation.

“When I had left the prison, we met with V.P. Kaznacheev (my cousin). We debated much on the problem of life. We suddenly found that physicians did not work from the end, from the patient's death. For what reason is he dying? And is it possible to do something to eliminate this cause? Chart diagnoses of routine inspection does not solve this problem. Such

patterns can be used in medicine, not only in prospective studies. Every decision that person makes affects his life — to zoom or to remove the date of his departure to the other world”.

After the liberation P.G. Kuznetsov worked in many organizations: the system MINGEO (1955–1961), Moscow State Pedagogical Institute (1961–1972), MEI (1974–1978), NIAA (1978–1986), publishing house "The Truth" (1986–1990), INEP (1990–1992), the Expert Council of the State Duma Committee. In science, he has gone from a laboratory, a researcher and head of the Laboratory to the Chief Designer for the development of systems “SPUTNIK” for the management of research teams in the development of life-support systems for people who work in Space (60s), Chairman of the Scientific Council for development of large-scale systems in terms of physical quantities (created in 1977 by Decree of the Presidium of the USSR Council of Ministers and the SST); in the late 70s – early 80s — as General Designer of the USSR; in the 90s as President of the Advisory Council of the State Duma of the Russian Federation.

His ideas were reflected in hundreds of scientific publications since 1954.

Comprehension of the ideas will be difficult and many times their understanding would be updated. But now we can say that the ideas expressed by him for the first time 40 years ago, begin to be perceived only nowadays

It’s safe to say that the doctor of physical and mathematical sciences, Grand Doctor of University of Brussels, Professor of the Moscow Physical-Technical Institute and the International University of Nature, Society and Man “Dubna” **P.G. Kuznetsov has become a classic during his lifetime.**

Twice during his life the book was published: “Pobisk G. Kuznetsov: Life and Ideas”. The first edition was carried out by “Concept” in 1999, and the second — by the International University of Nature, Society and Man “Dubna” in 2000 (ed. by S.P. Nikanorov).

It details the journey of life, his main ideas, their genesis and development, provides a detailed list of published and manuscript works. Much attention is paid to incredibly interesting recollections of P. Kuznetsov about his human and scientific “intersections” with outstanding personalities and our country’s scientists: Academician V.V. Parin, N.M. Fedorovsky, V.I. Vernadsky, K.E. Fersman, R.O. Bartini, A.N. Kolmogorov, E.V. Ilyenkov, A.I. Berg,

V.G. Glushkov, L.S. Pontryagin, V.S. Semenihih, V.G. Afanasev, V.P. Kaznachev, I.A. Efremov, A.L. Yanshin and others.

“There is no great merit that Americans first learned from us about the conceptual design of complex systems. Not very great merit is knowledge and ability to use mathematics, as opposed to mere knowledge of mathematics. **The great merit was that — speaks Pobisk, — we regularly discussed the development of humanity as a whole**”. During these discussions, many ideas of P.G. Kuznetsov were born and strengthened.

“My different ideas — says Pobisk, — are not branches, they are links, parts of the chain of processes of radiation energy transition that is dissipated in the space into the phenomenon of Life. There is a wide range of physical phenomena where the second law of thermodynamics is not valid. And this area of physical phenomena is called Life. The opposite is called Death. The struggle between them forms a whole set of processes of boundless Cosmos.

Patriarch Alexy II saw that mission of humanity was in the transformation of space into the garden of Eden, that was in heaven, and expressed it as a struggle against the second law of thermodynamics, against entropy increase. I don’t know where the patriarch gained this idea. But my first publication was in Estonia, and he was there prior, so it is possible that he could see my article. And Naan told me in 1958: “We don’t pay fees, but I guarantee you, as Vice-President of the Estonian Academy that not a single word of your article (1959) will be removed. I think Ewald Ilyenkov wrote “The Cosmology of the spirit” in 1956 after my

report in Moscow in the same year. Why? Because of in his report was the same defect that I had: he took God not there, not to the right category”.

Everyone who listened to P. Kuznetsov at least once experienced feeling brilliant simplicity, breadth and depth of presentation of super complex questions of philosophy, mathematics, physics, economics, which were discussed at meetings and seminars for over forty years.

History knows many prominent thinkers and scientists, who aim to discover the laws of motion of the world system. This is the main purpose of Kant, Fichte, Hegel, Kepler, Newton, Lagrange, Mayer, Maxwell, Carno, Clausius, Marx, Engels, Lobachevsky, Poincare, Einstein, Kron, Podolinsky, Bartini, Vernadsky, Tsiolkovsky and others.

Each of them has made an invaluable contribution to the development of world science. The contribution, that became the province of all Humanity as its philosophical and scientific heritage.

In this series, there are also scientific and theoretical works of P.G. Kuznetsov. They organically absorbed the fundamental ideas of his Great predecessors. Their thoughts were the “fulcrum” for further researches like the source of their development.

During his researches P.G. Kuznetsov was able to establish “spatiotemporal bridge” from I. Kant and Lagrange to A. Einstein, V. Vernadsky and G. Kron and to show that magnitude of the total capacity remains unchanged in a continuously changing world.

The law of conservation of power is the invariant and is the “guiding light” that connects all natural, social and spiritual processes into a single global system of Nature – Society – Man.

This principle is the basis of the laws of change of animate and inanimate nature, including all its forms and including Humanity. He was the first who show that the basis of the laws of historical development of Humanity is the principle of conservation of total power and thus saving development is provided by non-decreasing growth rate of net power of society. And this is true for any social order and forms of ownership.

Scientific and theoretical works of P.G. Kuznetsov have a pronounced applied nature.

He was the first who show the possibility of the development of the fundamental ideas of his Great predecessors and their practical application in order to maintain the development of Humanity.

Prior to works of P. Kuznetsov the possibility of harmonizing practices with the objective laws **repeatedly declared**, but there wasn't deep scientific study under it. The works of P. Kuznetsov first did this research **provided in this sense**, they represented **a new era in the development of the scientific thought of development management in the system of nature – society – people.**

Like many of his great predecessors, P.G. Kuznetsov had not managed to see the full realization of his ideas. They are ahead of time for decades.

When in 1987 the UN General Assembly endorsed the concept of Sustainable development, it more than thirty years have passed after the publication by P.G. Kuznetsov.

We are convinced that sooner or later the world scientific community will recognize these works.

In recent years, P.G. Kuznetsov headed the Advisory Council of the National Security Committee of the State Duma of the Russian Federation.

He has repeatedly raised the issue of the need to align the purposes of country with the natural laws of development. He understood perfectly that national security and development there were two sides to a **single target life-support system of safe development of the country**. Its main goals are security and development. In order to achieve these goals and, above all, **there should be a long-term country strategy** of education of people who were able to implement its capacity for innovation in Human welfare and sustainable development of society.

List of publications of P.G. Kuznetsov divided into two groups².

The first group of works — comprehension of law. The second — application of law.

The first group of works

1. "Problems of Life and the second law of thermodynamics" (Letter to the Institute of Philosophy of the Academy of Sciences of the USSR), v. Kazachinskoe, Krasnoyarsk Territory, 1954
2. "Application of differential polarography in the analysis of mineral raw materials", Bulletin of WIMSA, M., 1955, №11
3. "The problem of contradictions in the light of modern science and practice", Transcript of Conference 21-25 April 1958, Institute of Philosophy of Academy of Sciences of the USSR, M., 1958
4. "Contradiction between the first and the second laws of thermodynamics", Math. AS Est. USSR v. VIII, Series of technical and physical sciences, 1959 № 3
5. "Life" — an article in the Philosophical Encyclopedia, M., Sov. entsiklopediya, 1962
6. "Negative absolute temperatures", Techniques to Youth, M., 1961, № 10
7. "Problem of life and the second law of thermodynamics in biology", M., Sov. entsiklopediya v. 2
8. "To the history of the question about application of thermodynamics in biology", in book of K.S. Trincher "Biology and information". M., Science, 1964
9. "Some problems of quantum biology and questions of the transfer of information in quantum systems" (together with V.P. Kaznacheev and oth.), AN USSR Avtometriya № 2, Novosibirsk, 1965
10. "Theoretical basis of separation of rare earth elements and methods for evaluating the effectiveness of separation", PhD thesis Moscow State Pedagogical Institute, M., 1965
11. "Classification of electrochemical methods of analysis" (together with Stahev Y.N. and Melnikov G.P.), Abstracts, Novochoerkassk, 1965
12. "Towards the creation of Theoretical Biology", M., Knowledge, 1967
13. "About the role of ultra-weak light fluxes for biological systems (together with V.P. Kaznacheev), M., Science, 1967
14. "About some issues of Theoretical Biology (together with V.P. Kaznacheev), M., Science, 1967
15. "Thermodynamic aspects of labor as man's relationship to nature (together with Stahev Y.N.), "Nature and Society" in the np № 14, M., Science, 1968
16. "Some issues of the management of scientific and technical progress (together with V.G. Afanasyev), M., Thought, 1970
17. "Universal language for the formal description of the physical laws", M., Moscow State University, 1973
18. "Multiplicity of geometries and multiplicity of physics" (together with R.O. Bartini), Bryansk, 1974
19. "Artificial intelligence and the mind of the Human population" in the book of E.A. Aleksandrov "Fundamentals of the theory of heuristics", M., Sov. Radio, 1975
20. "Tensor analysis of networks" G.Kron, edited by Kuzin L.T. and Kuznetsov P.G., M., Sov. Radio, 1978
21. " G. Kron's Tensor Analysis of networks and its role in the design of systems (together with L.T. Kuzin and Petrov A.E.)//G. Kron "Tensor analysis of networks", M., Sov. radio, 1978

² The list does not include handwritten work. The proportion of published works is about 20-25% of the total number of works by P.G. Kuznetsov.

22. "Identity and contrast of grammatical and logical forms". Abstracts of the International Conference Moscow- Zelenograd, February 1999
23. "Origins of Life and the second law of thermodynamics", Journal of WMO name Mendeleev b.XXIV № 4, M., 1985
24. "Spin method for solving systems of nonlinear algebraic equations" (together with Pshenichnikov S.B.), DAN b.283 №5, M., 1985
25. "Irreversibility of the historical process of nature and society in the work of V.I. Vernadsky and in modern science", Science, M., 1987
26. "Laws of history and the social construction of the XXI century", Russia XXI: social-political and scientific journal, M., 1993
27. "About idols and ideals", M., 1994
28. "About the proof of Fermat's last theorem", M., Silver Wood, 1994 Mathematical software of management. Development measures (together with Gvardeytsev M.I., Rosenberg V.Y.), M., Sov. radio, 1996
29. "To the problem of the foundations of mathematics", M., Concept № 1, 1996
30. "Kilowatt per hour as a measure of value in the global economy of the III millennium". Economic Newspaper / Development № 6, 1997
31. "Projectology" // Methodology of Russian miracle, M., 1997
32. "Photonics", in a book by Gromyko Y.V. "Metaview. Problem", Tutorial, Inst of textbooks "Paideia", M., 1998
33. "Nature – society – man system: sustainable development" (together with Kuznetsov O.L. and Bolshakov B.E.), M., Noosphere, 2001
34. "Sustainable development: a synthesis of the natural and humanitarian sciences" (together with Kuznetsov O.L. and Bolshakov B.E.), Natural Sciences, 2001

The second group of works

1. "World Economy as a large system", Foundation Scientific Council on Problem "Cybernetics" of the Presidium of the USSR Academy of Sciences, M., 1962
2. "Chemical cybernetics", Techniques to Youth, M., 1962
3. Report on the application of network planning and management in organizations (together with Nikanorov S.P., Ulyanov V.M.), Oskhimkomitet, M., NIITEKHIM, 1964
4. System "Sputnik - 1", Moscow State Pedagogical Institute, M., 1966
5. System "Sputnik - 2" (together with Belyakov-Bodin V.I. and others), M., 1968
6. "Development of national economy and the problem of power-to work", M., Science, 1966
7. "Opportunities for energy analysis of the foundations of social production", Science, 1968
8. SPUTNIK-SCALAR systems, M., 1974
9. "Law of value and performance evaluation of major projects (together with Chesnokov V.S.), TSNIPNAS Proceedings, vol. 12, M., 1976
10. "Consistency and some problems of optimizing the management" (together with Afanasiev V.G.), M., Politizdat, 1981
11. "Targeted aspects of the organization of social prevention", Riga, 1983
12. About an international integrated program "President", M., Technosphere, 1994
13. "The power supply system: mind against genocide", M., 1994
14. "Projectology // Russia - 2010", M., 1994, № 5
15. "Engineering-economical analysis of transportation systems" (together with Obraztsova R.N. and Pshenichnikov S.B.), Novosibirsk, 1997
16. "Questions about pathogenesis and therapy of organosclerosis" (together with Kaznacheev V.P.), Novosibirsk, 1967
17. Answer six questions and Russia will be the most democratic country". "Truth of Russia», № 6, February 1996.