

Serghey Gherdjikov

Sofia University, Bulgaria

Limits of Science

(Scientific Ordering of the Life World)

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ГРАНИЦИ НА НАУКАТА

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English Abstract

The questions which gave a start to this study and their answers might be sum up and formulated as follow:

I. How is the human's life world (Lebenswelt) ordered?

The man is a vital form. Every vital form accomplishes an expansion against the chaos; it combats against the spontaneous disintegration.

Man's life world is put in order in accordance with his form and this order fulfils the expansion keeping the human's form ("The First Order").

II. How is the scientific form established and why?

Science is "The Second Order". The experimental science is a European mankind's creation and it is based on the logos as an "archetype" of order. The logos is doxa, epistema and scientia - opinion, knowledge, science. The experimental science originates in the late Roman antiquity. Archimedes' trials could be pointed as models of experimental science.

III. How does science order the world?

Science orders the world as a conceptual network (further used as "Conceptual") in a "epistemological field". The tensions (or the questions) are allocated in this field and they promote the expansion of that conceptual form.

IV. What is the meaning of this order (the scientific rationality)? How far does the science go?

The sense of this form is to reinforce The First Order and to make it adjusted to the power provident assimilation of the variety of the world which cannot be embraced by the spontaneous experience.

The first major question: *How is the human's life world ordered?* (Part I) can be resolved into the following problems:

1. About the sense of the "limits" of science see Chapter 1.
2. What is the form of the world of time and space given in the perception (Chapter 2)?

The form of the life world of time and space is teleological and has got one goal - the expansion.

The space is organized around a center - the physical Self. The Self, who has a body, fixes accordingly to this body a centered perceptual space. The center of this space is "here"; it is always limited as a horizon. The visual field, for example, has a form and a limit. This form differs radically from the geometrical space (Poincare) but it represents its basis. The visual space is a perspective one. All the distances are presented and can be identified in the experience as dimensions. The distances "decrease" the dimensions. The remote objects seem small. Thereby an unexhaustibility of the objects in the visual field is ensured. The perception reduces radially with taking away from the center - our body.

Time is organized like the space - teleologically. It has, just like the space, its center and it is the physical Self. The Self is always in the present; "behind" it there always stands the past; "in front" of it - the future is directed. The Self moves against the chaotic world and its present floats "from past through present to future" although the future always stands future in its relation to the present, to the "now". On the background of this floating the external world floats through the present to the past: first we expect the events, then we go through them and finally memorize them.

3. Does the perceived world have a transcendental form independent from the human's artefacts; a form which is common to all the people? What kind of form is it (Chapter 3)?

The man is a physical Self and a community of Selves. As a physical one the Self finds a teleologically ordered world. This world is such that the Self discovers there by itself the way to the improvement and the extension of its own form. There is an order of the life world which is common to every person - "The First Order". It is characterized by the high joined up energy which sustains it and defends it from the entropy. The first order can be described as the one having time, space corporality and eventfulness. It is organized by the logical definiteness. The first order is not sufficient for the survival of the man but it is crucial for the construction of the rest strata and order which characterize every culture.

4. Which are the plans of ordering of the life world (Chapter 4)?

By the Christian tradition the man is identified with spirit, soul and body. These are three plans of ordering and the phenomenology finds one form here. The human form is planned on several levels: physical (physical form), psychical (psychical form) and mental (mental form).

The physical form is the one of corporality and eventfulness and its source is the shape of the human body. First of all it is a sense form, colour and form, sound, taste, smell, touch. Thus the objects and the events are synthesized.

The psychical form "follows" the physical one and is determined by the pain and the pleasure and by the properties of the emotions. The pain and the pleasure have a sense as a drifting away or an approaching the entirety of the form.

The mental chains come after the emotional ones and they are spontaneously teleological and causal with a view to the adequate orientation and action in a world that demands a fight for survival and expansion.

The mere mental chains do not follow the telos of the body and the soul but they strive for an unity and an identity of the Self, of the mental center.

5. How is the comprehensiveness of the perceived world organized (the sense of the causality and the teleology as mental forms) (Chapter 5)?

The thought orders things and events in such way that it is possible to act efficiently at the highest degree on the conditions of the energy that flows out. That means that these actions have a form, trajectory, teleology. The action requires a synthesis of the chains of events. The man finds such chains ready (causal chains).

The causal chains are put and combined with the human physical actions. The designation is to reach the goal - survival and expansion.

The second major question: *How is the scientific form established and why?* (Part II) can be resolved into the following problems:

6. What is the artefact as a form and a plan of ordering (Chapter 6)?

The artefact is a human creation. It is not live. It is a body, sign, behavior, psychical and mental form.

The artefacts - tools, signs, models of action, manufactures and technologies - have the grounds for their existence out of themselves - in the Self which is incarnated and its aim is the expansion. The artefacts are mediate ways and structures that make possible the orientation and the expansion of the communities.

7. What is the cultural root of the Western form of ordering of the life world where the experimental science generated (Chapter 7)?

The experimental science has no transcendental roots in the structure of the mind or the Self. It is a cultural fact. We cannot find it in the ancient East. It had gone there from the West.

The logoz is is an order by means of words and numbers, teachings and theories, conceptions. According to the Western logoz the world is transparent for the words and the thought.

8. What are the projections of the logoz in the common sense of the Western man, in the objective knowledge and in the experimental science (doxa, epistema, scientia) (Chapter 8)?

The experimental science - scientia - originates in the latest antiquity (Archimedes). But as a mathematical inquiry of the movement it domineers and develops from the New times on.

The third major question: *How does science order the world?* (Part III) can be represented as:

9. Organization of terms in science (Chapter 9).

The epistemological field is charged with potentials (questions) among different points. These potentials shape the conceptual network and direct it.

The Conceptual gravitates to the first order. It presents every object as put in time and space, as a body and an event - the object is logically defined. Thus the structure of the Conceptual is determined. The Conceptual has a concentric form with two boundary strata - the central one is the logic and the marginal one - the data. The links between the terms strenghten in direction from the periphery to the center: data - facts - laws - universals - logical contants.

10. Plans of the investigation. How does the science work (Chapter 10)?

The investigation is a functioning of the Conceptual. The Conceptual synthesizes and fulfils an expansion as an order of the science by the means of the investigation. There are three research operations that correspond to the levels in the structure of the Conceptual: observation, description and explanation. The observation synthesizes the data while answering the question *what is observed?* The description fits the torn data in an integral picture and answers the question *what happens?* The explanation unifies the multitudes of facts as projections of certain laws and answers the question *why does it happen?*

11. What is the scientific explanation as a research process and as a purpose of science (Chapter 11)?

The explanation is the strongest research operation. The sense of the explanation is a strengthening by means of simplicity, power economy, terms and laws. The explanation is based on the description. When the law(s) is applied to the description an explained fact is obtained.

The Covering law model is evolved in the analytical philosophy. It represents the structure of the scientific explanation as a syllogism and corresponds to the explanation at the level of the first order. But the scientific explanation is not simply a logical following. There are lots of explicit and implicit synthesis accomplished in it. I offer a *matrix model* of the explanation which mould *not a logical following* but a *projection* of a theoretical element (law) on empirical material (description). As a result of this projection the elements of the explanations are connected with the strongest links between them; as explained facts.

The fourth major question: *What is the meaning of this order (the scientific rationality)? How far does the science go?* searches the limits of science and its common form (or “scientific rationality”) (Part IV). The problem is represented as follow:

12. What are the principles, the standards and the sorts of scientific rationality, the form of the scientific character in the experimental sciences (Chapter 12)?

Rationality is an ordering of the human creations and actions in conformity to a goal. All the goals are summed up in the keeping of the human form and the expansion. The scientific rationality is the scientific form as an efficient, advisable one; the one with the best organization.

The gravitation to the first order is shown in the form of the Conceptual and the investigation. The Conceptual “paints” the form as characterized by time, space, corporality and eventfulness; the explanation is an epistemological discourse based on the logical definiteness. This sets the following principles of the rationality:

- (a) Keeping the “data” as a keeping of the form of perception;
- (b) Keeping the “definiteness” as a keeping of the discursive form of treatment of the perception;
- (c) A conditional keeping and varying of facts, theories and categories in conformity to the object of the investigation. Every theory bears a change but only when the keeping of the data and the logic is in danger. The theories are refuted and corrected when they contain contradictions or a non-conformity to the data (Popper).

The form of the science can vary because it consists of inconstant elements. It can be constructed by words and numbers. These are the two sorts of rationality: *Galilean* (Pythagorean) and *Darwinian* (Aristotelian). The theories and the explanations can be constructed with different modality - probability, necessity, teleology.

13. What limits does the so outlined form of the science encounter when it works (Chapter 13)?

Non-observable is that which stands out of the perceptive form - space, time, body, event. *Non-descriptive* is the non-observable and the non-presentable in terms which has their meaning as bodies, events, measurable values, countable multitudes. *Non-explainable* is the non-observable, the non-descriptive, the illogical, the one that comes out of the modalities of the theories.

The logoz, eventually, has its limit. It is the entireness of the world, the floating of the life, the indefiniteness, the inconceivability.

14. Does the history of science encounter boundaries? What kind of dynamic form does the history of science have (Chapter 14)?

The history of science is an expansion of the science through the time. It moves from a decision to a decision through the avoidance and overcoming of the problematic situation. This form is just the opposite to the Popper's one (from a problem to a problem) as the latter assumes a surplus expence of energy. An event that comes out of the scientific form being logically impossible is historically impossible to happen in science. The scientific form itself preserves over the history of science. Right in this sense the science has its limits. Extensively the limit is a boundary as a non-applicability.

The theories cannot be applied to objects that are not formulated in their language and do not contain the values which construct them. The theories cannot explain experimentally indefinite "facts". The limits of the sciences and the theories are not defined by the non-strict notions for "spheres" like "physical", "biological", "social". The science has limits and they are determined by its form. The limits are revealed as impossibilities for scientific research in those fields that come out of the first order - the timeless, the spaceless, the non-corporal, the non-eventful, the illogical. The live current of the life and the world is not a scientific object - it cannot be gripped by the logical definiteness and the discource. There is no defined way from the definiteness (artefact) to the indefiniteness (life).

The science has no object that comes out of the human form. Everything that is incomparable to the dimension of the human body is reducable to notions which are commensurable to that body. This phenomenologically clears up some of the most important discoveries in the contemporary science. The Special Theory of the Relativity shows the dependence of the space and the time on the observer; The Quantum Mechanics displays the limits of the observation (Heisenberg) and the logical definiteness by compelling to create a macropresentation of the microobjects and to get round the logic (Feyerabend) through the additionality.

Main Conclusions:

1. The more concrete questions within the framework of the chapters was not preliminarily clear and has delineated in the course of the study. Explicitly or implicitly they were present all over the place where a research unity had been started.

In the investigation the experimental science has come out as an artefactual projection of the human expansion, not as a reflection of an transcendent order of the world itself. "The life world" successfully takes the place of "the objective world" of the modern rationality.

2. The thing that really exists is the *life permanent situation of ordering* which aims the compensation of the disintegration, the preservation of the form or overcompensation - the expansion of the form. To the man this continues in the experience and in the creation of an artefactual Conceptual which adjusts to this experience and along with its advance starts off supplying the place of the life perception. Thus we seldom turn to it to describe the world, on the contrary, we more radically full its place with "the scientific picture of the world".

3. A book that has been written for centuries by thousand authors cannot be started again at once as a new one with another conception. The choice is made and the alternative ways are "cut". This attaches importance to the science as an absolutely steady and undoubtedly knowledge - the only representative of the truth of the Absolute world.

Once the Western man has undertaken the climbing up the mountain of the science he always survives owing to his successful steps. He cannot give up the science because this means to vow to a sliding down the wall and to break up at its foundation. But after every single step the Western man looks around at the world and discovers it one more time forgetting about the ascending. The ascending, indeed, gives a height to the vision but the picture is always fragmentary and not completed. It lacks the virgin purity and the initial harmony of the live perception.

4. The science is an earning of energy (Mach) against the entropy. The mind, indeed, saves energy with the support of constructions such as the laws. But I suppose that there is a deeper metaphysics of the mind's striving for "laws".

5. *We arrange the world by means of artefacts - signs, languages, tools, machines.* The artefacts are absolutely worthless without us. Without those who have created the words and the numbers they have no sense. Our support - the numbers, for example - turns out to be leant on us. Even if the things created by us would have a sense for the reasonable creatures who are bound to live after us - this has no significance to us at all.

6. *The perfect definiteness is possible only to pure artefacts.* Every movement to a higher degree of definiteness - assessment, deciphering, measurement, specification - is a movement to a cleaning of the artefact from "alloys" of the nature, of the live perception. The abstracting, as it is repeated many times, is a mortification. We can get the exact co-ordinate of the fraction but we will completely lose its impulse (its movement). We can identify the succession of the bases in the DNA but after destroying it we can determine the sequence of the reactions in the peptide synthesis but we must reproduce it in parts out of the cell. We can detach an ideal metre by dividing the strength of the equator into 40 000 but when our metre standard is made it is already wrong. The ideal, perfect artefact is a human creation and it can exist without or independently from the piece of paper (metal, crystal, electronic memory) on which we are describing it. But as such the artefact always depends on the time, grows stale and in the end sinks in the non-existence. If we reach the absolute zero the movement of the atoms ends and the entropy is invalidated - there is no material movement. But the absolute zero is an ideal constant again.

7. The culture is a giant accumulation of artefacts. They carry the notional life of their creators. It is not amazing that the knowledge, the numbers and the words differs in the different cultures. According to Spengler the Apollo's number is corporal and sensuous while the Faustus' one is only a conceivable infinity.

The artefacts and the live phenomena must not be confused.

8. Immanuel Kant postulates that the structures of the mind are eternal and does not depend not only on the cultures but even on the reasonable creatures. Kant is a Western thinker and carries the same "Faustus" soul (Spengler) as Descartes or Leibniz. But he is not historical like the Faustus' soul, he is not dynamical but statical, universal like an "Apollo" man. He talks, indeed, about the infinity as an endless strive for the God or as an infinite divisibility (problematical) of the matter.

9. There are constant human forms (it cannot be otherwise). There is an evolution or a leap from the antiquity to the modern times. The confirmation: the Western mathematicians do not reject the Euclid's geometry but promote it; the Western physicians do not reject the Archimede's statics as incompatible with their one but accept it. In this way they do not separate Newton and Einstein.

10. The science lines an unlined world. But the "drawing-board" and the "instruments" for this lining are given in the kernel of the life world - the first order - and after that are complemented in the process of their making. And since this lined

world stays in the perception and does not disintegrate by reason of the endurance of the first order we gain the misleading impression that we discover some natural laws - rhythms and forms which the God or the Nature have chosen to outline the world with.

11. The act of seeing some kind of an “Absolute” in this order freezes the spirit of the Western culture and make it rather frail and weak against the disastrous changes that happen on Earth and against the self-produced alterations of the spirit itself.

12. The scientific picture of the world is not directed against the man and never actually leaves in the basic supporting elements of its anthropomorphous form as a first order. Therefore it is a stupid “humanism” to fight against the science calling it senseless or harmful.

13. The metaphysics of the mind’s striving for “laws” is the metaphysics of the empty mind (Zen Buddhism), the metaphysics of the pure contemplation of the enigmatic world in which everything is “understood” as a perfect entity and the laws are forgotten as steps of a ladder that is already unnecessary. This is an initial state brought back through self-completing and self-exhausting of the scientific explanation. The expectancy for a wider explanation is, in fact, *an expectancy for a reduced presence of laws*, for a reducable “scientia”.

14. Probably the final goal of the science nevertheless is the absolute simplicity and uniformity which lead to the absolute peace of the mind while keeping the full magnificence of the current multiform world. The sense of the scientific law thus is: from many to one; from perception and thought to calculation. *The law wants to bring back the mind to its, as though initial state of calmness, unity, simplicity, emptiness.*

The science wants to reduce the things to a minimum “eternal” truths of the existence and, finally, to the unified, to the unity. Zen, for example, wants to reduce the things to the emptiness which is beyond existence and non-existence.

15. Between this Unity and this Zero remains the gap between the Western and the Eastern world.

And now, at the issue of this study, occurs a question:

Does the pre-scientific grasping of the world through logic, space and time really need the “reinforcement” which the experimental science proposes?

Сергей Герджиков. *Граници на науката*. С.: Екстрем, Унив. издателство “Св. Кл. Охридски”, 1995

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