PHILOSOPHICAL TRENDS
IN THE 17TH CENTURY
FROM THE MODERN PERSPECTIVE

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edited by
Halina Święczkowska

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INTRODUCTION

This volume of Studies in Logic, Grammar and Rhetoric, entitled *Philosophical Trends in the 17th Century from the Modern Perspective* is a continuation of the problematic undertaken in the 15th (28) issue of the magazine concerning philosophical and social thought of the 17th century. We found it appropriate this time to present the analysis and evaluation of ancient knowledge from the contemporary perspective, accentuating the dynamic and evolutionary character of scientific cognition. It can also be assumed that, with the benefit to historical knowledge, we could consider implications of philosophy of this and other periods of development of philosophic thought, not only in the context of its reference to the present day, but also juxtaposed to the period, when new quality of philosophy and scientific cognition were formed. When we begin studying Descartes, we find amazingly strong influence of his thought on the knowledge and practical life of that time, which was proved by all authors of articles in the volume. The same, even though, to a smaller degree, concerns reformatory projects of Bacon, Petrycy of Pilzno or Leibniz analysed here. Deliberations on contemporary continuation of Thomas Hobbes's anthropology and theology fits in the concept of the volume.

I hope the adopted order of texts renders their subject interrelation. The issue starts with the article of A. Krupska *The so-called Cartesian and Newtonian Rationalism in the Contemporary Natural Sciences* superbly harmonizing with its title, and is ended with a text by J. Doomen *The Current Position of Philosophy*.

Even though the majority of texts featured in the present volume do not need justification, the article of P. Stecewicz and A. Włodarczyk *Modeling in the Context of Computer Science* does require a few sentences of comment from the editor. The text relates to computer models of mind against a background of a more broad methodological concept, in which the authors' original input defines differences between model and metaphor, as

well as shows the rules of valuable cognitive transformation of metaphor into model. It is worth adding that evolution line of contemporary computers leads to the 17th century calculators and machines. The notion of machine appeared then as a philosophical category, and it was also consciously used as metaphor in this role. It could be then, under certain assumptions, called a model. Interesting is the fact, that two diametrically different understandings appeared in the same trend of rationalism. In Descartes and Pascal, machine was the model of a body and in Leibniz's, the model of mind. Therefore, despite the fact that authors relate in their research solely to the present day, it is not difficult to indicate an important historical perspective for them.

The issue undertaken by U. Wybraniec-Skardowska appears as universal for philosophical problematic. U. Wybraniec-Skardowska presents in her text an attempt to answer the question "does the lie contradict the truth". Then, despite the lack of direct reference to the 17th century analysis in this scope, yet thanks to a presentation of wide historical context of the problem, the article completes well the wide thematic scope of this volume.

Finally, I would like to thank heartily all the authors who took part in realization of this publishing project and invite all interested to further cooperation. I also thank the reviewer of this volume Prof. W. Marciszewski for extremely thorough reviews of articles and argumentation justifying their appearance in print, which I have adopted above. Professor Marciszewski is also the author of the final version of the title of the present volume.

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THE SO-CALLED CARTESIAN AND NEWTONIAN RATIONALISM IN THE CONTEMPORARY MATHEMATICAL-NATURAL SCIENCES

In contemporary mathematical and natural sciences it is possible to notice many aspects of the 17th century Cartesian and Newtonian rationalism. To a considerable degree, it refers to methodology. The Cartesian deduction method or Newtonian new concept of hypothesis as well as his concept of science have successfully been applied in contemporary mathematics, physics, physical chemistry and biology. However, it is necessary to highlight that presently, the notions of atomism, mechanism, time, space or the essence of life are understood in a different manner when compared to the times of Descartes or Newton. What is more, the Cartesian and Newtonian rationalism has also been perceived differently by different thinkers and philosophers since the 17th century.

I. Cartesian rationalism

A primary aim of the French thinker of the seventeenth century – Descartes – was to build the new, certain knowledge. He claimed that in the first place it was necessary to disregard everything dubious. This stand has come to be known as methodological skepticism. Descartes argued that it was necessary to reject the statements regarding existence for they were based on sensory statements or, in other words, all the knowledge prevailing so far had to be rejected on the ground of being uncertain. Descartes used to say: *Perhaps we are only dreaming of the world*. He claimed that what people think may be a dream or a mistake. According to Descartes, only one thing was certain: the fact that we think. It is possible to be mistaken but only when one is thinking. One cannot be certain whether exterior things really exist. On the other hand, one can be absolutely certain that

people think. Hence, a famous statement of Descartes: *Cogito ergo sum*, which means *I think, therefore I am.* He writes:[1]

> (...) The simple meaning of the phrase is that if one is skeptical of existence, that is in and of itself proof that he does exist (...)

It means that I am a creature who thinks and thinking is a fact that is absolutely certain. Therefore, thinking itself constitutes a certain axiom, based on the experienced fact that was the base for Descartes to build the new, certain knowledge supported by the method of deduction.[2]

The Cartesian rationalism reveals two principle trends:

I. Axiomatic deductive
II. Mathematical physical

I. The axiomatic deductive trend

This trend postulates the creation of philosophy based on clear and plain truth.[3] Such philosophy should be constructed using the simplest and most certain notions, the ones which cannot be put into doubt. Such notions are revealed by axioms (postulates). While reasoning with the use of the method of deduction, they are used to educe the whole knowledge. On the other hand, the first step to take is to put everything into doubt to escape errors. Logical reasoning is of a primary role in the process. Its failure results in erroneous axioms and the knowledge based on them will also be erroneous.

Starting from the stated axiom of his philosophy *Cogito ergo sum*, Descartes built his tree of knowledge with mathematics being its roots. Being absolutely certain, analytic geometry and arithmetic constitute the base for they rely on the simple notions out of which everything can be educed. The roots of mathematics lead to physics, which is the stem of the tree. Other sciences are the tree's branches; the principle ones are mechanics, medicine and ethics.

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[1] R. Descartes, *Discourse on the Method and Meditations on First Philosophy*, (trans.) Elizabeth S. Haldane, Digireads.com.publishing, 2005. http://books.google.pl/booksid= 7b73a_4RVoMC&printsec=frontcover&dq=descartes+discourse+on+the+method& source=bl&ots=ateszC89oR&sig=mjwJ1KA7zDs86pVf_xj9RTL3-e0&hl=pl&ei=hpm GS4a_FsbD_gb43rSzDw&sa=X&oi=book_result&ct=result&resnum=5&ved=0CCsQ6 AEwBA#v=onepage&q=i%20think&f=false (assessed 23 February, 2010).

[2] *Ibid.*

[3] *Ibid.*

**I.1. The application of the axiomatic deductive aspect
of the Cartesian rationalism in contemporary mathematical
and natural sciences**

In contemporary science certain theories in the fields of mathematics, physics, physical chemistry or theoretical biology have been educed from axioms based on empirical data. Below are a few examples to follow.

Examples of scientific theories based on axioms (postulates).

I. Quantum physics/chemistry is based on four postulates:
1. It qualifies the probability of finding a particle in the element of space under consideration.
2. Every observed dynamic quantity of a system is corresponded by a certain linear hermitonian operator.
3. If a system remains in a stationary state described by the wave function Y which is also the function of the operator P, the measurement of the observed mechanical quantity, which is corresponded by this operator, must result in such value p that fulfills the equation:

$$PY = py$$

4. The expected value is counted up on the basis of the function Y.

II. Albert Einstein's theory of relativity is based on two postulates:
1. All laws of physics (Nature) have the same form in all the inertial systems of the frames of reference.
2. Velocity of light in empty space is similar for all observers in inertial systems of reference.

III. Irreversible thermodynamic is based on a few postulates. The most important ones are as follows:
1. Local formulation of the principle of thermodynamic II.
2. Hypothesis of local equilibrium.
3. The Onsanger postulate.
4. Cross effects.
5. The alternation relations.

IV. The principle of thermodynamic III is based on two postulates:
1. The Nernst postulate – a difference of the total entropy of products and the total entropy of substrates of the reactions taking place in the system near the temperature of absolute zero is zero.
2. The Planck postulate – in the temperature of absolute zero the entropy of every perfectly uniform body of the finite density is zero.

V. Statistic thermodynamic is based on the following postulate:
The entropy S is the function f of the thermodynamic probability W

$$S = f(W)$$

VI. Darvin's theory of evolution is based on the following postulates:

1. Life is old and has lasted for billions of years (it has been estimated that the oldest organisms – stromatolites are 3.5 billion years old).

2. Life started from one or several simple organisms (dating showed the presence of such organisms in rocks).

3. Natural selection, being the main mechanism of the evolution, means the preservation of the organisms which are better adjusted in the fight for existence; advantageous combinations of features survive.

Below are a few examples taken form the field of mathematics:

I. For two-dimensional Euclidean geometry a typical model is the Cartesian space based on the arithmetic axioms where:

- a point has been interpreted as an ordered pair of real numbers (that is, formally $Pu(x)$ is recognized as true if and only if x is a pair of such numbers)
- a straight line has been interpreted as a collection of the pairs (x,y), fulfilling the equation $(y_A - y_B)(x - x_B) - (x_A - x_B)(y - y_B) = 0$
- a relation "a point is on the straight line" as a relation of the attachment to the set.

II. Euklides called the axioms of geometry postulates. Currently, the notions "axiom" and "postulate" are synonyms in mathematics (and not only in mathematics).

Euklides proposed the following postulates:

- ***Postulate I.***
  A straight line segment can be drawn joining any two points.
- ***Postulate II.***
  Any straight line segment can be extended indefinitely, to form a straight line.
- ***Postulate III.***
  Given any straight line segment, a circle can be drawn having the segment as radius and one endpoint as center.
- ***Postulate IV.***
  All right angles are congruent.
- ***Postulate V.***
  If two lines are drawn which intersect a third in such a way that the sum of the inner angles on one side is less than two right angles, then the two lines inevitably must intersect each other on that side if extended far enough.

III. The axiom of the continuity of the set of real numbers states that every non-empty and in advance limited subset of the set of real numbers

has an upper bound. Alternatively, every non-empty and from below limited subset of the set of real numbers has a lower bound. The axiom has to reflect our intuition that the number axis is continuous; it does not have any "holes" – if any "place" is pointed out at the number axis, it is corresponded by a certain real number.

IV. Axioms of the ZF theory:
  - Axiom of extensionality. Two sets are equal if and only if they have the same elements.
  - Axiom of existence. There is a set to which no element belongs (this is an empty set).
  - Axiom of pairs. Every two sets have a set whose elements are these two sets.
  - Axiom of union. For any set x there is a set containing every set that is a member of some member of x and nothing else.
  - Axiom of infinity. There exists a set such that the empty set is its member and, whenever a set y is its member, then its memebr is the sum of y and the set of one element, whose only elelement is y.
  - Axiom of substitute (also called the axiom of excision). Intersection of any set and class defined by any formula is a set.
  - Axiom of power sets. Every set x has its power set or, in other words, a set whose members are all subsets of the set x.
  - Axiom of regularity. Every non-empty set x contains a member y such that x and y are disjoint sets.

V. Archimedes' axiom

This is an axiom formulated by Archimedes according to which, given two magnitudes having a ratio, one can find a multiple of either which will exceed the other. It results in the infinity of the straight line. To put it in other words, every pair of positive real numbers **a** and **b** has a natural number **n**, so that $\mathbf{a} < \mathbf{n \cdot b}$.

Considering the Cartesian tree of knowledge introduced deductively, it is possible to state that contemporary the tree may be captured in the following way. Currently, the principle root of the knowledge making the basis of the structure of the matter is comprised by the phenomena of electromagnetic effects with a universal and absolute velocity of light. According to the contemporary physicist and cosmologist, Stephen Hawking, such phenomena are responsible for the production of matter particles, that take place in the space in black holes.[4] Considering the properties of the electromagnetic effects and the quantum field theory nearby the event horizon,

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[4] S. Hawking, *Nature* **248**, 1974, pp. 30–31.

Hawking arrived at the conclusion that there should exist a certain quantum process relying on the constant creation of virtual pairs (particle – antiparticle) on the surface of the event horizon under the influence of the gravitation field. Contemporary, the stem of knowledge may be constituted by quantum mechanics, the laws governing at the level of elementary particles. It is possible to assume that quantum mechanics gives a raise to all other natural sciences: the whole classical physics, chemistry or biology are connected with the processes taking place at the level of elementary particles. Such sciences can be assumed to be the branches of the tree. And what is the position of mathematics? Nowadays, mathematics can be considered as a characteristic tool to describe different physical and chemical processes acting at the molecular level.

II. The mathematical physical trend

Descartes chooses a mathematical method to base his mechanical and rational philosophical system on. He writes that "sciences such as astronomy, music, optics, mechanics, among others, are called branches of mathematics".[5]

Descartes calls mathematical knowledge the knowledge which is reached as the result of the reason; science is only comprised by certain and obvious knowledge. For him, a scientific character is only revealed by analytic geometry and arithmetic, which are the archetype of universal mathematics.

Giving an example of wax,[6] Descartes shows that extensibility is the attribute of all bodies in Nature, whereas infinite divisibility is the attribute of extensibility. This is the basis for his assumption that bodies cannot be made of atoms for atoms are indivisible by nature. Therefore, he rejects the theory of atomism. Descartes considers movement to be the only change taking place in every body. According to him, bodies possess geometric properties and are only subjected to mechanical changes. Hence, Descartes postulates that all kind of phenomena are treated as movements. That view of him which gave a rise to the mechanistic theory of nature, which is a universal theory for the whole nature. For Descartes, life is a purely mechanical process, caused by material impulses taking place in blood; accordingly, animals are machines; the behavior of animals and people is purely mechanistic. He assumed that the amount of movement in the universe is stable. That assumption gave rise to his law of the preservation of movement. According

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[5] R. Descartes, "Rules for the Direction of the Mind", (in) *The Philosophical Writings of Descartes*, (trans.) John Cottingham, Cambridge: Cambridge University Press, p. 19.

[6] See R. Descartes, *Meditations on First Philosophy, op. cit.*

to Descartes, whole matter in the space remains in a constant circulation likewise a precise whirl.[7]

Associating substantiality with extension, Descartes introduced the notion of space as the indefinite continuum.[8] This is a theoretical construction which allows for the explicit definition of the location of every single body with the help of the respective coordinates on the axis. This is the so-called Cartesian system of reference.

I.2. How does the Cartesian mathematical physical concept refer to contemporary mathematical and natural sciences?

Albert Einstein's theory of relativity is a purely mathematical theory deduced from the two postulates based on experience. The theory states that time, space, movement, speed, weight and length of an object are relative; they depend on the system of reference. The theory assumes the appearance of relativistic effects for objects in motion, whereas motion is grasped not dynamically but as a static process. Relativistic effects cannot be observed for a little speed which is characteristic for our everyday life, but they become obvious when the speed of the object starts approaching velocity of light.

These effects have been proved experimentally in the accelerators for elementary particles or super-quick planes. The theory also assumes the existence of objects in space which have an unimaginable weight or their gravity is so strong that absolutely everything is irretrievably retracted there, even light. Einstein himself did not believe that such objects can really exist in the space. However, the existence of such objects has been proved and it is known that black holes (as they are called) really exist. Experimental facts that confirm the presence of black holes are as follows: the existence of x-rays radiation in the place where a black hole occurs, curving of the light rays nearby this object, impetuous acceleration and curving of the trajectory of a star nearby a black hole. The existence of space-time tunnels appears from the equations of the theory of relativity. Such a tunnel may exist in the black hole's interior. So far no experiment has proved the anticipations of these equations, they are still to be confirmed in the future. The above-mentioned example results in the conclusion that mathematics may describe and anticipate the already existing phenomena in nature and describe nature, which is in accordance with the concept of Descartes.

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[7] See R. Descartes, *Principia Philosophiae*, Amsterdam, 1644.

[8] *Ibid.*

Descartes suggested the infinitive divisibility of bodies in nature. Nowadays it is known that atoms are not the smallest, indivisible matter particles. They consist of quarks (it has been experimentally proved); quarks, in turn, are presumably made up of strings (it has not been confirmed yet). Contemporary atomism is a theory of elementary particles. A contemporary theory of space-time fluctuations, formulated by Hawking, shows the picture of matter as opposed to the atomistic approach.[9] Therefore, one may acknowledge that the concept of Descartes was close to the contemporary physics of elementary particles.

Contemporary, the Cartesian system of reference is the most frequently used system in contemporary mathematics or physics. A point (points) is (are) fixed at the respective axes which describe their position. However, apart from the Cartesian system of reference, other systems of reference have been applied: polar, cylindrical, spherical, geographic, and geodetic ones. The Cartesian system can easily be transformed into another type of the system of reference. Every system of reference is a certain adopted system in the space-time; it reflects the relativism of the object's position.

What can be said about the Cartesian mechanistic materialism as used contemporary? According to the theory of relativity, time and space are closely connected with each other making the space-time. In the space-time movement seems to be static, as a process, with no dynamics. On the other hand, in quantum mechanics every matter particle's movement appears to be the so-called phase of the way, that is, it seems to be static. Living organisms are comprised of atoms and other matter particles, whose movement has a static character and appears in the form of the packed wave. If movement has a static character, it is impossible to discuss any changes. It results in the statement that life cannot be perceived as a purely mechanistic process. Therefore, the data taken from quantum mechanics of the XX Century and the theory of relativity are inconsistent with the concept of movement and mechanism of Descartes of the XVII Century.

II. Isaac Newton's rationalism

Isaac Newton's rationalism is different from the rationalism of Descartes. Newton argued that phenomena were the subject of science whose aim was the search and establishment of relations between them, the so-called

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[9] S. W. Hawking, "Space-time foam", in *Nuclear Physics.*, **B144** (1978), pp. 349–362.

laws. He also highlighted causal relations between different phenomena. He excluded the search for transcendental causes of different phenomena from the range of science. For example, while studying weight, physics has to establish what laws it is subjected to, taking no interest in its nature. Basing on the experimental facts, he formulated his famous laws of mechanics. Newton understood natural history as the description of phenomena.

Newton pointed out a close connection between experience and deduction. He claimed that mathematical principles have a philosophical significance. He formulated the phenomenal and descriptive theory of science. Contrary to Descartes, Newton supported atomism.

According to Newton, nature makes the whole of the phenomena which are subjected to the laws of mechanics; what is more, all phenomena can be translated by the laws of mechanics. That assumption gave rise to the philosophical trend known as mechanistic materialism. Nevertheless, Newton failed to explain the movement of planets by the laws of mechanics. The main principles of mechanic materialism and the basic principles of mechanics (taught at every primary school) as well as his insight into space, time and matter were revealed in Newton's famous work *Philosophiae Naturalis Principia Mathematica.*[10]

According to Newton, movement constitutes the main characteristics of the world; the world is made up of movement and the system of the world constitutes a harmonious entity of movements – this statement can be recognized as the basic assumption of the Newtonian and Cartesian mechanism, which is about a constant movement of atoms which decides about the properties of the body. For Newton, there is no upper boundary of the sign transmission, therefore, any movement may take place at any speed. Movement take place according to classic laws of dynamics. Movement of the whole is a sum of the movements of certain parts.

For Newton, gravity is a universal force dispersing in space at the indefinite speed; that is, a universal force taking place between atoms. Only objects which are macroscopically given a (rather huge) mass are subjected to gravity. It refers exclusively to the inertial system. The force of gravity is active at a distance through empty space.

Newton was the first to introduce the notion of hypothesis in the sense of the assumption adopted to explain a certain phenomenon or a certain

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[10] I. Newton, *Philosophiae Naturalis Principia Mathematica*, Londini, 1687. http://books.google.pl/books?id=x-_K1KGZvv4C&printsec=frontcover&dq=Newton,+Philosophiae+Naturalis+Principia+Mathematica& cd=1#v=onepage& q=& f=false (assessed 23 February, 2010).

problem. Newton wrote that everything which cannot be deduced from phenomena is called a hypothesis.[11] He rejected the preceding Aristotelian question regarding the aim of the phenomenon on the ground that it was completely inexperienced.

II.1. Significance of Isaac Newton's rationalism in contemporary mathematical and natural sciences

Based on the Newtonian principle of finding laws between the already existing phenomena, many contemporary and well-known natural laws enveloping physics, physical chemistry or biology have been formulated. In contemporary science experimental facts are frequently connected with rational deduction. Likewise, Darvin's theory of evolution is based on the observations made by Darvin during his five-year voyage across the world in the ship called "Beagle"; quantum mechanics is rooted in the experimental observations (discontinuity of x rays, experiments with two gaps through which a particle enters); the theory of relativity is a consequence of the discovery of absolute velocity of light that took place by the end of the XIX Century.

Newton argued that mathematical principles sometimes may have a philosophical significance. This is well illustrated by Einstein's equations of the theory of relativity or equations of quantum mechanics.

Newton may be recognized as a precursor of the phenomenological description of events. The constitutive rules can describe empirical laws of nature. It refers to contemporary nature sciences. In science, especially in physical chemistry, certain theories are based on phenomenological constitutive rules. These are classical thermo-dynamics, the theory of phase transition, a phenomenological description of Brown's movements, a phenomenological description of the adsorption phenomenon, etc. The phenomenological description refers also to sociological life or psychological behavior. H. L. Dreyfus essay entitled "Phenomenological description versus rational reconstruction" shows that "phenomenology can describe how people are drown to act appropriately in a world". In conclusion Dreyfus writes: "...the constitutive rules that analysis discovers play a causal role in creating the everyday social reality phenomenology describes".[12] Searle himself observes the "construction of social reality".[13] He provides a "simplified version of the

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[11] *Ibid.*

[12] L. Dreyfus H., Phenomenological description versus rational reconstruction, *Revue internationale de philosophie*, 2001/02, no 216, p. 181–196.

[13] Searle J. R., The Construction of Social Reality, New York: The Free Press, 1995.

hierarchical relations between the different types of fact", begins from brute physical laws and mental facts and finishes on institutional facts. "One may have to get over following the rule one started with in order to cope most successfully."

While considering the Newtonian concept of atomism, currently it is known that atoms are not the smallest matter particles. It is considered that between atoms there is no empty space – there always exist corresponding fields.

Presently, it is known that the laws of mechanics cannot explain all natural phenomena, especially biological, mental or social processes. Newton's laws of mechanics in physics itself are not universal; they oblige only at a certain range of speed. Movement of the whole of the object does not constitute the sum of the movements of its certain parts.

II.2. How is Newton's mechanism applied contemporary?

The principles of Newton's mechanism oblige contemporary, but only when used for a small speed which is present in everyday life; that is, the speed where no relative effects are obvious. The principles of Newton's mechanism are not applied to a very big speed, which is close to velocity of light. Therefore, they are not universal. The laws of Newton's mechanism cannot be used to explain planets' movement or the movement of electrons in the atom. Neither can they be used to explain biological or mental processes. Newton himself acknowledged that planets' movement cannot be explained by the principles of mechanism. Currently, planets' movement is explained by Einstein's theory of relativity, whereas electrons' movement is explained by quantum mechanics. Gravity is not a universal force dispersing in the space at the unlimited speed; it refers neither exclusively to the inertial system nor to empty space. Currently, it is assumed that empty space does not exist. Hence, the factual state is different from what Newton used to think. Nowadays it is known that gravity is the force that curves the space-time and is strictly dependent on the mass of the object. What is more, currently gravity is not considered at the level of atoms. There is a serious problem with the gravity at the level of elementary particles. Recently there has been developing the so-called quantum theory of gravity aiming at unifying the force of the gravity with the three remaining interactions.

It is also known that the unlimited speed of the object does not exist. The maximum speed is 300 thousands km/s, which is distributed only by light and other types of electromagnetic waves, objects with no mass. At the same time, this is the maximum speed of the transmission of signals. No object which has a mass (even electrons or other elementary particles)

can move quicker than light; what is more, they can never reach this speed. Movement itself is currently perceived statically and not dynamically.

II.3. The application of the concept of Newton's hypothesis
         in contemporary mathematical and natural sciences

The concept of hypothesis as proposed by Newton is a modern notion that refers to contemporary mathematical and natural sciences. Below are several examples of the so–called Newton's hypotheses in science:

 I. Example from the field of physics:

Aim: to explain the nature of matter

Assumption: Hypothesis of de Broglie, forwarded in 1924: corpuscular-wave dualism does not only refer to light but it also refers to all matter particles.

This hypothesis has been fully proved experimentally – the experiment with two gaps through which a particle enters: it can enter only through one gap, which is characteristic for the particle, or it can enter through two gaps at the same time, which is a characteristic feature of the wave.

 II. Example from the fields of physics and cosmology

Aim: to explain the appearance of the Universe, time and matter

Assumption: The existence of groups of fields called the Higgs fields. There is a point in one place where the value of the Higgs field is the lowest. There appears an unstable state. In the process of quantum tunneling there appears a negative pressure of the vacuum, which leads to the impetuous decompression – cosmological inflation (a phase of the unimaginably rapid expansion of the Universe) which results in the conclusion that the whole Universe was initially concentrated in the extremely small territory connected by the cause-and-effect links.

It is assumed that the so-called Big Bang took place and gave rise to the beginning of the space, time and matter.

Probable evidence:

The consequence of Big Bang is the presence of heterogeneous microwave radiation of the background even in the furthest places in space.

III. Example from the field of biology

Aim: to explain the appearance of living organisms

Assumption: Darvin's postulate regarding the appearance of all living organisms on the Earth from the common ancestor/a common bank of genes.

Facts in favor:

  – universality of the genetic code,
  – homogeneity of biochemical mechanisms,
  – a phylogenetic tree reconstructed on the basis of molecular data.

IV. Example from the field of biology:

Aim: to explain the fact why descendant organisms resemble parental organisms.

Mendel's assumption made in 1866: organisms' inherited features are conditioned by the existence of separate "hereditary factors". The assumption was checked experimentally through growing pea plants. Basing on the result of the experiments, Mendel formulated two principles of heredity: the law of segregation and the law of independent assortment.

In 1910–1912 Morgan and his colleagues discovered chromosomes where hereditary factors were located – genes.

In 1953 Watson and Crick discovered the elements of heredity: acid DNA and RNA.

III. The evaluation of the Cartesian and Newtonian rationalism by other thinkers and philosophers

Blaise Pascal, a physicist and philosopher of the XVII Century, pointed out the limitations of the rational knowledge. But he did not reject the Cartesian trust in the rational cognizance. According to Pascal the intuition is needed in mathematics.[14]

George Berkeley heavily criticized the thought that reason is a source of cognizance. He argued that to exist means to be perceived; there exist only things which can be perceived.[15]

According to Immanuel Kant, a thinker of the XVII Century, pure reason is a system of the a priori principles which constitute a necessary condition for cognizance to take place.[16] Certainly, Kant's approach differs from the one presented by Descartes who claimed that reason is the first principle of cognizance.

According to Kant, thinking or, in other words, reason includes two functions:
- The ability to create notions – reason – transcendental analytic,

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[14] See B. Pascal, *Thoughts*, (trans.) W. F. Trotter, New York, Cosimo Books, 2005. http://books.google.pl/books?id=h_XUkAvW1tEC&printsec=frontcover&dq=pascal+thoughts&cd=1#v=onepage&q=&f=false (assessed 23 february, 2010).

[15] See G. Berkeley, *A Treatise Concerning the Principles of Human Knowledge*, New York, Cosimo Books, 2005. http://books.google.pl/books?id=jzQ0jZQLyqUC&printsec=frontcover&dq=berkeley&cd=1#v=onepage&q=&f=false (assessed 23 February, 2010).

[16] See I. Kant, *Critique of Pure Reason*, (trans.) J. M. D. Meikljohn, London. http://books.google.pl/books?id=DoIA4SlN-OEC&printsec=frontcover&dq=kant+critique&cd=1#v=onepage&q=&f=false (assessed 23 February, 2010).

- The ability to draw consequences form experience – reason – transcendental dialectic.

Descartes does not make such a difference.

In his famous work entitled *Critique of Pure Reason*, Kant qualifies the notions of numbers and space to the category of the a priori notions, which means that they are independent from experience and, when related to experience, they have the organization role, giving a form to the experiences.[17] He thinks transcendentally, differently from Newton, though similarly to the way that is characteristic to Descartes. According to Kant, the properties of numbers and space are also given to people not though the contact of some exterior things; instead, he assumes that they are the only possibility. Kant is convinced about the uniqueness of the Euclidean geometry. He ascribes the range of "spacial structure" with the quality of science to it. Contrary to Newton, Kant points out transcendental cognizance or, in other words, the cognizance of the principles of cognizance which preceed experience in the *a priori way.*

Taking a stand regarding Newton's hypotheses, Kant states that objectively significant are only those hypotheses that have been verified experimentally or confirmed. The success of the experimental science are contrasted with the uncertainty of metaphysics.

Albert Einstein, a physicist of the XX Century, rejected the approach of Newton regarding the way of creating the basis of science. He did not believe it was possible to prove any scientific hypothesis fully enough to make it a certain and unshaken theory. For him, every formulation of the laws of science was a defective work of the researcher's intuition. He was convinced that a single hypothesis should constantly be subjected to criticism on the basis of the newly created ideas or effects of the experiments. Referring to Newton's notion of space, Einstein states: "A four-dimensional space of the detailed theory of relativity is as stiff and ruthless as the Newtonian space".[18]

Einstein treats space as the product of the theory. Referring to the concept of the Cartesian continuum, he states:

> Along with the perception of the relativism of synchronism, there has taken place a fusion of space and time into the homogeneous continuum in such a way in which the three dimensions of space were joined into a homogeneous continuum.[19]

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[17] *Ibid.*

[18] See A. Einstein, *The world as I see it*, http://www.lib.ru/FILOSOF/EJNSHTEJN/theworld_engl.txt.

[19] *Ibid.*

In the methodological sense, Einstein supports the Cartesian method of deduction, rejecting induction. He writes: "The inductive scientific method [...] is replaced by deduction groping in the dark."[20]

It is known that since the times of Hegel nobody has tried to create philosophical systems based on the strict rationalism for the task of finding a perfect set of basic axioms, capable of the effective interpretation and description of the whole human knowledge, has been impossible to perform. It applies to mathematics as well as physics, physical chemistry or biology.

S U M M A R Y

In contemporary science we can see many aspects of the 17th century Cartesian-Newtonian rationalism. To a considerable degree it refers to the methodology. The Cartesian's deduction method or Newtonian new concept of hypothesis as well as his concept of science have been working well in mathematics, physics, physical chemistry and biology. However, presently, the notions of atomism, mechanicism, time, space or the essence of life have some other meaning than in the times of Cartesio or Newton. Cartesian and Newtonian rationalism is understood differently by some other thinkers and philosophers coming both from the 17th century and later times.

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DESCARTES' "RADICAL" RATIONALISM?
ON THE HISTORY OF THE THEORY OF SCIENCE[1]

The opposition "rationalism-empiricism" makes the basic backdrop against which to present the history of epistemology that occupies the central place in the middle stage of the history of modern philosophy, that is, in the seventeenth and eighteenth centuries. We owe it mainly to I. Kant[2] that this opposition was made present in philosophical historiography. Obviously, he had some predecessors, among others, F. Bacon who in turn took it over from Aulus Cornelius Celsus' Roman encyclopaedia. Celsus, like Clausius Galen and Sextus Empiricus, distinguished in ancient medicine between empiricists and rationalists. At any rate he regarded these two approaches as one-sided, and postulated their creative combination.[3]

This interpretative scheme has taken roots in the manuals on history of philosophy since the times of F. Ueberweg. The latter put the opposition dogmatism–scepticism together with the opposition rationalism–empiricism.[4] With time, those categories had lost their evaluative character determined by Kant, who stressed their one-sidedness, and took on a descriptive and ordering character. The latter served to define the two types of the philosophies in the seventeenth and eighteenth centuries. They were taken in combination, as it is in B. Russell's historiography (*History of Western*

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[1] I use the category "empiricism" above all in the sense of genetic empiricism and, to a certain extent, also in the sense of methodological empiricism, since the concept "rationalism" to define methodological rationalism, also partly genetic, i.e. in the sense of aprioricism.

[2] After *Epirismus*, in: *Historische Wörterbuch der Philosophie*, vol. 2 (ed. J. Ritter), Basel 1972, p. 478.

[3] After H.-J. Engfer, *Empirismus versus Rationalismus? Kritik eines philosophiegeschichtlichen Schemas*, Paderborn 1996, p. 19–21.

[4] F. Ueberweg, *Grundriss der Geschichte der Philosophie*, vol. 3. *Die Neuzeit bis zum Ende des achzehnten Jahrhunderts*, ed. M. Heinze, Berlin 1883, p. 43.

Philosophy). Russell linked rationalistic tradition with Descartes at the lead and Locke's empiricism.[5] J. Hirschberger did a similar thing, as he presents jointly the seventeenth and eighteenth centuries ("Die Systeme des 17. und 18. Jahrhunderts"), and grouped together the philosophers of that period in two paragraphs: "Der Rationalismus" and "Der Empirismus."[6] In Polish historiography, although W. Tatarkiewicz and Z. Kuderowicz,[7] stick to the chronological scheme, it is J. Woleński who in a historical outline would describe the history of this period and would use also the rationalism–empiricism scheme.[8]

Indeed, it is difficult to say that this scheme has no operative value in order the matter on hand, or that it does not have a number of substantive arguments that justify its validity, we cannot, however, fail to notice that there are problems to apply in an unambiguous manner. H. J. Engfer pointed to this issue in German literature, but Polish technical literature clearly understates this question. We shall limit ourselves to signal only some difficulties in classifying Descartes, who had unanimously been defined a typical rationalist. Descartes had overall accomplishments, i.e., not only in the field of epistemology and metaphysics, but also in natural philosophy. They are forgotten today, but were appreciated still in mid-eighteenth century, let alone by such an important person for the Enlightenment science as J. le Rond d'Alembert.[9]

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R. Descartes[10] attaches much weight to a proper scientific method. He states dramatically that it is better to give up learned activity than

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[5] B. Russell, *History of Western Philosophy and Its Connection with Political and Social Circumstances from the Earliest Times to the Present Day*, 1946, 1955.

[6] J. Hirschberger, *Geschichte de Philosophie*, vol. 2. *Neuzeit und Gegenwart*, Freiburg 1952, 1991.

[7] Z. Kuderowicz, *Filozofia nowożytnej Europy* [Philosophy of Modern Europe], Warszawa 1989.

[8] J. Woleński, *Epistemologia* [Epistemology], vol. 1. *Zarys historyczny i problemy metateoretyczne* [A Historical Outline and Metatheoretical Problems], Kraków 2000; the same, *Epistemologia. Poznanie, prawda, wiedza, realizm* [Epistemology. Knowledge, Truth, Knowing], Warszawa 2005.

[9] See S. Janeczek, *Teoria nauki w ujęciu J. le Ronda d'Alemberta. Między empiryzmem, racjonalizmem i intuicjonizmem* [The Theory of Science According to J. le Rond d'Alembert. Between Empiricism, Rationalism and Intuitionism], in: *Philosophia vitam alere. Prace dedykowane Profesorowi Romanowi Darowskiemu SJ* [The Works Dedicated to Professor Roman Darowski SJ], Kraków 2005, p. 199–212.

[10] I am using the edition *Oeuvres de Descartes*, ed. Ch. Adam, P. Tannery, Paris 1897–1913 (repr. 1996).

to continue it without a respective method.[11] As it is commonly known, the basic recommendations of this method modelled mainly on mathematics are reduced to determine certain conditions of infallible knowledge, that is, above all clarity and distinctness that would be a test of self-evidence, treated as a necessary and sufficient condition to approve of axioms and proofs, and that with regard to each step of demonstration. The method was supposed to be certain, easy, fertile, and complete. It refers to mathematics that integrates intuition with deduction, that relies on intellectual intuition that fulfils the requirement of immanent self-evidence understood in the sense of subjective self-evidence, for it is only what is clear and distinct that is approved as true. The method is supposed to be useful with regard to the simplest truths (axioms) by way of analysis and reduction, and in the creation of the mental series that satisfy the requirement of self-evidence.[12] This analytical, intuitive and deductive procedure postulated by Descartes was borrowed from mathematics, and it would become for many thinkers – in combination with various epistemological additions – characteristic of the rationalistic trend in modern philosophy.

At the same time, however, one cannot fail to notice in Descartes' methodology some elements characteristic of the then natural philosophy, therefore some traces of inductive and hypothetical thinking. They were not perceived by Descartes' proponents as well as by many scholars of his legacy, by those who stressed above all its a priori deductionism. The latter qualification is opposed especially by many contemporary specialists in Descartes. They stressed the "complete" character of his texts on the theory of science, or at least its "ambiguities" in determining the fundamental laws of nature, which he sought to formualte in the *Principia philosophiae*.[13] Pointing at some difficulties in distinguishing a coherent sense of methodological considerations, he emphasises, like e.g. Desmond M. Clarke, that Descartes's method is a peculiar "mix of conceptual analysis, empirical corroboration

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[11] R. Descartes, *Regulae ad directionem ingenii*, in: *Oeuvres de Descartes*, vol. 10, p. 375–377. Cf. ibid. p. 371–372. See L. J. Beck, *The Method of Descartes. A Study of the Regulae*, Oxford 1952, p. 172–189.

[12] See Janeczek, *Logika czy epistemologia? Historycznofilozoficzne uwarunkowania nowożytnej koncepcji logiki* [Logic or Epistemology? Historical and Philosophical Conditions of the Modern Conception of Logic], Lublin 2003, p. 181–217. Cf. E. Morawiec, *Przedmiot a metoda w filozofii Kartezjusza* [Object and Method in Descartes' Philosophy], Warszawa 1970.

[13] See S. M. Nadler, *Deduction, Confirmation, and the Laws of Nature in Descartes's "Principia Philosophiae"*, "Journal of the History of Philosophy" 28:1990 no. 3, p. 359.

and metaphysical explanation."[14] He states that experience will turn out indispensable at least at the suprarational level of natural considerations,[15] therefore – as Daniel Garber notes – when rational laws are referred to the explanation of concrete phenomena,[16] for "experience is an essential part of the method for constructing a deductive science."[17] Such a vision of Descartes' work diverges from the tradition to treat him as the father of modern epistemology and metaphysics. Without ignoring the arguments on behalf of such interpretation, he was above all a scholar who sought to formulate a new and integral vision of the world in which natural science would play an essential role, and which would be competitive to scholastics as it would combine metaphysics with natural science. Far from belittling the ideological importance of metaphysics that Descartes himself valued,[18] it seems that to a great extent it played an ancillary role towards natural science by laying its rational foundation.

Inasmuch as Descartes dwelt on the method used in philosophy that allowed him to formulate the principles of metaphysics,[19] the procedures postulated in reference to natural science may only be reconstructed by referring comparatively to the then methodological statements. On the grounds of universal method, adjusted to the introduction of metaphysical categories, he meant to reduce, by way of analysis, the data gathered from experience – the date that appeared first to be complicated and unclear – to simple and clear properties. Then they could become objects of an intuitive act and thereby could be grasped as certain, or follow from such theorems that concern the nature of thoughts or extension. A further stage was to explain the whole of experience data by demonstrating that they could be deduced from those simple natures.

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[14] D. M. Clarke, *Descartes' Philosophy of Science. Studies in Intellectual History*, Manchester 1982, p. 97. Cf. B. Williams, *Descartes. The Project of Pure Enquiry*, Middlesex 1978, p. 268.

[15] Ch. Larmore, *Descartes' Empirical Epistemology*, in: *Descartes. Philosophy, Mathematics and Physics*, (ed.) S. Gaukroger, Sussex 1980, p. 6–22.

[16] D. Garber, *Science and Certainty in Descartes*, in: *Descartes. Critical and Interpretative Essays*, (ed.) M. Hooker, Baltimore 1978, p. 114–151, especially p. 141.

[17] D. Garber, *Descartes' Method and the Role of Experiment*, in: *Descartes*, (ed.) J. Cottingham, Oxford 1998, p. 234. Cf. the same, *Descartes' Metaphysical Physics*, Chicago 1992; the same, *Descartes Embodied. Reading Cartesian Philosophy through Cartesian Science*, Cambridge 2001.

[18] See e.g. Z. Janowski, *Teodycea kartezjańska* [Cartesian Theodyce], Kraków 1998.

[19] See e.g. A. C. Crombie, *Augustine to Galileo. The History of Science, A.D. 400–1650*, vol. II, *Science in the Later Middle Ages and Early Modern Times, 13th–17th Centuries*, London 1961, p. 305–306.

In natural science, however, it seems that Descartes accepted a much more complicated way. On the one hand it drew on to Bacon's methodological considerations, and on the other to the methodological procedures postulated and applied by Galileo. Those procedures were only enriched by a systemic interpretation characteristic of philosophy that is in fact foreign to the typically "scientific" Galileo's approach, one that is concentrated on the explanation of the nature and causes of particular phenomena, and that is different from Bacon's mainly encyclopaedic approach. Although Descartes distanced himself from history as a purely erudite knowledge that is a synonym of the knowledge based only on authority. He opposed it to demonstrative knowledge modelled on mathematics[20] on *historia naturalis*, and not only modern scholars, including Aristotle. In his letters to M. Mersenne, whom he informs in detail about the integral approach to physics, we find some information that he is an avid reader of F. Bacon's,[21] a trace of which is his use of Bacon's expressions,[22] learns about Gassendi's experiences,[23] and asks Mersenne to send him some important works on natural science.[24] He appreciates the meaning of an ordered natural history that make research on typical phenomena, thus such that are regarded as certain and useful, contrary to some uncertain discoveries of natural peculiarities.[25] Hence he uses some extracts from Aritotle's natural writings made by Mersenne and he himself makes notes on Bacon's writings, and makes observations of nature (e.g. stunning with the anatomy of animals). Both in his approach to natural philosophy and in his postulate to explain its data one may notice the same postulate we find in the universal method to achieve clarity of knowledge, safeguarded by the simplicity of the subjects under study.[26]

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[20] Descartes does not hide his unwillingness to book knowledge (*Oeuvres de Descartes*, vol. I, p. 221). This will be seen especially when he presents the history of his education, putting it within the frameworks of erudite knowledge ("book knowledge" – "science des livres") including both linguistic and humanistic subjects, therefore rhetoric with poetry, history with geography, ethics with law, and the natural sciences with medicine. R. Descartes, *Regulae ad directionem ingenii*, in: *Oeuvres de Descartes*, vol. X, p. 367; the same, *Discours de la méthode*, in: *Oeuvres de Descartes*, vol. VI, p. 5–7, 12. See L. Lévy-Bruhl, *Cartesian Spirit and History*, in: the same, *Philosophy and History*, Oxford 1936, p. 193.

[21] *Oeuvres de Descartes*, vol. I, p. 195–196.

[22] *Oeuvres de Descartes*, vol. I, p. 318; see also the editor's note from p. 321.

[23] *Oeuvres de Descartes*, vol. I, p. 112, 148.

[24] *Oeuvres de Descartes*, vol. I, p. 103, 250.

[25] *Oeuvres de Descartes*, vol. I, p. 196.

[26] *Oeuvres de Descartes*, vol. I, p. 109. Cf. L. Chmaj, *Rozwój filozoficzny Kartezjusza* [Descartes' Philosophical Development], Kraków 1930, p. 160–162.

The application of such requirements will turn out more difficult in na-
tural science than in mathematics and metaphysics. In the first and in the
second case we are obliged by the fundamental postulate to preserve or-
der ("ordo"), a fact that calls for continuous analysis, treated as a broadly
comprehended disposition ("dispositio") recommended in synthetic prin-
ciple V.[27] This requirement equally deals with the formulation of the foun-
dations of knowledge and the procedures made real in particular sciences. In
the second case this disposition will deal with data gathered in experience.
He will recommend it to philosophers, broadly understood, and to astrono-
mers (astrologers) and mechanics.[28] The analytical ordering will take the
form of "stairs" that remind Bacon's induction. Following these stairs, we
gradually build the edifice of knowledge and avoid chaotic researches. The
ultimate explanation of phenomena will be possible only in science that is
deductively ordered, e.g. mechanics must refer to the principles of physics,
and the knowledge of the "nature" of nests will ensure the knowledge of
their "results".[29] In the heuristic aspect science is a peculiar game of theory
and experiments: in the first case the essential role is played by hypotheses
defined as "presumptions."

Descartes describes his own methodological position ("I hold on to this
order") first of all as being in line with the deductionistic ideal of science,
therefore he stresses the role of the basic principles of nature ("general les
principes ou premieres causes"), starting from the formulation of its essence
reduced to the idea of extension, shape, and movement. He referred therefore
to a priori truths (innate), for "only" these "certain truths ... are found in
our souls." It is from them that one should deduce, on the principle of the
cause-effect relationship, the principles characteristic of all material bodies,
which means the discovery of the nature of the substrate of earthly bodies.
All these principles, defined as first and most common effects ("les premieres
et plus ordinaires effects") that were supposed to satisfy the condition of
certainty, for they were "the most common and simplest of all, thus they
were easiest to be known," therefore they were accessible by way of intuition
and deduction characteristic of the universal method.

Only in reference to the more specific phenomena was Descartes to re-
vert the principles of this method, that is "to find the causes by way of the

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[27] R. Descartes, *Regulae ad directionem ingenii*, in: *Oeuvres de Descartes*, vol. X,
p. 379–380.

[28] Cf. A. Gewirtz, *Experience and the Non-Mathematical in the Cartesian Method*,
"Journal of the History of Ideas" 2:1941, p. 183–210.

[29] R. Descartes, *Regulae ad directionem ingenii*, in: *Oeuvres de Descartes*, vol. X,
p. 379–380.

effect and use many detailed experiences." Undoubtedly, the departure from his preferred method can be accounted for by his inability to distinguish by a purely mental manner "the forms or species of bodies on the earth from the innumerable variety of others that could be found there, if God willed to place them there." Therefore it is impossible to verify which of the "possible" bodies really exist. This change of method is, however, clearly enforced if it states that the human mind cannot exemplify the basic explaining principles by other means ("and adjust them to our use"). In this respect it is necessary to refer to some "detailed experiences" that were supposed to make us sure as to the laws formulated by way of a priori. At the same time he reviewed ("repasser") all the objects that he ever found by was of his senses. This review made him sure that "he failed to notice among them any thing that could not easily explain by means of the principles he discovered." Therefore from the very beginning the study of physical phenomena had a twofold character. Irrespectively of this intuitive and deductive series, that made it possible for him to discover the first metaphysical principles, and then physical principles, analysis specifically understood would seem indispensable. This analysis would make it possible to reach the simplest, therefore the principles of metaphysics, starting from those series that classify the most typical phenomena in nature. At this level Descartes reveals the role of experience that not only confirms what is well-known by way of internal mentality. It is in this sense that it serves to show such phenomena to which it refers as a simple simplification of the principles perceived in the extraobjective world. It is also a synonym, be that only introductory, of the systematisation of natural phenomena.[30]

The logic perceived in his lecture on the model of the Cartesian method manifests undoubtedly the preference for a priori and deductive procedures, therefore putting metaphysics superior to physics. No wonder then that Descartes, as it were, hides the undoubted accessions on behalf of inductive and hypothetical thinking, taking them in the categories of the first approach of the two. Even breaking the deductive series of considerations he is forced to admit the necessity to refer to experiences in order to attach a definite effect to its respective cause. Here we can find a manifestation of the use of empirical verification, then this procedure would be taken in deductionistic categories because in the form of deducing ("déduire") effects form their causes.[31]

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[30] R. Descartes, *Discourse de la méthode*, in: *Oeuvres de Descartes*, vol. 6, p. 63–64.

[31] R. Descartes, *Discourse de la méthode*, in: *Oeuvres de Descartes*, vol. 6, p. 64–65.

The deductive character of Cartesian analyses was ultimately supported by the a priori character of his considerations on physics. Thereby he could deduce, as he assured us, all the phenomena ("what concerns seeing, salt, winds, clouds, snow, thunderbolt, rainbow, and things of this kind") from the causes indicated by him.[32] The basic thesis was the truth about the bodies that are composed of parts, from which he deduced a thesis that bodies are infinitely divisive. This thesis is also understood as the belief that they are extensive, the fact that Descartes treated as approaches so simple that called for no definition. These theses conditioned uniformity in material nature. This uniformity was so thorough that from this matter each of the possible worlds would have to be built. The specific character of nature was ultimately reduced to divisiveness and movement, an expression of consequent mechanicism.[33]

The combination of a priori and deductive considerations with experiment made it possible to attribute a particular phenomenon to one of its many causes. These causes were found by a purely mental way, most obviously by trial and error (a cross experiment), and it was consequently the character of verification. This uniformity was broken, however, by his resolution to apply suppositions, a fact that is found in his writings on nature published together with *The Discourse on Method*, that is, in *Dioptrics* and *Meteors*.[34] A careful reading of those writings was supposed to "satisfy" the reader, i.e. the theses announced there had been demonstrated according to the standards of the postulated method. This statement may be partly understood in the sense of fictional considerations, assumed by Descartes for pragmatic reasons. He signalised it already in *The Discourse on Method*, where he indicated that in order to freely conduct considerations, without the then paradigms, and stay consequent, avoid disputes that would result from a need to defend one's position that questions common beliefs, he would leave for traditional philosophers of nature the analyses on the real world. And he "speak only about what would happen in a new world."[35] Using these suppositions, however, was first of all a manifestation

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[32] *Oeuvres de Descartes*, vol. II, p. 200.

[33] R. Descartes, *Principia philosophiae*, in: *Oeuvres de Descartes*, vol. VIII, part 1, p. 52–53.

[34] R. Descartes, *Discours de la méthode*, in: *Oeuvres de Descartes*, vol. VI, p. 76.

[35] R. Descartes, *The Discourse on Method*, p. 51; the same, *Discours de la méthode*, in: *Oeuvres de Descartes*, vol. VI, p. 42. He referred to a fictional formulation anticipating thereby his metaphysical considerations, when he defined *Discours de la méthode* as "only a history" ("une histoire"), or even if one prefers, as a parable ("une fable") in which one finds among examples that can be imitated many others that we should rightly hold on to"

of the application of modern inventive procedures. They presumed a specific game between experiment and theory, the game ultimately verified by way of experiment. The theory here was conceived as a manifestation of the rational and systemic approach. Descartes criticised Galileo's research practice. His criticism indicates the integral character of the two elements of scientific method of natural philosophy. Although he praised Galileo's "philosophy" in letter to Mersenne (*Discorsi e dimonstrazione matematiche intorno due nuove scienze*, Lugdunum Batavorum 1638) that it was better than other average philosophies, rejected errors of Aristotelianism. He praised it for the application of mathematical method, treating the latter as the only way to discover the truth, and yet "he built without foundations." Without indicating the first causes of nature, he limited himself to the explication of only particular phenomena by pointing to their respective reasons, that is, without building the whole system of physics. Writing, for instance, about the scales and lever he would therefore explain what is happening (*quod ita fit*), but why this is happening (*cur ita fit*), what Descartes was supposed to do in his *Principia philosophiae*.[36] No wonder then that A. C. Crombie would define his research attitude in physics as an approach characteristic of the philosopher who, as in the whole of science, seeks here the first "simple" natures like extension and movement in physics to which he added, as the consequences of the first: shape and set of elements. Crombie stressed the primacy of Descartes' operations that dealt with the formulation of universal method that made it possible to retain the unity of knowledge, especially by emphasising the role of its fundamental

(*Discours de la méthode*, in: *Oeuvres de Descartes*, vol. VI, p. 42), and on the grounds of physical considerations, where in the beginning of his treaty *On Light* he modestly assures that in order to avoid this consideration being boring he presented a part of it in the form of a tale ("dans l'invention d'une fable"). Being a tale it does not lose its character of demonstration (*Oeuvres de Descartes*, vol. XI, p. 31). A true reason for his operations would be given in a letter to Mersenne, where he states that in the then circumstances it was not possible to lecture any other philosophy than Aristotelianism. It was fused almost entirely with a lecture on theology "so that it should not in advance look contrary to faith" (*Oeuvres de Descartes*, vol. I, p. 85–86; see L. Chmaj, *Descartes' Philosophical Development*, p. 157–158). At the same time Descartes made every effort that his view be accepted, a proof of which we can find in his correspondence with the then authorities, e.g. the letter to Sorbone professors that precedes his *Meditationes de prima philosophia*. Counting on their acceptance, he would mention in the first edition that he received it, a fact that is absent in a further edition. Despite some support from, among others, G. Gibieuf, his friendly oratory father, he did not receive it (F. Alquié, *Descartes. L'Homme et l'oeuvre*, Paris 1969, p. 72). Alquié presumes that by publishing his *Principle of Philosophy* he hoped to popularise his physics, or even to introduce it in education (F. Alquié, *Descartes. L'Homme et l'oeuvre*, p. 118). His *Principles* bore a scholarly character, their lecture is not continuous, instead we find short and numbered paragraphs.

[36] *Oeuvre de Descartes*, vol. II, p. 380, 433.

statements obligatory in the whole system of knowledge. In this manner Descartes is different from Galileo who, according to Crombie, was supposed to treat movement on the part of mathematical descriptions, without a philosophical base in which it would find explication. The more so, it was Descartes who was the first to have formulated the whole vision of mechanistic philosophy being at the same time mechanistic physics. This philosophical approach led him to speculation, an example of which the a priori theory of whirls, with the conception of three kinds of matter,[37] understood as a consequence of the laws of mechanics that was not confirmed in experience.

Despite this actual rationalistic a priori approach at least the late Descartes would notice that it was inevitable to introduce hypothetical procedures in the mechanistic vision of physics. They were strengthened in the causal-consecutive categories in which the role of experience was made precise. Its role was supposed to be revealed at many levels and ultimately demonstrated that the principles formulated by physics corresponded with the laws of nature.[38] Empirical verification was indeed woven with the kind of thinking that was grasped in the categories of a model,[39] therefore hypothetical operations, especially if we take into consideration the fact that putting aside the rigours of indubitable knowledge, and being governed by pragmatic reasons, he would even allow for the use of hypotheses of which he knew they were false.[40]

Despite the principal emphasis on the role of intuitive-deductive procedures in science, Descartes must therefore agree to the multilevel character of the certainty of his theses in his system, for in *The Medita-*

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[37] R. Descartes, *Principia philosophiae*, in: *Oeuvre de Descartes*, vol. VIII, part 1, p. 100–105.

[38] See A. C. Crombie, *Augustine to Galileo. The History of Science, A.D. 400–1650*, vol. II, p. 162–163, 197–199, 303–304.

[39] A. R. Hall, *The Scientific Revolution 1500–1800. The Formation of the Modern Scientific Attitude*, London 1954, p. 178–185.

[40] Descartes justifies the application of hypotheses to which he had no doubts whether they were true. He demanded only that the conclusions introduced by their means should be confirmed by experience. Ultimately, they should serve to control nature (R. Descartes, *Principia philosophiae*, in: *Oeuvres de Descartes*, vol. VIII, part 1, p. 99). What is more, he even allows for putting forward hypotheses of which he knew they were false. When he responded to Gassendi's objection he said that in order to explain the truth one often assumed false things to be true. R. Descartes, *Meditationes de prima philosophia*, in: *Oeuvres de Descartes*, vol. VII, p. 349; cf. the letter to Morin of 1638, *Oeuvres de Descartes*, vol. II, p. 197. See also: the same, *Principia philosophiae*, in: *Oeuvres de Descartes*, vol. VIII, part I, p. 99–100; the same, *La Dioptrique*, in: *Oeuvres de Descartes*, vol. VI, p. 83; the same, *Les météores*, in: *Oeuvres de Descartes*, vol. VI, p. 233; the same, *Le Monde*, in: *Oeuvres de Descartes*, vol. XI, p. 33.

tions on the First Philosophy it turned out that the basic theses of metaphysics are more certain than mathematical truths. If one, however, attributes the principal role to experience at the starting point of physical analyses, or even that it was supposed to decide about the choice of one among many explications formulated by way of a priori hypotheses, although also with the use of experience, since on the principle by trial and error. Then at least in comparison with the certainty of metaphysical truths of physics they must remain, by necessity, only hypothetical, from which – as it was shown above – he excluded only the most general questions.[41] Thus the opinion formulated years ago by I. Dąmbska seems justified. She indicated that Descartes operated with two models of methodology, that is – as it were – official models explained in the *Regulae ad directionem ingenii*, *Discours de la méthode* and *Meditationes de prima philosophia*, and the semi-official formulated in the *Principles of Philosophy*, where he agreed to operate with hypotheses.[42] To sum it up, we can say that Descartes' approach is not far from our contemporary theory of science. Most certainly the opposition rationalism-empiricism, with respect to his theory of science, does not seem so radical as

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[41] In the end of the principles of physics he states that God could make it by many ways that natural phenomena would look as they look, and yet it is not impossible to recognise which of those means he wanted to use to make them real. R. Descartes, *Principia philosophiae*, in: *Oeuvres de Descartes*, vol. VIII, part 1, p. 327; cf. p. 327–329. Cf. F. Alquié, *Descartes. L'Homme et l'oeuvre*, p. 132–137; L. J. Beck, *The Method of Descartes*, p. 239–253.

[42] See I. Dąmbska, *Sur quelques principes méthodoloques dans les Principia Philosophiae de Descartes*. "Revue de Métaphysique et de Morale" 62:1957, fsc. 1, p. 57–66. J. Kopania also refers to J. P. Weber's opinion. Weber would indicate that Descartes allowed for hypotheses in his *Principles*. See J. Kopania, *Funkcje poznawcze Descartesa teorii idei* [Cognitive Functions of Descartes' Theory of Ideas], p. 373, ft. 243. Cf. J.-P. Weber, *Sur une certaine 'Methodologie officieuse' chez Descartes*, "Revue de Métaphysique et de Morale" 63:1958, fsc. 2–3, p. 246–250. Descartes' natural philosophy had a hypothetical character. Descartes treated his particular theses as only possible, thus at least with respect to natural philosophy he supplemented his intuitionistic and deductionistic rationalism by the empirical and hypothetical approach, see H.-J. Engfer, *Empirismus versus Rationalismus?*, p. 68–74, 89–94; E. Denissoff, *Descartes, premier théoricien de la physique mathématique. Trois essais sur le "Discours de la methode"*, Louvain 1970. Cf. G. Buchdahl, *Metaphysics and the Philosophy of Science. The Classical Origins. Descartes to Kant*, Oxford 1969, p. 118–155; P. A. Schouls, *The Imposition of Method. A Study of Descartes and Locke*, p. 75–87; D. M. Clarke, *Descartes' Philosophy of Science. Studies in Intellectual History*, Manchester 1982, p. 165–194; H. Poser, *Beobachtung und Theorie bei Descartes, Spinoza und Leibniz*, "Studia Leibnitiana" 9:1981, p. 116; cf. ibidem p. 115–146; R. M. Blake, *The Role of Existence in Descartes' Theory of Method*, in: R. M. Blake, C. J. Ducasse, E. H. Madden, *Theories of Scientific Method. The Renaissance Thought in the Nineteenth Century*, Seatle 1960, p. 74–103. In most recent Polish technical literature see especially T. Śliwiński, *Ratio et physis. Fizyka teoretyczna Kartezjusza jako realizacja projekty mathesis universalis* [Ratio et physis. Descartes Theoretical Physics as the Implementation of the Mathesis Universalis Project], Nowa Wieś 2005.

we have been accustomed to think on the grounds of manuals for the history of philosophy. It would be extremely difficult to treat Descartes' views as "radical" rationalism that is linked with equally "radical" apriorism and nativism.[43]

S U M M A R Y

This paper addresses the issue of categorisation of the theory of science worked out by R. Descartes. Inasmuch as it is justifiable to claim that Descartes is a typical rationalist in epistemology and metaphysics, we may still ask whether it is correct to do the same in his theory of science in relation to modern philosophy of nature, of which he was one of its founders. Descartes intended to work out a universal method which was supposed to be certain, easy, fertile, and complete. In principle, this task is satisfied by intuitive and deductive procedures. In practice, however, he had to consent to a multilevel character of certainty of the theses in his system. This concerns especially philosophy of nature. If he had granted experience the principal role in the starting point of physical analyses, or even it was supposed to decided about his choice of one a priori and hypothetical explanation, out of many, then at least in comparison with the certainty of metaphysical truths the theses of physics must of necessity remain only hypothetical, excluding only the most general questions. Thus it is also justifiable to think that Descartes had two models of methodology that is, as it were, one official elaborated in the Rules for the Direction of the Mind, Discourse on the Method and in Meditations, and the second one semi-official, formulated in the Principles of Philosophy, where he agreed to use hypotheses. It is therefore difficult to treat his views taken en bloc as a manifestation of radical rationalism connected with equally radical apriorism and nativism, a fact that if further supported by numerous textbooks on the history of philosophy.

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[43] J. Woleński, *Epistemologia. Poznanie, prawda, wiedza, realizm* [Epistemology. Cognition, Truth, Knowledge, Realism], p. 23–24.

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CONTEMPORARY CONTINUATIONS
OF HOBBESIAN ANTHROPOLOGY AND THEOLOGY

There is a persisting problem with continuation in philosophy as there is too many philosophers and too few philosophies. Thus for every philosopher we can find a continuator by the way of elementary similarities, and the whole procedure soon turns into combinatorics. Hobbes is obviously no exception. His most known propositions: materialism, nominalism, unchangeable human nature, contractarianism all were preached well before him, so if someone was his continuator in this respect, he could belong to some other tradition as well.

On the other hand, Hobbes expressed his really original ideas tritely and vaguely, so again we cannot be sure who really was his continuator. We mean chiefly the epistemological directive demanding introspective verification of propositions concerning human nature, phenomenalism concerning bodies and space, computationism concerning the mechanism of thinking. The latter can be found in Leibniz and in 19th-century British logicians, finally maturing as the modern system of mathematical logic. No wonder that Fr. Bocheński labelled the Hobbesian idea as "rather the *jeu d'esprit* of a dilettante than a theory of mathematical logic".[1] Bocheński was surely right, one can only ask whether (despite the developments of the logical and computing machinery), the contemporary computiationism is much better, or at least more convincing that its Hobbesian version?

As for phenomenalism – we do not have a better term – we find in *De Corpore* an interesting transformation of the Cartesian identification of matter and extension. Namely, bodies are, as it were, generated on the border of the real and the perceived space. A contemporary author[2] even claimed that

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[1] Józef Maria Bocheński *A History of Formal Logic*, tr. Ivo Thomas, Chelsea, New York 1970, §38.A.2.

[2] Gary Bruce Herbert *Thomas Hobbes. The Unity of Scientific & Moral Wisdom*, University of British Columbia Press, Vancouver 1989, p. 45–50.

Hobbes predated the Husserlian procedure of the phenomenological reduction of bodies by the way of double abstraction:[3] from the specific location and the specific attributes. That is probably too much, nevertheless we can surely discern two kinds of space in Hobbes:[4]

– imaginary space being an abstraction from specific attributes of an object;
– real space being an abstraction from specific location but not from extension/magnitude.

The second kind of space can be understood as generated by movements of a two-dimensional surface which in fact anticipates modern mathematical concepts.[5] Hobbes was thus a precursor of the modern problem of the nature and geometry of visual space. This problem is relatively independent of physics, and has been not finally solved.[6]

Finally, there are Hobbesian ideas which in fact had been developed after him and following him. These include monadism, i.e. the concept of reality as a net of irreducible, dynamic centres of force. Hobbes understood monadism anthropologically, however it was in fact a zoological understanding, as humans were animals for him. Leibniz generalised this concept for the whole Great Chain of Being.

The Malmesburian is routinely associated with the claim that the society results from a selfish mutual contract. It is a partial misunderstanding here, as a consistent contractarianism should assume a pre-contract state, a "state of nature", *bellum omnium contra omnes.* The latter is a fiction, as Hobbes never seriously claimed that it actually occured. It is a result of reduction of the social reality to interactions of human monads, directed by short-sighted selfishness, and not constrained by rules of reason called "laws of nature" in *Leviathan* (Ch. 14. and 15.). There is, by the way, one domain where the struggle of all against all takes place, namely international rela-

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[3] Hobbes does not use the term 'abstraction', speaking e.g of "privation; that is (...) feigning the world to be annihilated" *De Corpore*, II.7.2 [*EW*1, 91]. **NB**. For all Hobbes' works, we indicate the part, the chapter, and if needed the paragraph. The location in Molesworth's edition (*The English Works of Thomas Hobbes of Malmesbury*, ed. William Molesworth, John Bohn, London 1839–45) is given in square brackets, the Arabic number indicating the volume. A quote from his Latin works (LW) in note 22 below is given after *Thomae Hobbes Malmesburiensis Opera Philosophica...*, ed. William Molesworth, John Bohn, London 1839–1845.

[4] *De Corpore*, II.7.2 [EW1, 108–110].

[5] *Op. cit.*, II.8.2 [*EW*1, 119–120]; Herbert *Thomas Hobbes*, p. 49.

[6] Cf. Tarow Indow *The Global Structure of Visual Space*, World Scientific, Singapore 2004; Mark Wagner *The Geometries of Visual Space*, Lawrence Erlbaum Associates, Mahwah, NJ 2006. Since 1950s, the standard model of the space of binocular perception in the Lüneburg model, corresponding to hyperbolic geometry.

tions: all-in wrestling of Leviathans. The so-called Hobbesian paradigm is scholarly expression of a quite vernacular view that international relations are pure power play. The simplicity of this attitude does not mean that it can not be developed into an academic doctrine.[7]

Returning to the initial question of continuation, we emphasise that Anglo-Saxon thought in fact *does* include two traditions initiated by Hobbes. The first is the line of *possessive individualism*,[8] being a source of both classical and contemporary liberalism. We already wrote about that,[9] so we would not discuss again the paradoxical position of Hobbes – naturally the paradox occurs only if one accepts the routine labelling Hobbes as an "absolutist". We shall not dwell into subsequent modifications of Hobbesian doctrine between Locke and Mill, reminding only how anachronistic and one-sided classical liberalism seems to be now, after two centuries from the period it finally took shape.

Hobbesian 'absolutism' – and the very metaphor of the grand beast called Leviathan – runs through "political theology", the latter being a tradition of phraseology rather a genuine intellectual current. Its contemporary version is often associated with Carl Schmitt, who claimed that the main notions of political science were of theological origin.[10] Quite possible, as sometimes the very topic calls for a specific kind of language. Perhaps even theological elements in Hobbes could supply an example. Almost a half of *Leviathan* is devoted to the Holy Scripture and religious matters.[11] We can-

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[7] From the recent literature: Michael C. Williams *The Realist Tradition and the Limits of International Relations*, Cambridge University Press, Cambridge 2005.

[8] The term was introduced by Canadian scholar Crawford Brough Macpherson (1911–1987) in his *The Political Theory of Possessive Individualism*, Oxford University Press, Oxford 1962. – It was meant to denote a group of doctrines founded on the assumption that "a man's energy and skill are his (...) possessions, the use and disposal of which he is free to hand over to others at a price" (p. 48). Macpherson compares postulates underlying two models: the customary/status society and the "market" one (Ch. II.3.). Following him we can attribute the following postulates to Hobbes: (1) freedom is independence of the will of others; (2) it is specified as independence of, or abolition of any relations except those freely entered into for one's own gain; (3) individuals are sole possessors of their skills and owe nothing for them to the rest of society; (4) individuals are actually able to alienate their own possessions, especially own ability to work; (5) being human rests on freedom in such a sense; (6) society is the totality of exchange relations; (7) the state is a human invention guaranteeing ownership and exchange.

[9] See ours "Physical Anthropology of Thomas Hobbes", *Studies in Logic, Grammar and Rhetoric*, 15 (28) **2009**, p. 189–197.

[10] Carl Schmitt *Politische Theologie. Vier Kapitel zur Lehre von der Souveränität*, Duncker & Humblot, Munich 1922 [*Political Theology: Four Chapters on the Concept of Sovereignty*, tr. G. Schwab, MIT Press, Cambridge, Mass. 1985]; *Der Leviathan in der Staatslehre des Thomas Hobbes*, Hanseatische Verlagsanstalt, Hamburg 1938 [*The Leviathan in the State Theory of Thomas Hobbes: Meaning and Failure of a Political Symbol*, tr. G. Schwab & *al.*, Greenwood Press, Westport, Conn. 1996].

[11] Ch. III.32–IV.47.

not elaborate on a related topic: whether Christian declarations of Hobbes were sincere and how to tell his undoubted anticlericalism from possible rejection of Christianity.[12]

Schmitt is sometimes called "Heidegger of political science" and sometimes "German Hobbes", being equally difficult to pigeonhole. A Catholic (who was for 25 years excommunicated for bigamy), a Nazi supporter for some time, liberal and anti–Communist, supplied a doctrine of partisan warfare. As most commentators, we are not sure what really he has in common with Hobbes, except an inspiration, of course.[13,14] The proper measure of power to be granted to the ruler was certainly a common problem for both. They likewise feared more a weak government than a strong one. Both also feared people calling for softening of government. Hobbes called them "servants of the Kingdom of Darkness"; Schmitt used the term 'neutralisators' (*die Neutralisierer*).[15] Another common element is human nature as ethically neutral, however similar practical implications had different premises. For Schmitt, neutrality means that human nature lies *between* good and evil, somewhere around the ethical zero. For Hobbes, human nature is a basic fact *beyond* good and evil.

The Malmesburian clearly expressed bipolarity of man torn between the extremes of possessive and insatiable selfishness and of the fear of annihilation. It was certainly continued first by Darwinians and then by sociobiologists. There is an interesting analogy between Darwinism and the metaphor of universal war. As we noticed, *bellum omnium contra omnes* is a fiction. The same is valid for the Darwinian fight tooth and nail.[16] Contemporary biology assures us that nothing like that takes place in nature.

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[12] See: Patricia Springborg "Hobbes on Religion", (in:) Tom Sorell (ed.) *The Cambridge Companion to Hobbes*, Cambridge University Press, Cambridge 1996, p. 346–380.

[13] There was surely a biographical analogy between them, nonetheless a perverted one. The Malmesburian fled to the Continent on the eve of the Civil War, then returned and put himself at Cromwell's mercy. Nothing happended to him after the Stuart Restoration. Schmitt greeted the Nazi revolution with hope, soon fell into disfavour with the new government, reprisals against him being halted only by Göring. After 1945 he was interned for a year and even became a "possible defendant" in a planned trial in Nurnberg.

[14] Cf. Michael Hollerich "Carl Schmitt", (in:) Peter Scott & *al.* (ed.) *The Blackwell Companion to Political Theology*, Blackwell, Oxford 2004, p. 109–122.

[15] He declared that the secret keyword of his spiritual and journalistic existence is "the struggle for properly Catholic intensification (*das Ringen um die eigentlich katholische Verschärfung*) against neutralisers, aesthetic sluggards (*ästhetischen Schlaraffen*), against aborters, cremators and pacifists"; Schmitt Glossarium, *Aufzeichnungen der Jahre 1947–1951*, ed. E. von Medem, Duncker & Humblot, Berlin 1991, entry from 16 June 1948.

[16] "Who trusted God was love indeed / And love Creation's final law / Tho' Nature, red in tooth and claw / With ravine, shriek'd against his creed." – Alfred Tennyson *In Memoriam A.H.H.*, Canto 56 (a 1849 poem, predating Darwin's *On the Origin of Species*).

A possibility of a direct relation between Hobbes and Darwin is quite another point. The latter nowhere mentions the former.[17] However, critics and supporters of Darwin quickly noted the similarity between them, as did Asa Gray:[18]

> Curiously enough, Mr. Darwin's theory is grounded upon the doctrine of Malthus and the doctrine of Hobbes. The elder DeCandolle[19] had conceived the idea of the struggle for existence, and, in a passage which would have delighted the cynical philosopher of Malmesbury, had declared that all Nature is at war, one organism with another or with external Nature; and Lyell[20] and Herbert[21] had made considerable use of it. But Hobbes in his theory of society, and Darwin in his theory of natural history, alone have built their systems upon it. However moralists and political economists may regard these doctrines in their original application to human society and the relation of population to subsistence, their thorough applicability to the great society of the organic world in general is now undeniable.[22]

Historians of evolutionism notice something analogous to the fact noticed by Macpherson in the history of political doctrines: the Enlightenment which gave rise to the classical evolutionism (of course pre-Darwinian), liked the idea of unchangeable human nature, however in its Lockean, and not Hobbesian version.[23]

Let us remember that Hobbes was not an evolutionist, and displayed little interest in ancient evolutionism which was certainly well known to him. In a much quoted passage from *De Homine*,[24] supports the eternality of the human race, prudently invoking the Bible. In *De Cive* he gave the famous mushroom analogy: "Let us return again to the state of nature, and consi-

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[17] Electronic search in the database of Darwin's writings.

[18] Asa Gray (1810–1888) – American botanist.

[19] Augustin Pyrame de Candolle (1778–1841) – Swiss botanist.

[20] Charles Lyell (1797–1875) – English geologist.

[21] William Herbert (1778 – 1847) – English botanist and Anglican clergyman.

[22] Gray [Review of Darwin's] "On the Origin of Species by Means of Natural Selection", *American Journal of Science and Arts*, vol. **29**, series 2, no. 86 (March 1860), p. 170. Reprinted in: *Darwiniana: Essays and Reviews Pertaining to Darwinism*, D. Appleton & Co., New York 1884, p. 37.

[23] Peter J. Bowler *Evolution: The History of an Idea*, University of California Press, Berkeley 1989, p. 96.

[24] "De origine generis humani sententias philosophorum antiquissimorum fuisse celeberrimas duas (...). Alteram eorum, qui, cum mundum eternum, esse statuissent, necesse habebant etiam hominum genus ab aeterno extitisse dicere. Alteram eorum qui mundum definito tempore incepisse existimabant (...) Qua mollitie telluris, in locis soli subjectioribus, factum esse ajunt, ut in locis paludosis tumores sive pustulae quaedam enascerentur, membranulas habentes ex quibus post perustis perfractisque omne genus animalium, etiam homines, excludebantur. Propinqua quidem haec sunt iis quae traduntur in capite primo Geneseos, sed non eadem." – *De Homine* I.1 [LW2, 3–4].

der men as if but even now sprung from the earth, and suddainly (*like* Mushromes) come to full maturity without all kind of engagement to each other (...)".[25] It again serves as a thought experiment demonstrating the essence of human relations.

Hobbes did much for deconstruction of the Scholastic psychology including abolition of the will as one of the two main mental faculties. Will was for him a resultant of desires.[26] Today, will is rarely mentioned in textbooks of psychology, if so, rather as a historical term. English Jesuit Joseph Rickaby[27] (who really read Hobbes, unlike many of his critics) placed the Malmesburian, together with Locke, Hume, and Mill, as a main figure of British determinism which is the second tradition we wanted to mention here.

The problem of *will*, understood as an independent faculty of the soul and placed in a theoretical framework of human psyche is now completely separated with the problem of *free will*, a supposed ability to decide one's own actions. It is almost needless to remind that we have four positions here:

1. Free will ("libertarianism").
2. No free will (coercionism).
3. Universal determinism.
4. Universal indeterminism.

Hobbesian compatibilism joins positions 1. and 3., as we know from his polemics with Archbishop Bramhall. Not many of us are interested in how Hobbes personally reconciled both elements of compatibilism. It is important that it corresponds with some commnon intuitions – as the opposing view presented by Bramhall:

> Either I am free to write this discourse for liberty against necessity, or I am not free. If I be free, then I have obtainde the cause, and not to suffer for the truth. If I be not free, yet I ought not to be blamed, since I do it not out of any voluntary election, but out of an inevitable necessity.[28]

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[25] *De Cive* VIII.I., p. 117 [*EW*2, 108–109] [*De Cive* is quoted after the Clarendon editon: *De Cive: The English Version*, ed. Howard Warrender, Clarendon Press, Oxford 1983].

[26] Or "the last appetite in deliberation"– *Leviathan* I.6., p. 44 [*Leviathan* is quoted after: *Leviathan*, ed. Richard Tuck, Cambridge University Press, Cambridge 1991]; *De Corpore*, IV.25.13 [*EW*1, 409].

[27] Rickaby *Free Will and Four English Philosophers (Hobbes, Locke, Hume and Mill)*, Burns & Oates, London 1906. The author first declares concern "that my reader should not be determinist" (s. VIII), however in the final section he writes "The determinist, in England at least, shuts his determinism up with his books; and, in active life, uses his free will vigorously" (s. 234).

[28] *Vindication of True Liberty from Antecedent and Extrinsecal Necessity*, (in:) *The Works of the Most Reverend Father in God John Bramhall, D.D.*, vol. **IV**, J. H. Parker,

We prefer not to discuss here whether the four listed positions actually include all theoretically important elements of the free will controversy. Surely, the controversy still focuses on them, shifting from one point to another.[29]

Recently, the claim that we *lack* free will became fashionable again, often associated with vague claims of so-called "genetic determinism":

> In recent decades, with advances in psychology, sociology, and neuroscience, the notion that certain patterns of human behavior may ultimately be due to factors beyond our control has become a serious cultural concern. In our society, the possibility that criminal behavior, for example, may be caused by influences in upbringing or by abnormal features of the brain is very much a live hypothesis. Furthermore, many people agree that criminals cannot be blameworthy for actions and tendencies produced in this way. At the same time, most assume that even if criminal actions frequently have this sort of causal history, ordinary actions are not similarly generated, but rather are freely chosen, and we can be praiseworthy or blameworthy for them.[30]

Apart from the scope of the controversy, three things remain unchanged since Hobbes. First, the Hobbesian solution of the paradox of compatibility by combining determinism with restricting liberty to the lack of *external* constraints[31] still has supporters.[32] Second, both compatibilism and incompatibilism focus not on reconciling liberty with *ontological* freedom of the will, but on reconciling liberty with ethical counterpart of the latter, namely responsibility. Third, self-confidence of adherents of positions 3. and 4. remains unchanged. As we still do not have a physical theory of everything, so both the universal determinism and indeterminism remain doubtful generalisations of our actual knowledge.

Much was written about philosophy, especially bad philosophy invading the domain of natural sciences and depraving innocent souls of scientists. Perhaps it is time to say something about the reverse phenomenon. Hobbes

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Oxford 1844, p. 23. Reprint: *Bramhall's discourse of liberty and necessity*, (in:) *Hobbes and Bramhall on Liberty and Necessity*, ed. Vere Chapell, Cambridge University Press, Cambridge 1999, p. 1.

[29] A review of contemporary positions: Robert Kane (ed.) *The Oxford Handbook of Free Will*, Oxford University Press, Oxford 2003.

[30] Derek Pereboom *Living Without Free Will*, Cambridge University Press, Cambridge 2001, p. XIII.

[31] *Leviathan* I.6, p. 45 [EW3, 48–49].

[32] In Poland Bogusław Wolniewicz, see "Determinizm i odpowiedzialność" [Determinism and responsibility], (in:) *Filozofia i wartości* III, WFiS UW, Warsaw 2003, p. 113–119.

describes man "from inside" and "from outside".[33] His archaic – and precursory – "internal physics" contrasts with his picture of social interactions, much resembling contemporary econophysics and social physics. Econophysics links physics and economy, focusing now on financial markets and using a variety of tool taken from the arsenal of statistical physics.[34] Despite a new name (coined in the 1990s), if considered as a research tradition it can be traced back at least to Vilfredo Pareto at the turn of 19th century. Social physics is broader in scope and ambitions, aiming at extending physical methods not only on the whole economy, but on other social disciplines as well.[35] Social physics refuses to "look inside the man", settling for a description of interactions of social atoms and their aggregates. Nevertheless, some tacit assumptions concerning the construction of human being must be made. As in the case of sociobiology,[36] they have much in common with the bipolar Hobbesian model of man. All seemingly altruistic actions should result from combinations of desire and fear.[37] Statistical simplifications inevitably made in sociophysics resemble another Hobbesian premise: the basic equality of men.[38]

In geometry two vectors span a plane, and not a three-dimensional space. Something analogous is valid in ethics, too. We doubt that non-selfish attitudes can result even from the most clever summation of selfishness and the self-preservation instinct. The same concerns other ideas still pertaining to the liberal ideology as the infamous Benthamian calculus, reportedly enabling summation of "happiness and misery". Their persistence is another problem, calling not for explanation but for a practical solution.

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[33] Piotrowski "Physical Anthropology of Thomas Hobbes", p. 180.

[34] Rosario N. Mantegna & *al.*, *An Introduction to Econophysics: Correlations and Complexity in Finance*, Cambridge University Press, Cambridge 1999; Arnab Chatterjee *Econophysics of Markets and Business Networks: Proceedings of the Econophys-Kolkata III*, Springer, Milan 2007. The mentioned physical methods include among others: power laws and scaling, generalised statistical correlation, stochastic processes; see Mantegna, *op. cit.*, Ch. 1.

[35] Nicholas Georgescu-Roegen *The Entropy Law and the Economic Process*, Harvard University Press, Cambridge, Mass. 1971; Philip Mirowski *More Heat Than Light: Economics as Social Physics, Physics as Nature's Economics*, Cambridge University Press, Cambridge 1989; B. K. Chakrabarti & *al. Econophysics and Sociophysics: Trends and Perspectives*, Wiley-VCH, Berlin 2006.

[36] On analogies between Hobbesian anthropology and sociobiology, see e.g.: Johan M. G. van der Dennen "Human Evolution and the Origin of War: A Darwinian Heritage", (in:) *idem* & *al.* (eds.) *The Darwinian Heritage and Sociobiology*, Praeger, Westport, Conn. 1999, p. 163–164.

[37] See the story of Hobbes and a beggar from Strand: John Aubrey *Aubrey's Brief Lives*, vol. 1, ed. Andrew Clark, Clarendon Press, Oxford 1898, p. 352.

[38] *Leviathan* I.13., p. 87 [*EW3*, 110].

S U M M A R Y

Modern continuations of anthropology and so called "theology" of Hobbes are reviewed, including his phenomenalist theory of space, anthropological monadology, theory of international relations, relation to evolutionism, and compatibilist account of free will. Further analogies with modern doctrines, as econophysics are also considered.

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THE CONCEPT OF UNIVERSALS
AT THE BEGINNING OF JESUIT PHILOSOPHY

1. Introduction

There is a common conviction that the philosophical issues of the early scholasticism were centred around the classical concept of *universalia*. What is more: throughout all philosophical periods, beginning from the ancient times up to the modern times this concept was of the paramount importance to philosophy – both on the epistemological and metaphysical field. It was undoubtedly very important in the Middle Ages when philosophers made it the top criterion of distinction and differences among them and their philosophical thoughts.[1]

The restoration of scholasticism in the 16th century renewed discussions about the nature of *universalia* and thus heated disagreements among *the antiqui* and *the moderni* – e.g. supporters of different types of realism and nominalism – were being continued.[2] In other words: realists were supposed to belong to *via antiqua* schools – they were primarily Duns Scotus's followers, whereas Wilhelm Ockham's followers were in favour of the radical reism. There were different philosophical stances in this respect but realism and reism were dominant and they were the basis to differentiate between the old and the new way of looking at that problem and its various categories.

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[1] See among others the following books: S. Swieżawski, *Dzieje filozofii europejskiej w XV wieku*, vol. III: *Byt*, Warszawa 1978, pp. 19–21, 287–288; E. Gilson, *Historia filozofii chrześcijańskiej w wiekach średnich*, translated by S. Zalewski, Warszawa 1987, p. 142; J. Maréchal, *Le point de départ de la Métaphysique*, Louvain 1927, p. 76; J. Paulus, *Henri de Gand. Essai sur les tendances de sa métaphysique*, Paris 1938, p. 69; C. Giacon, *Guglielmo di Occam*, vol. I, pp. 48–49, 128–129; G. Manser, *Das Wesen des Thomismus*, Freiburg 1935, pp. 207–208.

[2] See, Swieżawski, *op. cit.*, p. 20.

Philosophers of the newly founded Jesuit Congregation join in not only in the flow of discussions on the above mentioned subject but also their philosophical conclusions are introduced in a syllabus curriculum of school education. Later they marked the way of the philosophical thought in the 17th century. In those times it was virtually impossible to be present in philosophy without a reference point – most philosophers of the time were dedicated to the Jesuit philosophy – and that was Francis Suarez and his philosophy. Jesuits among others were supporters of the notion that the direct and suitable subject of the intellectual acquisition is the individual being.[3] This conclusion led to the very realistic or concretistic approach to definition of general terms. Were they represented by the philosophy of Jesuits as a result? This article is aiming at answering this basic question on the grounds of Fonseca's philosophical doctrine – one of the most prominent Jesuit philosophers on the outset of the philosophical activity of the order.

2. Disputes among realists and nominalists

As far as universals are concerned, generally speaking, a question of the existence of generality was expected to be answered. Realists – taking into account the fact of differentiation between *ante rem*, *in re* and *post rem* claimed that the existence of universals is possible in the three above mentioned forms but they seemed to understand it in many different ways. Nominalists, on the other hand, claimed that the existence of generality was impossible and was a kind of the conventional outcome of language.[4]

At the beginning of the modern times reistic nominalism found its ground for development as it was assisted by the notional realism. The concept of fundamental realism did not benefit the goodness of theology and the orthodox theology, thus it was in disfavour and there was a saying: *Universalia realia sunt haeresis seminaria* (the real *universalia* are the grounds for heresies). So this kind of approach to fundamental realism resulted in a development of different forms of niminalism: buridan and ockhamism in the first place.[5]

The philosophical thought of Francis Suarez reflects those tendencies: he is the one to claim that the nominalists' thinking is not far from the real doctrine. Ideas of the nominalists – he wrote in his *Disputationes me-*

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[3] See, K. Gryżenia, *"Primum cognitum" w filozoficznej szkole jezuickiej*, in: *Philosophia vitam alere*, edited by S. Ziemiański SJ, Kraków 2005, pp. 183–198.

[4] See, Swieżawski, *op. cit.*, p. 288.

[5] See, *ibidem*, pp. 30–31, 289.

taphysicae – are rejected on the grounds of their presentation but in natural fact they were rational. Nominalists are of the opinion that natures that are described as universal and common are non-existent in objects but exist as object of the intellect solely. They are wrong to say, however, that scientific proofs and definitions are not grounded in things. According to Suarez, everything that is associated with terms is simultaneously reflected in the definite things.[6] Carlo Giacon states that Suarez defends in his declarations and opinions moderate realism of Thomas Aquinas, and being in opposition to the fundamental realism of Duns Scotus and nominalism of Ockham but in his philosophical thought, in natural fact, becoming similar to the later.[7]

In the theory of Suarez one cannot notice considerable influences of Scotus's philosophy, and that is why his speculations on the grounds of general terms i.e. *universalia* are out of accordance with thomism[8] and in fact brings it closest to nominalism of Ockham. When Suarez verbally criticises nominalism – Silvia notices – then it is worth studying Fonseca's dissertation on the subject.[9]

The latter, on the other hand, being in a constant conflict with nominalists was criticising them severely.[10] It was – most likely – due to the fact

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[6] See, F. Suarez, *Disputationes metafisicas*, Ed. Y trad. S. R. Romeo, S. C. Sanchez y A. P. Zanon, vol. I, Madrid 1960, d. VI, sec. 2, p. 1; see also C. Giacon, *La seconda scolastica*, vol. II: *Precedenze teoretiche ai problemi giuridici, Toledo, Pereira, Fonseca, Molina, Suarez*, Milano 1947, pp. 225–226.

[7] C. Giacon, *La seconda scolastica*, vol. II, pp. 225–226.

[8] Numerous authors are of such an idea: C. A. Ferreira da Silva, *Teses fundamentais da gnoseologia de Pedro da Fonseca*, Lisboa 1959, p. 8; J. Alejandro, *La gnoseologia del Doctor Eximio y la acusacion nominalista*, Comillas 1948; L. Feutscher, *Akt und Potenz*, Innsbruck 1933; R. Gironella, *La sintesis metafisica de Suarez*, "Pensamiento" IV (1948), pp. 169–213.

[9] Silva, *op. cit.*, p. 28. Fonseca outlines his doctrine about universals at length: commenting in the first place books V and VII *Metafizyki* of Aristotle. See first of all: P. Fonseca, *Commentariorum in libros Metaphysicorum Aristotelis Stagiritae*, vol. II, Coloniae 1615, 947 A – 987 F (issues I–IV). The above mentioned edition was based on: P. Fonseca, *Commentariorum in libros Metaphysicorum Aristotelis Stagiritae*, Coloniae, vol. I–III, 1615; vol. IV, 1629; reprint of all: Hildesheim 1964. In vol. I i II *Commentariorum* so called *quaestiones* are presented in two columns on each page. Columns are divided into sections from A to F. Further citation: *Commentariorum* II, 947 A – 987 F, in which II means volume, Arabic letters – suitable columns, letters od the alphabet – sections of the columns.

[10] "Ubique de hac re agitur, perpetua nobis sit ea cum Nominalibus quos illi plane sequuntur, contentio". *Commentariorum* III, 410b E. "Sunt enim nominales, ut multiplicitatis realitatum, entitatumve, et essentiarum osores". *Ibidem*, 303a C. In volume III the author of the work still keeps to the division of the book into columns and sections on each page but columns do not have a separate number system: they have just page numbers. In order to make it clear which column I cite, I introduce the following letters: a and b. Thus 410b E and 303a C.

that he himself had been accused of favouring nominalism. For this reason
– being at the same time aware of the objections[11] of others against him
– he was passionately trying to prove its groundlessness.[12] Nominalists of
his time he tended to compare with those of the ancient times, primitive
philosophers like: Heraclitus, Antisthenes and Epicures, who – perceiving
individual beings to have nothing common and permanent in them – re-
jected any sureness of knowledge.[13] More contemporary philosophers, and
Wilhelm Ockham in particular, says Fonseca, did not negate the validity of
knowledge but still kept limiting it to general terms which had no equivalent
in reality.[14] Nominalists – writing about the existence of common natures
and accepting purely identity of terms – proved to be unworthy to label
them as philosophers.[15]

In the times of the first Jesuit philosophers, it seems that realism and
nominalism are in opposition to one another and are unacceptable as such.
They received in that respect critical reviews. Having criticised them, Fon-
seca himself moves onto the next stage: he outlines his own theory on the
subject. To his mind – unlike nominalists – common natures do exist in

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[11] "Non desunt tamen, qui dicat, nos libro 5. postquam impugnavimus eam Nomi-
nalium sententiam, qua tollunt de medio omnem differentiam individuantem, et naturas
omnes, quas communes dicimus, afferunt esse ex se ipsis individuas, iterum in impugnatam
sententiam incidisse". *Ibidem*, 410b D.

[12] See, *Commentariorum* II, 951 B – 956 E (sections I–II). The fact that Fonseca was
opposed to nominalism mentions: C. Giacon, *O Neo-aristotelismo de Pedro da Fonseca*,
"Revista Portuguesa de Filosofia" 9 (1953), p. 409; D. Martins, *Essencia do Saber filoso-
fico, segundo Pedro da Fonseca*, "Revista Portuguesa de Filosofia" 9 (1953), pp. 399–401;
Silva, *op. cit.*, p. 28.

[13] "Occasionem huiusmodi Philosophis dederunt Heraclitus, Antisthenes, et Epicurei,
qui cum singularia omnia fluxa et caduca esse crederent, neque in eis stabile quicquam
conciperent, scientiam omnem, certamque rerum cognitionem de medio tollebant. (...)
Huius opinionis, veterum Scholasticorum realium industria pene iam sepultae, instaura-
tor fuit Guillelmus Ockham, Scoti auditor, homo ingeniosus quidem, sed novarum rerum
studiosior, qui apud recentiores Nominales tantum authoritatis obtinuit, ut quasi novam
philosophandi viam primus invenerit, venerabilis inceptoris nomen assequutus sit". *Com-
mentariorum* II, 951 D – 952 A.

[14] "Nullam etiam, quemadmodum et illi communem naturam, quae per se stabilis es-
set, et constans, in singularibus esse arbitrarentur: quanquam non negarunt, plurima esse
singularia stabilia et perpetua, de quibus, quia singularia essent, et quae haud proprie
definiri possent, scientiam quoque proprie haberi nolverunt". *Ibidem*, 951 E–F. "Sed no-
minales (quod eorum pace dixerim) dum omnem rerum inter se communionem de medio
tollunt, nullamque omnino cum alia in natura ulla communi, sed in solis earum commu-
nibus vocabulis convenire dicunt: sepsos Philosophorum choro indignos esse ostendunt".
Ibidem, 953 C–D.

[15] See, previous footnote and: "Nomina enim nec sunt in pluribus, cum singularia
qaedam entia sint, nec de pluribus dicuntur, nisi ratione rerum, pro quibus sumuntur,
tamen importunum quoddam Philosophorum genus facit, ut quaestionem hanc discutia-
mus". *Ibidem*, 951 C.

reality and against Scotism such nature is universal. Is this reason sufficient enough to talk about his proposed moderate realism?

There have been so far two different outlooks and interpretations of the matter in respect of Fonseca's understanding of the problem. Cassiano Abranches in one of his reviews presents Fonseca as a representative of moderate term realism.[16] Abranches notices that Fonseca is generally regarded to be the author of the radical term realism; not mentioning who the authors actually are.[17] Abranches is opposed to such assessment since to his mind the main works of Fonseca suggest something different i.e. moderate realism of St. Thomas Aquinas.

Diamantino Martins and Custódio Augusto Ferreira da Silva claim that philosophy of Abranches is closest to Duns Scotus, who was considered to have represented radical term realism.[18] This divergence of interpretations of Fonseca needs closer attention and more analyses of his theory.

3. Unity and ability to multiply through crucial properties of universals

Fonseca begins his considerations by giving three ways of understanding universals: a) in cause (*in causando*), b) in signification (*in significando*), c) in predication (*in praedicando*).[19] He thinks that only in predication is there the proper sense of universals, since it denounces its full meaning. Thus, he puts forward further aspects:

1. Universals are those general terms, such as: "substance", whose existence is of paramount importance or "animal", which is a subordinate genus. These universals are in themselves timeless; they are not born and they do not perish.

2. As far as correlation of generality and particular things are concerned, they depend on the same nature and time: i.e. they are unable to exist independently; and we cannot comprehend their existence independently.

3. According to the propriety of universality (*ratio universalitatis*) as something indirect one can adopt the first meaning, and that can be the basis for the latter.[20]

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[16] C. Abranches, *A Teoria dos Universais em Pedro da Fonseca*, "Revista Portuguesa de Filosofia" 12 (1956), pp. 291–298.

[17] *Ibidem*, p. 291.

[18] Martins, article cited, pp. 401–403; Silva, *op. cit.*, pp. 7–40.

[19] "Universale (...) tamen apud Philosophos tribus modis potissimum usurpatur: in causando, ut aiunt, in significando, in praedicando". *Commentariorum* II, 947 C.

[20] See, *ibidem*, 949 D–F.

Fonseca draws our attention to the third point of the issue saying that the philosophical disputes concentrate on that meaning. Discussing the problem of universals, Fonseca claims that of paramount importance it is to elucidate the fact it whether *ratio universalitatis* is prior to or rather later than individual beings. Referring to the ongoing discussion, he points to its beginnings in the classical period of the ancient times. He reminds us that for Plato universals are prior to individual beings and that they do exist in reality and independent of them. For Aristotle, on the other hand, they are posterior to them and separated from them in the abstract way: that gives them objective existence in the mind and they are at the same time identical to the natures of individual things.[21]

Fonseca is of the opinion that universals are generally understood as "something unique and able to exist parallelly in different things and (consequently) they can define many beings";[22] or adequately "something unique existing in different individual things and defining many"[23] thus *universale in essendo* and *universale in praedicando*. To put it briefly – universals are defined by their own oneness and their ability of realisation in many different objects and consequently ability to define many. These two essential parts of universals – oneness and ability to multiply – cannot exist independently without simultaneous negation of identical predication of many things.[24]

Oneness, intrinsic to universals, according to Fonseca is connected with the nature of things and the latter is existent in many different forms. As a result, Fonseca talks about three forms of nature and relevant to them three forms of oneness, following the Scotus notion of the common nature and the Avicennian understanding of the third nature; as well as referring to the classical differentiation of universals: *ante rem*, *in re* and *post rem*.

1. The state of priority in which common nature proceeds individualisation.

2. The state of limitation in which nature is restricted to individual differences, identifying with them at the same time.

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[21] *Ibidem*, 950 A–B.

[22] "Unum quid aptum ut insit in pluribus et (consequenter) ut praedicetur de pluribus". *Ibidem*, 950 C.

[23] "Unum quid in multis et de multis". *Ibidem*, 947 D.

[24] "Primum est unitas rei, non nominis tantum, sed rationis etiam; alterum aptitudo, ut in multis insit per modum identitatis, ac proinde, ut eo pacto de multis dicatur. Nam neque unitas sine aptitudine, neque aptitudo sine unitate satis est, ut rem faciat vere ac proprie universalem: siquidem analoga, ut ens, suo modo apta sunt, ut in multis insint". *Ibidem*, 950 C–D. These two characteristics of the universals that are discussed by Fonseca are also considered by Silva, *op. cit.*, pp. 34, 37; Abranches, article cited, p. 292.

3. The state of simplicity (*praecisionis*), i.e. abstract in which nature is separated from individuality. Each state of this kind of nature is characterised by adequate oneness.

In the first state nature is characterised by a certain universal oneness prior to any intellectual activity. Common natures are deprived – as it may seem – of the universal oneness when restricted to individuals. In the second state nature maintains oneness with the individual things that are identified with them. Finally, in the third state nature in the abstract, by means of intellectual process, is characterised by the universal oneness, i.e. oneness of simplicity (*praecisionis*).[25]

Fonseca, in spite of the differentiation, still asks what the oneness of the common nature is. For this reason he introduces further terms which demand particular attention of the reader. From the outset of these rather intricate disputes he states that the characteristic of the universality of nature is not true to say when considering its various forms. Thus universality seems to have different values depending on a form of nature it belongs to. Of paramount importance is the nature before and after thing – emphasizing the first form of the existence of nature. The author suggests: "Oneness of universals is not characteristic of themselves unless it is prior to its specific substance in particular things".[26] And he gives an example saying: if "animal" is prior in being to "rational" and "irrational", thus refers to humans and animals; in the same way "man" is one of universals before he is – due to individual qualities – restricted to an individual being.[27]

Oneness being intrinsic to natures as such and natures meant as absolute natures – therefore nature prior to its specific substance in particular things – is not the oneness in the numerical sense in its simplicity (*simpliciter*).[28] Neither is it oneness purely formal,[29] but oneness of its specific kind, proper to natures in the state *ante rem*.[30] Fonseca calls this oneness either a mixtum

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[25] See, *Commentariorum* II, 960 A – 962 B (section II).

[26] "Unitas universalium non est ipsis propria, nisi quatenus illa praecedunt contractionem sui ad particularia". *Ibidem*, 961 A.

[27] "Veluti animal, quatenus paecedit contractionem sui per rationale et irrationale ad hominem et bestiam; itemque homo, quatenus praecedit contractionem sui per differentias individuantes ad particulares homines". *Ibidem*, 961 A–B.

[28] "Unitatem rerum universalium propriam non esse numerarem simplicitem, sive qua numerantur res omnino singulares, ut homines singuli aut equi". *Ibidem*, 960 A.

[29] "Unitatem rerum universalium propriam esse ex genere formalium, saltem puro". *Ibidem*, 960 B.

[30] "Eam unitatem, quam quaerimus esse ex genere earum, quae sunt quidem peculiares rerum communium non proprie tamen illis per se conveniunt, nisi quatenus naturae ordine praecedunt contractionem sui ad particularia". *Ibidem*, 960 D.

unity coming from the numerical and formal oneness or a unity of simplicity (*unitatem praecisionis*), which is proper to universals *post rem*.[31]

The discussed author notices that this terminology does not solve all problems in this respect yet. He states that the terms "a mixtum unity" or "a unity of simplicity" entitle us to use other terms such as "a numerical unity" or "a formal unity". It seems that Fonseca used additional terms: "numerical unity of simplicity" and "purely formal unity" suggesting further possibilities of deduction. Thus, each term is adequate. Giving his reasoning of the following terms, Fonseca uses the term "unity of simplicity" to distinguish it from "formal unity" and to say that he means the nature whose oneness is of no kind – namely just before becoming existent in particular things.

He is of the opinion that this state of nature should be called "a mixtum unity" constituting as a result of "formal and numerical unity" since common natures are the result of forms of particular things. Fonseca is evidently aware that this unity is to a certain extent a formal unity being multiplied in individuals as well as the numerical unity limiting the number of the proper natures – and that is impossible when considering purely the formal unity. Thus, the formal and numerical unities are compatible and they create a new kind of unity the "mixtum unity". The common nature is therefore indefinite and not constrained. Apart from its common existence and prior indifference to the state of individuality, one cannot say anything about it.[32]

4. Avicenna and Scotus's origin of the doctrine

Fonseca's common nature equipped in *ex natura rei* – i.e. its own comprehensible oneness – is of Avicenna and Scotus's origin. Nature itself, for Avicenna as well as for Duns Scotus, is neither common nor particular but

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[31] "Unitatem, de qua est controversia (...) praecisionis appelavimus. Unitas universalium mixta ex formali et numerali dici potest". *Ibidem*, 961 D. More on the subject of understanding of the following types of oneness write: Abranches, article cited, pp. 292–294; Martins, article cited, pp. 401–402.

[32] "Si ad generalem divisionem unitatis in numeralem et formalem revocanda est, etsi quodammodo mixta ex formali et numerali dici potest: tamen numeralem potius appellandam esse. Cur autem praecisionis dixerimus, illa est ratio: quia non convenit rebus, quae denominantur universales, nisi praecise in eo prioritatis gradu, quo illa praecedunt contractionem sui ad sua particularia, quod autem quodammodo mixta dici possit". *Commentariorum* II, 961 D–E; see, *ibidem*, F. Bargieł, *Kazimierz Ostrowski i jego wkład w unowocześnienie filozofii scholastycznej*, Kraków 1990, p. 31.

as if neutral and indifferent to individuality and generality. Then, nature is "anterior" its individuality as well as "posterior" its generality. It is pure potentiality and nothing else. Since it does not possess differentiation and it is indefinite and not constrained – it can become either specific in the particular things or common in the intellect. It possesses its own *modus* i.e. its own way of existence. Duns Scotus – following the pattern of the third nature by Avicenna – admits that nature itself has priority equally in relation to the specifically existing reality as well as to the creating and acquisition of a term.[33]

Fonseca understands nature in the way portrayed above although he notices certain specific differences in understanding its universality. According to Scotus the universality of nature in non-existent without prior working of the intellect. The common nature possesses in itself no universality – it acquires it through the working of the intellect. In the process of intellectual acquisition the intellect – according to Dr Subtelny – plays the role of *father*, and the object of acquisition plays the role of *mother*. He has a tendency to underline the role of the intellect which coincidently meets a nature of some kind and creates an object of recognition in the state of an undetermined generality.

Consequently, Fonseca ascribes to the common nature – considered in the state prior to its individual existence and multiplication in the individual things – universality (which can be repossessed by nature by means of the abstract working of the intellect) and calls it adjustable, potential, fundamental or multiplying. A characteristic of this type of nature goes down to two inseparable qualities: the unity of simplicity and the ability to multiply. It possesses its *modus* as well, i.e. its internal way of existence. It is not, however, its actual modus of existence, but – Fonseca claims – positive, potential, and separated i.e. independent of particular things and the intellect. The problem of the existence of nature Fonseca explains in the following way: "one can say that the adjustable universality is not the actual way of existence as there is the very act of being in many things which we call actual – as it is in the nature of things, in the intellect – but it is the potential way of existence: such as the way of existence of some effect in its cause; and finally it does not exist in the way of total separation as it is in the case of the existence of incidental and necessary, complete or incomplete beings: but it is separated in the way the existence of things

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[33] See, E. Gilson, *Byt i istota*, translated by P. Lubicz i J. Nowak, Warszawa 1963, pp. 107–116.

in their causes. Therefore, particular things cease to exist in their causes (then we talk about their existence outside causes), universals in the same way, if they are dependent on the individual differences, they are dependent on their causes; and when they become abstract they begin to exist independent of the differences i.e. subjectively in the mind, and due to this reason the adjustable universality is possible".[34]

Fonseca concerned himself with giving subjective value for notional acquisition and prompted him to claim that the formal notion, as far as objects are concerned (a parte rei), corresponds to a certain reality formally distinguished.[35] There is also one condition according to which every formal notion, distinguished in the mind, should have its own separate formality in the reality. It is not possible for one adequate term to express the whole subject in its integrity. On the contrary: one particular object may have many different terms which describe its actual existence and point to its many different formalities. Each formality possesses in its essence its own and proper existence different from the existence of an individual object; separated from it, though.[36]

The above presented concept of parallelism between the notional and real orders shows clearly that Fonseca's stance in this regard is close to that

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[34] "Dicere enim possumus, hanc aptitudinem esse modum essendi intrinsecum rebus quae denominantur universales, hoc est, non per aliam entitatem eis convenientem: non tamen esse modum essendi actualem, ut est ipse actus essendi in pluribus multoque; minus eam, quam vocamus actualem existentiam, sive in rerum natura, sive in intellectu, sed esse modum essendi potentialem, ut etiam est modus essendi cuiusque effectus in sua causa: ac denique non esse modum essendi omnino inseparabilem, ut sunt necessarium esse et contingens, finitum et infinitum; sed modo aliquo separabilem, ut est modus essendi rerum in suis causis. Nam quemadmodum res singulares, postquam productae sunt, desinunt esse in suis causis (unde et extra suas causas esse dicuntur) ita res, quae denominantur universales, si desinant abstrahi a differentiis individuantibus, desinent quoque habere aptitudinem essendi in pluribus suo modo existentem, nempe obiective, qua sola ratione ea aptitudo existere potest". *Commentariorum* II, 974 F – 975 B.

[35] "Peto... utrum univocata conveniant in solo nomie et ratione formali quae in mente est, an etiam in ratione aliqua obiectiva, quae sit in ipsis rebus univocatis. Certe non dicent in solo nomine, et ratione mentali, sed in ratione etiam aliqua obiectiva, quae sit in rebus: alioqui plane faterentur se Nominales non modo re ipsa, quod non omnino negant". *Commentariorum* III, 383b E–F.

[36] "Potest enim intellectus, ea quae non univoce, sed analogice tantum conveniunt, unire in unum conceptum formalem, aut omnino confusum, aut partim confusum, partim distinctum, sive expressum, ut diximus... eaque dicere in rebus ipsis aliquo modo secundum eum conceptum esse unum, non tamen efficere potest, ut vel is conceptus formalis sit omnino unus in repraesentando, vel in rebus ipsis illi respondeat obiectum omnino unum". Ibidem, 393b E–F. "Dicendum est: etsi intellectus tantam vim habet, ut distinctissima ac disiunctissima etiam uno simplici conceptu apprehendat, nempe quatenus ea unum aliquid efficiunt, sive simpliciter, sive secundum quid, nunquam tamen concipere posse univoco conceptu quae analogice tantum natura sua conveniunt". *Commentariorum* II, 512 D–E; see, *ibidem*, 398 F – 401 E (section II); III, 296.

of Scotus for whom parallelism was a necessary condition of the subjective value of our acquisition.[37]

At this stage, one should be aware of certain nuances and differences in the terms used by Fonseca and those used by Scotus, although Fonseca followed the latter in the matter.[38]

It is commonly believed that Dr Subtelny was of the opinion that the ability of nature – in order to distinguish many individual beings – does not belong to the common nature *per se*, but such an ability is possible when it becomes *intentio prima* in the intellect. It is interesting to notice that the two philosophers (Scotus and Fonseca) carry on their deliberations on two different levels: theoretical and metaphysical. Fonseca, talking about the universals capable of multiplying in many objects and consequently able to describe many: thus talking about the universals *in essendo* and *in praedicando*, he pays attention to the universals *in essendo* in the first place. He is not interested in the problem of the logical or cogitative universality, which seems to be an outcome of the intellect. Silva draws our attention to the fact that Fonseca and Scotus adopt two different stances on the matter: Fonseca focuses on universal *in praedicando*, the latter puts emphasis on universal *in essendo*. In other words, for the Franciscan master the universality of nature would be adequate first of all in predication, and for our Jesuit – in existence prior to individual objects.[39]

Intellectual abstraction, leading to purification of nature of all different and numerous individual conditions, according to Fonseca is purely objectifying the nature without its modifications. The intellect does not create the adjustable universality of nature but it is its cause; it makes that universality in the abstract gains the quality of the unity of simplicity and the ability of adjustment: i.e. the ability to multiply that was typical of nature in its state prior to its limitations to individual differences.[40]

If we wanted to do a synthesis of our considerations made up to the present, we can say that nature existing prior to its particular beings is

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[37] More on the Scotus's doctrine write among others: E. Gilson, *Jean Duns Scot. Introduction a ses positiones fondamentales*, Paris 1952, p. 180; P. Stella, *L'ilemorfismo di Giovanni Duns Scoto*, Torino 1955, pp. 84–85, 114–115; Giacon, *Guglielmo di Occam*, *op. cit.*, p. 179; Silva, *op. cit.*, pp. 25–28. It is worth mentioning that in the thomistic theory tere is a certain parallelism between concept acquisition and reality but, all the same, it is still different to the one defended by Scotus as well as – what we can see – by Fonseca. In the thomistic theory one cannot talk about clarity in logic and metaphysics; thus about the absolute oneness but proportional.

[38] The difference shows perfectly well Silva, *op. cit.*, pp. 36–39.

[39] *Ibidem*, p. 38.

[40] *Ibidem*, p. 39.

common in its act, it has its unity in simplicity and the ability to multiply; and it is nature's positive and separate, not actual but potential way of existence. In other words: it is universality *in essendo* or universality *ante rem.* In Fonseca's considerations this approach to the concept of universals gives universals a possibility of undetermined and potential way of existence – its determined and actual existence is guaranteed in the actual and real existence of particular things.[41]

Similar qualities like the unity of simplicity and the ability to multiply are also characteristic of universality *in praedicando*, i.e. *post rem.* It possesses actual universality and in fact existing in reality, though its existence is dependent on the intellect. Its formal unity is obtained due to processes of thinking in the abstract.

When, however, the common natures are constrained by individual differences, they are deprived of the unity of simplicity and multiplying universality. In particular objects the common nature is identical to individual beings. It has no longer its potential but actual existence. Thus, the common nature which is characterized as unity of precision (*praecisionis*) and has the potential way of existence is not capable of co-existing in particulars together with the actual and determined nature since it would be at the same time potential and actual, determined and undetermined – and that is obviously an absurd.[42]

Therefore, Fonseca claims on the one hand that the quality of universality is typical of common natures before their existence in particulars as well as abstract notions, on the other hand. Universal common natures are non-existent in reality but potentially, or in the state prior to individual beings or even in the process of abstract thinking. He thinks that the theory is consistent to that of St. Thomas Aquinas and other philosophers of scholasticism, like Albert the Great, Alexander from Hales, Avicenna, Aegidius from Rome and others.[43] This stance of Fonseca is presented in his

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[41] See, *Commentariorum* I, 758 A.

[42] "Naturam sequitur per se unitas formalis: modum autem essendi potentialem naturae, sive aptitudinem, ut sit in pluribus sequitur unitas praecisionis. Unde non mirum est, si unitas formalis descendat cum natura ad omnia eius particularia; cum tamen impossibile sit unitatem praecisionis cum natura descendere, nec sane alia ratione, nisi quia is modus potentialis aptitudove simul esse non potest cum natura actuata et determinata iam enim esset actuata et non actuata, determinata et non determinanta". *Ibidem*, 986 E – 987 A.

[43] "Naturas communes non solum habere suam univesalitatem in suis particularibus, verum neque ex seipsis esse universales, sed sola operatione intellectus universales effici. Afferunt autem D. Thomam, et poene totam Scholasticorum antiquitatem in suae opinionis confirmationem. Divus enim Thomas (...) non tantum afferit, sed etiam probat,

other considerations: "There is, therefore, one definite opinion of the scholastic philosophers that the common natures exist of themselves (*ex se*), prior to their individual beings or even prior to the process of the intellect in the abstract. They are universal in the act, not just in possibility, although they have no universality actually existing – unless it is existent in the mind without individual differences".[44]

Abranches, taking into account Fonseca's stance on the matter of universals – that they do not exist in the way Plato's notions do – says that these are sufficient reasons for not calling Fonseca a representative of moderate term realism. He claims that Fonseca's theory of universals should be considered to be moderate realism defended by St. Thomas Aquinas and other scholastic philosophers.[45]

One cannot unconditionally adopt the way of thinking of Abranches. We can agree on his conclusions concerning logical universals, being a result of the intellect in the abstract. Fonseca's doctrine does not differ from other scholasticists in this regard. As far as universals existing *a priori* objects are concerned, the matter is more complex. Fonseca's unique stance on universals having solely potential but not actual way of existence defends him against the accusation of being a radical realist. He says nothing, however, that universals are a means of getting to know God. He states only that their existence is unlike the existence of intentional beings but similar to that of particulars. Therefore, Fonseca's philosophical considerations on the whole, make us conclude that he is inspired by the theory of the third nature by Avicenna and the common nature by Duns Scotus – what is highlighted in opinions of C. A. Ferreira da Silva and D. Martins.[46] Is it then radical term realism? Followers of Duns Scotus were frequently ranked among radical realists. It was due to their statements that individual beings are not the only way of existence of beings. General beings also had unique forms

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naturas communes nec secundum se, nec ut sunt in suis particularibus, sed ut sunt in intellectu, esse universales, et in eo tantum obiective sibi vendicare universalitatem: quod Avicennae etiam et Commentatoris auctoritate confirmat. Idem ex veteribus Scholasticis et priores D. Thoma, ut Albertus et Alensis: et posteriores, ut Aegidius et coeteri reales sensisse videtur". *Ibidem*, 994 E–F.

[44] "Est igitur vera germanaque et omnium ut credere par est, veterum Schlasticorum sententia, naturas communes ex se, et ante eam operationem intellectus, qua a suis particularibus abstrahuntur, nempe prius natura, quam in suis particularibus existant, aut contractae in eis sint, esse actu et non potentia tantum universales, tametsi non habent suam universalitatem existentem, nisi cum intellectum, nisi differentiis contrahentibus obiiciuntur". *Ibidem*, 995 D–E; see also: "Naturasque universales non existere per proprias et peculiares existentias, sed per existentias singularium per se". *Ibidem*, 758 A.

[45] See, Abranches, article cited, pp. 196–298.

[46] See, Silva, *op. cit.*, p. 39; Martins, article cited, pp. 401–403.

of existence different from individual objects and from intentional beings. It is not, however, Plato's way of thinking, but it is less radical aspiring to the moderate term realism.[47] Fonseca in the same way would – all in all – represent some form of the moderate term realism.

5. Conclusion

Fonseca's considerations on the subject of different ways of existence of universals are quite complicated and demand a lot of concentration on the side of the reader. It is difficult to count him in as one of those representing either side of two different philosophical opinions in the time of scholasticism: the radical realism and the reism of nominalists. As a matter of fact, he criticised nominalism and was inclined to support realism, but it does not mean that he wanted to adopt it in his philosophy without his own considerations, interpretations and specifications. Analysing the philosophical thought of Duns Scotus, he was trying to work out a theory that would settle ongoing disputes on the matter for centuries. Finally, one can say that he has placed himself somewhere in between the two above mentioned philosophical trends of that time – and it is the moderate realism. Whatever one may say about Fonseca in this regard, one should also admit that he managed to do a thorough analysis of conditions in which universals come to exist. Generally speaking, one can notice that in the initial period of the Jesuit philosophy Fonseca and Suarez – being in opposition to the radical realism of Scotus (many philosophers seen him that way at that time) and the nominalism of Ockham – in fact Fonseca is in favour of Scotus's philosophical considerations on the matter under discussion, and the latter in favour of Ockham.

Translated by Marian Nycz

S U M M A R Y

The issue of universals seemed to appear in almost all ages as a basic philosophical subject on the epistemiological as well as methaphysical plane. It was definitely that way in medieval period when it was placed in the foreground and was considered as the main criterion of divisions and differences between philosophers and currents. Along with revival

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[47] See, Swieżawski, *op. cit.*, pp. 290–292.

of scholasticism in the 16th century, the dispute over nature of universals became again the subject of polemics between *antiqui* and *moderni*, that is between supporters of different variants of realism and nominalism. From the wide range of taken stands in that matter tendencies for realistic and reistic points of view were dominant. Will one of them be presented by philosophers of the newly established at that time Jesuit order? Answers to that question was searched on the example of Peter Fonseca's doctrine – leading Jesuit philosopher in the early scientific phase of the order's activity.

Completed analyses do not allow to count Fonseca explicitly among followers of one of two leading positions at that time, namely – either extreme realism or nominalist reism. As far as logic universals are concerned, which were the effects of intellect's abstraction, Fonseca's doctrine is not different from the doctrines of the previous scholastics. Another way it is with the issue of universals existing before the thing. The very specific concept of Fonseca, in which he ascribes only potential not current way of existing to universals. It defends him from accusation of the extreme realism. He doesn't say anything about universals being the subject of learning God. Fonseca emphasizes that universals live in such a way that it is impossible to bring them either to existence typical for concretum or to the way of existence of intentional being. Such a presentation induces the conclusion that Fonseca is inspired by Avicenna's theory of the third nature and Scot's theory of common nature. It is not extreme Platonic solution but less radical, indirect one which aspired to moderate realism. More generally speaking, it is noticed that in the early period of Jesuit philosophy Fonseca and later Suarez, being in opposition to extreme – as it was commonly believed – realism of Scot and Ockham's nominalism, in fact is closer to Scot's solutions while Suarez more into Ockham's.

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FRITZ MAUTHNER'S CRITIQUE
OF LOCKE'S IDEA OF GOD

Fritz Mauthner (1849–1923), the author of such works as *Wörterbuch der Philosophie. Neue Beiträge zu einer Kritik der Sprache* (I–II, 1910/11), *Der Atheismus und seine Geschichte im Abendlande* (I–IV, 1920–1923) focused his own philosophical interests on critique of the language (Kritik der Sprache), considering it the most important task, compared with Kant's critique of the reason (Kritik der reinen Vernuft), Ernst Mach's critique of pure experience (Kritik der reinen Erfahrung), and with Friedrich Nietzsche's critique of European culture (Kritik der europäischen Kultur).[1] The attitude of nominalism was especially close to him; the attitude that recurred in the British thought several times (W. Ockham, J. Locke, G. Berkeley, D. Hume, J. S. Mill). Mauthner stated that "Ockham overcame scholastics, but his only weapon was the language of scholastics".[2] Ockham fought against the assumption made by conceptual realism, paving the way forward for the thesis that science only deals with mental contents, and not directly with things.

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[1] See: F. Mauthner, *Selbstdarstellung*, in: *Die Philosophie der Gegenwart in Selbstdarstellungen*, Hrsg. R. Schmidt, Leipzig 1922, Bd. III, p. 121–143, especially p. 126–128. On the underestimated philosophy of the language and Mauthner's critique of the language see O. Gramzow, *Geschichte der Philosophie seit Kant*, Charlottenburg 1928, Bd. II, p. 438–445. In the latest literature, however, works devoted to Mauthner appear, e.g. J. Kühn, *Gescheiterte Sprachkritik. F. Mauthners Leben und Werk*, Berlin 1975; M. Kurzreiter, *Sprachkritik als Ideologiekritik bei F. Mauthner*, Frankfurt/Main 1993; E. Leinfellner, H. Schleichert (Hrsg.), *F. Mauthner. Das Werk eines kritischen Denkers*, Wien 1995; H. Henne, Ch. Kaiser (Hrsg.), *F. Mauthner – Sprache, Literatur, Kritik*, Tübingen 2000.

[2] Id., *Der Atheismus und seine Geschichte im Abendlande*, Stuttgart 1920, Bd. I, p. 347. „Ockham hat die Scholastik totgeschlagen, aber seine einzige Waffe war die Sprache der Scholastik". (I give all the quotations in German in the text in my own translation – H. J.). It is worth mentioning here that one of Mauthner's teachers was Alfred Kühtmann, the author of the monograph *Geschichte des Terminismus*, Leipzig 1911.

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According to Mauthner, John Locke was a representative of a similar attitude in the 17th century; and his most important achievement is initiating psychology of cognition that is closely connected with philosophical critique of the language developed in the third part of *An Essay concerning Human Understanding*.[3] Mauthner emphasized that Locke tried to avoid scholastics' jargon, he accepted everyday vocabulary, according to the thesis that words first of all represent ideas, and indirectly – things. As the reasons for abusing words he indicated, among others, learning words before learning the ideas that were connected with them; changing the meanings of the same word; giving unusual meanings to colloquial terms; introducing new terms without explaining them; taking words for things (as in the case of Aristotle's ten categories), getting used to the connection between certain ideas and words because of the long tradition of doing so.[4] Locke justly postulated that no word should be used without connecting an idea (sense) to it.

In Mauthner's opinion, *An Essay concerning Human Understanding* had an immense impact on the sources of the European Enlightenment, paving both the way leading from Locke to the French Encyclopedists' dogmatism, and the other one, to Hume's and Kant's critical skepticism.[5] Mauthner gave a much higher appraisal to this latter trend in thinking, since it is in this trend that all the consequences were discovered that Locke did not yet see in his own epoch.

As Mauthner stated, "...since – practicing critique of the language – Locke as a psychologist was not on firm ground, over the course of the years he ever more decidedly applied psychological-empirical analysis to the origin of religion; however, he constantly returned to the metaphysics of childish faith".[6] Locke's writings show his hesitation over the attitude of a sensualist philosopher and one of a "theologian" who, as a participant in religious debates, saved many of his convictions from traditional childish faith, which,

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[3] *Ibid.*, Stuttgart 1921, Bd. II, p. 529–553. The thesis that Locke's critique of the reason leads to the critique of the language was also propagated by F. A. Lange, *Geschichte des Materialismus und Kritik seiner Bedeutung in der Gegenwart*, Leipzig 1926, Bd. I, p. 217.

[4] For Locke's most important theses on this issue see: J. Locke, *Rozważania dotyczące rozumu ludzkiego* (*An Essay concerning Human Understanding*); translated into Polish by B. J. Gawecki, Warszawa 1955, vol. II, Book 3, p. 9–193, especially the chapter O nadużywaniu słów (*Of the Abuse of Words*), p. 142–171.

[5] F. Mauthner, *Der Atheismus und seine Geschichte im Abendlande*, *op. cit.*, Bd. II, p. 539.

[6] *Ibid.*, p. 543. „[...] der sprachkritische Psychologe Locke da selbst auf keinem festen Boden stand, daß er mit dem Jahren immer entschiedener die psychologische Analyse und den Empirismus auf die Entstehung der Religion anwandte, aber immer wieder in die Metaphysik des Kinderglaubens zurückfiel".

in Mauthner's opinion, testifies to the bondage of verbal formulas kept in the collective memory of the participants in the culture of the West. Mauthner praised Locke for rejecting many theological sophistries that were accumulated in the history of positive Christianity, but he did not understand why Locke – contrary to the title of the work *The Reasonableness of Christianity* (1695) did not support the rational religion, but he accepted the belief in Jesus-the Messiah as indispensable for the salvation of the soul as the essence of Christianity. It was also incomprehensible for Mauthner that Locke was not satisfied with natural (rational) revelation as deists did, but he also recognized supernatural (extra-rational) revelation as a possible and useful source of cognition, speaking against the lack of faith presented by deists who interpreted Christianity in the wrong way.[7] Mauthner remarked that if supernatural revelation, resulting from God's inspiration, existed, it would have to be communicated to man in a natural way, e.g. via the sense of hearing, and then filtered by the traditional means of the human language, since we do not know the language of God.[8]

According to Mauthner, considering this question undermines the faith in the possibility of supernatural revelation. This is followed by another difficulty connected with the assessment of credibility of the witnesses of revelation. Locke considered the primary revelation as more credible, the one experienced by Jesus' apostles and supported by the testimony of miracles, than the revelation mediated by the Christian tradition; hence he trusted the Bible more than Christian theologians who put forward speculative dogmas that have no connection with the practice of Christian life.[9] He was skeptical about the phenomenon called religious enthusiasm or exaltation, which he understood as an inner experience of God, independent of the Bible, because in such cases it would be difficult to differentiate the illusions of one's own imagination from the real voice of God. In Locke's opinion reason should perform the function of the judge of the revelation, despite the fact that this revelation is concerned with super-rational faith. Although Mauthner saw a contradiction in this thesis,[10] Locke's intention could be defended

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[7] *Ibid.*, p. 539–540.

[8] Locke himself was aware of this difficulty, but he did not draw the conclusion that supernatural revelation is not possible, as Mauthner later did. See: J. Locke, *Rozważania dotyczące rozumu ludzkiego* (*An Essay concerning Human Understanding*), *op. cit.*, vol. II, p. 445–446.

[9] See: J. Locke, *Rozważania dotyczące rozumu ludzkiego* (*An Essay concerning Human Understanding*), *op. cit.*, vol. II, p. 447.

[10] F. Mauthner, *Der Atheismus und seine Geschichte im Abendlande*, *op. cit.*, Bd. II, p. 539.

by pointing to the difference in the area of revelation between the truths contrary to reason and hence deserving to be eliminated, and the super-rational truths.

Let us first reconstruct Locke's basic theses about God, and then take into consideration Mauthner's commentaries and assessments.

1. According to Locke the idea of God (as well as the name "God") is not innate, since it does not occur commonly in all the cultural circles.[11] There are differences in comprehending deity not only between representatives of polytheism and monotheism, but also within monotheistic religions, in Christianity itself; and what is more, followers of the same confession (e.g. Anglicans, Puritans) understand God's attributes and acts in the world in different ways, albeit they use the same name, that is "God".

2. According to Locke the idea of God may be considered as a natural discovery made by the human reason, which, at a certain stage of exercising its own cognitive powers and of looking for causes, reached the ultimate reason and called it "God".[12] This discovery was propagated and transmitted (albeit not without mistakes) by way of tradition to subsequent human generations.

3. According to Locke the idea of God (like any idea) signifies a direct object that is present in the mind.[13] It belongs to the class of complex ideas of substances constituting composition of a definite number of simple ideas originating from inner experience, that is from reflection. In Locke's opinion, "having, from what we experiment in ourselves, got the ideas of existence and duration; of knowledge and power; of pleasure and happiness; and of several other qualities and powers, which it is better to have than to be without; when we would frame an idea the most suitable we can to the Supreme Being, we enlarge every one of these with our idea of infinity; and so putting them together, make our complex idea of God".[14] Locke complemented this argument by referring to the indefinite and obscure idea of a substratum supporting the properties.[15]

4. According to Locke, the idea of God is a real idea as far as it contains simple ideas that have their correlates in reality, and it is a fantastical idea (fiction) when it does not satisfy this condition. The idea of God cannot

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[11] J. Locke, *Rozważania dotyczące rozumu ludzkiego* (*An Essay concerning Human Understanding*), *op. cit.*, vol. I, p. 94.

[12] *Ibid.*, p. 97–98, 114.

[13] *Ibid.*, p. 19.

[14] *Ibid.*, vol. I, p. 439. Cf. also vol. II, p. 74–75.

[15] *Ibid.*, vol. I, p. 424.

be fully an adequate idea, since it only partially, or not entirely represents the originals (God's properties) to which it refers. The human mind cannot cognize God's real essence, so it has to be satisfied with the knowledge of the nominal essence. As Locke wrote, "for, though in his own essence (which certainly we do not know, know, not knowing the real essence of a pebble, or a fly, or of our own selves) God be simple and uncompounded; yet I think I may say we have no other idea of him, but a complex one of existence, knowledge, power, happiness, &c., infinite and eternal".[16]

5. According to Locke, ignorance of God's real essence is not an obstacle that would make man unable to cognize his Creator and his own duties set by God the Lawgiver.[17] Locke emphasized the needs of the acting man, and not speculations that exceed the limits of our cognition. He stated that God equipped man with moderate cognitive abilities and harmonized the influence of things outside the mind with them, guaranteeing maintaining the life and a definite level of happiness in this and in the future life, however, on condition that divine law is observed.

6. According to Locke there are two sources for cognizing God: natural revelation (reason appealing to the help of outer and inner experience), and supernatural (super-rational revelation: primary and traditional). God's existence does not have to be accepted on the basis of the authority of Christian tradition or through blind (devoid of consideration) faith, but it can be rationally proved; however, not in an a priori (as in an ontological argument) but an a posteriori way, which is connected with the choice of a certain variety of a cosmological argument.[18] As Mauthner remarked, Locke wanted to prove the existence of God "like geometricians do",[19] placing the truth about God's existence in demonstrative knowledge that is characterized by certainty, which cannot be said about the probabilistic knowledge of the existence of sensual objects.

The structure of the cosmological argument is the following: Locke starts from an obvious fact (one that does not require a proof) of his own existence (I exist as a thinking subject) and hence he draws the conclusion

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[16] *Ibid.*, vol. I, p. 440.

[17] *Ibid.*, p. 26, 418.

[18] For a cosmological argument for God's existence, see: J. Locke, *Rozważania dotyczące rozumu ludzkiego* (*An Essay concerning Human Understanding*), *op. cit.*, vol. II, Chapter X, p. 336–353.

[19] F. Mauthner, *Der Atheismus und seine Geschichte im Abendlande*, *op. cit.*, Bd. II, p. 543. Mauthner undoubtedly refers here to Locke's statement: „It is as certain that there is a God, as that the opposite angles made by the intersection of two straight lines are equal" (J. Locke, *Rozważania dotyczące rozumu ludzkiego* (*An Essay concerning Human Understanding*), *op. cit.*, vol. I, p. 105.

that since something cannot originate from nothing, there has to exist an eternal, omnipotent and omniscient cause of my existence, and so there exists God.[20] It is worth noting that in his argument Locke not only stated the existence of God but also indicated God's properties, assuming that the cause of the intelligent being has to be the supreme intelligence, as a being devoid of thinking would not be able to cause a thinking being. Moreover, the cause has to have the supreme power at its disposal, for otherwise it would be impossible to create something that did not exist before. And finally, it has to be a cause that is free, which does not exclude determination of the will by imagining something that is the best. Stressing God's incomprehensible infinity Locke included among his properties first of all duration and omnipresence; and only secondarily and figuratively – power, wisdom and kindness.[21] He characterized God (not without Descartes' influence) as an infinite and incomprehensible substance that has created both a finite spirit and a finite flesh. As Mauthner justly remarked, Locke used two languages;[22] he drew on the Christian tradition calling God the Creator, the Administrator of the World, the Moral Lawgiver, the Just Judge, the Kind-hearted Father; he also used the language formulas of natural religion that were referred to "the colorless God of deists", such as the Supreme Being or Deity.

According to Mauthner, the very name, "cosmological argument", is misleading. It is rather a logical or sophistic argument characteristic of philosophers who remain at the stage of childishness of the reason. Every event presumes a cause, and every cause a further cause – and so on, as far as the ultimate cause that is called God. Mauthner intends to show that even Kant missed the significant weakness of the argument, which leads to a simple tautology. Similar to the ontological argument that says that an existing being exists, a cosmological argument states that the ultimate cause is the

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[20] F. Mauthner, *Der Atheismus und seine Geschichte im Abendlande*, *op. cit.*, Bd. II, p. 543.

[21] J. Locke, *Rozważania dotyczące rozumu ludzkiego* (*An Essay concerning Human Understanding*), *op. cit.*, vol. I, p. 280.

[22] F. Mauthner, *Der Atheismus und seine Geschichte im Abendlande*, *op. cit.*, Bd. II, p. 544. This thesis put forward by Mauthner is confirmed by relevant fragments of Locke's work. For instance, for the terms describing God according to the Christian tradition see *Rozważania dotyczące rozumu ludzkiego* (*An Essay concerning Human Understanding*), *op. cit.*, vol. I, p. 375, vol. II, p. 77 and others; whereas for deistic ones see e.g. vol. II, p. 76, 230 and others. The term "the colorless God of deists" (der farblose Gott der Deisten), "God-shadow" (Schattengott) appears in Mauthner when he analyzes the significance of Hume's work; Hume was a consistent and courageous continuator of Locke's inspirations. See: F. Mauthner, *Der Atheismus und seine Geschichte im Abendlande*, *op. cit.*, Bd. II, p. 590–591.

ultimate cause. What we have here is not any broadening of our knowledge. As Mauthner stated, both the assumption of the world's eternity, that is of an indefinite regression of causes in time, and the assumption that there is the ultimate or the first cause, which gives the mind satisfaction freeing it from the anxiety of searching for subsequent causes, may be defended with the help of equally worthless verbal combination-play.[23]

Mentioning Hume's contribution to awakening Kant from his dogmatic slumber Mauthner remarked that Hume was a more courageous and consistent thinker than Locke and Kant since he discovered that the concept of cause (Ursache) is an unreal one, that it is a fiction, which the human mind brings into the outer reality. Kant accepted causality as the adequate way by which the human subject orders the data from the sensual experience, that is he considered it an a priori category of the intellect; however, he did not venture to interpret it as the result of a mental habit, or as a common pretence, and this is why he did not apply Hume's discovery to analyzing the concept of cause in the cosmological argument.[24] According to Mauthner the weakness of the argument may be shown by interpreting a causal sequence only as a sequence of temporal events, that is indefinitely small changes in indefinitely small time segments. The concept of cause in contemporary physics has lost all its meaning, and this is why physics gives up the function of explaining the nature and is satisfied with a description of phenomena. Resignation from explaining is tantamount to accepting the concept of cause as an exclusively regulative principle of thinking. The opposite attitude may be called dogmatism, which may assume two forms. Dogmatic materialistic monism, which explains light, heat, electricity, magnetism as different consequences of the same unknown energy, that is of an unknown deity, makes a similar mistake that dogmatic scholastic philosophy makes, which refers everything to the ultimate cause called God.[25] From the point of view of critique of the language practiced by Mauthner, differences of attitudes result from an argument over words.

Let us remind that the cosmological argument is supposed to lead to a poor tautology: the ultimate cause is the ultimate cause. All the same it is considered permissible to substitute the second part of the statement with an apparently identical, as far as the meaning is concerned, word: the ultimate cause is God. This would be permissible only if the word "God"

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[23] F. Mauthner, *Der Atheismus und seine Geschichte im Abendlande*, *op. cit.*, Bd. IV, p. 431.

[24] *Ibid.*, p. 431–432.

[25] *Ibid.*, p. 433.

was understood as nothing but the unknown ultimate cause, without giving it the properties of a personal being. Mauthner quoted the example of mystics who only in the state of ecstasy feel the essential unification with God, eliminating all the notions about God's superhuman and supernatural personality. When they wake from this state they start thinking about God like average Christians do, supplying God with all the properties that are mentioned in the Christian catechism.[26] However, Mauthner remarks that "it is ridiculous in the language of ideas to ask about a deity [going beyond – H. J.] ideas".[27]

The cosmological argument, in Mauthner's opinion, is a childish play on words also because the mentioned properties of God-the ultimate cause are mutually based on each other; this also concerns the connection between such concepts as God, soul and will. Liberation from the apparent concepts of soul and freedom of the will effected by the psychology of Mauthner's times questioned human immortality and responsibility, as well as God's properties: spirituality and justice. From the point of view of critique of the language the words "God", "soul" and "will" do not have their counterparts in reality; however, theologians conditioned something very important, namely man's eternal happiness, on faith in the existence of God, soul and will.[28] Illusion (superstition of the language) consists in the fact that the existence of the soul and will (that is, of a certain substrate) has already been assumed, and hence only faith in the properties (immortality, freedom) was required. It is the same with the basic problem of any religion, because faith in God-abstraction would remain empty and ineffective if it was not supplemented with faith in certain properties of God. Hence orthodox followers of various religions that were considered as the only true ones were right giving the name of atheists to those who doubted the existence of God's such or other properties, even though they did not deny the existence of God.

Mauthner stated that three ideas: God, immortality and freedom are inseparably connected with each other. Indeed, it is possible to conceive the possibility of faith in God without faith in immortality and freedom of the will, but it is a fact that theology of Christian denominations that are common in the West based the three dogmas on each other. The property of God called justice had man's freedom of the will and responsibility as its

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[26] *Ibid.*, p. 434.

[27] *Ibid.*, p. 443. "Es ist töricht, in der Sprache der Vorstellungen nach der Gottheit hinter der Vorstellung zu fragen".

[28] *Ibid.*, p. 445.

premise; the conclusion drawn from the premise were rewards and punishments to the immortal soul in the next world.[29] Incorporeity of God – so similar to man – was to result from spirituality of the human soul, and then the existence of spirits (including the soul) – from God's incorporeity. The so-called omnipotence of God's will, that may be understood as the highest level of human will seemingly found in our self-awareness, completely cancels the freedom of human will, but again postulates man's responsibility. These statements only concern the God of the Western theologians, and they do not refer to the God of the Old Testament, in which there is no thesis concerning the immortal human soul, or the concept of man's free will.[30]

As Mauthner remarked, medieval scholastic philosophy, on which all theology has been based until today, worked out these questions extremely penetratingly, assuming the attitude of conceptual realism, which means ascribing metaphysical reality to the words: "God", "soul", "will", without taking into consideration any possible experience. In Mauthner's interpretation, behind the theoretical decisions made by the Western theologians there were assumptions of practical metaphysics, e.g. existence of rewards and punishments after death, that were treated as more important than joys and sufferings of the earthly life.[31] The words: God, soul, will even today belong to the colloquial language; even today – like in the medieval realism – they are understood as names referring to reality; and only some people treat them as empty ideas of practical metaphysics, using the Kantian formula: as if there were God, soul and will.

The result of Mauthner's critique of the language is the thesis about three lingual images of the world illustrated by the example of the concept of God. It is possible to describe God as a thing (in the language of nouns), as a property (in the language of adjectives), and as an activity (in the language of verbs). This is similar to Aristotle's attempt of deriving adequate categories from an analysis of a simple Greek sentence, which was brought by A. Trendelenburg to his contemporaries' attention. Mauthner reduced the list of ten categories to three, referring to L. Valla's thesis that the most important categories are: substantia, qualitas and actio.[32]

The God of the noun world (the God of the traditional metaphysics) is not a thing like other things, but a living thing, a being similar to man,

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[29] *Ibid.*, p. 436.

[30] *Ibid.*

[31] *Ibid.*

[32] *Ibid.*, p. 438–442. For three images of the world see also: Id., *Selbstdarstellung*, in: *Die Philosophie der Gegenwart in Selbstdarstellungen, op. cit.*, especially p. 138–143.

to which properties similar to human ones and superhuman activities are ascribed; however, activities that again are similar to human ones, and hence can be compared. In the oldest Greek philosophy the name of what is divine was identified with the primitive matter, e.g. fire; in the polytheist Greek religion the name "God" was a generic one, later it became the proper name of the Christian God, and in pantheism it again became the name of the matter from which first the four elements, and then inanimate and animate bodies were formed.[33]

The God of the adjective world underwent a similar transformation. God's main property is infinity; he was called the Endless if he was a person, and then, that which is endless and impersonal. A change in understanding God's activities, described in the language of verbs, occurred in the same way. God's main activity was creating as far as God had personality; but for God's pantheistic activity it was difficult to find an adequate name, because such names as: transformation, movement, conservation of energy and development had lost their religious meaning. The God of the verb world as the Creator is a proper name; and as energy – the name of the matter.[34]

A linguistic analysis of the three images of God may be applied not only to the notions of philosophy of nature. Also the God of the church faith changes, depending on the accepted point of view and on the accompanying language. Theological theory is basically satisfied with the noun God. Although God-person's existence is shown by alleged proofs, one believes in the existence of God-person without proofs. Traditional definitions of the concept "God" refer to an abstract, which is a paradigm for imagining all possible things; this abstract does not exist beside and apart of its properties, powers and results. Confessors of the church (childish) faith treat God's activity called rule over the world or providence with hope and fear, assessing the activity as good or bad from the point of view of one's own needs and emotions.[35]

Mauthner remarked that history of atheism in the West gradually achieves the aim, which is liberating human minds from the power of the word "God", unknown in the tradition of the East. Every word is entangled in its own history; it is subject to various transformations of its meaning, until it discovers that behind the curtains there are no contents that can be referred to the real outer reality. Instead of rational convictions (unmasked as sophistic) we should – according to Mauthner – be satisfied with the

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[33] Id., *Der Atheismus und seine Geschichte im Abendlande, op. cit.*, Bd. IV, p. 437–440.
[34] *Ibid.*, p. 440.
[35] *Ibid.*, p. 441.

irrational sense of our unification with the whole of the world. Mauthner argued that his critique of the language culminates in skepticism if one looks back, and in mysticism without God if one looks forward, that is towards the future.[36]

Finally, it is worth making an attempt at an assessment of the significance Locke has in Mauthner's history of atheism, or history of liberating the minds of the West from the fiction of "God". Mauthner accused Locke of incompleteness, willingness to compromise, and a lack of consistence. However, as a historian of atheism he thought that "human thinking had to pass through sensualism, materialism, to the view expressed in the critique of the language, according to which thinking is nothing but language, and language cannot be a tool for understanding reality".[37] Referring to I. Kant, F. K. Forberg and H. Vaihinger Mauthner stated that the formulation they used, "as if God existed" signifies an empty idea of the so-called practical metaphysics. Since the world is a subjective representation, a practical interest appears that inclines one to search for what is outside the representations and to try to name this unknowable X. (God, thing in itself, will). The concept of God, cleared of all the layers piled on it by the theological tradition, should be understood, according to Mauthner, as a simple phantasm, a sound lie of the life, an illusion that is necessary for living, and not as reality.[38] Hence an acting man treats the concept "God" as a useful fiction (or a regulative idea), a poet – as an ideal or a living symbol.

As Mauthner suggests, Locke rightly turned the human mind off the useless metaphysical speculations and directed it towards the study of what has practical value. For this reason in his work *The Reasonableness of Christianity* Locke proclaimed himself in favor of the need to separate necessary truths (indispensable for salvation) from unnecessary ones causing unsolvable arguments over words. In this way he started the tendency to reduce the multitude of Christian truths to the indispensable minimum of truths

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[36] *Ibid.*, p. 447. „Sprachkritik war mein erstes und ist mein letztes Wort. Nach rückwärts blickend ist Sprachkritik alles zermalmende Skepsis, nach vorwärts blickend, mit Illusionen spielend, ist sie eine Sehnsucht nach Einheit, ist sie Mystic". The quoted fragment is part of Chapter 10 entitled „Der Frieden in gottloser Mystik".

[37] *Ibid.*, p. 426. „Um ganz frei zu werden, frei von den Worten des Glaubens, aber auch frei von den Worten einer überheblichen Philosophie, mußte das menschliche Denken hindurchgelangen durch den Sensualismus, Materialismus bis zu der sprachkritischen Einsicht, daß es, das Denken, nichts als Sprache sei, und daß die Sprache ein ungeeignetes Werkzeug sie, die Wirklichkeit zu begreifen oder gar die sogenannten letzten Fragen, obgleich oder weil diese nur Menschenfragen der Menschensprache sind, in befriedigender, in beruhigender Weise zu beantworten".

[38] *Ibid.*, p. 446.

connected with the moral perfecting of man, although he was not an advocate of deism. He tried to show rationality of Christianity saying that Christian revelation cannot contain truths contrary to reason, although it contains super-rational truths. Moreover, he thought that reason should be the judge of revelation.

In Mauthner's opinion Locke yet did not know (which was later proven by Hume and Mach) that reason, referring to the data from experience, is a kind of instinct serving human activities and practical needs.[39] Compared to Locke who was a rationalist in matters connected with religion, Mauthner assumes irrationalistic positions, substituting rational reasons with a vague feeling. Also as a historian of atheism he cannot assume an objective attitude, which would require eliminating the emotional factor. Mauthner's work is a testimony to a crisis of the reason, or even something like a philosophical suicide, as it leads to the conclusion that the reason has to be identified with the language, which does not allow us to contact things beyond the mind, or even access our inner world. Hence, what we call cognition may be reduced to poor tautologies of play on words.[40]

Finally, it is worth noting that nominalism often treated by Mauthner as a result of his own considerations, is indeed an assumption for his critique of the language, accepted at the beginning. The charge of the vicious circle made in *Der Atheismus und seine Geschichte im Abendlande* against numerous thinkers in the history of philosophy, also refers to Mauthner himself. He was under the illusion that his last word in philosophy is not skeptical resignation, but mysticism without God. This only confirms the thesis that he did not understand the meaning of the word "philosophy", since he saw its main task not so much in the argumentative layer, but rather in formulating emotional appeals for liberating mankind from the bondage of the linguistic fiction consolidated in the tradition of the West. If Locke rightly emphasized abusing words and looked for a remedy to prevent it, Mauthner does not seem to trust any of the words, either uttered or written. If he

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[39] *Ibid.*, p. 442.

[40] This is confirmed by Mauthner's following statement: „Maybe what we call philosophy is merely humanity's questioning look, the question in itself, a question without contents". „Und vielleicht ist das, was wir die Philosophie nennen, eben nur der fragende Blick der Menschheit, die Frage an sich, eine Frage ohne Inhalt". (Id., *Beiträge zu einer Kritik der Sprache*, Stuttgart 1901, Bd. I, p. 703; I quote after Kühn, *Gescheiterte Sprachkritik. F. Mauthners Leben und Werk, op. cit.*, p. 74). It follows from this that words not only do not refer one to extra-mental things, but also they do not refer one to ideas (meanings). Accepting the assumption of nominalism Mauthner accused Aristotle (whom he completely misunderstood) of taking words for things; and here he cited Locke's *An ssay concerning Human Understanding*, especially Book II. See note 4

was consistent, he would recognize silence as the only right way, instead of writing many-volume works that were a record of his recurrent mistakes, among which one sometimes finds ones that are similar to his own predilections and attitude – which does not mean that they are right.

Translated by Tadeusz Karłowicz

S U M M A R Y

In his book *Der Atheismus und seine Geschichte im Abendlande* Fritz Mauthner asks what the place of Locke's idea of God is in the Western history of atheism. In the philosophy of Locke he appreciates the psychology of cognition which was related to the philosophical critique of language, developed in the third part of *An Essay Concerning Human Understanding*. However, Locke did not have the courage to extract consequences which D. Hume and I. Kant drew in their critique of the idea of substance, including the idea of God. It indicates that Locke remained under the influence of the Western Christian tradition, although at the same time he undermined its foundations. Mauthner accepts the thesis of his contemporary H. Vaihinger that the name of 'God' means a utilitarian fiction rather than an extra-mental being.

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LOCKE'S ETHICS IN
AN ESSAY CONCERNING HUMAN UNDERSTANDING

Locke did not deal with ethical issues in a systematic way. However, in his *Essay* he observed that ethics could be structured in such a way that it would be as precise as mathematics because "(...) morality is capable of demonstration as well as mathematics".[1]

According to Locke it was supposed to happen by means of a meticulous analysis leading to the formulation of rational and demonstrative ethics. Let us, then, consider what Locke says about moral issues.

In the Book III of the *Essay* we find an explanation of what the philosopher understands by ideas and moral judgments, which makes him believe that ethics may be practised the same way as mathematics. In Locke's terminology, moral notions are complex ideas referred to as 'mixed modes'. All our knowledge is based on simple ideas which are derived from empirical experience. They are passive reflections in our mind of what we experience. Thus, they come from two possible sources – a sensual experience and an observation. Our mind is not able to produce such ideas on its own nor can it have any ideas which do not consist of simple ideas. "But as the mind" – says Locke – "is wholly passive in the reception of all its simple ideas, so it exerts several acts of its own, whereby out of its simple ideas, as the materials and foundations of the rest, the others are framed."[2]

Complex ideas, which Locke calls modes, consist of substances and relations.[3]

Ideas or moral notions may be defined exhaustively and precisely. It is their virtue and advantage over the ideas of substances, which, at the same

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[1] J. Locke, *An Essay Concerning Human Understanding*, The Pensylvania State University 1999, IV.12.8.

[2] Ibid., II.12.1.

[3] Ibid., II.12.3. See also: Zbigniew Ogonowski, *Locke*, Warszawa 1972, p. 244.

time, enables a precise ethical discourse leading to verifiable conclusions. Since moral words (identified by names) are the collections of partial ideas introduced into the range of notions by our mind, we can easily – says Locke – understand precisely the words used in such a discourse; and if they are unintelligible, it is enough to make more precise what we mean by pronouncing certain statements, i.e.: what the words (ethical terms) we use mean. And the fact that the discussions about moral issues are often "obscure and vague" is just the result of "negligence". That leads Locke to the following conclusion:

"Upon this ground it is that I am bold to think that morality is capable of demonstration, as well as mathematics: since the precise real essence of the things moral words stand for may be perfectly known, and so the congruity and incongruity of the things themselves be certainly discovered; in which consists perfect knowledge. Nor let any one object, that the names of substances are often to be made use of in morality, as well as those of modes, from which will arise obscurity. For, as to substances, when concerned in moral discourses, their diverse natures are not so much inquired into as supposed".[4]

Locke lists three kinds of rules which are annexed to actions (precisely – the complex ideas of actions) in terms of conformity or disagreement. He mentions the divine law, the civil law and the law of opinion or reputation. The consequence of referring one's actions to the divine law is sinfulness or the conformity with duty, in terms of the civil law – criminality (illegality) or legality and according to the reputation – virtuousness or vice. The touchstones to which human actions are referred and on the basis of which they obtain their moral qualifications have the status of laws because their structure covers not only the standards, but also the power which enforces actions through orders (or prohibitions), i.e. punishment and prize.[5]

Some of Locke's expressions seem to suggest that the law he considers the most important is the divine law, which constitutes the final moral instance.[6] Indeed, this law is listed as the first one among the three and it is accompanied by the following categorical remark:

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[4] J. Locke, *Essay*, III.11.16.

[5] See: Z. Ogonowski, *Locke*, quoted edition, p. 257.

[6] Frederick Copleston claims that Locke does not believe the civil law to be the final criterion of what is good and what is evil. Hence, the final criterion in relation to which all the actions are judged as moral good or moral bad is the divine law, see: F. Copleston, *Historia filozofii*, volume V, Polish translation by J. Pasek, Warsaw 1997, p. 142. However, it is not so unquestionable since Locke does not treat the revealed law as the component of true knowledge, which we will see later.

"That God has given a rule whereby men should govern themselves, I think there is nobody so brutish as to deny. He has a right to do it; we are his creatures: he has goodness and wisdom to direct our actions to that which is best: and he has power to enforce it by rewards and punishments of infinite weight and duration in another life; for nobody can take us out of his hands. This is the only true touchstone of moral rectitude; and, by comparing them to this law, it is that men judge of the most considerable moral good or evil of their actions; that is, whether, as duties or sins, they are like to procure them happiness or misery from the hands of the *Almighty*".[7]

But God promulgated this law to men "(...) by the light of nature, or the voice of revelation".[8] What does that mean?

In view of what Locke says in Book IV about the relations between knowledge and faith, the revelation may be the proper source of truthful propositions but only when we are sure that what pretends to be a revelation is one indeed. And that we can hardly ever be sure of. Thus, if the voice of revelation cannot inform us about the moral law in an exhaustive and decisive manner, we have to rely on the light of nature, i.e. our reason. However, in Book II of the *Essay*, Locke repeatedly refers to the divine moral law. Yet, he does not say straightforwardly what its contents are, what the divine orders are, which does not imply at all that he assumes that these orders are so well-known in the religious tradition that there is no need to mention them at all. The only thing which follows from what he says is that the divine law informs us only that virtue is morally right and vice – morally wrong and sinful. However, the philosopher suggests that also this truth must in fact be arrived at by reason alone on the basis of the analysis of the divine being. While writing about the third law, i.e. the law of opinion, Locke states that "virtue" and "vice" are the names denoting, as it is commonly believed, right and wrong actions; "(...) and as far as they really are so applied, they so far are coincident with the divine law above mentioned".[9]

In other words, when Locke refers to the divine moral law, he means that the man may only know it by means of natural learning; secondly, that divine rules can in fact be reduced to one conclusion: the moral righteousness of virtue, which implies a prize and the moral wrongfulness of vice, which implies punishment. All other, detailed moral qualifications such as, for instance, that murder, theft or lies are sinful are concluded by human

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[7] J. Locke, *Essay*, II.28.8.
[8] Ibid., II.28.8.
[9] Ibid., II.28.10.

reason assuming that God disapproves of such actions. Locke does not at any moment describe precisely the divine law, he only refers to it in a general manner.[10]

It means that the only tangible and somehow available instances, which can serve for moral qualification of our actions are the civil law and the law of opinion, which, by source but not by contents, has the same status as the divine law (the law of opinion is created by human reason, the divine law is the assumption made by human reason as to what God expects from us). Therefore, the divine law is, generally speaking, the law of opinion with an assumed divine status. Stating that in almost all societies, virtue is the object of esteem and vice – the object of censure, Locke finds that it conforms to the divine rule of right and wrong. It is in this interpretation that I mean that this rule is the only element of the divine law, which Locke refers to openly. "For, since nothing can be more natural than to encourage with esteem and reputation that wherein every one finds his advantage, and to blame and discountenance the contrary; it is no wonder that esteem and discredit, virtue and vice, should, in a great measure, everywhere correspond with the unchangeable rule of right and wrong, which the law of God hath established".[11]

This divine rule is universally accepted and has a useful nature as there is "(...) nothing that so directly and visibly secures and advances the general good of mankind in this world, as obedience to the laws he has set them, and nothing that breeds such mischiefs and confusion, as the neglect of them. And therefore men, without renouncing all sense and reason, and their own interest, which they are so constantly true to, could not generally mistake, in placing their commendation and blame on that side that really deserved it not".[12]

Locke makes it even clearer that the divine law is a task which consists of the human reason grasping God's moral expectations and not a type of a readily available code, in the following context. While writing about the essence of morality, i.e. that the moral judgments about actions are made in a relation, by comparing actions to the positive, customary or divine law, he

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[10] With a different assumption, i.e. that Locke accepts revelation as the way of God announcing the moral law, this interpretation would have to be totally different; then, the divine law would not only be formal, but would also have the character of a religious natural law, which has been referred to by numerous authors in the Christian tradition (with the Decalogue having a special place in such references). However, such an assumption disagrees with Book IV of the *Essay* and it is therefore discarded here.

[11] J. Locke, *Essay*, II.28.11.

[12] Ibid., II.28.11.

announces one of these possibilities: "If I have the will of a supreme invisible Lawgiver for my rule, then, **as I supposed the action commanded or forbidden by God**, I call it good or evil, sin or duty".[13]

After such a declaration of the philosopher, there should be no more doubts – it is the human reason that fills the divine law with material content. Hence, it is the interpreter of the divine law and, to a great extent – its creator rather than a recipient. The only thing that we can use as a moral indication of the divine law is the worthiness of virtue (equal to moral good) and the unworthiness of vice (equal to the moral evil) although also this indication may be understood as the object of human conclusion and not something which is given to us from outside, from outside the scope of earthly experience.

According to Locke the limits of the "natural law" are permanently marked by "the rule of virtue and vice" even when manners are corrupted because even then we condemn in others the mistakes we make ourselves, but we do not lose the proper ethical perspective.[14] This rule, however, is a product of human reason. It sounds more justified when we realize that according to Locke all our knowledge is genetically empirical; it refers to our moral knowledge the same way as to any other,[15] which rules out the ethical knowledge coming from any sources of cognition other than the sense or reflection.

The law of opinion or reputation, being the collection of proper moral notions, includes two norms: virtue and vice, which cover specific names of right and wrong actions. Although in different societies and cultures different actions are described as virtue and vice, the structure is the same every- where: what we consider praiseworthy is referred to as virtue, to which

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[13] Ibid., II.28.14 (bold font added by me – S.R.).

[14] Saying that people unmistakably praise virtue and reprehend vice, Locke adds: "Nay, even those men whose practice was otherwise, failed not to give their approbation right, few being depraved to that degree as not to condemn, at least in others, the faults they themselves were guilty of; whereby, even in the corruption of manners, the true boun- daries of the law of nature, which ought to be the rule of virtue and vice, were pretty well preferred"; *Essay*, II.28.11. The natural law mentioned by the philosopher may be understood as the divine law in this sense, of course, that is presented in this interpreta- tion. Sometimes, however, Locke writes about the divine moral law in another, traditional meaning, as if it was a collection of values and norms given by the Creator; see: II.28.12. I interpret this kind of statement as Locke's inconsequence.

[15] Locke says that: "That it is evident, that all relation terminates in, and is ultimately founded on, those simple ideas we have got from sensation or reflection: so that all we have in our thoughts ourselves, (if we think of anything, or have any meaning), or would signify to others, when we use words standing for relations, is nothing but some simple ideas, or collections of simple ideas, compared one with another"; Ibid., II.28.18. Since all our knowledge is reduced finally to simple ideas, also the moral notions must have the same genesis and structure: earthly, temporal and completely empirical.

we are encouraged with prizes, whereas what is considered as vice is re-
prehended and discouraged by punishment. Locke, as he himself admits,[16]
does not analyze the truthfulness of different customary laws, he only tries
to show the nature of ideas and norms which people act upon. It appears
that everywhere actions are judged in relation to what is considered as
virtue or vice, and everywhere virtue is connected to prize and vice – to
punishment: "Thus the measure of what is everywhere called and esteemed
virtue and vice is this approbation or dislike, praise or blame, which, by
a secret and tacit consent, establishes itself in the several societies, tribes,
and clubs of men in the world: whereby several actions come to find credit
or disgrace amongst them, according to the judgment, maxims, or fashion
of that place".[17]

At the same time, this silent consent is equipped with power which is not
smaller than the one possessed by the legislators although it is not based on
any formal authority of imposing legal regulations since the customary law
is made by "private persons". It seems that recognition or condemnation,
being the sanctions of the law of opinion, are powerful enough to make
people behave accordingly to what is covered by the scope of virtue and
vice in a given community; the power of approval and disapproval may be
bigger than the fear of divine or legal punishment, "the greatest part whereof
we shall find to govern themselves chiefly, if not solely, by this law of fashion;
and so they do that which keeps them in reputation with their company,
little regard the laws of God, or the magistrate".[18]

Nobody is able, unless he is full of contradictions – says the philosopher,
to put up with the antipathy or condemnation expressed by their environ-
ment when they break customary rules or generally accepted moral rules.
Locke talks here then about the inevitability of punishment. In fact, only the
punishment related to customary law is inevitable and immediate, which is
why these are the rules which people obey most often. Punishment inflicted
by God or by the state tend to appear as such that can be avoided either
by the hope that the wrongful act will never be discovered or by repentance
and then reconciliation. Hence the conclusion that the law of reputation is
the most powerful and it seems to be the most proper exemplification of
Locke's basic sense of the notion of natural law.

To end the discussion of Locke's ethics one more issue must be consi-
dered: what is the real structure of the norm to which we compare our acts

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[16] See the footnote to II.28.11.
[17] Ibid., II.28.10.
[18] Ibid., II.28.12.

within what the English philosopher calls 'the moral relation' and which results in the notion of moral good and evil?

Locke claims that the moral rule is a collection of simple ideas. Therefore the conformity with the moral rule consists of directing our actions in such a way that the simple ideas they consist of would conform to those which are required by the law.[19]

The state law is seldom questioned as a moral instance. Therefore Locke does not devote too much attention to this type of law.

What is the structure of the divine law and the law of opinion? On one hand, they include notions denoting morally good acts together with a prize received for doing them, on the other hand – notions denoting morally wrongful acts together with punishment received for committing them. Can such a structure be considered as a law in the full sense of this word as it is claimed by Locke? Or is it just a collection of notions, whose range of significance encompasses the element of prize and punishment, i.e. a collection of such notions which have moral connotations (positive or pejorative)? It seems that the divine law is not a law in the strict sense of this word. Firstly, it is not announced, i.e. it is not proclaimed as a law. I assume here that the revealed moral law is not authoritative for Locke since, according to his doctrine, the revelation itself does not reach the level of certainty. Secondly, this law is in fact a conjecture or rather – a collection of conjectures of moral subjects. Thirdly, the sanctions of this law do not affect those who are not covered by this law even though they appear as a certain reality in a distant future perspective. However, these are not inevitable sanctions. As a matter of fact, it is difficult to talk here about a law in the strict sense.

Things are different with the law of opinion. It seems that its structure meets the criteria which are given to the law as such. It includes prohibitions and commands expressed in the form of certain notions, there are also sanctions related to respecting or violating the norms and a mechanism of enforcement in the form of, at least theoretically, the inevitability of prize (i.e. respect) or punishment (i.e. infamy or social disgrace). This law is also announced in the sense of being widely known and accepted by the majority of people.

However, also in the framework of this law, the moral subject has the decisive vote because it is the moral subject who creates the ideas of his own actions and then compares such interpretations of his own actions to the notions included in the norms of customary law.

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[19] See: ibid., II.28.14.

Locke says: "So that whensoever we take the rule of moral actions; or by what standard soever we frame in our minds the ideas of virtues or vices, they consist only, and are made up of collections of simple ideas, which we originally received from sense or reflection: and their rectitude or obliquity consists in the agreement or disagreement with those patterns prescribed by some law."[20]

It means that we get moral ideas from the law of opinion (it refers analogically to the divine law) by the fact that knowing which patterns of moral good ("the ideas of virtues") and moral evil ("the ideas of crimes") are generally respected, we fill them with content, i.e. simple ideas coming from empirical cognition and reflection. In other words, the law of opinion is a general guideline telling us which actions are accepted by most and which are not; but we have to interpret this guideline by ourselves basing on our experience and knowledge, i.e. we have to give them some meaning and then compare them to the ideas of our own actions. According to Locke himself, not all moral notions of the law of opinion (which also refers to the divine law) are well-constructed; "very frequently the positive idea of the action, and its moral relation, are comprehended together under one name, and the game word made use of to express both the mode or action, and its moral rectitude or obliquity",[21] disregarding its relation to the moral rule.

All it means is that the "patterns" of virtues or crimes are subject to verification or at least, that they should, because the ideas denoted by moral terms are defectively or vaguely constructed or else the moral names (terms) are understood differently.[22] It often results in misjudgements of actions. Thus, the law of opinion is not a final and unquestionable moral instance, a collection of ready-made and precise patterns to which the ideas of moral action could easily be compared to. From the *Essay's* author's words we can conclude that the defectiveness of moral notions is due to the fact that they are created by individual humans basing on their natural reason, which is naturally prone to making mistakes. Therefore, what we see as the finished moral pattern (after all, the customary law is an established thing) is not such in reality. The divine law should be treated analogically. It is a collection of positive and negative moral notions, a collection understood in the context of our human conjectures as to what God wishes for and what he most probably disapproves of.

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[20] Ibid., II.28.14.
[21] Ibid., II.28.16.
[22] See: ibid., II.28.19.

Therefore, we can say that these are not moral laws that constitute the final instance but rather the moral subject, who, using the natural light of reason, interprets the law of opinion and the divine law according to the criteria of his own reason and social or divine expectations. As a matter of fact, the moral subject appears to be the creator of the three laws listed by Locke and also the creator of the moral interpretations of these rules, which is most clearly evident in the case of the statute law, but also refers to the law of opinion or the divine law.

In such case, what are the grounds for Locke's belief that morality is as capable of demonstration as mathematics? What Locke says is neither precise nor in the least convincing.[23] His examples of moral judgments are misleading and, what is more, imply that he may have in mind the creation of a certain system of interrelated and ordered judgments. On the other hand, the clear notion of a moral relation, which Locke seems to consider as the key to the properly structured ethics, is not enough to talk about mathematically demonstrated ethics. Anyway, it has to appear as inadequate because we would need to be sure of the elements which are compared within the relation whereas the law and moral notions are in fact only tasks that ethics has to deal with rather then ready-made "facts", which we can simply relate to.

S U M M A R Y

John Locke did not deal with ethical issues in a systematic way. However, in *An Essay Concerning Human Understanding* we can find several interesting remarks, which suggest that this English philosopher was deeply convinced that the formulation of a widely recognized ethical system is an easy task. It is enough to base it on a mathematical formula and a philosophical procedure of empiricism. Did Locke manage to convince the reader to his optimistic vision at least a little? Rather not. The ethical evidence he quotes are not as precise as mathematical ones while the examples of moral judgments are simply misleading.

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[23] See: J. Gibson, *Locke's Theory of Mathematical Knowledge and of a Possible Science of Ethics*, "Mind", Vol. 5, No. 17 (Jan., 1896), p. 50.

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PASCALIAN THEMES IN THE PHILOSOPHY OF SØREN KIERKEGAARD

Pascal and Kierkegaard belong to those most outstanding Christian philosophers for whom explaining what the essence of faith is constitutes a fundamental problem. For Pascal as well as for Kierkegaard the dialectical opposite of faith is despair, without which one cannot understand the human condition as it is.

One should add that the concept of dialectics constitutes a method allowing to discover the truth about man and provides them with a category necessary for the description of human personality. Despair and faith are ways of existence for the human personality in relation to God.

Such a point of view appears for the first time in the works of Pascal, then Kierkegaard takes it up and analyses the phenomenon of despair in detail, making it the second philosophical category along with faith. Thus those interpretations which consider Pascal's views as an anticipation of the philosophy of "the father of existentialism"[1] are correct. Kierkegaard knew Pascal's philosophy and many times made reference to his thoughts. They shared many views on Christianity and one of them, a fundamental one, was the understanding of the concept of humility. Kierkegaard wrote in his "Diary":

Pascal says: it is so difficult to believe because it is so difficult to be obedient.[2]

Humility is here not only an affirmation of one's own self, the I in confrontation with the greatness of God's Thou, but also a response to the

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[1] A. Siemianowski, *Wielkość i nędza człowieka. Rozważania o Pascalu* (*Greatness and misery of man. Reflexions about Pascal*), Wrocław 1993, p. 85.

[2] S. Kierkegaard, "Dziennik" (Wybór), (*Diary (Selection)*, translated by Antoni Szwed), TN KUL, Lublin 2000, (757), p. 461. All passages from Kierkegaard's *Diary* (*Journals*), quoted here, were translated into English from the Polish translation, which somewhat differs from the English one (A. Dru, 1838) in this and possibly other places.

value which the other, another man, constitutes for us.[3] Referring to the French philosopher, Kierkegaard describes humility in the following way: *Pascal says, at some point, that it would be ridiculous to be shocked by Christ's humility, as if that humility was of the same kind as the Majesty which He reveals. One could also say that it would be ridiculous indeed had Christ come in earthly splendor and majesty, since the Majesty that He was to express was in fact the opposite. Existential transparency requires that one be what one teaches.*[4] The philosopher warns, however, against false humility, typical of lay mentality, present in protestant thinking, which we find in the attitude: *I am too humble and modest to aspire to being extraordinary.*[5]

The Danish philosopher remarks that what Protestantism avoids so much and what it calls something extraordinary is nothing else than taking up the reality of the cross. He asks: *What is that extraordinariness? Is it not living in poverty and misery, being hated, cursed, and finally killed?*[6] In order to understand well the concept of humility one should see it through the model of Christ, who shows us fully what transparency identical with the truth of existence is. That is why Pascal wrote: *True religion shows us our duties, our weaknesses – pride and covetousness, it also indicates the medicine – humility and mortification.*[7] Noticing the difference between his own and Pascal's conception of humility, the Dane stresses this existential theme. He writes: *Pascal says that very few people speak humbly of humility, not many innocently about innocence, few express doubt when speaking of their doubts – it is only a lie within us, a duality, a contradiction. It is an expression of that to which I attach a greater significance – duality. For Pascal they seem to have still an almost aesthetic character, I strongly stress their existential aspect.*[8]

It seems that the opinion quoted above is too radical, since, following Pascal's train of thought on this matter we notice that the French philosopher also sees in humility a state that reveals the truth of existence. The

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[3] P. Bartkiewicz, *Rola pokory w kulturze myślenia (wokół "Veritatis splendor" i "Fides et ratio")* (*The role of humility in the culture of thinking (commenting on "Veritatis splendor" and "Fides et ratio")*), [in:] *Polska filozofia wobec encykliki Fides et ratio* (*Polish philosophy in relation to the Encyclical Fides et ratio*), ed. by Marian Grabowski, Toruń 1999, pp. 214–215.

[4] S. Kierkegaard, *Dziennik, op. cit.*, p. 461.

[5] S. Kierkegaard, *Dziennik, op. cit.*, p. 359.

[6] S. Kierkegaard, *Dziennik*, p. 359.

[7] B. Pascal, *Myśli* (*The Pensées*), Instytut Wydawniczy PAX, Warszawa 1972. (435), p. 183. This Polish edition of Pascal's *Pensées* was used as a source for translating quotations into English.

[8] S. Kierkegaard, *Dziennik, op. cit.*, p. 462.

realism of man consists in seeing himself as he is. His natural state is misery and greatness. Knowing the former brings despair, knowing the latter brings pride. Despite the awareness of his misery man has instinct which lifts him up. He suffers from a lack of power to learn the truth, yet he has an indestructible consciousness of what the truth is. He seeks truth, but finds uncertainty. His rational self fights an endless battle with his emotions and passions. We possess truth and goodness only partially, always mingled with evil and falsehood. For Pascal there is no liberation from theses contradictions in any other way than through faith, since, according to him *all contradictions come together and are united in God and through God alone.*[9] That is why humility is a way of existence for man confronted with the mystery of God who is a reality beyond human understanding. Infinity, being an attribute of His nature, is difficult to grasp for a finite mind limited in its capacities. Being aware of the human mind's limitations is, for both philosophers, a trait of man's wisdom.

John Paul II took notice of this characteristic of the Frenchman's and the Dane's philosophy referring to it in his philosophical encyclical, in which he writes that in Christian philosophy one can see its subjective aspect *which consists in the purifying of reason through faith. As a theologal virtue, faith frees the reason from presumptuousness, a temptation to which philosophers tend to surrender. It had been condemned by Paul and the Fathers of the Church, and in times closer to us by philosophers such as Pascal and Kierkegaard. Thanks to humility the philosopher finds courage to take up certain problems which would be difficult to solve if he did not take into consideration knowledge attained through Revelation. As examples one can indicate: the problem of evil and of suffering, God's personal identity, the meaning of life, and in a more direct way – the metaphysical question "why does something exist?"*[10]

Lev Szestov who analyzed the philosophy of Pascal and even more so that of Kierkegaard claims that whoever has full confidence in his own wisdom, sense of justice, and counts totally on his own power will not be saved since such an attitude is a symptom of the biggest of sins: pride. Pride means being absolutely certain of where to go and how to get there, counting only on one's own judgment and abilities. He wrote: *Who has hope in himself renounces God. Because between ways in which man saves*

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[9] M. Tazbir, *Świadomość heroiczna (Heroic conscioussness)*, "Życie i Myśl" 1962, No. 9–10, p. 7.

[10] "Fides et ratio" (in) *Encykliki Ojca Świętego Jana Pawła II (The Encyclicals of The Holy Father John Paul II)*, Wydawnictwo Znak, Kraków 2005, pp. 1164–1165.

himself from his troubles and the way in which God saves man there can be nothing in common.[11] Speaking about humility, both philosophers have in mind the many meanings it can have. One of them consists in a realistic assessment of oneself, that is because *the majority of people are subjective towards themselves and objective towards others, sometimes frighteningly so – but the correct goal should be to have an objective attitude to oneself and a subjective one towards everyone else*[12] – wrote Kierkegaard. In order to obtain a proper evaluation of oneself it is absolutely necessary to keep an objective distance to oneself.

In a different meaning, humility consists of feeling one's own nonentity in relation to the greatness of God and the awareness of sin as being the constitutive principle of life. This type of humility makes one conscious of the fact that, as Kierkegaard wrote, *we can never be right about anything in relation to God*, that is why *It is necessary to have three qualities, those of the pyrrhonist, of the geometrician and of the humble Christian. These unite with and attemper one another, so that we doubt when we should, we aim at certainty when we should and we submit when we should.*[13] That is, one must have a powerful, lucid, mathematical mind, know where its borders lie, and then with a child's trust subject oneself to Revelation. In a yet different meaning, humility is accepting one's own suffering. The attitude towards suffering was a theme linking the two philosophers as some commentators of Kierkegaard's thought pointed out.[14]

The conviction that suffering is a natural state for a Christian because it is the best way to imitate Christ was what Pascal and the Dane had in common. The fact that after the resurrection He allowed to touch his wounds was, for Pascal, equal to showing that man's duty was to integrate oneself with His suffering.[15] Accepting one's own suffering is therefore the most perfect form of human obedience. Kierkegaard develops this theme in Pascal's thinking when he writes *Only suffering prepares us for eternity, because the essence of eternity is faith, faith consists in obedience, and we learn obedience through suffering. There is no obedience without suffering,*

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[11] *Tylko wiara. Antologia tekstów Lwa Szestowa* (*Only faith. An anthology of texts by Lev Szestow*), (ed.) Patrycja Wyligała, Wydawnictwo M, Kraków 2004, p. 255.

[12] B. Alex, *Soeren Kierkegaard: życie prawdziwe. Życie i dzieło chrześcijańskiego filozofa* (*Soeren Kierkegaard: true life. Life and work of the Christian philosopher*), Oficyna Wydawnicza "Vocatio", Warszawa 1998, p. 122.

[13] *Pensées, fragments et lettres de Blaise Pascal*, edited by P. Faugère, Paris 1844, p. 347. English translation of this passage is given here after W. F. Cobb, *Pascal*, [in:] *Encyclopedia of Religion and Ethics*, part 18, 2003, p. 657.

[14] S. Kierkegaard, *Dziennik*, *op. cit.*, footnote 604.

[15] B. Pascal, *Myśli* (*The Pensées*), *op. cit.*, (734), p. 323.

no faith without obedience nor is there eternity without faith. In suffering – obedience is obedience, in obedience – faith is faith, in faith – eternity is eternity.[16]

For both philosophers suffering is the only way to perfection for man and the character which best embodies this road to self-improvement is the biblical Job. *Salomon and Job knew and expressed human misery better than anybody else: one being the happiest, the other the most miserable of men: the former knowing the emptiness of sensual bliss, the latter the truth of suffering*[17] – wrote Pascal. Kierkegaard added that suffering takes place in the solemnity of silence because *silence hides suffering within itself like a mystery which nobody dares to disclose.*[18]

For Kierkegaard, Job is a man of trial. Trial, in this sense, is God's obverse, that is, a sort of way of discouraging the believer, of making him disappointed in relation to God. According to the Danish philosopher, trial occurs every time *when someone decides to exist in a religious manner, as an actual, definite, concrete man.*[19] Job receives his misfortunes with a religious acceptance expressed in the words *The Lord gave, The Lord took away, may His name be blessed*, at the same time through his lamentations he demands of God the returning of what he has lost. Job takes up a crazy struggle to achieve what seems impossible because he is convinced that nothing is impossible to God. And it happens that everything is returned to him, against all rational judgments of his friends.

Since suffering is a factor furthering mental concentration, it allows man to achieve spiritual depth, which is a condition of discovering his true nature. Lack of thoughtful deliberation *leads nowhere, outwards, towards what is objective, whereas what comes from faith is mysterious, directed to that which is internal, what makes man more himself. This "being oneself" is oftentimes called "pessimistic" realism, renouncing the shallow joys of this world in return for the depth of Christianity.*[20] That is why for both philosophers suffering is a necessary condition of being a Christian. Achieving spiritual depth allows man to discover his true nature which is tantamount

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[16] S. Kierkegaard, *Rozprawy* (*Dissertations*), [in:] B. Alex, *Soeren Kierkegaard: życie prawdziwe. op. cit.*, pp. 108–109.

[17] B. Pascal, *Myśli* (*The Pensées*), *op. cit.*, (169), p. 86.

[18] S. Kierkegaard, *Powtórzenie* (*Repetition*), Translation and introduction B. Świderski, Fundacja Aletheia, Warszawa 1992, p. 117.

[19] S. Kierkegaard, *Dziennik, op. cit.*, p. 392.

[20] J. A. Prokopski, *Posłowie nad Szestowem i egzystencjalizmem* (*Postscript: on Szestov and existentialism*), [in:] L. Szestow, *Kierkegaard and existential philosophy*, Wydawnictwo ANTYK, Kęty 2003, p. 249.

to reaching the state of authentic existence, this being the main task of man. Kierkegaard looked at Pascal from the perspective of the French philosopher's sufferings, both these that fate ordained and those that were a result of ascetic practices deliberately chosen by him. The Danish philosopher was irritated by the fact that many scholars separate the thoughts of Pascal from the life of the author. He writes with quite a bit of bitterness: *Who, in our times, has been more often used by preachers and professors than Pascal? They adopt his thoughts, but leave out the fact that he was an ascetic, he wore a hair shirt and performed all actions connected with it and that is not mentioned today.*[21]

One as well as the other philosopher realized that truth is found in subjectivity, which, through suffering and despair becomes refined spirituality. This spirituality is characterized by a specific duality which is a result of revolt and humility coexisting, since only such an attitude can accept faith. Particularly since faith is not a conviction but a mode of existence and life in faith suspends moral norms, as well as norms of rational thinking because it accepts paradox. That is so since paradox is born always from the link between the one who exists and the eternal truth. Therefore, the highest form of paradox is the absolute paradox of God-man, which goes beyond human understanding and so one can only believe in it.

When trying to define paradox Kierkegaard writes: *Paradox is not a concession but a «category» – an ontological statement which expresses the relation between the existing, knowing spirit and the eternal truth.*[22] Paradoxical thinking is present in Pascal's thought, even though the expression "paradox" is not used by the philosopher. He describes it as a situation of two extremes attracting each other or a concordance of two contradictory truths. Inability to think of reality as contradictory, according to him, is the root of all heresies, of which the Arians are the best example since they cannot understand that Christ is God and man. Pascal wrote: *Therefore there exists a large number of truths of faith and of morality which seem to be repulsive to each other and which in fact continue to exist together in perfect order.*[23] For both philosophers, being "above reason" does not mean complete cutting of connections with rationality. Truth defined as paradox does not stop to be truth; it does, though , go beyond the border of reason and only as such can it be given to man. That is why only by way of the category of paradox could one describe human condition full of contradictions

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[21] S. Kierkegaard, *Dziennik, op. cit.*, p. 463.

[22] *Ibidem*, p. 240.

[23] B. Pascal, *Myśli, op. cit.*, (788), p. 347.

and only this way through the intermediary of God-man similar to people in His subjectivity could man receive the fullness of truth. The category of paradox applies also to knowing God, who, for both philosophers, is a reality going beyond human understanding since the infinity of His nature is difficult to grasp for the mind, which, being finite, is limited in its capacity.

Thus, on an intellectual-philosophical level it is impossible to know God, who is, at the same time, hidden and undetectable directly in His creation, and revealing himself, not so much in the world, as within human spirituality.

For Pascal, as well as for Kierkegaard, God is and, simultaneously, is not hidden, *His immanence coexists with transcendence.*[24]

Both thinkers consider God, as well as many other problems, from a dialectical point of view. Kierkegaard refers to that in his *Diary*, in which in turn he refers to a letter of Pascal to Mademoiselle Roannes, where we can find the thought that God in his mysterious nature reveals himself to only a few and up to the moment of Incarnation he remained behind the veil of this mystery.

But *in this way He hides himself even more by wrapping himself in being in its human form. Because He was more knowable when He remained invisible. Now He has hidden himself even more deeply in the sacrament* (...) *We have here a dialectic which is given meaning by Johannes Climacus – that is, that there is a revelation recognizable through its opposite, that is, through mystery.*[25]

This is difficult to understand for somebody who makes use of his reason alone, since the logic of a religious man differs from his logic. Because God cannot be grasped by reason, rather He makes himself known to man who calls on Him from his bottomless despair. Man will not address his prayers to an immovable subject for philosophers, neither could God thus conceived be an inspiration to prophets and apostles. Thus, the God of Pascal and Kierkegaard is not a God of philosophers understood as an abstract, universal law.

Kierkegaard repeats after Pascal, that the Christian God is the living God of Abraham, the God of Isaac and the God of Jacob, not the God of philosophers and scholars. For Pascal, *the God of Christians – is the God of love and consolation: a God who fills the hearts and souls of those He possesses; it is the God who makes them feel their misery and His endless*

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[24] S. Kowalczyk, *Bóg w myśli współczesnej* (*God in contemporary thought*), Wrocław 1982, p. 388.

[25] S. Kierkegaard, *Dziennik, op. cit.*, p. 463.

mercy; who becomes part of their souls interior, who fills their souls with humility, joy, trust, love, who makes them incapable of having any other goal than Himself.[26]

That is why it is the duty of man to reciprocate this love. Kierkegaard referring to his predecessor remarks that, according to Pascal, *the knowledge about what is divine remains in a reverse relation to the knowledge about the human. One has to first know what is human in order to, as the next step, start loving. One should first start loving what is divine and then know it. What Pascal means by this is that the knowledge about what is divine, is in fact a transformation of human personality: he must become another man in order to know what pertains to God. This has been completely forgotten in our times*[27] – he wrote in his *Diary.* According to Kierkegaard, God reveals the truth about Himself to a given man in proportion to this man's existential transformation. In no other philosophy, it seems, do the old and constantly used religious expressions: conversion (being reformed) and revival (being born again) become so clear, as in the philosophy of the Dane. Conversion, for him, means going through despair in order to return to the state one was in from the moment of birth. That is, a self relying clearly on the Might that created it. Thus, in Pascal's philosophy, God who values human freedom remains partially hidden so as to give man the opportunity to search for him, whereas in Kierkegaard's philosophy, man in his liberty has to make the effort of becoming born again, since his personality is seen as a gift and a requirement at the same time, a requirement which he must fulfill. Finding God as well as discovering one's own personality does not depend on man alone. On the contrary, on the part of man there can be only a great thirst for God and such a deepening of one's own personality which will lay the ground for resolutions having eternal significance. For both philosophers the road to these leads through suffering and despair.

The objective of my paper was, not so much to show similarities and differences between the two philosophies, even though it is evident that Kierkegaard is a continuator of Pascal's thinking in the matter of the dialectical opposition of despair and faith as elements of the human condition, as to demonstrate those themes in Pascal's reflections to which Kierkegaard makes direct reference.

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[26] B. Pascal, *Myśli, op. cit.*, (602), p. 285.

[27] S. Kierkegaard, *Dziennik, op. cit.*, p. 462.

S U M M A R Y

The paper analyses Pascalian motifs in Søren Kierkegaard's philosophy. The Danish philosopher can be considered the follower of Pascal in respect to the dialectical concept of human condition. For both philosophers, despair and faith constitute two categories which are inseparable from human existence. Therefore, the views that the French philosopher's concepts anticipated the thought of "the father of existentialism" seem well-grounded. However, the paper does not aim at indicating the similarities and differences between the two philosophical theories. Instead, it focuses upon those aspects of Pascal's reflections and also his biography, to which the Copenhagen philosopher directly referred. Kierkegaard knew the philosophy of his predecessor and highly appreciated it. He emphasized that Pascal's interpretation of humility, suffering, God-man paradox, and the importance of paradoxical mode of thinking were crucial for Christian approach. What is significant is the fact that Kierkegaard wrote about such problems in his *Journals*, addressing these issues directly, without using pseudonyms, which were typical of his other writings.

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PETRYCY OF PILZNO VERSUS FRANCIS BACON: BREAKING THROUGH TOWARDS HARMONY AND COMPREHENSIBLE PHILOSOPHY

The aim of this paper is to present and compare the views of two prominent thinkers of the seventeenth century – Petrycy of Pilzno and Francis Bacon. Although they belonged to the same century, they were facing different geopolitical and cultural circumstances. A comparison of their views will help to shed some light on the philosophical tendencies around the turn of the seventeenth century as present in Poland, where Petrycy of Pilzno (1554–1626) remained a central figure in the field of philosophy occupied with the issue of language development, and in England, where Francis Bacon (1561–1626), a politician, scientist and philosopher, saw clarification of language as a primary condition on the way towards true philosophy and harmonious political state.

In the book entitled *The Structure of Scientific Revolutions* Thomas Kuhn argues that social and cultural conditions may and do affect the direction of every scientific development. Therefore, scientific knowledge is relative, for it depends on a certain paradigm dominating a given field at any given time. The domination of such paradigms leads towards their uncritical acceptance as being true. They are to remain until a "scientific revolution" creates a new orthodoxy.[1] The new orthodoxy, in turn, requires "a paradigm shift" from "one set of domain assumptions to another" and the new paradigm explains why the particular anomalies led to the deficiency of the old paradigm while simultaneously reinterpreting it.[2] Similarly, though to

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[1] See T. Kuhn, *The Structure of Scientific Revolutions*, The University of Chicago Press, Chicago, 1996, pp. 92–98 and pp. 101–102.

[2] *Ibid.*, pp. 182–191.

a different degree, both Petrycy of Pilzno and Francis Bacon saw a necessity to initiate a shift of paradigm seeing the inadequacy of the scholastic thought prevailing so far.

Philosophy, being one of the major components of each country's cultural and national identity, must and does preserve individual features. A distinct character of different nations became obvious with the beginnings of the Renaissance when Western Europe, dominated by the Greco-Latin world, started creating autonomous cultures with a clear reference to their national features. The Middle Ages philosophy, characterised by the language uniformity as well as social, political and religious circumstances, was doomed to remain rather problematically and methodologically congeneric. Starting with the sixteenth century there appeared a new, specific way of making philosophy among thinkers with respect to their cultural and national identity, which presupposed not only the issues to be tackled but also the methodology to be used.

Although to a different degree and from different perspectives, both Petrycy of Pilzno and Francis Bacon were preoccupied with the issue of modernisation of the language of philosophy. Those reparation tendencies appeared in Petrycy's practical philosophy where he aimed at making a complicated language of philosophy simple enough to popularize it among the middle-class people. Bacon, on the other hand, approached the issue of language at a global scale being preoccupied with the idea of creating a perfect language, clear of any ambiguities and able to solve the problem of faulty communication, which, according to him, was responsible for the poor political state of the country.

Needless to day, the views and philosophical programs of both thinkers were deeply rooted in the social and political situations in Poland and England. In Poland at the turn of the sixteenth century a rich publicistic activity could be observed. After a long period of religious quarrels the main issue of Polish literary output became preoccupied with the issues of home affairs. Polish nobility opposed the program of Royalists and resisted the King by forms of arms which marked a clear division into the advocates and opposers of King Zygmunt III. Strong reformation tendencies towards the influence in the state appeared. The views of the people were created both by writers as well as philosophers engaged in the trend of reorganising the law and customs of the country.

A political situation in England during the first half of the seventeenth century was in sharp contrast to the political situations of other European countries of the same period. While European continental states were developing absolute and centralized monarchies, England, in a chaotic and

violent way, aimed at a radical reduction of the monarchical power and the development of an alternative state in which the powers of the monarch were to become subsidiary to the power of governmental branches.[3] Although the seventeenth-century England managed to stay away from European military problems from the thirties to the fifties, the situation of England was generally framed in what has come to be called "the crisis of the seventeenth century."[4] Just as its European neighbours, England was going through a severe economic and political crisis.

However, dramatic experiments exercised in the English politics starting from absolutist tendencies at the beginning of the century to the overthrow of the monarch in the middle of the century and the development of the English Republic did not correspond directly to any other European cases. Being rooted in the growing conflict between the crown and the House of Commons, they consequently led to significant limitations of monarchical powers in the second half of the seventeenth century.[5]

Needless to say, both Petrycy of Pilzno and Bacon were affected by the political and economic situations of their countries. Being engaged in home affairs, Petrycy was one of the most prominent Polish intellectuals. Both aristotelic and horacian, he took his inspiration form the Renaissance ideas to enter the spheres of new solutions in the fields of aesthetics and philosophy. He was also a true Catholic, sharing the spirit of the Post-Trientic ideology, as well as a philosopher, doctor, poet and translator. Petrycy of Pilzno is known as the first translator of Aristotle's *Nicomachean Ethics*[6] and *Politics*[7] as well as Pseudo Aristotle's *Economics*[8]. He enriched those works with numerous comments presenting his own views in the filed of practical philosophy, which was the biggest enterprise in the Polish phi-

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[3] T. Munck, *Seventeenth-Century Europe: State, Conflict, and the Social Order in Europe, 1598–1700*, The Macmillan Press Ltd, New York and London 1990, pp. 80–84.

[4] *Ibid.*

[5] Historians highlight the unprecedented character of the background of the English Revolution pointing out that no European revolution before had the same causes and effects. It was the English Revolution that would become the model to study during the revolutions in France and Russia. See P. Johnson, *A History of the English People*, Perennial Library, USA 1985, pp. 198–202.

[6] *Etyki Arystotelesowej, to jest jako się każdy ma na świecie rządzić, z dokładem ksiąg dziesięciorga*, Publisher M. Jędrzejowczyk, Kraków 1618. Only the first part including five books and comments was printed.

[7] *Polityki Arystotelesowej, to jest rządu rzeczypospolitej z dokładem ksiąg ośmioro*, Publisher Sz. Kępini, Kraków 1605.

[8] Edition I: *Ekonomika Arystotelesowa albo raczej nauka domowego gospodarstwa, printed by* Łazarzowa, Kraków 1601; Edition II: *Ekonomiki Arystotelesowej, to jest rządu domowego z dokładem księgi dwoje*, Kraków, Publisher M. Jędrzejowczyk, 1618.

losophical literature.[9] Petrycy of Pilzno is also known as the designer of the first, almost complete, translation of Horace's *Odes and Epodes* entitled *Horatius Flaccus w trudach więzienia moskiewskiego na utulenie żalów* [...] *w liryckich pieśniach zawarty*. What is more, Petrycy of Pilzno was a practising doctor and a scientist. He also wrote two scietific works *De natura, causis, symptomatis morbi gallici eiusque curatione quaestio*[10] and *Instructia abo nauka, jak się sprawować czasu moru*,[11] which were thought to have influenced the development of the Rennaisance science. He is also referred to as the father of the Polish philosophical and medical school.[12]

As it was mentioned earlier, Petrycy of Pizlno represents the so-called Renaissance or popular aristotelism.[13] This is revealed by his choice of the topics concerned with ethical and political interests ignoring inquiry in logic and metaphysics. Moreover, his aim was to popularize philosophy among his Polish contemporaries, which also corresponds with the Renaissance aristotelism. He is rightly called a Renaissance scholar which implies a combination of the Middle Ages methodology with a modern way of thinking regarding human beings and values.

Francis Bacon, in turn, is often referred to as the father of natural philosophy and new sciences, who marked a definite department from the era of the Renaissance.[14] Indeed, the name of Francis Bacon has always been associated with the beginnings of the new science and much has been said and written about his contributions to its development. Accordingly, the persona of Bacon has largely been presented as a reformer and innovator who "freed science from the misty land of dialectics and led it to the enlighted

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[9] It is necessary to highlight here that Petrycy was one of the first Europeans to translate the above mentioned works. It was not until 1791 that Spanish and English people first translated Aristotle into their languages. Frenchmen, on the other hand, had translated all the three works long before other nations: *Ethics* (1488), *Politics* (1489) and *Economics* (1544). Italians translated *Ethics* in 1550, and *Politics* in 1547. On the other hand, it was not until 1774 that Germans translated *Economics* as the first work of the trilogy. See W. Wąsik, *Literatura polskich przekładów Arystotelesa jako przyczynek do historii filozofii w Polsce*, "Przegląd Filozoficzny" Chapter 15, 1912, p. 321.

[10] Publisher Łazarzowa, 1591.

[11] Publisher M. Loba, 1613.

[12] L. Zembrzuski, *Pionierzy medycyny w Polsce XVI wieku*, "Wiadomości Lekarskie" 1953/1, p. 48.

[13] See W. Wąsik, *Historia filozofii polskiej*, Vol. 1, Warszawa 1958, p. 150. Compare K. Grzybowski, Introduction to: Sebastian Petrycy z Pilzna, *Pisma wybrane*, Vol. 1, *Przydatki do Etyki Arystotelesowej*, Warszawa 1956; *Zarys dziejów filozofii w Polsce. Wieki XIII–XVII*, ed. Z. Ogonowski, Warszawa 1989, pp. 414–418.

[14] See K. Leśniak, *Franciszek Bacon*, Wiedza Powszechna, Warszawa, 1961, p. 7.

fields of experiment."[15] Naturally, the idea of progress forwarded by Bacon became the trademark of his thought: "Like Columbus sailing for India, Bacon had a definite idea of how to venture into the Renaissance open world, namely by means of progress in science and technology, and he also conceived where this progress should leave."[16]

Being a convicted royalist and politician in the first place, Bacon arrived at the principles of his natural philosophy and new science to a great extent as a response to the contemporaneous political inadequacies threatening the Jacobean order. Being tightly connected with the Parliamentary scene of the Jacobean court, Bacon's philosophical mind developed in the political framework of his time and in the first place it must be seen as a natural consequence of his political convictions. To paraphrase Liebig's words, Bacon's philosophical methods cease to be incomprehensible when looked at with the eyes of the royal advisor and Lord Chancellor.[17]

While analysing a political stand of Petrycy in the historical background of his times, it is possible to call him a spokesperson of the program conducted by the royalists surrounding Zygmunt III. On the other hand, from a middle-class perspective, Petrycy modified that program significantly. He supported the form of government which allowed for a union between the nobility with the middle-class elite under a strongly positioned monarch. Such a form would successfully cater for the middle-class people's interests. In Petrycy's opinion, the middle class was represented by many Polish citizens who, nonetheless, had been deprived of basic rights.[18]

Petrycy often expressed his intention of reforming the language of philosophy in his comments which were attached to Aristotle's works. He was convicted that his primary aim was not ornamentation of speech but the easiness of expression of the Aristotelian ethical and political thought so that "plain people could get the taste of dialectic" to be able to tackle more difficult philosophical issues later.[19] He often highlighted his attempts to preserve a dialectic precision of a statement. In moral philosophy, to his mind, a misused word could result in more harm than if it had been

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[15] Translation – mine; M. Wiszniewski, *Bacona metoda tłumaczenia natury i inne pisma filozoficzne*, Państwowe Wydawnictwo Naukowe, Warszawa, 1976, pp. 25–26.

[16] K. M. Meyer-Abich, *Technological Trajectories and the Human Environment*, National Academy of Engineering, The USA, p. 177.

[17] Liebig in G. Bachelard, *La formation de l'esprit scientifique*, J. Vrin, Paris, 1938, p. 84.

[18] *Zarys dziejów filozofii w Polsce. Wieki XIII–XVII*, ed. Z. Ogonowski, Warszawa 1989, p. 418.

[19] Translation – mine, *Polityka* I, *Przedmowa do czytelnika*.

used in theoretical sciences. Ethics, in turn, could not reach the precision of argumentation characteristic for metaphysics and mathematics. According to him, the primary aim of ethics was to be an effective science where "one does not have to sharpen his mind, but to moderate one's will from the evil."[20]

Based on the Aristotelian aretology, Petrycy's own aretology fits perfectly in the trend of the contemporary spirit of moralization. Intellectual and moral formation of the young as well as formation of the citizens useful for Poland were a major aim of the intellectual environment around the turn of the seventeenth century.[21] Although the philosophical works of the time did not reveal such forms of persuasion as found in Orzechowski or Skarga, rhetoric as a "verbal equivalent of dialectic"[22] was to define the frames for those works. In accordance with Aristotle's intention, it focused both on the sphere of analytical knowledge as well as practical philosophy or, in other words, politics in its broad sense.[23] Petrycy was concerned with the formation of a good human being – the aim of moral philosophy – which presupposed the promotion of a virtues life and the ignorance of the devil. A philosophical discourse was to unite dialectic argumentation and persuasive elements making a statement successful.

Petrycy's reflection on virtues was of a systematic character. He did not only give recommendations and reprimands regarding a virtuous life present in the works of many popularizers of ethics. Petrycy did not limit his concept to the reconstruction of the model of the Master. The model was to be modernised to meet the expectations of Petrycy's contemporaries. Therefore, he was participating in what MacIntyre has called the tradition of virtue.[24]

Bacon was also concerned with a clear need to depart from the scholastic mode of thinking dominating thus far. According to Watts, three systems of thought prevailed in the late 16th-century England, namely: Aristotelian

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[20] Translation – mine, *Etyka*, p. 54.

[21] See I. Dąbska, *Filozofia w Akademii Zamojskiej w dobie renesansu*, in *Nauczanie filozofii w Polsce w XV–XVIII wieku*, (ed.) L. Szczucki, Wrocław 1978, pp. 87–110. The intellectual environment was mainly represented by Adam Burski, Szymon Birkowski, Tomasz Drezner, Andrzej Abrek. See J. Czerkawski, *Arystotelizm renesansowy i scholastyczny*, in his *Humanizm i scholastyka*, p. 157.

[22] K. Burke, *Tradycyjne zasady retoryki*, (trans.). K. Biskupski, "Pamiętnik Literacki" 1977, Chapter 48, p. 224.

[23] See. Arystoteles: *Retoryka* 1356a 25, 1359b 8.

[24] A. MacIntyre, *Dziedzictwo cnoty. Studium z teorii moralności*, translated and edited by A. Chmielewski, Warszawa 1996.

Scholasticism, scholarly and aesthetic humanism, and occultism.[25] Learning remained highly Aristotelian, even though some criticism of Aristotle's logic had reached Cambridge at the time Bacon was its student. The Christian humanists such as Petrarch, Lorenzo Valla, and Erasmus glorified the world and appealed to the beauty of art, language, and nature – the features which soon became the trademark of the humanists all over Europe. The third important current of thought Bacon's contemporaries were inclined to was that of occultism, or esoterism – "the pursuit of mystical analogies between man and the cosmos, or the search for magical powers over natural processes, as in alchemy."[26]

While discussing Bacon's shaping of intellectual mind, it is necessary to mention that there was one more mode of Renaissance thought outside England which Bacon was highly impressed by, namely the philosophy of Nicholas of Cusa, Thomas Campanella and Giordano Bruno who praised knowledge of nature as a "matter of extrapolating from the findings of the senses."[27] It was their thought that Bacon followed wholeheartedly. It was already during his studies in Cambridge that Bacon realized the erroneous position of the scholastic thought remaining in teaching. It was also there that he set his mind upon discovering a new focus upon nature and its laws. Consequently, Bacon, with his empirical thought, succumbed to the mode of the new science, whereas experiment, seen in the light of nature, had become a trademark of his philosophy.

While elaborating his program of natural philosophy, Bacon was not indifferent to another philosophical trademark of the seventeenth century, that is, a universal language movement which remained in the general agreement with the seventeenth-century European philosophical thought. It would hardly be exaggeration to say that the issue of language appears as a linking chain between Bacon's philosophical ideas.

In contrast to Bacon, Petrycy was humble enough to limit himself to a didactic mission. While translating and making comments on Aristotle's works, he wanted "from Greece and Lazio to bring philosophy to Poland and make it common".[28] In the foreword to *Politics* in one of the "arguments" entitled "Intentions of the author" he wrote: "I consider it useful to translate

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[25] See R. Watts, *Gender, Science and Modernity in Seventeenth-Century England*, in "Paedagogica Historica", 2/February 2005, vol. 41. pp. 79–93.

[26] See A. M. Quinton, P. M. Urbrach, and K. M. Lea, *Francis Bacon*, http://search.eb.com/shakespeare/macro/5000/52.html (accessed June 14, 2005).

[27] *Ibid.*

[28] Translation – mine, *Ekonomika*, Dedicated to Mikołaj Oleśnicki.

it into the Polish language all the skills and philosophy, which is perfectly described by Aristotle 's deep mind, being driven by the desire, as far as I can, I want to lead people so eager in their evil towards virtue and Christian traditions".[29] Petrycy presented himself as a mediator between the work of Stagiryta and his contemporaries, he felt a great desire to educate Polish middle-class people in the field of philosophy at least at the elementary level.

Petrycy's moral code includes thirteen virtues: 1) courage, 2) abstention, 3) generosity, 4) nobility, 5) dignity, 6) magnificence, 7) briskness, 8) courtliness, playfulness, 9) honesty, 10) dexterity, humanity, 11) shame, 12) "nemesis", 13) the ability to appreciate happiness. These virtues make the ideal *vir bonus*. Petrycy, following Aristotle, claimed that the ideal was not available for every addressee of his ethical works. Therefore, he did not attempt to create a model which enveloped all the virtues, which was so characteristic for the sixteenth-century parenetics. What is more, he did not promote any particular position, what he did promote was the very idea of virtues. Each man could see one's reflection in the mirror of Petrycy's ethics. His ethical code did not mean to highlight an ideal model of a personality but focused on numerous models of behaviour and conduct present in the society.

Petrycy's rhetoric argumentation, when directed to a wide audience, takes different forms. A primary rule which unites every discourse about virtues is to unmask common opinions falsely taking some harmful habits for virtues. Separation of knowledge (*episteme*) and opinion (*doxa*) does not only take place on the surface of dialectic argumentation but also relies on the use of emotional persuasion. Irony is often a more powerful means than dialectic syllogism. Searching for moral truth, he also seeks for the right tools to be used. "Harshness", which philosophy needs, is not enough to make "wicked people" practise a virtuous life. On this basis, Petrycy enriches his program with emotional amplification.

Bacon, on the other hand, was concerned with the nature of language on a more global scale. Language, due to its conventional character, succumbs to human imperfections, which Bacon quickly realized. Throughout his philosophical program he was particularly concerned with the superficiality of distinctions in everyday language. Bacon showed that people tend to class things fundamentally different together (whales and fishes as fish) and to distinguish things fundamentally similar (ice, water, steam).[30] Moreover,

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[29] Translation – mine, *Polityka*, I, *Przedmowa do czytelnika*.

[30] See A. M. Quinton, P. M. Urbach, and K. M. Lea, *Francis Bacon, op. cit.*, http://serach.eb.com/shakespeare/macro/5000/52.html (accessed June 14, 2005).

Bacon was the first to tackle a tottering status of language, the idea which was to be elaborated by later critics of language, who were concerned with the capacity of words in the discussion of meaningless.[31]

Before arriving at the foundation of his philosophical tool, that is, his scientific method of induction, what Bacon did was examine what he considered to have been the most important obstacles in the process of human reception of knowledge in the past. A close study of those obstacles pushed Bacon towards the development of the theory of idols, in which he pointed out certain human prejudices and predispositions as a false source having a significant influence on human perception of nature and affecting scientific advancement. In *Novum Organum* Bacon pointed out a striking difference between the real perception of the world, clear of any obstacles, and the one being governed by human errors: "how vast a difference there is (...) between the Idols of the human mind and the Ideas of the divine."[32] According to him, *Idols* are perceived as only "arbitrary abstractions" whereas *Ideas* are "the creator's own stamp upon creation, impressed and defined in matter by true and exquisite lines."[33]

The thought concerning the source of human false assumptions resulting from thinking corrupted by different idols had been haunting Bacon since his early youth. As early as *Temporis Partus Masculus* (1597) Bacon, aware of the danger hidden in human inclination towards erroneous perception of knowledge, warned a student of empirical science not to tackle the complexities of his subject without previously cleansing the mind of its idols: "On waxen tablets you cannot write anything new until you rub out the old. With the mind it is not so; there you cannot rub out the old till you have written in the new".[34]

In *Redargutio Philosophiarum* written in 1608 Bacon once again tackled the same issue criticizing certain prejudices and false opinions (especially the system of speculation established by theologians) as a serious obstacle to the progress of science.[35] Again, he emphasized the errors governing the process

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[31] *Ibid.*

[32] F. Bacon, *Novum Organum*, the html text based on the standard translation of James Spedding, Robert Leslie Ellis, and Duglas Denon Heath in "The Works", Vol. VIII, Boston , Taggard and Thompson, 1863, B1:CXXIV http://www.constitution.org/bacon/nov_org.htm (accessed April 16, 2005).

[33] *Ibid.*, B1:CXXIV.

[34] F. Bacon, *Temporis Partus Masculus*, in B. Farrington, "The philosophy of Francis Bacon", Liverpool University Press, Liverpool 1964, p. 72.

[35] B. Farrington (ed.), *The philosophy of Francis Bacon*, Liverpool University Press, Liverpool 1964. p. 107.

of human thinking. The deficiency of human thinking was also discussed in the Second Book of *The Advancement of Learning* (1605) in the context of *Arts Intellectual* (invention, judgment, memory, tradition): "... (...) invention (...) of speech and arguments (...) I do report deficient; which seemeth to me to be such a deficiency as if, in the making of an inventory touching the state of a defunct, it should be set down that there is no ready money."[36]

In 1620 Bacon was already ready to give an elaborated theory of idols. In his preface to *Novum Organum* he promised to introduce a new method capable of bringing senses to their former rank in order to begin the whole labour of the mind again. The method would open two sources and two distributions of learning. Basically, it was a method of cultivating the sciences and arts of discovering them.[37] Again, the new beginning presupposed the discovery of the natural obstacles to the efficient scientific analysis which was based on seeing through the idols, so that the mind's function as the subject of knowledge acquisition comes into focus.[38] He stated:

> The idols and false notions which are now in possession of the human understanding, and have taken deep root therein, not only so beset men's mind that truth can hardly find entrance, but even after entrance is obtained, they will again in the very instauration of the sciences meet and trouble us, unless men being forewarned of the danger fortify themselves as far as may be against their assaults...[39]

According to Bacon, there were four types of idols: the idols of the tribe (idola tribus), the idols of the cave (idola specus); the idols of the market place (idola fori), and the idols of the theatre (idola theatri). As R. E. Stillman points out, Bacon's first two classes of idols refer to errors deeply implanted in human nature, whereas his last two classes correspond to the errors that infect human arts.[40] In both two pairs he proceeds from general to specific information: from consideration of errors endemic to mankind (tribe) to errors ingrained in individuals (cave), from an analysis of faults inherent in language (market place) to faults described in learned discourse (theatre) – that gradation is, according to Stillman, not a coincidence for

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[36] F. Bacon, *The Advancement of Learning*, B2 (XIII:1).

[37] See K. Leśniak, *Franciszek Bacon, op. cit.*, pp. 50–51.

[38] See R. Brandt, *Francis Bacon, Die Idolenlehre*, in J. Speck (ed.) "Grundprobleme der großen Philosophen. Philosophieder Neuzeit", Göttingen 1979, pp. 9–34.

[39] F. Bacon, *Novum Organum, op. cit.*, B2:XXXVIII.

[40] R. E. Stillman, *The New Philosophy and Universal Languages in Seventeenth-Century England Bacon, Hobbes, and Wilkins*, London: Associated University Press, London 1995, p. 94.

Bacon "clearly ascribes the origin of these most fundamental of all human errors to the perturbation of desire."[41]

The idols of the market place (idola fori) are, according to Bacon, the most troublesome since they creep into human understanding through misalliances of words and things: "These are formed in the reciprocal intercourse. Such errors in themselves could constitute a major obstacle to the progress of knowledge, for "men believe that their reason governs words, but it is also true that words react on the understanding; and this is that has rendered philosophy and sciences sophistical and inactive."[42] Therefore, that frequently fallacious influence of language resulted, according to Bacon, from two principal imperfections: the admission of words for things which have no existence at all in the real world and the attribution of names to objects in a confused, distorted, and quite arbitrary manner.[43]

To conclude, Petrycy of Pilzno and Francis Bacon were lucky to live in the turbulent and eventful century – perhaps the most important century in the making of the modern world. The foundation of modern science and beginnings of modern philosophy and political theory were the seventeenth-century reply to the old scholastic thought. In the same century many European countries faced numerous political crises highlighting a strong division into separate political groupings within and outside each country. At the same time, the biggest European countries entered into worldwide international competition for wealth and power. European intellectualists were actively participating in history. Petrycy's philosophical program aimed at the improvement of the language of philosophy and meant to popularize practical philosophy. He also introduced theoretical concepts from the fields of ethics, political philosophy and economics into a public discourse. While translating and commenting on the Aristotelian works, he enriches them with a rhetorical argumentation. By doing so, he also reached emendational aims. Certainly, in the light of his engagement in the issue of improving the language of philosophy he was forwarding the idea of progress among the Polish middle class.

Unlike Petrycy, Bacon cannot be explicitly evaluated and located in the history of the seventeenth century. It has to be pointed out that many a time the role of Francis Bacon has been represented one-sidedly – his role was emphasized either as a reformer of science or the Lord Chancellor, the mediator between James I and the House of Commons at the Jacobean court. Paolo

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[41] *Ibid.*

[42] F. Bacon, *Novum Organum, op. cit.*, B1:LIX.

[43] See K. Leśniak, *Franciszek Bacon, op. cit.*, p. 55.

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Rossi, a devoted researcher of Bacon's philosophy, appeals for the interdisciplinary analysis of the latter, otherwise there is a danger of arriving at the conclusions that "distort the historical significance of Bacon's attitude."[44] It was only lately that the complex role of Bacon had come to be analysed in the light of his political convictions, whereas his role in the universal philosophical program was revolutionary in many aspects for it replaced the scholastic mode of thinking prevailing at the end of the sixteenth century. Therefore, the names of Petrycy of Pilzno and Francis Bacon complement the seventeenth-century strive for progress in their countries whereas a comparison of their philosophical programs shows their deep engagement into the idea of improving the lives of their countrymen.

S U M M A R Y

The aim of this paper is to present and compare the views of two prominent thinkers of the seventeenth century – Petrycy of Pilzno and Francis Bacon. Living in the same century, they faced different geopolitical and cultural circumstances. A comparison of their views sheds some light on the philosophical tendencies around the turn of the seventeenth century in Poland, where Petrycy of Pilzno (1554–1626) remained a central figure in the field of philosophy occupied with the issue of language development, and in England, where Francis Bacon (1561–1626), a politician, scientist and philosopher, saw clarification of language as a primary condition on the way towards true philosophy and harmonious political state. The authors of the article analyse different approaches of Petrycy and Bacon towards the issue of purification of language: Bacon's theoretical and cognitive assumptions as opposed to the ethical direction of Petrycy's reflection aimed at the reformation of public life in Poland.

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[44] P. Rossi, *Francis Bacon From Magic To Science*, (trans.) Sacha Rabinovitch, Routledge & Kegan Paul, London 1968, p. 10.

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THE LEIBNIZIAN *UNFORGREIFFLICHE GEDANCKEN* AS A POLITICAL TREATISE

1. Introduction

Polish critical literature has given a little attention to the analysis of the Leibnizian political legacy. Leibniz as a politician, diplomat and active participant of the European political scene, has largely been overshadowed by Leibniz – the great duke of philosophy.[1] What is more, the philosopher's political publicism and his diplomatic engagement do not constitute a major trend of the analysis of the sources of the contemporary political thought and the beginnings of the shaping of the new German community, that is, the modern state, society, and nation.

Leibniz did not unfold his ideas in a systematic way. They are scattered in his rich correspondence and writings, only a part of which was printed during his life. Leibniz's political publicism, frequently revealing contrasting threads, constitutes his reflection upon the reality as seen by the thinker aiming at combining local interests of the state with the broadly understood interest of mankind. The philosopher's research objectivism is frequently faced with a practical approach of the mature diplomat. The whole of his political reflection is revealed by three major trends: a return to the religious union of the Western Christianity, Leibniz's attempts to organize science treated as a tool of the development of the state, international collaboration and inter-cultural agreements, as well as the analysis of the notion of power and its attributes. However, as J. Sitniewska proves, it is impossible to

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[1] An unpublished PhD thesis entitled *Jedność Europy, wspólnota kultury, interes państwa. Dylematy myśli politycznej G. W. Leibniza*, written by Julita Sitniewska and defended at the University of Silesia in Katowice in 2005, is the only comprehensive study of the issue in the Polish literature.

discuss Leibniz's coherent system of political system as it is revealed by T. Hobbes or J. Locke.[2]

Frequently, commentators take a stand that Leibniz's political writings cannot be analysed without a prior consideration of the major assumptions of his philosophical system. Undoubtedly, certain ideas and projects present in political writings do become much more comprehensible when compared within this system. Nevertheless, one should not lose a sight of the temporary pursuits the philosopher was aiming at, acting frequently on behalf of full political powers of his protectors, which is illustrated by *Specimen demonstrationum politicarum*, commissioned by the baron von Boineburg and dealing with the support to be given to the candidate of the duke Philip Neuburg to the Polish throne after the abdication of King Jan Kazimierz.[3]

It is necessary to highlight here that Leibniz belonged to the supporters of the Holy Roman Empire of the German Nation as inheritors of the Roman and Carolinian traditions. His political writings fully support the unquestionability of the emperor's authority as the highest secular power in the Empire and in Europe.[4] For him, the emperor is the first among equal rulers in Europe, a leader of the Christians, whose duty is protection of authentic faith and directing Christianity towards the highest virtue, which is proved in his *Unvorgreiffliche Gedancken*, the work devoted to the totally different subject. In his political publicism not only did Leibniz take a stand as the German devoted to the interests of his patrons, rulers of the German states, but he also revealed himself as a diplomat engaged in the protection of the position of the emperor at the arena of international politics against the aggressive politics of Ludwig XVI. The role of the Empire was perceived by Leibniz in a traditional way – as a guardian of the European order. Moreover, he did not approve of the French cultural supremacy whereas the French king was perceived by him as the main source of the problems the Empire was suffering from.

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[2] Ibid, typescript, p. 209.

[3] See G. W. Leibniz, *Sämtliche Schriften Und Briefe*, Darmstadt 1923, Leipzig 1938, Berlin 1950, IV, I, pp. 3–98, (from now on marked as AA, I cited as Volume, Chapter, page).

[4] J. Sitniewska, *Jedność Europy, wspólnota kultury, interes państwa*, cited typescript, p. 148. See also G. W. Leibniz *Caesarinnus Fürsternerius*, in: P. Riley, *Leibniz Political Writings*, Cambridge 1985, p. 111.

2. Political perspective of *Unvorgreiffliche Gedancken*[5]

This paper does not aim at the analysis of the whole of the Leibnizian political publicism. Nevertheless, it aims at highlighting the arguments for introducing the text *Unvorgreiffliche Gedancken* into Leibniz's output as a political thinker in that part where the philosopher deals with the problems that are absolutely fundamental in the issue of constituting the basis of the contemporary German community.

Contrary to such countries as France, England or Russia, on the turn of XVII Century the Empire had formed neither a centralized structure of the state nor any state nation had been formed on its territory – a homogeneous union ruled centrally and inhabiting a certain area treated as a national state. That situation resulted in the reflection of the German intellectual elite and posed questions as to the future position of the Holy Empirer as well as the question regarding the future of its German-speaking inhabitants in the context of the possibility of uniting them into one state nation whose causative factors would be a common confession, similar range of experiences and, finally, a common language. Starting from the middle of XVII Century, the necessity of elaborating the mechanisms leading towards the formation of a homogeneous nation and state became visible. Within the German communities belonging to the Holy Empire of the German Nation that aim was pursued by a social group whose role was frequently marginalized in the contemporary political history for its members had no political background and, therefore, could not influence the course of political actions in the German states. On the other hand, their contribution was their engagement into the formation of the German culture. It was also them who started a discussion of the political problems regarding the state, society or nation. Samuel Pufendorf, Johhann Joachim Becher (1635–1682) and Veit Ludwig von Seckendorff (1626–1692) belonged to the most significant thinkers representing that trend of the contemporary German enlightenment as well as (or perhaps, above all) Gottfried Wilhelm Leibniz.[6] Belonging to the wealthy middle class or nobility, those people owed their prestige almost exclusively

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[5] G. W. Leibniz, *Unvorgreiffliche Gedanken, betreffend die Ausübung und Verbesserung der Teutsche Sprache*, in: G. G. Leibnitii, *Collectanea Etymologica, illustrationi linguarum, veteris Celticae, Germanicae, Gallicae, aliarumque inservientia*, cum praefatione Johannis Georgii Eccardi, Hanoverae 1917 (From now on cited as UG and the point).

[6] See T. Namowicz (ed.), *Państwo a społeczeństwo. Wizje wspólnot niemieckich od oświecenia do okresu restauracji*, Wydawnictwo Poznańskie, Poznań 2007, p. 8. Leibniz's contributions in this matter are especially emphasized by P. Chaunu in *La civilisation de l'Europe des lumières*, B. Arthaud, Paris 1971, Part 1, Ch. 3.

to their university education which enabled them to hold a position in the state service in both the Empire and certain German states, Leibniz serving as the best example – holding a post simultaneously at the Hannover and Empire courts. This group is defined by the term **Bildungngsbürgertum**. The term can hardly be given its English equivalent. Researchers claim that the term **intelligence** in the sense of a social group or **educated middle class** serves as its nearest synonym. The place of that social class in the structure of the German communities differentiated German states from the centralized English or French monarchies. What is more, it depended upon the feudal elites of power for generally it did not have any sources of income apart from the posts held, which is perfectly illustrated by the life situation of Leibniz.

T. Namowicz argues that a discussion of the social, political and national character of the state remained a marginal issue for the remaining social classes especially of the second half of XVII Century. Therefore, the elites of power, kings and dukes as well as the aristocracy connected with the ruling courts, were interested in keeping their *status quo*. On the other hand, the peasantry and uneducated middle class were characterized by their indifference towards issues of that character. The existence of many small states or the existence of one big state had no significance for the lower social class. The phenomenon of German federalism was a significant reason for the lack of interest in the processes of modernization. It was neither the Empire nor the territorially state but it was a bound with a small homeland being the most significant area of one's cultural or material existence that determined the identification of an individual as a member of the German community.[7]

According to the statistics gathered around 1770, it was estimated that only 20000 people (0,1% of the whole population in the Empire) were interested in the discourse regarding the situation in the Holy Empire. Undoubtedly, G. F. Leibniz was among the first ones to initiate that discourse. Initially, it focused on the problems of the state, which resulted from the special structure of the political life represented by the Holy Roman Empire of the German Nation. On the one hand, the place it was occupying in the history of the European statehood was marked by the idea of the universal Christian republic (*respublica christiana*). On the other hand, it was marked by the desire to highlight a national character of the Holy Empire. Characteristic is the fact that, although the term **Heiliges Römisches Reich Deutscher Nation** (the Holy Roman Empire of the German Nation) ap-

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[7] Ibid, p. 10.

peared after 1512, it was till the end of the Empire in 1806 that a traditional medieval term **Heiliges Römisches Reich** was used in which the discriminant "German nation" was omitted. It meant that in the European consciousness the Empire was not fully identified with a German state.[8]

A political treatise of 1648, which finished the Thirty-Year War, determined a political division of the Empire establishing above 300 sovereign territories in its structure. The Empire existed *de facto* as a conglomeration of territorial states. Although the majority was represented by the German-speaking inhabitants, the territory of the Empire was also inhabited by people who did not speak or use German in their daily life (e.g. inhabitants of Czech, Hungary, the duchy of Milano, Lotarginia, etc). On the other hand, many territories whose inhabitants spoke German did not belong to the Empire, which is well illustrated by the example of the Ducal Prussia which occupied the territories out of the Empire.

Paul Chaunu argues that after 1680 the Empire gradually continued the bits of political substance which remained after the demographic catastrophe of 1630–1640 and the Peace of Westphalia. A traditional tension North – South based on the religious criterion (the Protestant Germany – the Catholic Germany), which was also understood as efficiency and enlightenment opposed to ignorance, did not simplify the survival of the imperial myth. In the texts published in 1676–1689 while facing threats from France, there were some attempts made to establish common principles of trade to be used in every territorial state of the Empire. Peaceful Leibniz, being scientifically and intellectually close to Spinoza writing *Tractatus* to defend the lost Republican business and to Locke, a theorist of the winners of the Glorious Revolution, started a fight for the survival and protection of the traditional structure of the Empire and his thought adopted the expression of a political challenge.[9]

The awareness of the connection of the German states with the idea of the Empire as well as the recognition of the primacy of the Emperor over the German rulers along with the creation of the definition of the sovereignty of German duchies within the boundaries of the Empire made Leibniz an enthusiast of the German federation as opposed to Pufendorf who linked federation with the collapse of Reich.[10] According to Leibniz, the connection between the Empire and the German states was a sufficiently good model of the statehood. The philosopher's critique regarding that matter,

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[8] Ibid, p. 11.

[9] P. Chaunu, *La civilisation de l'Europe des Lumières*, *op. cit.*, Part I, Ch. 3.

[10] See S. T. Namowicz (ed.), op. cit., pp. 69–82.

if appeared, dealt with the lack of respect of the law by the members of that federation, which partly resulted in the reduction of power of the Empire. Leibniz's attachment to the idea of the Empire as the community of the multitude of sovereign subjects creating its structure finds its justification when compared to the philosophical principle of harmonia praestabilita which is reflected by political harmony of a number of singular political existence constituting Reich.[11] Nevertheless, it seems that, though easy to be indicated, all references to the philosophical system of Leibniz should be treated cautiously for Leibniz proves the existence of the international legal subjectivity of the German states,[12] fighting simultaneously for the equal political status of the dukes and the German electors within the Empire.[13] However, independently from his inconstancy of views on certain political issues, for Leibniz, undoubtedly, the Holy Roman Empire is the structure for which a better alternative can hardly be found. What is more, the structure is under the leadership of the emperor who is almost an immaculate ruler for Leibniz, which is illustrated by the portrait of Leopold I presented by the philosopher in his treatise *Mars Christianissimus*.[14] The unquestionability of the authority of the emperor as the supreme secular power in the Empire and in Europe whose duty was to protect real faith, to rule the universal church and to develop the Christianity towards the highest virtue constitutes the content of the second point of *Unfforgreiffliche Gedancken*. While proving the significance of the principles constituting that community, Leibniz refers to it directly calling it the German Nation (**Die Teutsche Nation**).

At this stage a fundamental issue is being approached which demands a reference to the state of research regarding the beginnings of the formation of the German People's state. Critical literature reveals a view which claims that starting from XVIII Century till the twenties of XIX Century the existence of the German People's state cannot be discussed for that function was revealed neither by the Holy Roman Empire of the German Nation nor by any territorial state it consisted of. Instead of the one state representing one nation, there were several states inhabited by people being at variance defined as **German communities**. This term is opposed to the term **German nation** in the contemporary meaning of the word.

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[11] AA, IV, ii, p. 291.

[12] AA IV, ii, pp. 296–297.

[13] See J. Sitniewska, *Jedność Europy, wspólnota kultury, interes państwa*, cited typescript, pp. 173–182.

[14] AA, IV ii, p. 481.

Moreover, it was not identical with the imagination of what the Germans should be. Therefore, it is definitely stated that neither the German state nor the German nation as a political phenomenon really existed.[15]

A research regarding general problems of the nation reveals two approaches enabling the description of the processes constituting the formation of the nation. The first one is known as the "instrumentalistic" approach found in the works of Hans Kohn, Benedict Anderson, Eric Hobsbawm or Ernest Gellner. The second one is referred to as the "constructivistic" one and is revealed by the works of Frederick Barth and Abwer Cohen.[16] The "instrumentalistic" approach assumes that the formation of the notion of the nation is an ideological construct talking about the participation in the "unreal" community (as opposed by the "real" one) where feelings of a certain bound are being formed referring to the mutual language, symbols, etc. Eric J. Hobsbawm defines bounds of this type as **proto-national**.[17] The "constructivistic" concept supplements the ideological conditioning discussed earlier by indicating in the human awareness the formation of boundaries in relation to other people, who are ethnically different, hence creating their own national identity.

Researchers argue that the issue of language, or more precisely, the existence of congenial variants (dialect) of German, was constitutive for **German communities** as a specific form of the existence of certain proto-national community. It was already in the Middle Ages that the words **German, a German**, as well as **Germans** appeared.[18] Nevertheless, it is pointed out that those words signified a certain affiliation to the community referring mostly to the cultural phenomena. It is also highlighted that till the beginning of XIX Century those words did not reveal any political connotations. Some researchers claim that the use of those terms appeared on the ground of the intuitive feeling of some bounds between the people speaking

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[15] See T. Namowicz (ed.), *Państwo a społeczeństwo…*, op. cit., p. 17 and the reference of the literature there.

[16] Ibid, p. 17.

[17] E. J. Hobsbawm, *Nationen und Nationalismus. Mythos und Realität seit 1780*, Frankfurt a. M 1991, p. 59 and following, cited after T. Namowicz (ed.), op. cit., p. 18.

[18] *The Dictionary of the German Language* by Jakob and Wilhelm Grimm signifies the existence of those words already in the early Middle Ages but mainly in the form of an adjective, eg. **deutsche Sitte** (German custom), **deutsche Tracht** (German outfit). On the other hand, the noun **German** to signify the person belonging to the German community appeared much more later and was rather rarely used. The term **Deutschland** is the latest (more frequently used from XVI Century) which generally meant **das deutsche Volk** (nation/German peoples). This information is given T. Namowicz (ed), *Państwo a społeczeństwo…*, op. cit., pp. 18–19.

different dialects of the German language independently from the territories they inhabited. It also resulted from the need to define one's local as well as supra-regional identity in the situation of the fall of the Christian homogeneity of Europe and the creation of the states in the west of the continent which were emphasising their individual national character, especially France. Therefore, form the very beginning, the language was the main or even the exclusive element connecting people. As it is pointed by some researchers, other terms, which are generally used nowadays such as mutual territory, mutual historical experience, mutual state or religion are not consistent with the reality of the German communities both at the beginning of the modern era and in the later period.[19]

3. Language as a political project

It seems that all the above considerations, true in their general scheme, are difficult to preserve in a unitary perspective of the vision of the society, state and nation as presented by Gottfried Wilhelm Leibniz. The philosopher proudly describes himself: I am German[20] and he makes the German character the basic foundation to raise the vision of the enlightened German society, the German nation, united in the framework of the conservative formula of the Empire, which, in his opinion, is consolidating the German individuality in Europe. That vision is presented by him in *Unvogreiffliche Gedancken*, and the vision concerns the community Leibniz calls the **German nation**.

Leibniz creates the idea of the German community by referring to the common historical experience, memories of the former power and the German courage and valiance.[21] He points out common cultural output which is the outcome of the writers and poets writing in German. Leibniz also shows the achievements of the German legislation and cultural outcome of the reformation movement. One can also find a reference to the real Christian faith – Leibniz's peaceful attitude does not allow for the indication of its one and only form. Being a confessional Lutheran, he was serving his Catholic patrons for many years and the biggest part of his life was devoted to the matter of building the unity of the church through his deep engagement

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[19] Ibid.

[20] AA IV, ii, p. 472.

[21] UG, 2, 3.

into the reunion attempts.[22] Finally, there is an element which is a necessary condition of the whole community's autonomy, that is, the language which envelops the integrity of the historical, cultural and spiritual experiences recording the history of human discoveries.[23]

Hence the philosopher notices and clearly qualifies all the conditions which ultimately define something that constitutes the essence of the idea of **nation**. It does not mean the real existence of the German nation in the modern sense of the term but Leibniz designs that nation. The reconstruction and modernisation of the German language is the beginning of that project. For Leibniz this is a matter of priority for it decides about the realisation of other matters connected with administration, legislation, science and culture uniting the German-speaking community into one national body.

As a researcher and an expert in the field of history, Leibniz frequently emphasises cultural individuality, which is illustrated by *Dissertatio de origine Germanorum* (1697) or his rich correspondence with Job Ludolf regarding the German language. The text *Unvorgreiffliche Gedancken* is not free from emotional and ideological features. While presenting the program of repairing and rebuilding of the language, first of all the philosopher highlights the insufficiency and defects which should be eliminated from the German language. He points out the lack of adequate terminology in many specialistic disciplines. Latin, the official language of science, is to blame in this case. However, Leibniz notices that it is not the lack of abilities of Germans but the lack of their goodwill that prevents them from perfecting the language. For if "everything that a plain man does can be expressed in German, undoubtedly, the things that are more suitable for remarkable and educated people, if they only wanted, could be expressed very well or even better in the pure German".[24] It seems that Leibniz goes back here to the thought presented in a radical way in the *Introduction to Nizolius* where he argued that if something cannot be expressed in a colloquial language, it should be removed from philosophy. Similarly to *Introduction*, it is possible to notice certain incoherence in his views. Leibniz claims that in principle every language to the same degree corresponds to the needs of everyday life and adapts to the requirements of science. Advancement in science de-

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[22] See J. Sitniewska, *Jedność Europy, wspólnota kultury, interes państwa*, cited typescript, pp. 114–147.

[23] G. W. Leibniz, *New Essays on Human Understanding*, trans. P. Remnant, J. Bennet, 1969, Cambridge University Press, BK III, Ch. i, § 5.

[24] UG, 34.

pends on a clear and precise formulation of thoughts whose manifestation is best fulfilled in a native language. Therefore, it is not important whether philosophy is practised in English, German or French; it is only important that each of these languages follows the trace of our discoveries and reflects the inner order of thoughts in the best way. It appears that if Germans overcame psychological barriers, by perfecting the language they would be able to achieve success in every field. In the fight to strengthen the "spirit of the nation" that democratically sounding argument seemed too weak for Leibniz. Adopting rather publicistic than scientific style, Leibniz explains to his compatriots that none of the European languages is good enough as the German language is to formulate and verify different philosophical doctrines. He argues that this is because "We, Germans, have a strange standard of thoughts that others are not familiar with (...) and this is our language in itself for what can be expressed in it without borrowed, extraordinary words is something really reliable; the German language does not accept empty words that are not supported by anything but only by the foam of vain thoughts".[25]

Leibniz builds argumentation using his diplomatic and political skills. He refers to the all achievements of the Germans in the fields where they have achieved any success. He is aware of the fact that it is difficult to point out a significant scientific achievement for he notices that German scientists used Latin letting their native language take their course. Being the language of the uneducated majority, German could not develop properly.[26] To his mind, that majority achieved a high level of knowledge in such fields as mining, hunting, forestry, mechanics or navigation. This is to be proved by specialist vocabulary accepted by the languages of different nations.[27] Leibniz also recalls military victories Germans have participated into and writes that the nation that has given the evidence of courage and valiance is capable of the same effort in the intellectual field. This is possible due to the development of one's own language.[28]

Although Leibniz's argumentation is emotional to some degree and slightly demagogic, it reveals a good deal of common sense for Leibniz behaves like a real psychologist making efforts to cure the German wretched spirit experienced by military misfortunes. He writes that among all, it was the Thirty Years War that put "our language in a similar state of chaos as

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[25] UG, 11.
[26] UG, 25.
[27] UG, 9.
[28] UG, 4.

our homestead",[29] whereas after its end Germany became dominated by the French power and elegance. However, Leibniz evaluates all foreign influences in a different manner than language purists do. He does see possible threats but he also highlights certain profits resulting from a mutual penetration of different cultures. It was from Italians, among all, that Germans had learnt how to prevent infectious illnesses and French people taught them how to improve military structures.[30] What is more, an intercourse with the French culture had given some easiness to a serious "German nature" and allowed for the change of their aesthetic likes and lifestyle. The language itself had also been enriched with the expressions which had entered the German language in a kind of natural manner like plants given a new ground.

Nevertheless, Leibniz is generally against a common use of any foreign language in everyday life as well as in any types of institutional life. He writes that it would be a never-ending pity and shame if our major language, the language of brave people, was to decline due to our carelessness.[31] The common use of the language which is different from the national one, which is never acquired perfectly enough by everybody, also results in some chaos in the way of thinking. The one who does not know all the meanings of foreign words and expressions cannot write well and thinks erroneously for nothing good can result from the acceptance of a foreign language and, moreover, it brings a danger of losing one's freedom.[32] Making references to the materials and documents comprised in the emperor's archives, Leibniz writes that their analysis allows for the observation of a gradual fall of the German language which used to reveal its purity at the times of Reformation. It is from the goodwill of scientific, ecclesiastic and educated elites that the introduction of the reparation program aiming at the restoration of the appropriate range of the German language depends on.[33]

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[29] UG, 25.

[30] UG, 27.

[31] UG, 21.

[32] UG, 20, 21. The main point made here is that the acquisition of a foreign language at the level of its skills *stricte* does not bring the same psychological and social causes. Rightly but not consequently, Leibniz notices that not everything which can be translated verbally is equivalent in the sphere of verbal behaviour connected with actions of sociological and cognitive character. The language, being at the grammatical or systematic level, separated from the semantic sphere of its vocabulary, which to a great extent reveals an extra-linguistic character, is not the tool of building a community whose interest is marked exclusively by the symbolism or dictionary adopted from outside.

[33] UG, 33.

4. Conclusion

A concern for the intellectual development of Germans connected with the actions for the protection and development of the whole cultural legacy of the German people present in *Unvorgreiffliche Gedancken* is the expression of the thinker's stand who builds the conditions and future of his compatriots on strong and rational premises. They are a common approach to knowledge, a new organization of the education system, improvement of administration, a modern way of recording the data and, above all, the protection and development of the language that Leibniz treats as the highest national property. The treatise is not the only text of Leibniz where he appears as a philosopher and a German patriot. He notices the dependence between the wealth of the nation and its education even as a young man while writing *Einige Patriotische Gedancken*,[34] where he postulates the introduction of the national language into the schools of the entire Empire. Interesting is the fact that it is directly refers to the moral renovation of the whole German society which is to be guaranteed by a good grasp of the language for not only does it allow for the mastery of the art of reading, writing and counting but it also implants many virtues and respect to God in people.[35]

Leibniz's project of the repairing and improvement of the language is a mature plan aimed at building the new enlightened German society aware of their value, potential and power reflected by the language echoing creative skills of its speakers. Although the plan was to be realized by the next century, it was done without any awareness of acting according to the ready made philosophical or political plan. As a "social engineer", Leibniz failed to come into being as the inspirer of concrete modernization acts in cultural and social spheres. The fact that the text *Unvorgreiffliche Gedancken* has been pigeon-holed to the philosophical output of the thinker resulted in a limited reception of a narrow group of receivers. Leibniz as a political thinker cast in his lot with Leibniz as a logician whose contributions in the development of logic and mathematics were to be discovered only in XX Century. A lack of understanding of his contemporaries along with the negligence of his descendants has resulted in the fact that Leibniz, instead of becoming the father of the modern German nation, has been placed in the consciousness of Germans as an esoteric philosopher.

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[34] AA, IV, iii. 359–365.

[35] Ibid., p. 264.

The Leibnizian "Unforgreiffliche Gedancken" as a political treatise

S U M M A R Y

The aim of the article is to present arguments to support the thesis that the text by G. W. Leibniz concerning the repair and improvement of the German language can be includedin his works as a political thinker in the part where philosopher undertakes the absolutely fundamental issue of establishing the basis of modern German national community. The project of constructions of e new enlightened German society based on a firm linguistic foundation laid out in *Unforgreiffliche Gedanken* is a mature thought underestimated political plan of the philosopher. Leibniz as a political thinker never became known in cultural and social circles as initiator of specific modernization actions. Including the text of treatise into the linguistic works of the philosopher was the reason of the limitation of its reception to a small audience. Leibniz – political thinker shared the fate of Leibniz – logician, whose contribution to the development of logic and mathematics was unraveled only by the 20th century. Incomprehension of his contemporaries and the oblivion of his posterity caused that even if Leibniz could became the father of the modern German nation, he has remained in its consciousness mainly as an esoteric philosopher.

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DOES THE LIE CONTRADICT THE TRUTH?

> *The most dangerous lies are truths but slightly distorted*
>
> G. C. Lichtenberg

Introduction

Philosophers usually do not 'philosophize' in separation from an ideology that is built into a political activity, which – in turn – is embedded in the given time and environment of their lives. The dignity of philosophy, and any other science, consists in an overall, undistorted constructing of an image of the reality, with the inclusion of the role of human being who learns about this reality, including that of a participant in the political life. In this context, we can say about reliable cognizance of reality. What is it? It is:

- searching for the truth,
- nearing the truth, and
- discovering the truth.

Without *reference to the truth*, acquiring the reliable knowledge about the world, as well as passing on such a knowledge in the process of language communication become *mendacious*, or even impossible. Righteous *approaching the truth* "opens the eye to injustice in the state and in the private life" – Plato wrote in his autobiographic *Letter* (VII 324 b), on the basis of his personal experience acquired in the course of his active political life.

Arriving at the truth and convincing in favour of *the truth*, in various spheres of life, has been one of the most important principles of life and dealing in science. This classical, universal, moral virtue devalues through the following phenomena, which are omnipresent today:

- widespread neglect of agreeing on the meaning of a word,
- lack of responsibility for consequences of uttering words with no publicly-established meaning,
- distorting the truth,
- evident lies.

These phenomena violate the care of the adequacy of representation of knowledge about the objective reality, as well as that of building a faithful linguistic reflection of the knowledge and also its correct transfer and the care of convincing in favour of *the truth*.

The art of language-based convincing which deals with political issues always brushes against the `problemate of the truth and the lie`. On the political scene there is a fight going on not only for power, but also for the truth. By means of political rhetoric (and not merely political one) it is possible to pass both the truth and the falseness in the process of language-based communication. When the sender's intention, in the act of communication, is to lie to the receiver, to pass false information to the latter, using persuasion, the former creates all sorts of impressions of telling the truth: he has to take into account what the receiver of the information knows and also what the former is ready to accept as plausible; he renders information in a certain order, in compliance with language rules of passing information, still – however – he infringes the rules of conversation proposed by H. P. Grice (1975)[1] and ethics of acts of communication by means of speech.

The main task of this work is not to determine the bases for a moral evaluation of the lie; neither is it to describe its negative qualification. We are interested rather in the very `problemate of the truth and the lie` itself, considered as a juxtaposition of two of its notions: *the truth* and *the lie*, one that aims to provide a positive – as it would seem obvious – answer to the question contained in the title of the present work:

Does the lie contradict the truth?

Will we, however, really obtain an obvious answer? A positive one?
The very motto itself in the opening of the work raises certain doubts:

Maybe the lie does not contradict the truth at all?

And if we add that a lie is often regarded as not only useful or necessary, but also even as a virtue of contemporary civilization, as a new principle of life, a "new truth", then there may arise even new doubts. Is it, by any chance, possible that the foundations of a moral evaluation of the lie have changed and maybe this new "quality" is beginning to constitute such a quality for the coming times as the supreme value, that is *the truth*, makes

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[1] It is violation, in particular, of the so-called maxim of quality, which reads (see Tokarz, M. (1993), p. 220): "Do not offer views about whose falseness you are convinced, nor even views for which you do not hold sufficient justification".

for opponents of all sophistry? And if, moreover, one adds that, after all, many of us could learn ourselves that a liar – against his intention – can tell the truth, then does there exist any explicit satisfying answer to the questions posed above?

The considerations presented in this work are an attempt at giving an answer to the arising doubts: it is obvious to philosophers and logicians that such considerations must be grounded on a relevant conception of *the truth* and *the lie*, on bringing up one of the most difficult and disturbing philosophical problems, that is the `problemate of the truth`, on investigating what `the lie` is. The confusion about the notions related to the ambiguous terms of "the truth" and "the lie" introduces, in turn, a confusion connected with attempts at answering the questions posed.

Thus, in the first part of this paper, we will deal with the very notion itself, or – more precisely – with the notions of *the truth*; in the second one – with the notions of *the lie*, and in the third part – we will juxtapose the notions of *the truth* and *the lie* in such a way that in each case it should be possible to provide an answer to the question asked in the title of the work. Part four, being the final one, contains certain summary of it, as well as final considerations as a peculiar challenge.

1. On the truth[2]

1.1. On the truth from the ancient perspective and the contemporary history of philosophy and logic

The history of forming of the notion of 'the truth' had begun a long time before philosophers and logicians took up the problem of the `problemate of the truth`. "People who were communicating with one another wanted to make sure that they were not deceived. After all the lie is one of the most elementary means of manipulating the receiver of the message," as J. Werszowiec Płazowski and M. Szuwara write.[3] And we know this, too. People – while communicating with one another – as receivers of messages – wanted not to be led astray, they wanted the messages to be carriers of the truth. Thus, we cannot speak about the lie without making references to the truth.

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[2] This part includes a discussion and reference to some themes considered in the author's earlier work entitled *On Truth...* (2009).

[3] See: Werszowiec Płazowski, J., Szuwara, M. (2008), p. 111.

What is the truth, however?

Can we speak about many kinds of the truth?

Does there exist one, commonly binding, objective truth?

These and similar questions have been asked from times immemorial. These and similar questions – relating particularly to the aim of science, philosophy, or to the sphere of ethical issues connected with 'the truth' have troubled philosophers for over two and a half thousand years. We will first make a presentation of certain reflections concerning the understanding of 'the truth'. Further in the work, we will juxtapose them with some reflexions on the understanding of 'the lie'.

It can be assumed that the contemporary ways of understanding of 'the truth' are connected with the traditional philosophical problem area around this notion and that they have their source in the ancient Greek philosophical thought, which gave raise to the beginning of the European philosophy.

In the ancient Greece, philosophers, that is 'lovers of wisdom', reserved to themselves the monopoly of truth; more exactly – searching for the truth and wisdom. In the V–IV centuries B.C., on the territory of Greece, mainly Athens, there were Sophists – travelling teachers of 'wisdom' and educators, who – charging a fee – offered education in the scope of subjects that were useful both in an active public life and in the private one.[4] Although they did not create a uniform philosophical school, they worked out a style of new rational thinking about the natural and social reality. They are considered to be the first humanists in the history of ancient philosophy, since the object of their interest was life and human action, man. The Sophists regarded the relativism of human cognition and of the whole knowledge, because this is based on fallible perceptions of the senses. *The truth is relative* – the Sophists claimed, it has the character of human supposing, which can be – for our own purpose – freely shaped by means of argumentation, skilful convincing to accept our own views. In the opinion of the Sophists, there is not one, commonly binding and objective truth; there exist better (more useful) and worse (less useful) truths. The choice of the better truth depends on its higher usefulness, benefit(s) it brings. Wise men are those who can choose more useful truths and this not only in cognitive disciplines, but also in the domains of ethics, religion, legal norms.[5]

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[4] See: *Słownik kultury antycznej* (*A Dictionary of the Ancient Culture*), Winniczuk, L. (ed.) (1989), p. 483 ff.; Szymanek, K. (2001), p. 293 ff; Tatarkiewicz, W. (2001).

[5] In this place and others that follow, we are quoting ample fragments of the author's work entitled *On Truth...* (2009), p. 26.

It is this taking the relativistic view of the truth, the pragmatism of the Sophists, the conditioning of justification of the truth to a practical goal had, with time, their consequences in the form of their abuse of science through application of unreliable argumentation in justifications of the advocated theses, making use of the so-called *sophisms*, i.e. skilful, seemingly correct reasoning, which contains logical errors hidden in it on purpose.[6]

The attitude of the Sophists led to acknowledging the view that one can announce two contradicting, yet true, sentences about every phenomenon, about every thing. This, obviously, required proficiency and dexterity in proving the theses which were propagated, false though they might be, as well as in refuting the adversary's theses. A lot of Sophists succumbed to the temptation of teaching deceptive, twisting arguments that had little to do with truth to rich Greek youngsters who wanted to make a political career. This resulted in the fact that the word "Sophist" acquired a pejorative meaning, the term being applied to the pseudo-educated people and teachers of pseudo-wisdom, specialists in using far-fetched, though convincing arguments. This notion of a Sophist has been in force until today.[7]

Socrates (469–399), counting as one of the most outstanding Ancient thinkers, originated from the circle of Sophists.[8] Opposing the science and teaching of the Sophists, undertaking to fight against their theses and seeming truths, he claimed that

The truth is one, objective, commonly binding.

Socrates regarded dialogue as the only way of reaching the truth and exposing it.[9] He propagated the cult of the truth, acknowledged the existence of the absolute good and the absolute truth. He also considered cognition of the objective truth and leading people to learning the truth to be the supreme ethical value. His teachings and methods that touched upon the problem area of ethics and those of human life had a strong influence on his disciples, among whom there were also politicians.

Socrates' views, in particular those on the truth, which are known mainly thanks to Plato's reports, have found their representation in the further development of the philosophical and ethical thought, not only in the ancient times, but also during the Middle Ages and modern times. Various

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[6] *Ibidem*, p. 26.

[7] *Ibidem*, pp. 26/27.

[8] See: Krońska, I. (1985).

[9] The style used by him in dialogues was later on named 'socratean' and fixed in the famous Plato's dialogues.

schools made references to the great thinker's views throughout centuries, many a time themselves being totally in opposition to one another and understanding the truth in completely different ways.

Both Plato – the founder of the famous philosophical school called *Plato's Academy* (which managed to function for as long as ten centuries, until VI century BC) – and Aristotle (384–322), Plato's disciple and co-worker for many years, objected to cognitive relativism of the Sophists, acknowledging the primacy of the truth about science (objective truth) and fighting against the rhetoric plied by the Sophists.

Aristotle – one of the greatest and the most versatile scientists of the Ancient times – laid foundations under almost all domains of science. He distinguished, in particular, logic, separating it from philosophy; he is also called the "father" of formal logic. We owe to Aristotle the classical definition of the truth in the cognitive sense, the definition that has been around until today. The relative, utilitarian, truth, as well as the *pragmatic definition of the truth* are replaced by the objective truth and Aristotelian corresponding definition, according to which (putting it in brief):

> ***The truth is an agreement of thoughts and things which are the subject of the thoughts.***[10]

In the formulation by St. Thomas of Aquinas

> ***The truth is an agreement of the intellect with the state of things consisting in that the intellect acknowledges the existence of what there is, or non-existence of what there is not.***

The classical Aristotelian definition of the truth makes the foundation of contemporary semantic concept of the truth offered by Alfred Tarski (1933), the famous representative of the Warsaw School of Logic and then the Californian Logical School founded by the scholar. According to this concept, the condition of adequacy (agreement) is preserved:

> ***The sentence is true if and only if it is as the sentence states.***

Let us go back, however, to our questions relating to the notion of 'the truth':

> *Does there exist one, objective truth or are there many truths?*

Answering the above question requires, without a doubt, pondering over the very notion of 'the truth' itself. Since the question: "What, indeed, is the

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10 *On Truth...*, *op. cit.*, 28.

truth?" which was asked in derision by the official of the Roman Empire – Pontius Pilate – while examining Jesus of Nazareth – if devoid of the derision – is one of the most challenging and disturbing questions posed to philosophers, and not only.

1.2. On the notions of the truth[11]

Truth (t) can be conceived as:

t1. an object of cognition, hence, substantially,

t2. a feature, property of descriptive sentences or logical judgments[12] expressed by them or the cognition whose results are these judgments,

t3. all the sentences (all judgments) describing the broadly-conceived reality,

t4. a cognitive-ethical value,

t5. the truth relativized to the domain of knowledge,

t6. pragmatic truth.

In the case of t1, the word 'truth' is used as noun predicate, like in the sentences below:

The fact that the lie has been in use since the times immemorial is the **truth***.*

The fact that the lie is often a tool of fighting, especially of a political fight, is the **truth***.*

or as an operator function in the following examples:

The **truth** *is that the lie has been in use since the times immemorial.*

The **truth** *is that the lie is often a tool of fighting, especially of a political fight.*

Such a usage assumes that *the truth* is something existing, is an abstract object, perceived with intellect as a set consisting of `partial truths` (in the exemplary sentences the partial truth are the following facts: that the lie was in use in the oldest times we know of and that the lie is often a tool of fighting, especially of a political fight). *The truth* is then something one and only which "can be discovered in an infinite effort of mankind".[13] `The truth`

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[11] Speaking about the notions of the truth, we apply here the approach accepted in the papers by the author (2008, 2009). Still, for the use of the present paper we do not analyze the notion of "the absolute truth" or the notion "absolute falseness" which stands in opposition to the former, although all the notions of 'the truth' or 'the lie' discussed in it can be framed as relevant explications of these "absolutistic" notions.

[12] Logical judgments are meanings of sentences-*types* (cf. Reference 15). Thus, they are not psychological judgments (certain thoughts) of individual people.

[13] Agazzi, E. (1994), p. 292.

conceived in this way is then a philosophical notion, an ontological one. One can say then about the *ontic truth.*[14]

In the case of t2, the word "the truth" is used in its role of an adjective, meaning that the truth is a property of sentences (or judgments corresponding to them), which consists in their being *true.* Then the word "the truth" is replaced by that of "truthfulness", meaning certain property of descriptive sentences treated as sentences-types.[15] This usage assumes then the existence of such sentences. We come to deal with them, for instance, in utterances, like the ones below:

The sentence *"The lie has already been in use since times immemorial"* is `true`.

The sentence *"The lie is often a tool of fighting, especially the political fight"* is `true`.

The truth understood in this way is then a logical notion, a semantic one. We speak then about *the semantic notion of the truth. The truthfulness* of the sentence is here a property, the possession or a lack of possession of which by the given sentence depends on whether between it (resp. what it expresses – a thought, an opinion) and what it concerns – the broadly conceived reality – holds a respective relation, within the framework proposed by Aristotle, the classical one – *agreement. The truthfulness* of the sentence is then an objective feature, it does not depend, in particular, on whether we consider the sentence to be true according to some criteria. The contradiction, negation, of *the truth* (*truthfulness*) is then *falsehood* (*falseness*).

It must be observed here that the feature of *truthfulness* is attributed not only to sentences or their thought-relating correspondents, or to cognition, whose results are true sentences; in the last case we can speak about *the epistemological truth.* We speak about the truth also with reference to somebody or something that is not a sentence, opinion, or cognition, using, for instance, the expressions: "a true friend", "true friendship", "a true love", "a true work of art", "true good", "true freedom", "a true doctrine", "a true theory", "a true lie", and the like. We use the word "true" then in its secondary, not the primary meaning, having in mind realizations of the essence of the object, its internal unity, harmony, *agreement* with some ideal, a cultural pattern, a modelling idea, a model, criteria.

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[14] Philosophy recognizes also the notion of *ontological truth.*

[15] Sentences-*types* are abstract objects, non-physical. They can be conceived as classes of physical, concrete sentential inscriptions, in a sense identifiable, e.g. with respect to their shape(see Wybraniec-Skardowska 1991).

The truth, in the case of t3, is usually framed as the whole of sentences (logical judgments) which are objectively true, thus – as carriers of true cognition, propositions aptly, adequately describing the reality, that is sentences possessing the feature of *truthfulness. The truth* is then an abstract notion, an existing object, composed of all *partial sentences-truths*, such as:

The lie has been in use already since times immemorial.

The lie is often a tool of fighting, especially of the political fight.

In the case of t4, we use the word "the truth" to denote what is good, valuable, worthy of human cognition, what is an aim of human aspirations, what is an axiological value. When we speak about "cognition of the objective truth", *the truth* is framed as a supreme cognitive value. When we speak about the purposefulness of "aspiring after the truth" and "propagating the objective truth", *the truth* has a moral value for us.

Does there exist a relation between the ontological, semantic, epistemological and axiological conception of *the truth*? Getting to know more and more of new single partial truths (the *ontic truth*), we get to know also true propositions (the semantic and epistemological truth) about the reality which is of interest to us, and if searching for the truth (ontic or semantic), propagation of the truth (true propositions), becoming acquainted with the truth (with true statements) are the goal of our aspirations, the truth has to us a cognitive-ethical value.

The word "the truth" in ontology, logical semantics, epistemology and axiology has different, though – in the above-mentioned framework – related meanings.

It is often said, too, about different truths in individual domains of knowledge, treating them as laws or theorems of these sciences. Conceiving *the truth*, as we have so far, in an abstract sense *the scientific truth* consists of concrete laws, or theses of the given science, is the whole set of theses or theorems of the given science, the whole of *partial truths*. We come to deal then with the case of t.5 and a completely different conception of *the truth. The truth* in these disciplines is established by means of various methods of checking the truthfulness of judgments, according to different *criteria*. If, then, the meaning of the word "the truth" bears some reference to *criteria of the truth*, and these can vary in different domains of knowledge, one sometimes says about different kinds of truth, and even about many truths, since there are a lot of sciences. Then, one generally thinks about *truths relativized to the given domain of science*, e.g. ethics, aesthetics, philosophy of language, theory of cognition, logic, physics, geo-

metry, etc.[16] If the criteria applied to establishing truths of science are reliable and serve to better understand the examined reality, *the truth –* then – has the scientific-cognitive value. Sometimes, however, *the object evidence*, internal in relation to cognition and connected with the manner in which the object of cognition (the state of things) is given to the subject in the act of cognition, guaranteeing the truthfulness (faithfulness) of the cognitive result, is accepted as a well-justified effective criterion of the truth.[17]

Still, it needs to be clearly underlined that the criterion of the truth – the basis according to which we recognize *the truthfulness* of cognition or the conditions sufficient to acknowledge a sentence, a view or a conviction (logical judgment) to be *true* – cannot be identified with the definition of the truth, with the definition of an objectively true sentence. The classical definition of the truth does not refer to any of its criteria. The definition of a criterion was clearly differentiated by Bertrand Russell and Jan Łukasiewicz. It can be accepted, following Kazimierz Ajdukiewicz, that acceptance of the classical definition of the truth allows eliminating the criterion of the truth at all.[18]

In the case of t6., *the truth* is conceived in compliance with the *pragmatistic definition* which makes the truthfulness of a sentence, a thesis, dependent on some pragmatic criteria: usefulness in foreseeing and practical applications, convenience, economicality. The American pragmatists of the 20th century (W. James, Ch. S. Peirce, J. Dewey) claimed that the truthfulness of sentences or propositions is determined just by broadly-conceived criteria of usability. Rejecting the classical definition of the truth and – thus – acquisition of theses which make a stable basis of our knowledge, pragmatists make the truthfulness of sentences dependent on some aims and actions, investing the truth with a relative character, and cognition – with a relative one. Acknowledging the primacy of action over thinking and practice over theory, pragmatists come closer to the stance of the Sophists. The *pragmatic truth* is then composed of particular *relative truths* which can be treated as those acknowledged by the pragmatists as true.

We can raise objections with reference to the pragmatistic definition, like to other non-classical definitions of truthfulness, that – to some extent

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[16] See: Agazzi, E. (1994), pp. 285–307.

[17] See: Herbut, J. (ed.), *Leksykon Filozofii Klasycznej* (*A Lexicon of the Classical Philosophy*), pp. 438 and 439.

[18] Ajdukiewicz K. (1985), pp. 13–14.

– it is justified by assuming the classical definition.[19] Furthermore, as it was mentioned earlier, the classical definition does not require making references to any criteria of the truth. "The notion of truthfulness is a natural and fundamental characteristic of science, differentiating science from other creations of mental culture in the fullest manner".[20]

The aim of science, philosophy, is to strive for cognition of the objective truth as this is what invests the latter with a cognitive value. The Polish philosophers and logicians who were members of the world-famous Lvov-Warsaw School, whose founder was Kazimierz Twardowski,[21] strove for the primacy of thinking, for the truth in science, and also in education and politics, for maintaining the classical, Aristotelian, definition.

2. On the lie

2.1. The lie yesterday and today

We know that the lie has been in use since times immemorial. It is rooted in our civilization and plays different functions. It was and is applied to enforce something or to reap some benefit. It was often and still is a tool or weapon of fighting, especially in a political fight, one in which a conflict of interests or opinions comes to the fore, in which human thoughts, views and struggles of intellectual, social, political spheres of life clash with one another, a fight targeted at entrapping or deceiving the opponent or society through not telling the truth to the public or, at least, not the whole truth.

The past century, the 20th century, took over the lie which is generally simple (a lie used while playing cards, a lie in the relations of sale-purchase, etc.). Lies of the past and of the current, the 21st, century are obviously more sophisticated and they are not simple lies, but frequently twisting political games, games on the international arena, ones that are shielded by accomplishments of contemporary civilization and commercial mass media.

The lie has become inseparable not only from politics – it has attacked all spheres of our lives. The modern lie has become insidious. Publicly and popularly repeated – like a typical commercial – it is becoming an integral part of our lives, not allowing us to perceive or come closer to *the truth*.

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[19] See: *Leksykon, op. cit.*, p. 439.
[20] Czeżowski, T. (1958a), p. 70.
[21] A study devoted to this famous School was published by Jan Woleński in 1985 (English version in 1989).

This is a result of the information policy in force. The difference between the notions of the lie and the truth is getting blurred.

In this context, one can quote the well-known statement by the Minister of Propaganda of the Third Reich – Joseph Goebbels – a close collaborator of Adolf Hitler, who said:

> *"A lie that is repeated a thousand times becomes the truth".*

Does the lie which is referred to in the statement above, indeed, become *the truth*? If so, what kind of truth? The objective truth? The latter is stable and unchanging, independent of situations and contexts!

If the quoted sentence uttered by Goebbels were true, then the *liar's paradox*: *On the truth-telling liar*, well-known already in antiquity, could perhaps be removed as well. After all, a liar could be truth-telling in fact, since one cannot see a contradiction in that the liar, saying "I am lying!", is lying and is not (is telling the truth) at the same time,

because:

- if he is lying, then it is not so as he says, that is he is not lying, he is telling the truth,
- if he is not lying, he is telling the truth, then it is as he says, he is lying.

Why, then, solving this paradox has caused many a sleepless night to many a thinker for centuries?[22]

We can feel here that the chaos in the use of notions, connected with the different meanings of the words "the lie" and "the truth", makes it difficult to formulate rational answers to the questions posed in the present work. It is also felt justifiable to make a distinction between the notions of *the lie*,[23] like we already did about the notions of *the truth*.

2.2. On the notions of the lie

One cannot say about the lie without making references to the truth. Thus, we will refer the notions of 'the lie' to those of 'the truth'.

The lie can be perceived as:

l1. an object, substantially,
  a. of negation of cognition, or
  b. of falsifying cognition;

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[22] Solving this ancient semantic paradox had not been possible – as it is well-known – until the 20th century; the contradiction lies in not respecting the differentiation of expressions of objective language from expressions of its metalanguage.

[23] Detailed considerations relating to the notions of lie, from the perspective of logic, are taken up by M. Tokarz (2006), pp. 267–276.

l2. a feature, property belonging to descriptive sentences or to logical judgments expressing them,
   being the carriers of:
   a. of negation of cognition, or
   b. of falsifying cognition;

l3. the whole of sentences (judgments) being carriers:
   a. of negation of cognition, or
   b. of falsifying cognition;

l4. opposing cognitive-ethical values, anti-values;

l5. pseudoscientific "truth";

l6. a pragmatic lie.

In the cases of l1. a/b, *the lie* is an existing object perceived as one composed of all concrete lies, when the case

a. of *untruth* (contradictions of partial truths, concrete facts) is concerned, and when it comes to the case

b. what is perceived in concrete *behaviours* or *communication-related actions*, in which we come, or we came, to deal with *lying about a certain state of things s*, that is with a conscious formulation by the sender of a determined act (or acts) of communication, in a determined situation, of an utterance whose aim is to mislead the receiver and to lead the latter to interpret this utterance as one referring just to the state of things *s*, with reference to which he himself – as the sender of the utterance about *s* – is convinced that it does not hold, that it is not a fact, therefore being sure that his utterance is false; then, we say about such an utterance that it is `mendacious`, about its sender – that he/she is *a liar*, that he/she *is lying as regards case s*, about the state of things *s* – that it is *the object of the lie*, and about the receiver of the mendacious utterance that he/she is *one who is lied to*.

A lie in the sense l1.b can be meant to add colour to facts, to distort and misinterpret the latter, to falsely create the reality. It is then connected with falsifying the true cognition.

When the object of a lie in a communication-related action is a political issue, we shall call the lie *a political lie*.

In the cases l1.a/b, the word "the lie" is used as a noun, like in the following sentences:

a. *That politicians always speak truth is* *a lie (an untruth)*.

   That the crime perpetrated in Katyń is the responsibility of the Nazi is *a lie (an untruth)*.

b. *What is publicly stated, that is that the Katyń crime is the responsibility of the Nazi is* **a lie**.

What some historians claim, that is that Poles contributed to the outbreak of WW2 is **a lie**.

Political and historical lies provided in the last two examples are – at the same time – concrete, verifiable untruths, concrete lies at the most general conceiving of "the lie" as the whole of all untruths (the case l1.a). Untruths in the sense of a, obviously, do not have to be lies in the sense of b, since they do not have to be connected with lying to somebody. This is testified to, at least, by the first of the examples given above.

In the cases of l1.a/b it is also possible to use the word "lie" as an operator, making use of certain expressions:

in the case of a, this can be: *It is* **a lie (an untruth)** *that* ...,

in the case of b, this can be: It is **a lie** *what X stated while trying to convince that ....*

In the cases of l2.a/b, the word "lie" is used in the adjectival function and what is meant here is a feature, property of sentences (or judgments corresponding to them), being the carriers:

in the case of a – of false cognition, and

in the case of b – of falsifying the cognition,

a feature consisting in their being:

in the case of a – untrue, false, and

in the case of b – mendacious.

Then, the word "lie" is replaced, in the case of a, with that of "falsity", and in the case of b – with the word "mendacity". The adjectival usage of the word "lie" can be encountered, for example, in the following utterances:

a. The sentence, *"Politicians always tell the truth"* is **false** (**untrue**),

b. The sentence, *"The Nazi are responsible for the crime perpetrated in Katyń"* is **mendacious**.

The lie conceived in the way like in the case of l2.a (as *falsity, falsehood*) is then a logical semantic notion. The *falsity* of a sentence, similarly as the *truthfulness* of a sentence is an objective property: its possession or the lack of possession of it depends only on whether between it (resp. what it expresses, the judgment) and what it describes – the respective state of things – there holds the Aristotelian *agreement*. Thus, the *falsity* of the sentence does not depend on the time, place of circumstances, situation of its uttering. Neither is it conditioned by any criteria.

A sentence is **false** if and only if it is not so as it claims.

A contradiction of **the lie** (*falsity*, *falsehood*) is then the *truth* (*truthfulness*).

The lie conceived in the way like in the case of l2.b (as *mendacity*) becomes relativized to the following: the subject of the lie (the liar, the sender of mendacious messages), the one who is being lied to (the receiver of the mendacious messages), the mendacious utterance of the sender, and – obviously – the communication situation in which this utterance is formulated. The *mendacity* of a sentence (judgment) is not then its objective property. Whether or not the utterance intermediating between its sender and the receiver in the verbal communication is **mendacious** depends on sincere and insincere intentions of its sender.

The lie in the case of l3.a is conceived as a whole of untrue, false sentences, thus the whole of carriers of untruths. Each of such false sentences is then treated as a concrete lie. *The lie* in the case of l3.b is a different thing: it is the whole of mendacious sentences connected with communication-related behaviour consisting in lying to somebody about a certain issue. Each of such sentences is then treated as a concrete lie. For example, a concrete *Katyń lie* is not what is publicly stated about the Katyń crime, but the very sentence itself which is announced publicly:

"The crime of Katyń was committed by the Nazi."

The lie, as a cognitive-ethical anti-value (the case of l4.) – in relation to conceiving 'the truth' as a supreme cognitive-ethical value (the case of t4.) – is connected with the use of the word "lie" to denote what is bad, wrong, unworthy of human existence, what should never be the goal of an action, what is usually an axiological negative value, what is not the aim of true cognition, what is not the source of knowledge about the world, does not aim towards the objective truth or spreading true sentences about the world. The axiological qualification of the lie depends on the motives which control it, on distinguished axiological criteria. In politics and rhetoric, neither *the truth* nor *the lie* are objective logical values.

In a similar way as one often speaks about various truths, one can speak about various *lies* in the area of sciences, which are to replace these truths, about pseudoscientific "truths" (the case of l5.) that are sets of mendacious, pseudoscientific theses (sentences) founded on unreliable arguments, on false or mendacious assumptions, on premises that are often unsubstantial, most frequently shorn off their primary meaning. *Mendacious theses* are formulated and justified for some utilitarian purposes and are related to assigning relative value to the truth. They were and are applied in politics with the aim to manipulate, with regard to shape given views, ideas, *Welt-*

anschauungs, ideologies, although – certainly – they are used not only for such purposes.

Mendacious theses are ones of pragmatic value, which can determine *a pragmatic lie* itself, that is *the lie* in the framework of l6. The lie in this sense is always conditioned by some criteria of usability determined by an established purpose of communication-oriented action, criteria connected with effective lying. The lie in the sense of l6. is thus of a relative character and consists of mendacious sentences – *relative lies* functioning in communication-related behaviours and established by given pragmatic criteria. The notion of the pragmatic lie can be – with the framework given here – considered subordinate in relation to the notion of the lie in the sense of l3.b. The political lie, whose aim is, after all, to prevent an unfriendly political situation, can be conceived as a kind of pragmatic lie.

3. Does the lie contradict the truth?

Undertaking, in this work, to discuss the difficult `problemate of the truth and the lie`, we cannot but separate the notions of the lie and the truth from each other, as well as – even the more so – endeavour to answer the question posed above. It is obvious that trying to answer this question we should not connect the notions of the lie and the truth, which refer to different categorical beings, with each other. But even eliminating such juxtapositions, the question asked here is ambiguous, since it may be relativized to different notions of ln and tn, with n = 1, 2, ..., 6. In addition, answers to questions already suitably relativized may not be unambiguous, since we do not know what meaning of the word "contradict" is meant in the question: Does "contradict" mean "being in contradiction with something"? or Does it stand for "being in opposition to something"? Taking no account of the latter differentiation, answers to the following question in the affirmative:

(?n)   *Does a lie in the sense of* ln *contradict a truth in the sense* tn*?*
       with n = 1, 2, ..., 6,

will determine the exclusion relation between the extensions of the notions of ln and tn, whereas those in the negative – and they can be so in contrast to popular beliefs – will determine the crossing relation between the extensions of them.

"Moving from the bottom to the top of the list" and juxtaposing *the lie* in the sense of l6. – as one composed of *relative lies*, with *the truth* in

the sense of t6. – as one composed of *relative truths*, we cannot exclude the possibility that there exist (relative) lies which are (relative) truths, accepted both by liars and those whom are lied to. One can again quote here Goebbels' statement:

> *"A lie that is repeated a thousand times becomes a truth."*

It has been proved psychologically that the liar usually starts to believe in his lies which he repeats a number of times, acknowledging them to be truths, and in the case of political rhetoric which is carried out in relation to the receiver, the strategy of shaping the opinion makes the lie craftily penetrate into his mind and by readjusting the appropriate course of reasoning favours acknowledgement of the lies passed to the one that is lied to as truths.

One can also, undoubtedly, provide examples of concrete lies founded on certain pragmatic criteria, which – according to some other criteria – are relative truths. Illustrating, by means of graphs, problems relating to the question (?6) with the aid of Fig. 1,
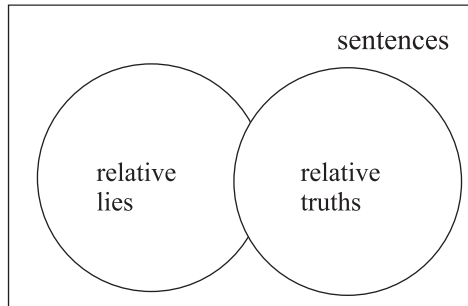
Fig. 1

we insert the negative answer to the question in the table below:

l lie	t truth	Does l contradict t?
l6	t6	No

Then, juxtaposing, *the lie* in the sense of l5. – as "a new truth", a pseudoscientific one, composed of mendacious, pseudoscientific theses – with *the truth* in the sense of t5 – as a scientific truth consisting of theses, scientific laws, we cannot exclude the fact that there exist pseudoscientific, mendacious theses, justified on the basis of doubtful premises which are

scientific truths, too, justifiable on the basis of scientific criteria (mendacious theses may turn out to be true or made probable on the basis of applied scientific arguments). Illustrating these observations with the help of Fig. 2,
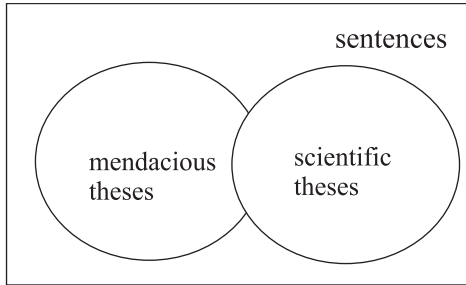

Fig. 2

we insert the negative answer to the question (?5) in the table below:

l Lie	t truth	Does l contradict t?
l5	t5	No

The answer to question (?4) is not unambiguous. If, by the ethical or cognitive value – as *the truth* in one of the possible meanings of the word "truth", we understand the whole of cognitive-ethical values attributed to particular sentences that are objectively true (the whole of morally positive values), and by the ethical or cognitive anti-value – conceived as *the lie* in a certain meaning of the word "lie" – all of the cognitive-ethical values attributed to particular mendacious sentences, then it will turn out that certain ethical values of this kind are not always morally negative values *in sensu strictu*, since they can happen to be among mendacious sentences acquiring a positive value as they are evaluated to be morally good. After all, it was already Plato who wrote:

> *A lie sometimes becomes the authority if it is necessary*
> *for the good of citizens.*

Some mendacious utterances are thus accepted when offered by politicians, and we know only too well from life that not only by politicians. Then, we invest them with the morally positive value (+). When, however, we acknowledge that truth-telling is a principle in force in ethics, that all kinds of the lie are something wrong, we invest all mendacious utterances

with the morally negative value (–). The criteria of moral evaluations are very much varied. It is they that the answer to question (?4) depends on. Illustrating our considerations by means of Fig. 3 and Fig. 4,
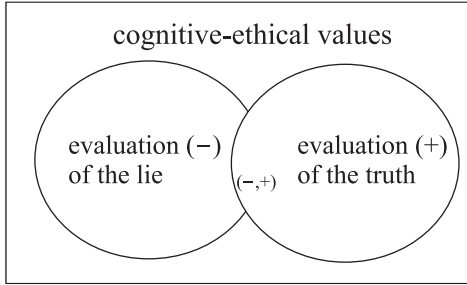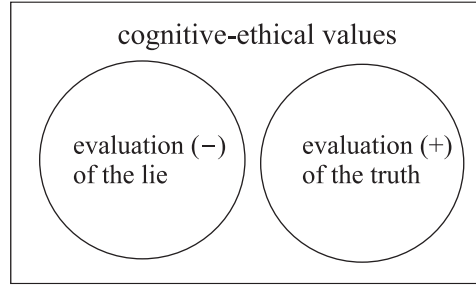

Fig. 3   Fig. 4

we obtain an answer "No" which is shown in Fig. 3, and an answer "Yes" illustrated in Fig. 4. Using a table, we can thus frame the answers to question (?4) in the following way:

l the lie	t the truth	Does l contradict t?
l4	t4	Yes-No

Let us move on to the answer to question (?3). Since we have differentiated two notions of the lie in the cases of l3.a and l3.b, we juxtapose each of them with that of the truth in the sense of t3. The notion of *the truth* as the whole of objectively true sentences (t3) is contradictory, thus it excludes that of *the lie* in the sense of l3.a, as the whole of untrue, false sentences (see Fig. 5). However, this notion crosses that of *the lie* in the sense of l3.b conceived as the whole of mendacious sentences, because the liar – against his own intentions – by lying to somebody can utter a true sentence, being convinced that it is false. Mendacious sentences can at times be objectively true. The liar, while lying, can be telling the truth, utter a true sentence[24] (see Fig. 6). Mendacious sentences – torn out of their context – can be ambiguous, at the same time, vague, insinuating, allowing various interpretations of them and investing them with different logical values: truth or falsehood. They do not have to be logical sentences.

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[24] See: Wójcik, A. (2002).

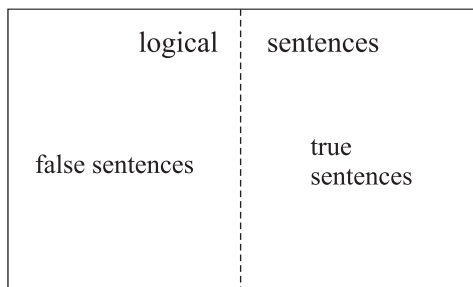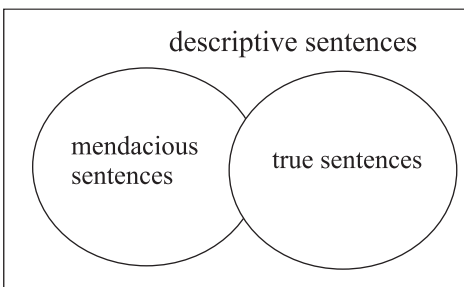| logical	sentences	descriptive sentences	
false sentences	true sentences	mendacious sentences	true sentences

Fig. 5   Fig. 6

Thus, there are two answers to question (?3). They are included in the table below:

l the lie	t the truth	Does l contradict t?
l3.a/b	t3	Yes/No

Let us move on to the answer to question (?2). Since the notion of *the truth* in the sense of t2. – as a feature of objectively true sentences – is juxtaposed here with the notions of *the lie* – as a feature of objectively untrue sentences, false ones (the case of l2.a) and then with the notion of *the lie* – as a feature of mendacious sentences – it is obvious that we will obtain two answers. It is easy to notice that the feature of truthfulness of the sentence is contradictory to the feature of falseness (no true sentence can be at the same time false and each logical sentence is either true or false /see Fig. 5/). Taking into account the case of l2.a, the answer to question (?2) is in affirmative. Let us note that also in the second case – l2.b – the answer is affirmative, as the features of truthfulness and mendaciousness are opposing ones: *the feature of mendaciousness* is a subjective one depending on the intention of the sender of the verbal message. It is appropriate for sentences which are false – in the intention of the sender (although they may be true), while *the feature of truthfulness* is an objective one and belongs to objectively true sentences, independent of what anybody thinks about, or is convinced of the truthfulness of this sentence. Juxtaposing the answers to question (?2) in the table, we obtain:

l the lie	t the truth	Does l contradict t?
l2.a/b	t3	Yes/Yes

Now, it remains to answer question (?1). Let us consider, first, the situation when the objective truth, as a set of all facts, states of things that hold (described by true sentences) which we discover – as *partial truths* – in the "infinite effort o mankind", is juxtaposed with the notion of *the lie* in the sense of l1.a – as everything that is not a (partial) truth, everything that consists of untruths, states of things that do not take place. In this case, between the extensions of the notions: *the lie* (in the sense of l1.a) and *the truth* (in the sense of t1) there occurs a contradiction relation (see Fig. 7). Then, we should rather not say that the person who is telling untruth (a false sentence) is *lying*, but that the person in *telling untruth*. As a matter of fact, one can, even in a conscious way, be telling untruth (*e.g.* in jest) but is not lying at all.

When we consider the notion of *the lie* in the sense of l1.b – as everything that is the subject of mendacious utterances which are carriers of falsifying the cognition (and may, though they do not have to refer to untruths, to states of things that have not taken place, when such utterances – against the liar's intentions – are true), then it needs observing that objects (states of things) which are objects of reference of the liar's insincere statements are "de-objectivized", state of things as objects of cognition shorn of objectivism, since they are based on the liar's internal beliefs that the states of things which he is spreading around do not take place. Therefore, they cannot be state of things, partial truths or untruths referred to in logical sentences – objectively true or false. Thus, the extensions of the notions: *the lie* in the basic sense (l1.b) and *the truth* as the object of a true cognition (t1) oppose each other (see Fig. 8).
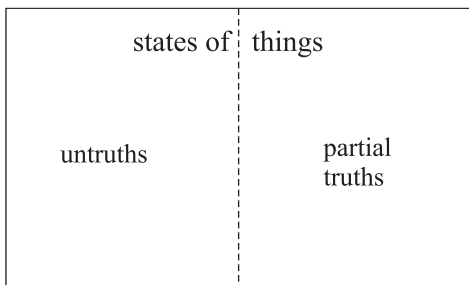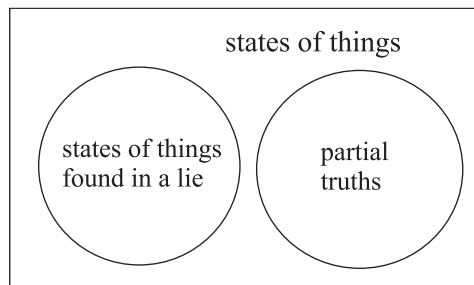

Fig. 7

Fig. 8

Juxtaposing the results of the considerations carried out above with reference to (?1) we have:

l the lie	t The truth	Does l contradict t?
l1.a/b	t1	Yes/Yes

A global juxtaposition of all of the inquiries into answers concerning the question posed in this work is presented in the table below:

l the lie	t the truth	Does l contradict t?
l1.a/b	t1	Yes/Yes
kl.a/b	t2	Yes/Yes
l3.a/b	t3	Yes/No
l4	t4	Yes-No
l5	t5	No
l6	t6	No

Thus, there is no unambiguous answer to the question posed in the work:

Does the lie contradict the truth?,

and the negative answers to its variants: the questions (?4), (?5) and (?6), manifesting in the last rows of the global table, can indeed be disturbing, since these answers violate certain ethical principles which are binding – primarily – in science, whose aim is searching for the *objective truth* (in the sense of (t1)), as well as accumulation and systematization of partial truths. *The truth* can be attained only through "pure" cognition, devoid of utilitarian goals. Scientific truths ought to be founded on reliable, logical arguments or well-verified hypotheses. There should be no room for any *lies* and acceptance of pseudoscientific theses in science.

And what should it be like in other spheres of life? In politics? Has anything changed since the times of Athenian democracy? The widespread hypocrisy which prevents any reliable communication has become a constant accompaniment of our contemporary life, and the very ethical postulate itself "do not lie" is beginning to sound quite anachronistic, the causes of which can be seen while endeavouring to answer the following question in the negative:

Is fighting with the lie more difficult today than it used to be in the past?

Answering this question, we can base on our own observations. From the perspective of my own experience – as a participant of the political life and events of the past fifty years – I would like to share some of my reflexions which the above question raises and I would also like to present a handful of my own ideas.

4. Is it easier to lie nowadays than it was in the past?

The title of this part of the work is borrowed from the short treatise written by Tadeusz Czeżowski in 1943.[25] The word "nowadays" is an occasional one. Its meaning changes in dependence on the context of its usage, time and circumstances.

Over half a century has passed since the treatise was published. T. Czeżowski gave an affirmative answer to the question posed in his work, justifying his choice with the following reasons:

- the inseparability of language and the reality has been violated

(in the realism of the ancient philosophical thought a faithful reflection of the objective reality was found in words),

- the object of cognition has been de-objectivized, a subjectivistic conceiving of the world has been noticed

(creation of the image of the world as the basis of an effective action, a visible tendency in compliance with the pragmatic conceiving of the truth),

- the foundations of the negative moral qualification of the lie have changed, one of the motives of which is disturbance of social relations, which was already emphasized by Kant

(moral evaluation of the lie is losing its acuteness within society due to justifying the aims which it serves; this causes traditional sanctions aimed against the lie to become very lenient).

An affirmative answer to the question asked in the heading above – in this context – speaks for itself in a peculiar sense as there arise the following questions: Is the sense of it the same today as it was in the past?, and Has it been so in the past fifty years? We should then make a slight reference to the affirmative answer to this question in the post-war years, in the time of 'real socialism', when – in defence of the lie – a whole system of political lies was constructed, lies which were connected with the sphere of views and which resulted from the following factors:[26]

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[25] See: Czeżowski, T. (1958).
[26] See: Wierzbicki, P. (1986, 1987).

1. annulment of the language,
2. annulment of logic,
3. annulment of reality,

and thus from factors connected with:

1'. tearing the language away from the reality,
2'. justifying mendacious theses without any logical argumentation, and
3'. creating new, false reality.

Having at its disposal hosts of defenders of those lies and forgers of *the truth*, as well as a whole arsenal of tricks and manners of telling lies, known already to ancient Greeks, and also the methods applied by masters of lying of the interwar period and the methods of political rhetoric of post-war non-communist states, the moral evaluation of the lie was losing, and almost completely lost, its acuteness, imperceptibly creating, in society – through imposition of a peculiar obligation – a belief in the truthfulness or probability of the streams of lies that were passed and repeated. This also changed the society's attitude towards the lie as an unethical value, one that was supported by slogans propagating relativity of the truth and the "scientific" nature of the mendacious theses which were disseminated. The *New Speech*, connected with the propaganda of the 20th century and the functioning in it of two totalitarian state systems, did play an important role in deforming societies' consciousness, in not condemning the lie, or even – in the acceptance of the lie as a "new truth".

Times have changed. Political systems have changed in many countries. The factors differentiated by Tadeusz Czeżowski, those favouring the lie and the principle "It is worth lying", are becoming readily augmented by 'mediatization' of politics and social communication. Such mediatization allows fairly faithful presentation of politics, but also propagating untruths; it allows – as we often put it – missing the truth, or contradicting it. Today, society tells "the truth" or "the untruth" with the help of its media.

Philosophy is a friend to wisdom. But: Is it also a friend to the "wisdom" that is often hidden in a political lie? Is a commonly repeated lie, frequently accepted by society as "a new truth", bound to constitute any value in the times to come, when public and social mendacity grows to attain the status of a new life principle?

This "new truth" is materializing within the thinking process in a community, in which the direction of thinking is not determined by logic, but by some emotional factors. If there is a lack of good will and willingness to learn the truth, then working out new ways of acceptance of authentic political or historical events is a hard task. What is, then, the task set to philosophy in the service of politics?

A philosophical reflexion on the sphere of influences and interface of various political subjects is connected with shaping of political and logical culture, as well as with the level of it in contemporary society and among the very politicians themselves.

Entering the area of problems relating to political ethics and social ethics, it needs underlining that fight for power is also a fight for *the truth*, the objective truth. Such a truth cannot be defenceless in the face of the lie, especially those political and historical ones, it must defend itself against deceptive arguments, against being deluded into lying. The truth – as people say – will always out. Yet it will not defend itself only because it is *the truth*. It must be a result of the process of reliable searching for it, discovering it, justifying it, thorough understanding of it, and then – passing and absorbing it.

Philosophy occupies a central place among sciences. "By making the very truth itself the subject of its studies, by lighting up paths leading to it, by creating the theory of scientific cognition, philosophy becomes an ally and guide to all who – in any field of human study – aim towards the truth," Kazimierz Twardowski – the founder of the famous Lvov-Warsaw School mentioned earlier – wrote.[27]

It is time the appropriate study standards of philosophy – this lover of wisdom and truth – returned and stood up to the "dubious forces" that prevent the studies from being conducted.

One of the basic tasks to carry out by philosophy today is:

To serve the truth in politics.

It is a particular challenge and it requires engagement on the part of many philosophers who – while analyzing different problems pertaining to political philosophy, come closer to the new perception not only of its problems, but also of the very world of politics itself, exerting an influence on working out a sense of responsibility for the high level of public life. This task requires delineating new routes for philosophy of politics, which will allow developing a high political and logical culture in society – the culture which guards intellectual work related to shaping views or *Weltanschauungs*, as well as allows a critical analysis of the already accepted views.

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[27] Twardowski, K. (1933).

Urszula Wybraniec-Skardowska

S U M M A R Y

The paper deals with one of the most difficult and worrying philosophical problems, that is the `problemate of the truth and the lie`. First, certain analyses are made with reference to notions related to attempts at answering the questions: What is the truth? And What is the lie?, then – taking into account problems pertaining to political and social ethics – various notions of the truth and of the lie are juxtaposed, respectively, in such a way as to be able to answer the basic question raised in this work: Does the lie contradict the truth? Answers to this question are not unambiguous. In the author's opinion, this presents a peculiar challenge to philosophy, and – in particular – to philosophy of politics, as well as to the idea of shaping the culture of politics and logic in our society.

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MODELING IN THE CONTEXT OF COMPUTER SCIENCE – A METHODOLOGICAL APPROACH

1. Introductory remarks

Modeling is one of the basic methods in *empirical* sciences. Generally speaking, it consists of the gradual construction of a cognitively useful – though simplified and idealized – image of described phenomena. As this image often takes the form of an abstract **formal description** – for example, a system of equations, or a set of logical formulas – modeling relies significantly on formal sciences such as mathematics, logic, or computer science.[1]

The following can be pointed to as typical **examples** of models constructed in empirical sciences: a) in physics – models of the *atom*, for example, the Bohr atomic model; b) in neurobiology – models of the *neuron*, for example, the McCulloch-Pitts linear neural model [McCulloch, Pitts 1943]; c) in psychology – computerized models of semantic memory, for example, Quillian's network model [Quillian 1968]; d) in cognitive science – partial[2] models of *mind*, including a rich collection of rule-based reasoning models (implemented in the form of expert systems) [Stacewicz 2010].

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[1] In formal sciences, especially in logic, models are also discussed in different terms. This is especially so in the case of <u>semantic</u> (logical) models [Marciszewski 1998; *Mała encyklopedia logiki*; entry: *model semantyczny* (*semantic model*)]. These are interpretations of axiomatic systems which make their axioms true (thus making true all statements derived from these axioms). It must be provisionally noted that a fragment of a theory which has a semantic model, that is, an interpreted theory, may play the role of a theoretical model of a given object (a model as an image – in the sense mentioned above.)

[2] The expression *partial model* means that a given model concerns a certain section of mental activity, for example, particular cognitive functions, such as learning or reasoning.

The last two examples demonstrate that many – if not most – contemporary models have the status of **computer science models**, that is, formal constructions which are described theoretically in the language of computer science (the language of algorithms and data structures), and, therefore, can be implemented in the form of applications and activated on a computer.

As modeling is a cognitive procedure – carried out primarily in empirical sciences, but significantly involving the theoretical means of formal sciences – both this procedure and the generated models are the object of **methodological analyses**, that is, analyses pertaining to the methodology of sciences, both empirical and formal. For this reason, the relationships between the model and the theory, as well as the model and the metaphor reconstructed below will be called *methodological relationships*.

In this article we will concentrate on the **methodology of computer science**. This means that we will discuss computer science models. However, the models which will be discussed are used for the description of phenomena whose nature is different from data processing in artificial systems.

The above mentioned methodological relationships may be studied by taking a **dynamic** approach – that is, in the context of modeling activity, as well as by taking a **static** approach – that is, in the context of temporary products of the modeling process.

In the first mentioned context above, it is necessary to take into consideration the compound modeling procedure which, as we will see, has a **cyclical**, **open** character and involves various operations connected with the formalization, interpretation, simplification and verification of subsequent versions of the model being constructed. The procedure is often initiated by a metaphor which determines the rough shape of future models.

To conclude these introductory remarks we must mention that the most significant function of a model in the methodological sense is **mediation** between the researcher and the studied object (the phenomenon). This means that a model leads to the discovery of new knowledge about the studied object. Specifically, it allows for certain problems pertaining to the object to be perceived and formulated, and then for an attempt to be made at addressing them. The mediatory function understood in this way is necessary in two situations: firstly, when the studied object is cognitively inaccessible (for example, for technical or axiological reasons), secondly, when the studied object is too complex to be studied directly and totally (as happens, for instance, in the case of the human brain).[3]

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[3] The mediatory function which characterizes models makes the tripartite system

2. Computer science models

Generally speaking, models (in the methodological sense) can be divided into **theoretical** and **real** [Marciszewski, 1988; *Mała encyklopedia logiki*; entry: *model*]. The former consist of a set of simplifying assumptions[4] and theses which can be derived from them, while the latter are physical *realizations* of adopted assumptions and theses; i.e. objects and systems of objects which satisfy them. The aforementioned assumptions and theses constitute the theoretical image of the studied object and they derive from the theory according to which (or parallel to which) the model is built. Therefore, the theoretical model should be treated as a certain narrow fragment of the theory whose aim is to specify the description of a limited group of phenomena and to solve problems concerning this particular group. Most often these are phenomena of one type only, for example, human cognitive processes.

Due to its pertinence to a particular theory, the theoretical model performs cognitive functions similar to a theory: it allows for the formulation of hypotheses, its adequacy may be tested, it enables problem solving and it provides the necessary explanations. It is highly important to bear in mind, however, that the model and the theory are constructed in a parallel way – that is, the theory is not closed and definite: the theory changes in the course of the verification of the model and its development among others.

In fact, when discussing the theory entangled in the modeling procedure, one has to consider two theories: a) the first is the **meta-theory** – the formal theory which provides (not yet interpreted) language for the model; e.g. in the case of the linear model of a neuron, it is the simple matrix algebra (see subsequent example); b) the second, however, is the **proper theory**, that is, the theory of the discipline being studied which is formulated and, at the same time, formalized in the language of the meta-theory. The proper theory is, therefore, the very basis for the construction of the model, while

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[*researcher-model-reality*] the natural context for their analysis. In this system the researcher plays the decisive role, as the subsequent steps of modeling procedure depend on his decision. However, is the researcher's presence necessary at every step of modeling? Can this procedure not be automated? These are important questions which today – in the age of computer models and ever more autonomous computer systems – take on real meaning.

[4] Choosing particular assumptions, one decides which features of the studied object are cognitively significant, and, furthermore, "effective" as far as the aim of the research is concerned.

the meta-theory (or strictly speaking, its fragment) may be called the formal basis of the model.

It should be added here that the concept of meta-theory is extremely flexible and that in the case of most advanced models more than one formal theory (for example, a particular field of mathematics) is considered. In other words, the meta-theory usually consists of a class of formal theories. For example – and this will be elaborated subsequently – the computer science models we are interested in here refer both to certain mathematical formalisms (for example, algebra) and to certain general methods or computer techniques (for example, genetic algorithms).

Although not all theoretical models must be formalized – some of them may take the form of precise verbal descriptions – **formalized models** are considered to be the most advanced. These are formal constructions interpreted in a particular subject domain. They are defined in the language of mathematics or disciplines which are closely related to it, such as logic or computer science.

Depending on the discipline from which the formal frame of a model is derived, models are therefore qualified as mathematical, logical, computer scientific, etc. It must be borne in mind, however, that each of these disciplines has its particular divisions which allows for the use of narrower terms such as, for example, algebraic models.

2.1. Models Formalized Using the Language of Computer Science

An extremely useful – and due to the speedy development of computer techniques, nowadays dominant – class of formalized models are **computer science models** (CSMd). These are constructions formalized in the language of computer science which usually rely on certain techniques/methods of data processing. They are carried out in practice by means of computer programs or programmatically controlled systems. Such constructions are frequently used for the description of very complex phenomena evolving with time, for example, mental processes.[5]

The following are typical **examples** of CSMd in the field of mental phenomena: **a)** models of **reasoning** – referring to logic and realized, for example, within a framework of rule-based expert systems; **b)** models of **perception** – referring to neurobiology and often proposed in the form

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[5] This includes both the general language of computer science (concerning certain typical structures of data and the rules of processing them) and a particular language connected with a certain distinct "micro-theory" of data processing (for example, rule processing within the framework of specified expert systems).

of artificial neural networks; **c)** models of **learning** – referring to psychology and realized by means of systems able to increase their effectiveness depending on their interaction with the environment[6] [Russel, Norvig 1994].

With regard to the computer science models presented above, the concepts of the theoretical model, the real model and the formal basis of a model take shape.

In this case:

a) the **formal basis** of a model is: **a1)** in a broad sense – a certain distinct theory of data processing: for example, a theory of data processing by (generally speaking) artificial neural networks; **a2)** narrowly understood – a certain algorithm,or a set of algorithms which specifies in an abstract manner particular methods of data processing, described generally by the **a1** theory (for example, perceptron type networks learning through backward propagation of error information); **b)** an application[7] is **a theoretical model**: an algorithm coded in a particular programming language and applied in a particular interpreted field; **c)** a **real model** is – **c1)** a *running* (activated) application, the subsequent steps of which can be traced (for example, on the computer display); or **c2)** a *running system*, controlled by the application which, contrary to the application itself, directly interacts with the environment. In the case of **c1** we are dealing with a *virtual* real model, while in the case of **c2** it is a *non-virtual* real model.

Regardless of the aforementioned realizations, it should be noted that CSMd is rarely a purely **computer science model**. More technically speaking, its meta-theory rarely pertains to computer science only. By that we mean that most CSMd have a certain mathematical (for example, algebraic) description which is more primitive and superior with respect to

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[6] Even the examples provided suggest that a model is named *computer science model* for the reason of the modeling method which is itself connected with computer science, not because of any other elements, such as the object of modeling, the source of observational data or the source of inspiration for research (although these elements may also derive from computer science).

[7] We do not use the concept of the computer program here (replacing it with the concept of application), because in theoretical computer science this concept merges with the concept of algorithm. This is mainly because most algorithms are presented in the form of programs written in the high level languages of programming (for example, in PASCAL). The term application is better suited here, because it draws attention to the fact of the use (application) of an algorithm in a particular field. We could say therefore that applications are interpreted programs/algorithms.They are interpreted because they are put to a particular use.

computer science. This is realized and often expanded by means of computer science concepts (for example, by the introduction of specific data structures). In other words: such models have a **deep** (mathematical) layer and a **proper** (*sensu stricto* computational)[8] layer.

Preempting slightly the contents of Chapter 4 in which we will undertake an analysis of modeling procedure, we must affirm that, as far as computer science models are concerned, modeling involves various activities, amongst which **programming** (creation of applications) is considered to be central. Apart from programming, we should also mention **algorithm design** (or use of the existing algorithms) on the one hand because it precedes programming and is more general in character, and on the other hand the **formalizing** of phenomena and processes in the language of mathematics. The latter is even more primitive and it determines the shape of an algorithm and its respective application.

2.2. Examples of Computer Science Models

The above mentioned distinctions and explanations will be illustrated with a well-known example of the **model of a neuron**, initially proposed by McCulloch and Pitts [McCulloch, Pitts 1943] which, at present, is developed in many different ways within the theory of artificial neural networks (cf. for example [Tadeusiewicz 1993], [Żurada 1992]).

The theoretical basis for the primary model and its various developments is formed by the following *simplifying assumptions*. Firstly, the model describes the regularities of the functioning of a neuron, not its biological properties, and therefore, its character is functional, not substantial. Secondly, three functions are considered basic for a neuron: the reception of impulses from other neurons, transforming these impulses into output signal and transferring this output to other neurons. Thirdly, the impulses received and transferred are coded numerically and the operations performed on them are notated in the language of mathematics – thus the model is formalized (mathematized) in character.

These general assumptions allow for many different theoretical constructions, among which the simplest (and historically the first) is the so-called <u>linear model</u>, formalized in the language of simple algebra. According to this model, a neuron consists of: a) n inputs of definite weights (these in-

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[8] As both theoretical computer science and mathematics are formal sciences, and the scope of their competences often converge (thus often giving rise to the problem of the vagueness of their scope), the difference between the mathematical layer and the computer science layer of a model is not always easy to discern.

puts correspond to real dendrites), b) one output (corresponding to the real axon) and c) a processor transforming the input signals. As far as the functioning of a neuron modeled in this way is concerned, it is assumed that the neuron consists of the reception of n input signals (from x_1 to x_n) of values ranging between [0,1], transforming them into the output signal following the (algebraic) formula $y = \Sigma w_i * x_i$ (where w_i is the weight of the i-input), and transmitting the signal to other neurons. Because of the type of function being used to consolidate the input signals x_i (the weighted sum), the model is called a *linear* one. By choosing other functions – allowed by the initial assumptions – other models are generated (see, for instance, [Tadeusiewicz 1993]).

The description mentioned here characterizes the theoretical model formalized in the language of mathematics (simple algebra) and, therefore, it is a mathematical model. If this model were developed in the form of a running application simulating both the functioning and – having extended the model – the learning faculty of a real neuron, a theoretical computer science model would be created. If the application were run on a computer, or if an electronic system corresponding to it were constructed, we would be dealing with a real computer science model.

The issues surrounding models, characterized above, become most apparent when the linear neuron model becomes the basis for a wider construction, i.e. a *linear neuron-like network* which is no longer a model of a single neural cell, but that of a certain brain region. In the case of this new model there is an actual need for reference to computer science theories (namely, the theories of artificial neural networks), as well as to some universal algorithms of functioning and learning of a particular kind of network. These theories should be treated as meta-theories, the algorithms as the least complex elements of the meta-theories, the applications created on the basis of them (and interpreted as tools for modeling neurobiological phenomena) as theoretical models, the running application models as virtual real models, and the physical systems controlled by these applications as non-virtual real models.

The second model we chose as an example refers to another aspect of computer science – not connectionist this time but a logistical one. The proposed construction is embedded in a particular situational context. This context should be regarded as a set of simplifying assumptions determining the shape of the model.

The context is a natural science experiment, the object of which is a rat trying to discover and record in memory the rules linking the appearance of particular external stimuli with the possibility of satisfying

hunger and avoiding pain. The experiment consists of several repetitions of the same procedure: after emitting three signals – a light one, a sound one and a thermal one – the rat is to choose one of three containers. A bijective connection is assumed between the combination of the signals and the content of a container (with or without food) and the pain stimulus (present or absent).

The model concerns the **rat's memory** which is to provide the animal with the ability to differentiate, on the basis of a limited number of random choices, the stimuli leading to the right decision from all the others [Bolc, Cytowski, Stacewicz 1996]. The decision is considered right if the container with food is chosen, but only provided that the administration of food is not accompanied by pain. The model proposed has its **structural** part – determining the shape of memory – that is, the manner of representation of data linking the stimuli to possible reactions, as well as its **procedural** part – responsible for the use and alteration of the shape of memory – that is, learning.

The formal basis of both these elements of the model forms Zdzisław Pawlak's decision logic [Pawlak 1991]. Without undertaking a detailed reconstruction of the logical calculus, we will attempt to present the general idea of our model. Its structural part consists of attributes and their values, corresponding to the experimental situation assumed. These are as follows:

a – *number of the container*, with values 1, 2 and 3
b – *sound*, with values 0 (*weak sound signal*) and 1 (*strong sound signal*)
c – *light*, with values 0 (*weak light signal*) and 1 (*strong light signal*)
d – *temperature*, of values 0 (*cold*) and 1 (*hot*)
e – *food*, with values 0 (*absent*) and 1 (*present*)
f – *pain*, with values 0 (*none*) and 1 (*strong*)

The first four attributes (*a* to *d*) are called *conditional attributes* (their values are stimuli), the two remaining attributes (*e* and *f*) are called *decision attributes* (their values are the circumstances accompanying the stimuli). Using this kind of designation, it is possible to present the course of the experiment and the "raw" information coded in the rat memory modeled here in the form of the so-called *decision table*. Its successive rows contain information about the consecutive attempts made by the rat, i.e. the information on values of decision attributes which accompanied a given combination of conditional attributes. For instance, the third row of the table will be interpreted as follows: *"In the experiment, with weak sound and light signals, as well as high temperature (hot), in the container number 2 there was no food and the pain stimulus was non-existent."*

	a	b	c	d	e	f
1	1	1	1	1	0	0
2	2	0	0	0	0	0
3	2	0	0	1	0	0
4	2	1	1	0	0	1
5	2	1	1	1	1	1
6	2	1	1	1	1	1
7	3	0	0	0	0	0
8	3	1	1	0	0	0
9	3	1	0	1	1	0
10	3	1	1	0	0	0
11	3	0	1	1	0	0
12	3	1	0	1	1	0

The table above may be rewritten using a logical form, namely the form of decision rules R_i. Each R_i rule corresponds to the i-th row of the table. The a_v term in R_i rule means that in the i-th row of the table, v is the value of the a attribute. All a_v terms are linked by the conjunction symbol and the link between the condition attributes and decision attributes is marked by the implication symbol. For example, the first two rows of the table correspond to the following rules (the total number of rules is 12):

$$(a_1 \wedge b_1 \wedge c_1 \wedge d_1) \rightarrow (e_0 \wedge f_0)$$
$$(a_2 \wedge b_0 \wedge c_0 \wedge d_0) \rightarrow (e_0 \wedge f_0)$$

The notation above defines the structural part of the model, i.e. the formal way of representing the knowledge stored in the rat's memory. It may be generally assumed that knowledge of this kind forms a representative description of situations which may occur.

The functional element of the model has an algorithmic character and defines the way in which current knowledge is used, including its effective transformation. This element is necessary because, as we all know, the rat is intelligent, and thus it is able not only to preserve knowledge, but also to extract from it what is most crucial as far as the quality of the decisions taken is concerned. In other words, it can be assumed that the rat can perform an **effective reduction** of knowledge: firstly it can choose that part of it which is comparatively small, and, secondly, this provides the rat with the same decision making ability as full knowledge.

Wishing to model the assumed ability of the rat, one can rely on the method of decision **table reduction** elaborated by Z. Pawlak. It is one of the methods of learning using induction by elimination [Pawlak 1991]. Avoiding detailed description – noting, however, that there exists an algorithm of the method and that it is effectively being used – the following result of reduction can be given for the rules presented above:

$$a_l \lor b_0 \lor (a_3 \land d_0) \rightarrow e_0 \land f_0$$
$$a_2 \land b_1 \land d_0 \qquad \rightarrow e_0 \land f_1$$
$$a_3 \land b_1 \land d_1 \qquad \rightarrow e_1 \land f_0$$
$$a_2 \land b_1 \land d_1 \qquad \rightarrow e_1 \land f_1$$

3. Computer science metaphor

The relationships between the model (generally understood) and the metaphor have a **generative** character. That is, there are models which derive from metaphors – metaphors understood as initial, **informal images** of the studied phenomena [Pelc 2000]. The model generation function of the metaphor is most clearly revealed in the case of phenomena/processes about which there are certain *imaginations* established in culture, although these may be vague. Such is the situation in the case of modeling mental functions. As typical examples of metaphors initiating modeling in this field, the following may be indicated: a) the mind as a *black box* (behaviorist psychology), b) the mind as a *brain* (neurosciences), and c) the mind as a *mechanism* (cognitive psychology, cognitive science). (see, for instance, [Stacewicz 2010])

A specific case of a mechanistic metaphor (point c) is the **computer science metaphor** (CSMt) which consists of comparing the modeled object (for instance, the mind) to an information processing system. In order to define it precisely – as will be explained further – one has to determine the type of information processing system and then reach for the theory describing how data is processed by such a system.

3.1. From Metaphor to Model

Contrary to the model, the metaphor which leads to the construction of the model has a general and imprecise character. It relies on the **initial comparison** of an object X to a better known and theoretically better described object Y. This comparison suggests a further possibility of describing object X by means of precise concepts concerning object Y. It includes also the possibility of heuresis, that is, the possibility of gaining new knowledge

about object X. In order for these contingencies to take place, heuristically justified *similarities* have to occur between both objects, for example, structural or functional ones [Old, Priss 2001], [Stacewicz 2010].

We must add here that as metaphor is not a strictly scientific construction (only the model can become such), its **heuristic justifiability** is determined not only by methodological issues, but also by *psychological* considerations, such as the suggestiveness, intuitiveness, or vividness of the comparison at the core of the metaphor. For instance, the power of the metaphor which compares the mind to a computer is determined by the fact, among others, that in the common understanding a computer is strongly associated either with enhancing human cognitive activities, or with their artificial reconstruction. This is what makes the analogy so suggestive [Hetmański 2000].

In order to regard the metaphor – which in this approach takes the form of the comparison "object X (modeled) is similar in some respects to object Y (the basis)" – as a starting point for a model, a *theory* concerning object Y (T_Y) is necessary. It is only on the basis of this theory, or specifically, through the concepts which constitute the theory, that it becomes possible to transform the object Y into the model of the object X. In our opinion, there are two parallel ways of carrying out this possibility.

On the one hand, the right segment of the metaphor (containing object **Y**) is **theoretically specified** within the frame of T theory. This means that an approximate description of object **Y**, defining in fact the whole class of objects of some kind, is determined, and thus the range of objects which correspond to this class is narrowed.

On the other hand, the concepts drawn from T theory – the same concepts which were used to characterize object **Y** in detail – are then applied to the object contained in the first segment of the metaphor (that is, **X**). As they are used for an object of a different kind, however, they change their primary meanings. Possibly, their scope changes as well. In this way, a **new T_X theory** appears; the assumptions contained in this new theory become the theoretical model of object X.

The clearest situation, from the methodological point of view, takes place in the case of a formal theory, and thus formalized models. In such a situation, T_X theory remains formally identical with T_Y theory. Yet, it acquires new, objective *interpretation*. In other words, the same formal frame T (common to both T_X and T_Y) is used for an object different from the initial one (X instead of Y).[9]

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[9] The extent of T theory development can be regarded as a factor determining

If the description above is presented as a series of points, we will obtain the following image of the **modeling procedure** that should always be used by the researcher:

1) The researcher observes significant **similarities** (an analogy) between the modeled object X and the general description of the base object **Y**. In short: $X \sim \mathbf{Y}$ (X is similar to **Y**).[10]

2) The researcher makes the description of object **Y** more **specific** by choosing the Y with a sufficiently rich T_Y theory. In short: $X \sim Y$, $Y \leftarrow T_Y$ (Y has its description in T_Y).

3) The researcher is faced with the task of **constructing the theory** of X, that is, T_X theory which has the same formal frame as T_Y. In short: $T_X = ?$ (T_X is unknown).[11]

4) The researcher constructs the T_X theory by interpreting the terms of T theory; he obtains the description of X basing it on T_X. In short: $X \leftarrow T_X$.

5) The researcher chooses some of the assumptions of T_X which he considers cognitively significant, **obtaining** a (theoretical) **model** of X. In short: $X \leftarrow M_X$, where $M_X \subset T_X$;

Putting these points in a brief and symbolic form we get:

$$(X - \mathbf{Y}, X \sim Y, Y \leftarrow T_Y, TX = ?) \Rightarrow_T (T_X, X \leftarrow T_X, M_X \subset T_X, X \leftarrow M_X),$$

where the notation "$\Rightarrow_T$" means "we move from ... to ..., based on T theory".

The points above generally define the pattern of moving from the informal metaphor ($X \sim Y$) to the initial model of object X, where there is no model M_Y (Y does not have to be an object having a model, it is enough for it to have a certain theoretic description). The metaphor is understood as similarity (analogy) between objects X and Y, as far as some of their features are concerned. Specifying a metaphor understood in this way consists of moving from **Y** to Y and then **reasoning by analogy**, that is,

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the similarity of the model to the metaphor which originated it. A richer theory leads to a more precise model, differing widely from the initial metaphor. A scantier theory leads to a model more closely tied to the metaphor. Consequently, when talking about the computer science metaphor of the mind, we can say that the general thesis "the mind functions similarly to an information processing system" transformed into a model, departs further from the metaphor (moving in the direction of the model) the more advanced are the concepts and the computer science tools used by the creator of the model.

[10] Bold letters are used to differentiate between the base object understood generally (**Y**) and the base object understood specifically (Y).

[11] We must assume that T theory (the formal frame of the model) is a meta-theory (see chapter 2.1).

interpreting T theory anew, in order to achieve T_X by analogy with the way it was interpreted with reference to Y.[12]

The procedure of building the initial model, presented above, is different if the model of the base object Y, $\mathbf{M_Y}$, **exists**. In such a situation, the researcher may omit the first stage of specifying the metaphor (X $\sim$ **Y**), that is, points 1) and 2) – M_Y model determines the exact description of object Y. Furthermore, it constitutes a part of T_Y theory.

The researcher may then proceed directly with the construction of the M_X model, making use of the assumed analogy between the two **mappings**: (a) X $\leftarrow_{TX}$ M_X (M_X maps/describes object X based on T_X theory) and (b) Y $\leftarrow_{TY}$ M_Y (M_Y maps/describes object Y based on T_Y theory). The analogy may be notated symbolically as A: (X $\leftarrow_{TX}$ M_X) $\sim$ (Y $\leftarrow_{TY}$ M_Y); it should be kept in mind that this is a different analogy from the X $\sim$ Y analogy which defines the initial metaphor.

Reasoning on the basis of the analogy A, the researcher carries out points 3), 4) and 5) of the above pattern, that is, he makes use of T theory which is more general and more abstract than T_Y (and more abstract), trying to **interpret** its terms **differently**. The discretion of this interpretation is limited by the MY model which has been chosen by the researcher as a reference point for the new model.[13]

Following the reasoning presented above, we obtain the pattern:

$$\{(X \leftarrow_{TX} M_X) \sim (Y \leftarrow_{TY} M_Y), M_X = ?\} \Rightarrow_T \{M_X, X \leftarrow_{TX} M_X\}.^{14}$$

3.2. Computer Science Metaphor and the Models of Mind

In this article, we focus on the computer science metaphor (CSMt) which consists of the comparison of the modeled object with an information processing system. This metaphor provides a natural starting point for partial models of the mind (partial in the sense that they do not refer to the

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[12] An important conclusion is to be drawn from these explanations. The statement that Y is a model of X (which is sometimes made – for example, the statement that a digital computer is a model of the mind) is a great mental abbreviation. In fact, the model of X is not Y, but it derives from the theory regarding Y. It derives from it in the sense that the assumptions constituting the model have the same formal configuration as some assumptions concerning object Y.

[13] It has to be noted here that a researcher does not have to (although he may wish to) construct T_X theory. He may confine himself to constructing only the M_X model which is the most cognitively significant element of T_X theory as far as modeling is concerned.

[14] The pattern is portrayed by the example, well-known from the history of science, of the construction procedure of the Bohr atom model (M_X) by analogy to the heliocentric model of the Solar System (M_Y).

mind as a whole, but to certain mental activities and phenomena). With regard to the mental sphere the metaphor will take the form: *"the mind (X) resembles an information processing system (Y)"*.

This formula may be considered a **heuristically justified metaphor** only because it is a good expression of two basic facts about the mind: 1) the essence of mental activities, contrary to physical ones, is the processing of **information** (as opposed to matter or energy) and 2) similarly to information processing systems used to **control** physical systems, the task of the mind is, among others, to direct physical activities of the body on the basis of information which is obtained from the outside the body and suitably processed [Hetmański 2000].

The move from CSMt to a partial model of the mind is performed on the basis of the pattern described in the chapter 3.1. The subsequent steps of its formulation are as follows:

In the first step the researcher accepts the general thesis that "the mind (X) reminds us in some respects of an information processing system (**Y**)." In step 2) he must clarify the vague concept of an information processing system, that is, he has to define the type of system (for example, a rule-based system), as well as describe its structure and the rules of its operation. Proceeding with the necessary specifying procedures, the researcher makes use of the meta-theory, here: computer science. Specifically, he uses a certain chosen theory of data processing (for example, the theory of expert systems).

In the next step the researcher moves from computer science theory (T_Y) to the theory of the mind (T_X). In order to do this, he makes the structure and the functions of the mind similar to the construction and the rules of functioning of the chosen information processing system. For example, if we decided to choose a rule-based system, certain modules of the mind responsible for particular cognitive functions must be specified. Then the functioning of each of these has to be described by rules in the form: *"If A, then B."* Both the configuration of these rules and the formal schemas of their use or improvement (i.e. algorithms), should remain the same, as they do in the case of the initial information processing system. This is exactly what is required by the postulation of retaining the formal core of T theory, as formulated earlier.

As a result of the aforementioned actions, in specifying the initial metaphor "the mind $\sim$ the information processing system", various computer science models of the mind (CSMM) are constructed which owe their specific form to a choice of a particular base system.

The general concept of CSMM goes as follows: (a) the **formal frame**

of the model consists of suitable algorithms and data structures, embedded in the wider context of a particular technique of data processing, (b) all formal computer science concepts are **interpreted** as concepts concerning mental activities, (c) the accepted interpretation aims at **explaining** these activities and/or their artificial **realization**. Again, on the way from the initial metaphor to the final partial model (i.e. the model referring to a certain section of mental activity) a particular technique of data processing must be chosen. The choice of its type determines the type of the model.

It must be noted that the natural background (both theoretical and practical) of CSMM is formed by research on artificial intelligence – research which aims at mechanization, that is, an artificial realization, of some of the human cognitive activities.[15] We should note in passing, that both exemplary models discussed in 2.3 may be considered inspired by research on artificial intelligence, as both artificial neural nets and decision tables belong to this field.

With reference to particular techniques of 'intelligent' data processing one can distinguish – again, as an example, not as an exhaustive list – between the following types of CSMM:

a) **rule-based** models – referring to the theory of symbolic data processing by means of clear rules, such as *'if a premise, then the conclusion'*, implemented in the framework of expert systems [Ignizio 1991];

b) **connectionist** (network-based) models – referring to the theory of sub-symbolic data processing in a distributed and parallel way, carried out practically by means of artificial neural nets [Żurada 1992];

c) **evolutionary** (selective) models – referring to the theory of simulated electronic evolution, including, among others, the theory of genetic algorithms[16] [Michalewicz 1992].

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[15] One of the typical definitions of artificial intelligence as a discipline is "Research aiming at the realization of activities which require intelligence when they are performed by humans". Consequently, the research aims at the artificial realization of mental activities instead of modeling them. However, constructions created in the context of realization are also used in the context of modeling.

[16] This choice is largely arbitrary – in the authors' opinion, however, it characterizes quite well contemporary research tendencies among computer science experts. What is more, it presents an image of a certain important distinction between the logicistic (referring to logics) and the naturalistic (referring to empirical observations) trends in research on artificial intelligence [Russel, Norvig 1994].

4. Modeling procedure

The characteristics of modeling proposed above are obviously incomplete because they do not take into consideration the dynamics or the **interactivity** of the whole procedure. They account for only one of its stages which consists of the elaboration of the initial model of the phenomenon on the basis of the initial metaphor and the theory specifying its content. The subsequent stages, composing the proper procedure, consist of a gradual modification of the initial model, both for the sake of its formal properties (simplifying the assumptions which constitute the model) and for the sake of confronting the theoretical model with the reality (experimental tests).

4.1. Interactive Modeling Loop

Portrayed in the simplest way, the schema of the proper procedure of modeling a phenomenon X is **linear** and **cyclical** in character (see [Stacewicz 2010]). This means that the schema comprises four stages of modeling which are sequentially ordered and which can be iterated in a loop. These are:

(1) **abstraction** – a procedure in which those *features* of the modeled phenomenon which will be included in the model are specified, while the rest of the features are ignored;

(2) **formalization**[17] – a procedure in which we must refer to the metatheory. That is, we need to choose and make use of formal tools (mathematical theories, computer science theories, algorithms, data structures, etc.) allowing us to describe precisely,usually in a symbolic manner, the modeled phenomenon;

(3) **simplification** – a procedure in which the formal structure of the model is simplified by means of formal transformations in such a way that its initial level of coherence is preserved, together with its initial explanatory and predictive power.

(4) **verification** – a procedure in which features of the model are checked for their adequacy with respect to the described fragment of reality (adequacy), their non-contradiction, or their desired level of non-con-

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[17] The abstraction and formalization stages are closely related. Possibly, they constitute a unity. The result of abstraction, that is, the choice of significant features of the modeled phenomenon, depends largely on the formal tool used (a given type of formalism eliminates some types of abstracted features). On the other hand, the initially assumed result of abstraction, that is, the abstracted features, motivate the researcher to choose a given formal tool.

tradiction (coherence), as well as their predictive effectiveness and simplicity (from the point of view of the interpreter).[18] We must add that the model should be checked both separately from other constructions – for example, by drawing certain conclusions from it and then checking their adequacy with respect to reality – and with reference to alternative constructions – for example, by comparing the predictive power or simplicity of various models.[19]

We must emphasize that as a result of the definitional "approximation" of a model, and thanks to the activity of the researcher constructing the model, at stage (4) the procedure of modeling, or arriving at the most adequate model does not end, instead it **enters into a loop**. There is a move to stage (1), in which – depending on the results of verification – features of the modeled phenomenon which are different from the ones highlighted in the previous cycle are accentuated Thus a **different kind of abstraction** is performed, forming the basis for subsequent stages. We must add that, depending on the intensity of the changes introduced within the framework of the new abstraction procedure, the constructor of the model may choose new formal (meta-theoretical) tools, or retain the tools he has used so far.

The four stages of the complex modeling activity, consisting in fact of performing certain cognitive procedures, should be considered with reference to the four elements to which these procedures pertain. These are:

(a) the studied **domain** D – constituting a fragment of empirical reality;
(b) a given **meta-theory** MT – constituting a hierarchically ordered conglomerate of strictly formal theories, micro-theories and schemas (in reference to computer science models, we assume that the highest position in the hierarchy is occupied by mathematical theories, and the lowest by the algorithms and data structures used in them);
(c) the constructed **theory** of the studied domain DT – formally identical with a certain fragment of the meta-theory (in other words, the theory the formal language of which is determined by the meta-theory);
(d) the constructed **model** M – constituting the currently tested fragment of DT theory (the fragment which, in the case of positive verification, validates the DT theory).

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[18] In fact, we could talk here – as Popper did – about falsification tests, the aim of which is verification directed at rejecting the model. See [Popper 2002 (1934)].

[19] We should add here, that schema described above can be considered either in the system [*researcher-model-reality*] for which we assume that the researcher follows the its subsequent steps, or in the system [*model-reality*] for which we look for some automated methods of modeling.

As a result of the four elements mentioned above – D, MT, DT and M – the following characteristics of the four stages of modeling can be given:

(a) **abstraction** concerns the initial choice and the description of these "fragments" of reality – among them the D domain – which the researcher wishes to include in the model. Therefore, it takes place between D and DT (M),

(b) **formalization** means applying a meta-theory MT to give a precise description of the domain D in the form of the model M (in the narrow sense) and the theory DT (in the broad sense). Therefore, it takes place between D, MT and M/DT. This operation can be called an interpretation of a certain fragment of the meta-theory.

(c) **simplification** takes place within the framework of MT (for example, if MT is a deduction theory, particular rules of reasoning apply) and it concerns the model M,

(d) **verification** consists of the confrontation of the model (as well as of the predictions derived on the basis of the model) with a particular fragment of reality, that is, the domain D. Therefore, it takes place between M and D (indirectly, it is the verification of the theory).

We should keep in mind that in certain models – for example, partial models of mind – created using computer applications and/or information processing systems, the initial shape of the model is defined by a **metaphor** (for example, the metaphor of mind as an information processing system).

Consequently, the metaphor has to be **included** in the interactive loop of modeling. It is even possible to note something further: in the modeling practice, as a result of a series of negative verifications of models based on a given metaphor, a need arises for replacing this metaphor with a different one (for example, replacing a metaphor of the mind as a "black box" with a computer science metaphor) Therefore, the presence of the metaphor in the schema of the interactive modeling loop is fully justified.

It should also be noted that the meta-theory used (the choice of which often depends on the content of the current metaphor) is not finite and fully specified. In the course of modeling, mainly as a result of negative verification of subsequent models, a need arises for abstracting from realityor, possibly, constructing *a priori*, new elements of the meta-theory. Such an operation may be called **meta-abstraction**.

These observations are visualized in the chart below.
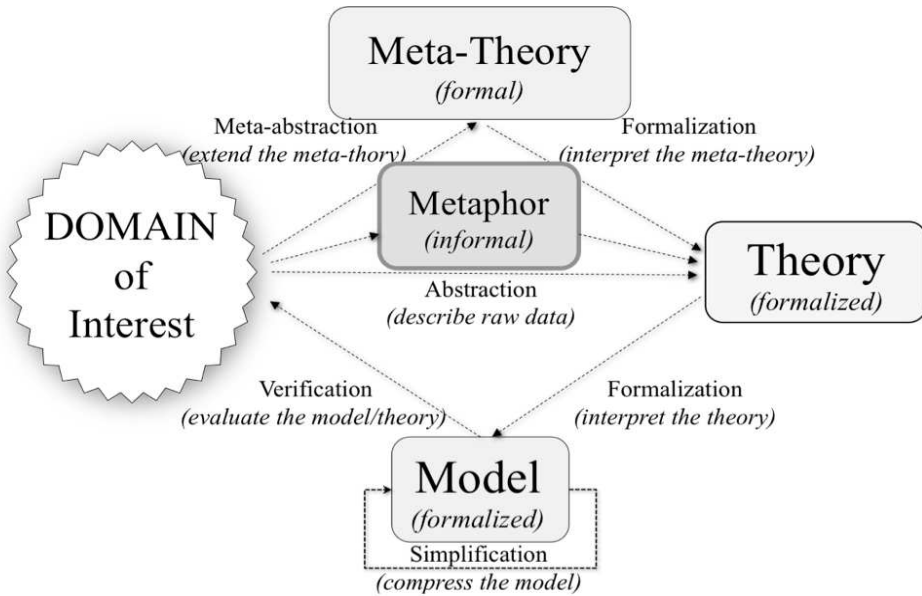
Considering the terms, explanations and the chart above, it is possible to explain in greater detail what we understand by the **modeling loop**. This loop is interactive, as it engages the researcher at every step. It consists of the three following cycles:

(1) **small simplification cycle** – this loop, consisting of a purely formal/syntactic elimination of the superfluous/excessive elements present in the model under construction, may be created automatically, that is, without the participation of the researcher. Machine learning algorithms (for example, decision tables reduction algorithms) prove very useful for the purpose of its computer-aided implementation.

(2) **proper modeling cycle** – this loop consists of cyclically iterated procedures of abstraction, formalization, simplification and verification using a meta-theory, and sometimes including initial reference to a metaphor. The whole process remains under the researcher's control (deciding, for example, on the course of abstraction and formalization). It is possible, however, to think about its mechanization (also using learning algorithms), in which case the role of the researcher would be rather limited; that is, it would consist of assessing temporary models.

(3) **wide modeling cycle** – in which it is acceptable to construct new elements of meta-theory and to make use of new metaphors (new with respect to the one which initiated the whole procedure).

4.2. Modeling Procedure in the Context of Computer Science

Examining the aforementioned procedure in the context of computer science, we must remind the reader (in accordance with paragraph 2.2) that in this context modeling is understood as **programming** – embedded in mathematics and referring to various computer science techniques – aiming at designing a modeling application and/or a system controlled by this application.

Assuming this perspective, we should, however, inquire in general about the functions of computer science,including programming, in the process of modeling. The answer is connected with an important distinction between a) computer science as a **supporting tool** in modeling, and b) computer science as a domain to which the application-model (computer science model) is supposed to belong.

Therefore, it is necessary to differentiate between: a1) the procedure of construction of any model with the active use of various computer science tools by the researcher (including, among others, algorithms of knowledge acquisition and reduction) and b1) the procedure of constructing a computer science model, that is, a (theoretical) model in the form of an application based on an algorithm (in a broader sense: based on a mini-theory of data processing). The distinction suggested here is not an alternative: the situation b/b1 may be treated as a special case of the situation a/a1.

From now on, we will focus on the b/b1 situation, bearing in mind, however, that contemporary computer science, as the most efficient tool of the automation of cognitive processes, is used in almost every modeling procedure.

Having limited our analysis to the situation b/b1, we can generally characterize subsequent **stages** of modeling, each time paying attention to the possibility of the **automation** of a given stage. This is an extremely interesting issue, since the automation of various processes is the most important and, in many cases, the already achieved aim of computer science research.

We will start from the two interwoven stages of **abstraction** and **formalization**. They concern a description of the modeled phenomenon in the precise terms of data structures (or, in broader sense: methods of knowledge representation), considered usually within the framework of a certain general technique of data processing. For example, the representation of knowledge in the form of formulas for classic or First Order Logic (FOL) is inseparably interwoven with rule-based techniques of data-processing, while representation in the form of neural nets is intertwined with connectionist techniques, and representation by means of genetic structures with evolutionist techniques.

When the researcher has made the meta-theoretical choices, that is, when he has decided on a particular formal shape of the model, he can proceed with the **interpretation** of formalisms in the domain in which he is interested. He does not need to build a whole theory of this domain, he may proceed directly with the construction of some of its fragments, that is, a particular application-model which will be used in the chosen domain. Here we have to make two remarks about automation: (1) automation of the abstraction stage would be possible on condition that there existed a universal schema of the choice of more and more promising features of the modeled phenomenon (as far as the adequacy of the model is concerned); (2) as far as modeling can be considered a domain of the human mind, the automation of the formalization process should be feasible on condition that there existed a universal formalism (for example, a logical calculus) or, at least, a finite class of formalisms which could describe mental activities.

At the subsequent stage, that is, the **simplification** stage, the researcher must make use of a certain computer science tool to simplify the initial application-model. It seems that methods of *machine learning* – concerning reduction of knowledge – may become most widely used here [Mitchell 1997]. One such method is the reduction of decision tables, mentioned in paragraph 2.3. Among other methods, those based on self-organizing neural nets and genetic algorithms can be mentioned. Automation is absolutely possible here, due to the algorithmic character of these methods.

At the next stage the researcher has to proceed with the **verification** of the application-model. That is, he has to check whether the simplified application works, whether it realizes the modeled process (in the sense of obtaining the same results), whether it displays significant functional-structural similarities to the known features of the modeled phenomenon, whether simpler and more efficient applications exist, reflecting the modeled phenomenon...

Having done a suitable number of precise and meticulous tests, the researcher may consider the application a sufficiently good temporary model, or may reject the model in order to refer to another form of the computer science metaphor and/or other formal tools of computer science.

As an example illustrating the above remarks, we will consider an issue which is particularly important as far as the contemporary use of computer science is concerned: the process of using **concepts** in order to recognize objects of a particular type. The object of modeling will be a concept,[20]

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[20] In the general sense, concept may be understood as a decision function which maps

considered with respect to the possibility of recognizing objects based on their chosen features (for example, recognizing *fruit* based on its *color*, *shape* or *taste*). Keeping this example in mind, let us have a closer look at each of the stages of modeling.

At the first stage – the abstraction stage – the constructor of a model has to choose the **significant features** of objects to be recognized and narrow down the further steps to these features. Let us assume that he chooses only four such features (*color*, *shape*, *taste*, *time of ripening*) and that there is a particular class of values connected with each of them (for example, for the feature of color he chooses the following values: *red*, *green*, *yellow*, *orange*, *violet*).

At the second stage, that is, at the stage of formalization, a **type of concept representation** should be determined – a representation schema embedded in a relatively rich formal theory which will enable operations on similar representations. Let us assume that the constructor of the model chooses Z. Pawlak's theory of a rough set [Pawlak 1991] and the method of representing concepts as decision rules which derives from it (see the example from paragraph 2.3). In this case the concept corresponds to an alternative of decision logic implications in the antecedents of which there are conjunctions of values of the features which have been chosen, and in the consequents of which there are numbers 0 and 1 (0 – indicates that a given rule is a negative description of a concept, 1 – indicates that a rule is a positive description).

At the next stage, that is, at the stage of simplification, a method has to be chosen (at best, an automated method) which will allow for the maximum **simplification (compression) of the model**. In this case it involves the number of rules and their elements, all of which combine to create a representation of the concept. Let us assume that an algorithm of reduction is chosen, derived from the theory of a rough set mentioned in paragraph 2.3.[21] Having performed the simplification as understood in this way, the model constructor has to assess the simplified model, for example, as far as the degree of the performed reduction is concerned, and thus he

a set of objects into a set of binary decisions (1 – yes, the object is a designatum of the concept; 0 – no, the object is not a designatum of the concept). In psychology, concepts are usually treated as cognitive representations of the above mentioned decision function.

[21] This algorithm leads to a minimalized class of rules which provides the same ability to recognize the designata of a concept as does the initial class. In other words, if a class of decision rules is understood as a model of a concept, this algorithm leads to a simplified model.

proceeds to the verification stage.[22] If the degree of reduction is not sufficient in his opinion, he can return to the stage of abstraction and choose another class of features and their values. In this way, the modeling cycle may start all over again.

5. Final remarks

The reconstruction of modeling procedure proposed here, in the computer science environment, should be considered as one of the **possible models** of what is in fact carried out by theoreticians and practitioners when constructing computer science models of phenomena. Our model has an approximate character (as any model has) and it reflects general frames of the process which, in reality, is much more complex and can certainly be expressed (i.e. modeled) in many different ways. What we have presented, however, justifies the formulation of a certain vision of computer science as an ever more efficient modeling tool.

It seems that scientific research in this field, particularly in the branch of so-called **artificial intelligence**, heralds a great breakthrough in modeling practice. Within the next decade, the incredible possibilities of the accumulation of knowledge in databases, as well as new computer functions imitating the abilities of human intellect, will enable even closer cooperation between researchers representing various branches of knowledge. This will prove efficient inasmuch as man in his interaction with the computer will be able to think *together with machines*. It must be emphasized that machines will not think instead of humans, but humans will *think* using machines as their intellectual "partners" (see [Włodarczyk 2009]).

In other words, information processing machines will become a more efficient tool of human thinking than they have been so far. Even today's achievements in computer science make one incline towards this conviction. For nowadays computers can to some extent imitate the most crucial activities of the human mind, namely *reasoning* (for example, deduction) *learning* and *inventiveness* (enabling development). In some respects, the abilities of these machines exceed even the abilities of the human mind.

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[22] It should be noted that the procedure of simplification based on the proposed algorithm of reduction does not change the most crucial property of the model which is the ability to recognize the designata of a concept. Therefore, when verifying a model, its constructor cannot consider this ability, but, at most, the simplicity of the model.

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In the context of contemporary computer science, thinking with machines may be provided with the technical label of *data mining*. This is the (undoubtedly provisional) name of a new, dynamically developing branch of computer science which includes various computational methods such as knowledge discovery in databases, fuzzy logic and decision logic, formal concept analyses, logic of distributed systems, granular computing (also called methods of computing with words), and automated discovery.

We trust that, in the very near future, this discipline will provide a series of new, formal tools which will allow for a significant increase in the effectiveness of the interactive modeling trial-and-error loop described in this article.

S U M M A R Y

The article deals with computer science models (CSMd), that is, formal constructions which are described theoretically in the language of computer science (the language of algorithms and data structures), and which can therefore, be implemented in the form of applications and activated on a computer.

After distinguishing different kinds of CSMd (e.g. theoretical and real) and presenting some examples of CSMd (especially in the field of mental phenomena) we discuss in detail the modeling procedure. This procedure can be initiated by a metaphor (understood as an initial, informal image of a studied phenomenon), has a cyclical and open character, and – according to our methodological reconstruction – consists of four stages: abstraction, formalization, simplification and verification. We discuss these stages in the context of computer science, referring to four elements: the studied domain, a meta-theory (always formal), the constructed theory of the studied domain (formalized in the language of meta-theory), and the constructed model (always temporary). We present a simplified scheme of the whole procedure and identify three cycles of the modeling loop: small, proper and wide.

Finally we claim that contemporary CSMd (especially computer science models of the mind) should be constructed using artificial intelligence tools, such as machine learning and data mining techniques.

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THE CURRENT POSITION OF PHILOSOPHY

Introduction

Philosophy typically reflects on anything considered relevant, and it is no wonder that many, over the last century predominantly critically, have examined the role of philosophy and its tasks. In this article, a modest attempt is made to describe the position (academic) philosophy occupies, in particular in relation to the sciences. In the first section, I briefly describe the contrast between philosophy and the sciences, whose focus is different. The second section inquires into the relation between philosophy and the sciences; their perspectives may differ, but a number of the fundamental issues in the sciences are the subject of philosophical pondering.

It is, accordingly, important to make it clear to what extent philosophers are, or can be, expected to have an insight into scientific developments and to assess their merits. This is illustrated with a number of representative examples. The question then arises what the implications are for philosophy's ambitions, especially when one also considers the fact that philosophy itself has specialized to a high degree. It appears to be difficult to maintain a unity in philosophy, and that a means to facilitate this is in order. This is argued in section 3, where a possible suchlike means is suggested.

1. The character of philosophy

Philosophy has evolved from an encompassing discipline, in ancient times, through an auxiliary one in the Middle Ages, embracing what is now known as the humanities and some basic education in logic, mathematics and astronomy – dubbed together the *artes liberales* – to a present, relati-

vely clearly demarcated one.[1] With the progression of the various sciences, several new fields have come to the fore, having been divided as specializations, such as biochemistry, geology and linguistics. Philosophy itself has only recently come to the fore as a distinct discipline.[2]

This development is usually beneficiary or even necessary: one often needs to command a specific knowledge to a high degree, or be able to perform very particular tasks; still, this doesn't mean that a critical attitude can be dispensed with. In the case of the sciences, there are a number of *external* elements that necessitate specialization. In the field of medicine, for instance, new approaches, inventions and applications make it possible to cure diseases, or facilitate treatments.

This situation does not apply to philosophy, or at least not necessarily. Philosophy, too, has flourished, albeit not in the same way as the sciences, and has witnessed the rise of new branches, and its body of thought has vastly expanded. Moreover, within the already existing branches, there has been a degree of specialization not unlike that in many of the sciences. It may now be difficult for someone who has focused on one of its fields to comprehend the results obtained in another, let alone gain a sufficient overview.

The developments in the field of logic, in particular since the rise of predicate logic, for example, are impressive, both quantitatively and qualitatively; it can be very hard – and not just as a result of a lack of time – to command them if one is (supposedly) relatively informed. Some of the specializations in philosophy may nowadays indeed be regarded as fully developed fields of study, with enough literature and relevant topics at one's disposal to fill a Bachelor's program if one would so desire.

The thorough specialization which has slowly become characteristic for philosophy in the same way as it has for the sciences has led to results not unlike those which can be ascertained in the realm of the sciences. Here, too, the representatives of the various subfields don't have an overview of each other's research and are in some cases even unable to understand each other or find the time to study their respective findings.

This state of affairs is easily contrasted with those in earlier times. As simplistic and outdated as some theories propagated by ancient and

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[1] There was, of course, no specific moment when this situation presented itself; rather, a gradual development occurred, and it may be argued that as late as the 18th century, philosophy was not yet regarded as a separate discipline in some respects (R. Posner, *The Problematics of Moral and Legal Theory*, pp. 111, 112).

[2] Cf. R. Rorty, *Philosophy and the Mirror of Nature*, p. 131.

medieval philosophers may seem to be at present – though I would by no means want this to imply that they in fact are –, those thinkers seem at least to have been able to discuss their topics in common. Of course, it can be advanced that the reason this was possible lies precisely in the fact that their approaches were, in a number of respects, somewhat crude and lacking. Although this is not without merit, it rather points to something else.

None of the issues previous philosophers has dealt with has been resolved at present in a philosophical way;[3] if any answers have been found (albeit provisional ones), they can be qualified as scientific, having been emancipated once rubricating the results obtained necessitated this process. Actual responses were found, so that any *philosophical* interest waned. The real philosophical discussions have become more sophisticated, but their quality has not necessarily increased, precisely because an improvement in relation to previous ways of thinking cannot be ascertained as easily as in the sciences; perhaps one may even say that once an improvement can be established, the matter is no longer philosophical but has become scientific.

Incidentally, the issue whether progress can be established in the sciences themselves needs to be approached critically. One may argue, defining 'normal science' as "[...] the research firmly based upon one or more past scientific achievements, achievements that some particular scientific community acknowledges for a time as supplying the foundation for its further practice.",[4] that "[...] it is only during periods of normal science that progress seems both obvious and assured."[5]

2. Philosophy and the sciences

In order to establish the position philosophy occupies at present, it is important to consider the role of a number of scientific issues in philosophical discussions. I indicated in the previous section that philosophy has gradually evolved as a separate field of research. Due to the interrelatedness of many philosophical and scientific discussions, however, this isolation is not absolute. The philosopher who wants to maintain an overview seems, ac-

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[3] It may be argued that philosophical issues *have been* resolved thus, e.g. because something is no longer relevant (or is not an issue at all (L. Wittgenstein, *Tractatus logico-philosophicus* (1997), § 4.003, p. 26)), but it seems impossible to ascertain this as it is not clear how they could be approached from some sort of meta-perspective, supposedly granting an overview.

[4] Th. Kuhn (1996), p. 10.

[5] Th. Kuhn (1996), p. 163.

cordingly, forced to familiarize himself with at least the basics of the relevant developments in the sciences, which proves to be an ever more demanding task.

The difficulty does not merely result from the fact that philosophical topics have become increasingly intricate (and that the history of philosophy obviously expands) (cf. section 1); the sciences themselves have shown the need for an ever greater specialization, even leading to entirely new disciplines. As, e.g., a number of questions demanded quantitative approaches, which philosophy was insufficiently able to provide, economics, psychology and sociology were acknowledged as emancipated sciences. In time, this has led to further divisions within the established sciences.

At present, it is not surprising that scientists of widely different disciplines can hardly understand each other's research. This is not just the case in extreme examples, such as between a geneticist and an archaeologist, who have relatively little in common; it can also be established between people working in related fields, a situation which will only increase as time goes by and there will be a growth in results, which will moreover become more intricate than before. As I mentioned in section 1, external elements are largely responsible for this outcome. As long as one wants to maintain the standard of living one has come to know and to strive for progress (in whatever way one wants to comprehend the word), benefiting from new cures to diseases, relatively safe ways of transportation, and such, this situation, at least to some degree, must be accepted.

In the following, I will point out some of the difficulties resulting from the fact that some discussions in philosophy are closely connected with scientific issues. These are merely examples and there is no claim to exhaustiveness, neither concerning the fields referred to (one could also, e.g., point to artificial intelligence or quantum physics) nor the topics discussed. I will illustrate my reasoning by pointing to discussions in representative disciplines of the exact sciences, life sciences, social sciences and the humanities.

2.1. Mathematics

Mathematics is a relatively equable discipline; yet it has evolved, just as the other sciences, which has eventually led to some highly sophisticated results. Kant's observation, that geometry, which he considered a single field of study – as was at that time still possible – proceeds through mere a priori knowledge,[6] and provides immediate evi-

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[6] ("[...] Die Geometrie [geht] ihren sicheren Schritt durch lauter Erkenntnisse a priori [...].") I. Kant, *Kritik der reinen Vernunft*, p. 101 (edition of 1787: p. 120).

dence,[7] is not just based on his epistemological convictions, but results from the perspective that geometry is assessed from a single, undisputed interpretation.

It has proved to be difficult to maintain this: not only has the field of mathematics rendered very specialized results, but its nature has also been subjected to philosophical reflections. More specifically, doubt has been cast by Poincaré on Kant's thought[8] that synthetic judgments a priori are involved in geometry.[9] This is connected with the fact that his observations are made from the assumption that no non-Euclidean geometry might serve as an alternative for traditional geometry.[10]

Poincaré himself concludes that geometrical axioms are conventions[11] and that "a geometry cannot be truer than another one; it can only be *more convenient*",[12] which brings him close to James, who clings to the notion of 'truth' but establishes its content idiosyncratically (at least at the time he wrote it): "[...] When the pragmatists speak of truth, they mean exclusively something about the ideas, namely their workableness [...]";[13] "I contend that you cannot tell what the *word* 'true' *means*, as applied to a statement, without invoking the *concept of the statement's workings*."[14]

The relation between mathematics and logic, to mention another relevant issue, has also given rise to ample debate. It has been claimed, by those who are at present known as logicists, that arithmetic is part of logic: "I hope [...] to have made it probable that arithmetical laws are analytic judgments and subsequently a priori. Accordingly, arithmetic would only be a further developed logic, and every arithmetical theorem a logical law, albeit a derivative one."[15] Husserl even pleads pure logic ('reine Logik'), which is supposed to be independent of any (other)

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[7] *Ibid.*

[8] I. Kant, *op. cit.*, p. 54 (edition of 1787: pp. 40, 41); p. 68 (edition of 1787: pp. 64, 65).

[9] H. Poincaré, *La Science et l'Hypothèse*, pp. 65, 66.

[10] Cf. H. Poincaré, *op. cit.*, p. 65.

[11] H. Poincaré, *op. cit.*, p. 66.

[12] ("Une géométrie ne peut pas être plus vraie qu'une autre; elle peut seulement être *plus commode*.") H. Poincaré, *op. cit.*, p. 67.

[13] W. James, *The Meaning of Truth*, p. 4.

[14] W. James, *op. cit.*, p. 120.

[15] ("Ich hoffe [...] wahrscheinlich gemacht zu haben, dass die arithmetischen Gesetze analytische Urtheile und folglich a priori sind. Demnach würde die Arithmetik nur eine weiter ausgebildete Logik, jeder arithmetische Satz ein logisches Gesetz, jedoch ein abgeleitetes sein.") G. Frege, *Die Grundlagen der Arithmetik*, § 87 (p. 91 (edition of 1884: p. 99)).

science,[16] and to provide an epistemological foundation.[17]

It may be argued, on the basis of an influential analysis, that, on the contrary, arithmetic, and mathematics in general, is not dependent on logic, but logic is dependent on mathematics.[18] Even if one can decide upon a way to find an answer to the question if one of these lines of thought is correct, and, if so, which one,[19] it would require a substantial grasp of mathematics only to be found among specialists.

2.2. Darwinism

The impact of Darwin's ideas, conveyed primarily in *The Origin of Species* and *The Descent of Man*, is great. Not only biology and related subjects have been significantly influenced; Darwinism has become an approach in a large number of sciences.[20] Its impact on religion is also evident, albeit in another way, conflicts rapidly arising after Darwin presented his views.[21]

Accordingly, Darwinism has become a field of philosophical interest. One may even argue that with respect to it, "[...] science and philosophy get completely intertwined."[22] There is of course the danger of promoting Darwinism, which provides impressive but no certain results, to a practically unquestionable frame of reference,[23] ironically turning it into a dogma itself, but this is not the place to evaluate its merits.

These findings are difficult enough to grasp without an extensive training in biology, but the recent general focus on genetics has complicated things even further. The developments in this young science have given rise to debates in ethics, philosophical anthropology and other fields. Within Darwinism itself, genetics has come to play an important role, so that an approach has come to the fore which may be qualified as 'gene centrism'.[24]

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[16] E. Husserl, *Logische Untersuchungen*, first volume, § 61 (pp. 225, 226).

[17] E. Husserl, *op. cit.*, §§ 67–69 (pp. 244–249).

[18] ("Is [...] de wiskunde niet afhankelijk van de logica, de logica is wèl afhankelijk van de wiskunde [...].") L. Brouwer, *Over de Grondslagen der Wiskunde*, p. 127, founded primarily in chapter 3 (pp. 125–179).

[19] I think this is very difficult to do, or even impossible, for reasons I won't elaborate here.

[20] Cf. M. Ruse, *Darwin and Design*, p. 294.

[21] Cf., e.g., M. Ruse, *The Evolution-Creation Struggle*, pp. 130–145.

[22] D. Dennett, *Darwin's Dangerous Idea*, p. 21.

[23] D. Dennett, *op. cit.*, pp. 46, 47.

[24] D. Dennett, *op. cit.*, pp. 325, 326; explored in detail by Dawkins (*The Selfish Gene*, Chs. 2, 4, 11, 13).

2.3. Economics

It is not surprising that philosophy and economics converge in a number of important respects. The question how goods are, or should be, divided is a basic question of economics and also appears in many philosophical debates, which are increasingly technical and require an ever greater grasp of this comprehensive science. In his *magnum opus A Theory of Justice*, Rawls describes what a just distribution of goods and attribution of liberties would be.[25] He opposes 'the ideal market process' (simply put, the 'laissez faire' approach).[26] Although he himself claims, "Certainly economic theory does not fit the ideal procedure.",[27] it cannot be denied that his is in fact an economic theory, just not of the sort he qualifies as the stumbling stone. In order to fully appreciate the merits of his approach, one needs to be familiar with the (in this case at least basic) concepts of economics.

Another obvious field of research to mention here is game theory, which deals with the choices individuals make in order to optimize their interests in situations their options are partly determined by the behavior of others. A domain of both economics and mathematics, it has, from the first presentations,[28] about halfway through the 20th century,[29] become a territory of specialists, inaccessible to any others aspiring to contribute. As in most cases described in this section, this field has isolated itself as a result of its success. In time, it may even, all the more since its applications grow,[30] evolve from the interdisciplinary approach it is today into a separate science, a process often manifested in the academia,[31] rendering it ever more recondite.

2.4. Linguistics

The relationship between language and thought has a long tradition, but has increasingly become a domain of specialists, particularly since the 'linguistic turn', when a great number of thinkers started to grant language

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[25] J. Rawls, *A Theory of Justice*, § 11 (p. 53); § 46 (p. 266).

[26] J. Rawls, *op. cit.*, § 54 (p. 316).

[27] J. Rawls, *op. cit.*, § 54 (p. 317).

[28] (although there were some thinkers in previous times who can, in retrospect, be considered as propagators).

[29] E.g., J. Nash, "Two-person Cooperative Games", pp. 129–136. Rawls' theory mentioned above can, by the way, be interpreted in the context of game theory, considering the crucial 'veil of ignorance', which means one isn't supposed to know one's position in society once one is to decide how it is to be arranged (J. Rawls, *op. cit.*, § 24 (pp. 118–123)), though he only resorts to technical explanations in a few instances.

[30] Cf., e.g., J. Buchanan, G. Tullock, *The Calculus of Consent*, Chs. 11, 12 (pp. 147–188).

[31] In such diverse fields as, e.g., medieval studies, psycholinguistics, and artificial intelligence.

a pivotal role in analyzing philosophical issues. The question whether language is fully acquired through experience or there are innate principles at work has a long history, going back to the rationalism/empiricism (to use these designations) debate in the 17th and 18th century, while its roots may even be traced back to some of Plato's thoughts.[32]

Chomsky has pleaded the first alternative, initially by pointing out the difference between a deep structure and a surface structure,[33] which he uses to present an elaborate syntactical theory,[34] culminating in a universal grammar. In his research, Chomsky seeks a parallel with rationalism,[35] though, of course, as he himself grants, there are significant differences. His findings have also proved to be influential on some ideas in the philosophy of language,[36] or have at least been incorporated into philosophical theories.

In the field of semantics, the link between philosophy and linguistics is evident as well. Dealing with meaning, in order to find one's way in this interdisciplinary field, a familiarity with philosophy of language and some basics of linguistics is required. This domain too, although it deals with themes which were already at the focal point of attention in ancient philosophy, has become progressively technical from the 20th century onwards.[37]

2.5. Philosophy's fate

It is not my intention to deal with all philosophical aspects of scientific discussions – it is, in fact, as was indicated, part of the purport of this paper to make it clear that this is increasingly more difficult and has become (virtually) impossible. The discussions mentioned rather serve as representative examples. In fact, in order to be able to estimate the merits of discussions similar to those represented, which are relatively straightforward, it would be necessary to have an overview of all relevant recent developments in the sciences, an enterprise which hardly seems possible in our age, when, notwithstanding the special talents some people display, the notion of 'homo

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[32] E.g., *Meno*, 82a–86c; *Phaedo*, 75b–76a.

[33] E.g., *Aspects of the Theory of Syntax*, pp. 16–18.

[34] This has been improved in his new approach (cf. N. Chomsky, *The Minimalist Program, passim*).

[35] N. Chomsky, *Aspects of the Theory of Syntax*, pp. 47–59; *Cartesian Linguistics*, p. 59.

[36] E.g., G. Harman, *Deep Structure as Logical Form, passim*.

[37] Once one starts investigating the relation between semantics and syntax (e.g., P. Seuren, *Autonomous versus Semantic Syntax, passim*, or, more recently, D. Bouchard, *The Semantics of Syntax, passim*), things get even more complicated.

universalis' can only be deemed an unattainable ideal.[38] This is also how I would like to answer to the objection that an overview is still possible as I have discussed a great number of sciences. It must be acknowledged that I have done this rudimentarily and not in detail, which I would in the case of many sciences hardly or not be able to do.

Philosophy differs from the sciences in that the presence of the external elements mentioned is less compelling. There is no need for philosophy to produce material results craved for by society. Its presence is justified by its task to reflect on issues such as those discussed here. In order to maintain this position, however, it seems necessary that it is not dispersed like the various sciences. In the case of the sciences, this is to some extent a result of their own successes; in the case of philosophy, no similar success has been reached. By keeping developing as it has, it will in the end render itself useless as the justification mentioned will have ceased to exist: it will in fact be scattered and lose its (only) task, a process culminating in many cases in discussions that have lost all meaning and purpose.

To be sure, the highly specialized debates it produces are not devoid of value, but this consists primarily in the exercise of (academic) abilities; because of the ever higher degree of differentiation, it will prove to be difficult to share thoughts except between a small group of specialists, which is exactly the case for the sciences, with the crucial difference, again, that in their case there is a need to resort to this state of affairs, a need which does not rise for philosophy.

3. A remedy

How can some unity be maintained in philosophy? It seems necessary to ascertain a canon of literature, comprising the most important works which have appeared. Of course, it may be a matter of debate which would be included. Still, the problem is not yet as great as it might seem. At the moment, there is still enough coherence and some consensus about the literature appears to exist, considering the contents of the courses taught at

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[38] Cf. in particular with respect to mathematics H. Putnam, *Reason, Truth and History*, p. 177: "[...] It is not [...] true that one can get overwhelming agreement on the truth of an arbitrary accepted scientific theory. The fact is that most people are woefully ignorant of science and many theories, especially in the exact sciences, require so much mathematics for their comprehension that most people are not even capable of understanding them."

universities. It may seem to be difficult to realize a canon for philosophy,[39] but at present grossly the same philosophers are studied; students are at least expected to be generally familiar with their ideas, and, in addition, to have a thorough knowledge of those of whose teachings one has acquired detailed information through specialization.

It is still possible to share thoughts on the ideas they put forward, but unless a canon is established, the continuation of this situation may be threatened. This would mean that philosophy as a whole would disappear and be replaced by metaphysics, logic, epistemology, etc. Philosophy is, of course, already divided into these branches, as it has been throughout its rich tradition, but these are still, it seems, embedded in a common frame of reference. Cohesion is thus realized; that this may be maintained somewhat artificially, as the similarities between these branches are slowly surpassed by the differences, is no decisive objection.

Philosophy thus being consolidated obviously does not mean that it can resume its role as the mother of the sciences; the division into branches mentioned above can, accordingly, not take the same form it did with, e.g., Descartes, who famously likened philosophy to a tree, whose roots are metaphysics, and whose trunk is physics, the branches springing from it constituting all the other sciences.[40] The results found in section 2 rather lead to the conclusion that philosophy's claims in this respect must be modest, while it was pointed out in section 1 what internal problems it encounters. Yet philosophy may produce some unity in order to prevent the sciences from alienating from one another; it may serve as a common basis and – paradoxically – assume its new role as the constant element in a continually changing scientific landscape. That its role will indeed be different from before is clear.[41]

The canon itself is relatively easily established; as I said, at this time we still share a lot of ideas (which by no means implies agreement with regard to their value; it just points to their being studied in general), so that one can determine a list with a number of works; as I realize I won't get away with just leaving it at this, I point to the following, I think uncontroversial,

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[39] I limit this to Western philosophy, i.e., American and European ideas, here. It would, however, be preferable for students of philosophy to have some (basic) knowledge, which can be acquired in a relatively short time span, of, e.g., Buddhism and the ideas of Al-Farabi and Xunzi, to mention some important representatives of some diverse schools of thought. It would, I think, not be realistic to expect students to gain an extensive knowledge of Eastern philosophy.

[40] ("[...] Toute la philosophie est comme un arbre, dont les racines sont la Metaphysique, le tronc est la Physique, et les branches qui sortent de ce tronc sont toutes les autres sciences [...].") R. Descartes, *Les Principes de la Philosophie*, p. 14.

[41] R. Rorty, *op. cit.*, pp. 377–394.

examples: Plato's *Republic*, Descartes' *Meditations on First Philosophy*, and Kant's *Critique of Pure Reason*. I wouldn't presume to provide a complete list here, nor deny the convenience of being dismissed from the task of presenting this by myself.

It should not be intended to lead to a dogmatic set of literature in that it would never come up for revision (works can be added or eventually removed), nor in that the works included should determine the outcome of subsequent philosophical discussions; they merely constitute a common background representing various important views. Preferably, the original works would be read (i.e., in the languages in which they were originally written), so that an immediate access to the text is possible, but if necessary compromises can be made here; in general, the important works have been translated accurately.

Apart from the canon, containing works to be studied in detail, students should, as is the practice at the moment, familiarize themselves with the basic ideas contained in other books by these philosophers, and with those of other philosophers whose works they don't have to read themselves. To that effect, textbooks and encyclopedia can still be used.

As for the writings that are produced, it is necessary that one focus on the contents rather than on the quantity of secondary literature. If it serves a supporting role, the use of secondary literature is desirable, but it should indeed have a function (and not be mentioned for the sake of being mentioned), and not replace the primary goal, to convey one's message, a danger which lurks with the ever growing amount of (secondary) literature with which one is expected to be acquainted.[42] In some respects, many of the writings of the 17th and 18th century, in which hardly any (explicit) references are made, and those of the medieval philosophers, who refer to sources with which they were all familiar (such as the Bible and materials they studied in common), may serve as useful exemplars.

Conclusion

Philosophy has been conceived in many ways throughout history. Its position in relation to the exact sciences and theology and, in time, once they had evolved into distinct fields of research, to the other sciences, has left its status unsettled. Having been known in a number of guises, such as

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[42] Ironically, of course, this paper itself suffers from this problem, too. In this case, however, the point is demonstrated in part by it, although the literature incorporated is circumstantial and unavoidable.

the handmaid of theology and (conversely) the mother of the sciences, in this article I have attempted to describe how it can be maintained at present, against the background of a rapidly changing and ever more inaccessible scientific climate.

Philosophy's reflective role is in peril of being eroded. This is a result of two relatively recent developments. First, the sciences have developed from the beginning, but the scientific discoveries and improvements have meant that in most cases even a basic understanding, which seems necessary for philosophy if it doesn't want to be isolated, means a thorough schooling. However, it is nowadays hardly possible to have a sufficient understanding of more than a handful of sciences, let alone a detailed overview. Secondly, and perhaps not unrelated to this, philosophy itself has seen a rise in the number of specializations, which have also become less accessible. Scientific *and* philosophical developments are manifested at a seemingly exponential rate.

In section 2, I pointed out more in detail what difficulties one encounters when one wants to maintain an overview of relevant scientific developments pertaining to philosophy. It turned out that it is virtually impossible to keep up with these, let alone be well versed in them, even when one limits this to the extent relative to one's interest.

In section 3, I presented a remedy to this rather gloomy outlook. At present, in (Western) philosophy a coherence similar to that manifested in the Middle Ages has become unattainable, partly because of its own developments, and partly because of the scientific issues mentioned. This does not mean, however, that some coherence should be impossible. In fact, the programs at universities agree to a great degree with regard to the works studied. Still, this coherence should not be taken for granted; it may be maintained in the future by establishing a canon with the relevant works to study.

S U M M A R Y

What does the fact that academic philosophy has specialized to a high degree entail for its pursuit? In particular, how can philosophy at present contribute to discussions pertaining to scientific issues? Due to its evolved character, it doesn't, in contrast to earlier times, when it was still intertwined with the sciences, produce substantial material results. Now that the sciences have established themselves as independent domains, its role is limited, being focused on reflection. This doesn't, however, lead to its demise; in fact, it may, in order to preserve at least the appearance of stability, turn out to be the covering discipline in an ever changing scientific landscape.

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