SKEPSIS

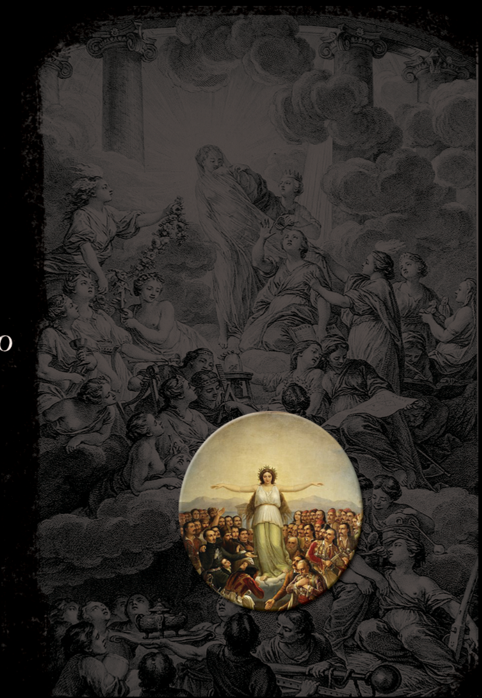
ΠΕΡΙΟΔΙΚΗ ΕΚΔΟΣΗ ΦΙΛΟΣΟΦΙΑΣ ΚΑΙ ΔΙΕΠΙΣΤΗΜΟΝΙΚΗΣ ΕΡΕΥΝΑΣ
A JOURNAL FOR PHILOSOPHY AND INTER-DISCIPLINARY RESEARCH

OCTOBER, 4-6, 2019 ANCIENT OLYMPIA

PROCEEDINGS OF THE XXVIII INTERNATIONAL CONFERENCE OF PHILOSOPHY

XXVII
2019-2020

Αφιέρωμα
στον Καθηγητή Σωτήρη Φουρνάρο
Special edition in memory
of Professor Sotirios Fournaros



organized by

Region of Western Greece

Olympic Center for Philosophy and Culture

ΠΕΡΙΕΧΟΜΕΝΑ - CONTENTS

STAMATIS PORTELANOS
INTRODUCTION 9

MARTHA BECK
ANCIENT GREEK ENLIGHTENMENT
AND THE DEVELOPMENT OF WESTERN CULTURE:
HAS THE LIGHT GONE OUT? 12

ANDREAS MARKANTONATOS
ANCIENT GREEK ENLIGHTENMENT AND THE SOPHISTS:
THE CASE OF SOPHOCLES' *PHILOCTETES* 25

ANASTASIOS G. MARÀS
THE ATTITUDE OF ORTHODOX THEOLOGY TOWARDS
THE MODERN GREEK ENLIGHTENMENT DURING
THE OTTOMAN DOMINATION 32

MICHAIL MANTZANAS
HUMAN REPRODUCTIVE CAPACITY
AND SURROGATE MOTHERHOOD 43

MARIA D. GEORGOUSI
TWO ASPECTS OF RHETORICAL PERSUASION
IN SOPHOCLES' *PHILOCTETES* 48

ANTONIOS KAPETANAKIS
LANGUAGE AND MUSIC IN THE FRENCH ENLIGHTENMENT 68

KONSTANTINOS STAVROPOULOS
EUCLID'S MATHEMATICS AS A PROBATIVE SCIENCE 77

MARIA PANAGIOTOPOULOU
A CASE STUDY:
THRASYMACHUS AND BULLYING BEHAVIOR 89

DIMITRIOS BALIATSAS
LA METAPHYSIQUE DE KALVOS
DANS L'ODE "SUR LA MORT" 97

APOSTOLOS KAPROULIAS
PIRRON ILIOS: THE PHENOMENOLOGICAL
CONSIDERATION OF THE *DIALECTIC OF ONESELF*,
AS AN OPENING TO THE PROSPERITY 119

ANASTASIA OIKONOMOU
THE PHILOSOPHICAL APPROACH
OF THE ANCIENT TRAGEDY BY CORNELIUS CASTORIADIS 127

ANASTASIA D. KARAMPAS
THE INDIRECT COMMUNICATION
AS A TEACHING METHOD BY KIERKEGAARD 136

PANAGIOTIS A. TSILIGROS
MEDICINE AS A LARGE-SCALE POLITICAL
INTERVENTION IN THE AGE OF ENLIGHTENMENT 147

MARIANTHI POLYZOU
INVESTIGATION OF THE KEY FEATURES
OF THE ENLIGHTENMENT SPIRIT CONCERNING
THE RELIGIOUS EDUCATION IN PRIMARY SCHOOLS 152

THOMAS KARAGKIOZOPOULOS
THE PROJECTION OF THE EUROPEAN ENLIGHTENMENT
ON THE SOPHIST MOVEMENT AND THE CONCEPT
OF THE SOCIAL CONTRACT 167

VIRGINIA GRIGORIADOU, FRANK A. COUTELIERIS,
KOSTAS THEOLOGOU, ANTONIOS KANAVOURAS
THE CONCEPT OF SIMILARITY IN NATURAL SCIENCES
IN POST ENLIGHTENMENT ERA 176

PANAGIOTA PAPANIKOLAOU
SUBJECTIVITY AND ENLIGHTENMENT
FROM MICHEL FOUCAULT’S PERSPECTIVE 188

ANGELIKI POLYCHRONOPOULOU
THE SIGNIFICANCE OF THE ENLIGHTENMENT
IN MODERN EDUCATION. A CASE STUDY 197

DESPINA COSMOPOULOU
SOPHISTIC THOUGHT: ODYSSEUS’ AND PHILOCTETES’
CHARACTERS – A SEMIOTIC APPROACH 204

GEORGIOS ARABATZIS
ANNA COMNENA’S COMMENTATORS OF ARISTOTLE
IN BYZANTIUM 213

VIRGINIA GRIGORIADOU
FRANK A. COUTELIERIS
KOSTAS THEOLOGOU
ANTONIOS KANAVOURAS

THE CONCEPT OF SIMILARITY IN NATURAL SCIENCES IN POST ENLIGHTENMENT ERA

ABSTRACT

The Scientific Revolution along with the ideas coming from the intellectual movement of Enlightenment gradually led to a different conception of the world and to a redefinition of the scientific methodology. The world at this period was perceived as a machine regulated by natural laws. Methodology and discoveries of Copernicus and Galileo were the forerunner of the significant changes that were going to appear in methodology of natural sciences. Scientists of 17th and 18th century started investigating the world systematically through experimentation, logic and mathematics, which contributed to the formulation of laws. These conditions favored the utilization of scientific techniques, mechanisms and models that contributed to understanding, explaining and describing the natural world and also to drawing of scientific inferences. An interesting example is the mechanism of similarity, which seems to be recognized after the Scientific Revolution, and its systematic exploitation extended significantly after the 19th century through the technique of scientific models, mainly in the fields of Engineering and Physics. Notions of similarity and similar systems were rapidly evolved after the 17^{th} century. This fact leads to the following important question: How did the Scientific Revolution and the Enlightenment influence the evolution of these concepts?

The concept of similar systems has been identified in Galileo's theories, but it was introduced by Newton, who defined the similar systems mainly based on geometrically similar configurations, similar movements between particles and similar paths in proportional times. In 1914, the American physicist Edgar Buckingham proposed the term ''physically similar systems'' in order to replace Newton's previously widely accepted term, ''similar systems''. Buckingham focused on physical similarity. He argued that two physical systems are similar if there is a proportional relation between two corresponding quantities, which can be described by the same equation.

At the beginning of the 21st century, the American philosopher Susan G. Sterrett highlights the significance of similarity, of similar systems and scientific models in the field of Philosophy of Science. Sterrett accepts that the concept of similarity is related to the concept of ratio and she understands the concept of physical similarity as a generalization of the concept of geometrical similarity. Her contribution to the evolution of the concept of similarity is detected in her argument that similarity is always defined in the light of a scientific hypothesis. Therefore, the similarity between a model and an object of interest is usually not absolute, as it is always defined with respect to particular characteristics. In addition, Sterrett argues that similarity is a function mechanism of analogue models, which are used to draw inferences, observations or predictions about similar set-ups that scientists cannot observe.

KEYWORDS:
Scientific revolution, Enlightenment, Similarity, Ratio, Scientific models

INTRODUCTION

The 17th century is often regarded as an intersection between old and modern science. The mechanistic conception of the world, the acceptance of logic as the basic tool of the correct method and the utilization of mathematics as the basic technique of the experimental method are considered three important features of scientific methodology after the 17th century. As a consequence of these conditions the development of the 17th-century experimental method followed, which requires systematic experimentation, which is performed by directed, organized and repeated observation of the world through the utilization of experimental instruments and the development of new scientific methods.

In the context of this new way of thinking that suggested the rational study of nature, the mechanism of similarity was utilized as a tool of experimental technique of natural sciences after the 17th century. The concept of similarity has been defined by many scientists who have presented the views and applications of their respective scientific fields on the matter. In philosophy, similarity is defined as the existence of a common, similar or analogous property or attribute between two or more objects, while in geometry it is attributed as the equal or proportional dimension (Sterrett, 2010). In physics, similarity is considered the analogy between specific relations of particular physical quantities of two or more physical systems (Sterrett, 2010). In engineering similarity is perceived as a mechanism that operates on the basis of a set of rules, laws, principles or mathematical relation that are exploited by the experimental technique of analogue models, during the process of selecting or constructing the model and during the process of extending the model's conclusions to the phenomenon, object or system of interest (Sterrett, 2005), (Sterrett, 2002).

The repeated attempts to define the concept of similar systems after the 17th century, along with the extensive and systematic utilization of the mechanism of similarity of physical bodies, systems and phenomena that has been applied from the 18th century to the present, lead to the following question: How did the Scientific Revolution and the Enlightenment affect the evolution of the concept of similarity and the utilization of the mechanism of similarity as an experimental technique's tool, after the 17th century?

The purpose of this paper is to address this issue through a historical review of the concept of similarity in the context of new science after 17th century.

SCIENTIFIC METHODOLOGY AFTER SCIENTIFIC REVOLUTION AND ENLIGHTENMENT

The Scientific Revolution and the Enlightenment marked significant changes in the scientific methodology concerning the perception and the explanation of the world, thus laying the foundations for the formation of the new science.

Before the 17th century, researchers were developing theoretical systems that were based more on classical antiquity than on systematic experimentation. However, in the late Middle Ages there were researchers conducting experiments, but they used their findings mainly in order to write descriptive encyclopedias rather than to describe, explain or make predictions about natural phenomena (Butterfield, 1983).

After Copernicus and Galileo's discoveries of celestial bodies and their movements, the preceding scientific methodology was disputed and the ancient explanation of the universe began to collapse. Eventually, this was followed by the period of the Scientific Revolution (1543-1687), through which the natural sciences advanced rapidly. New theories were introduced in physics, astronomy, biology and other fields and the issue of a general scientific methodology was emerged (Butterfield, 1983).

As a consequence of the Scientific Revolution, in the late 17th century the intellectual movement of the Enlightenment appeared in England and in the late 18th century in France and then it spread to the rest Europe. The roots of the Enlightenment are traced in the theory of rationalism, according to which knowledge can be acquired just through the pure reason. The representatives of the Enlightenment expressed their belief in the pure reason and they encouraged people to reject any authority (Outram, 1995). Moreover, they believed that people should be free from ignorance, prejudice and superstitions of the past, and they believed in the ideas of progress and evolution of science. The period of the Enlightenment was not only the continuation and culmination of the Scientific Revolution, it was also a period of knowledge dissemination, not only through the encyclopedia of Denis Diderot and Jean le Rond d'Alembert, but also through the spreading of books, newspapers and magazines, which was supported by the development of typography.

A dominant point of view, after the 17th century, was mechanocracy, the idea that nature is a huge machine, and that the work of scientists is to interpret the mechanisms behind the phenomena. The mechanistic idea is found in Galileo's scientific methodology. He believed that order and harmony dominate the universe and in order to be studied, a quantitative experimental methodology should be developed and adopted (Westfall, 2008). René Descartes argued that God created the universe as a perfect clock mechanism and that after its creation it was capable of operating without any intervention. Francis Bacon expressed his concerns about the distinction between observation and explanation. He believed that the explanation should come from observation and not from a system of explanation inherited from ancient philosophy. Bacon argued that scientists should systematically experiment and induce generalizations, that would point the way to the next experiment (Butterfield, 1983). Denis Diderot, a leading enlightener, presented a similar point of view, arguing that the main means of research are nature's observation, thought, and experiment.

In the 18th century science had been configured as an organized social and intellectual activity, distinct from other intellectual activities, such as philosophy or theology. In the context of the new way of thinking and of critically approaching nature which was established by the Enlightenment movement, logic was the essential tool of the correct method. As the new science sought to achieve absolute accuracy, clarity and generalization of the description, scientists turned their experiments toward to things that can be measured. Thus Mathematics was an integral component of the new scientific methodology. The prevalence of the mechanocratic conception has as a result a change in the way that scientists used to study the world. Physics was shaped as a quantitative experimental science aimed at discovering the laws that determine the functioning of the universe (Hankins, 1998). The systematic experimentation becomes a main part of the rational approach to nature and it contributed to the development of experimental measuring instruments, of scientific techniques, to the exploitation of mechanisms and models capable of contributing to scientific explanation and prediction of phenomena.

THE CONCEPT OF SIMILARITY AFTER THE 17TH CENTURY

Since ancient times philosophers and scientists were concerned with the concept of similarity of natural phenomena. The roots of the concept of similarity can be found in the Pythagorean Philosophers, who dealt with the similarity of phenomena in music, in Thalis who formed the theorems of similar triangles and in Euclid, who systematized the existing knowledge through his theories and this way he prepared the ground for what later was called geometrical similarity (Sterrett, 2010), (Sterrett, 2017 (b)). Later Aristotle referred to the form, that is, the set of attributes that each being has in common with other beings and puts it in the same class of similar beings.

During the Middle Ages, research was mainly limited to the study, the translation and the commentary of ancient texts and it was not characterized by organized and systematic experimentation. Mechanisms, tools, and techniques used in the experimental method which contribute to conclusions, such as the similarity mechanism, did not attract the interest of the majority of intellectuals during this era.

From the time of the Renaissance, the idea of similar systems utilized by a number of scientists with characteristic example Galileo Galilei. Galileo used the idea of similar systems in his attempt to explain particular behaviors of machines and generally structures with mass. Galileo focused not only on geometrical similarity, on the similarity of dimensions or structures, but also on the proportion of relations between natural quantities. Galileo's most important contribution to the development of the concept of similar systems is found in the pendulum's experiment and its law of correspondence. Galileo observed that the quantities that determine the behavior of a pendulum are related with a constant relation, which applies to all pendulums. These quantities are the oscillation time and the length of the pendulum's string. According to his observations, the value of the ratio including the length of the string and the frequency of oscillations of the pendulum is constant and applies to every pendulum. This constant ratio functioned as a correspondence law, which correlated each of these two quantities of one pendulum with the corresponding quantity of the other pendulum, and allowed him to calculate the length of a pendulum's string from the number of oscillations of the two pendulums at a given time (Sterrett, 2002), (Sterrett, 2017 (b)). The idea that each pendulum relates to each other pendulum with a law of correspondence, identifies the base of the idea of similar systems (Sterrett, 2017 (b)).

During the early 17th century, the application of the mechanism of similarity traces in experimental physics, and particularly in the case of imperceptible or weightless fluids. Electricity, heat, gravity, and magnetism, which had physical properties, but they were not regular material according to this period's physics, were called weightless or imperceptible fluids. Their movement was conveying their physical properties, but it did not carry mass. When the researchers observed heat flowing from a hot to a cold object, they did not detect any mass change (Hankins, 1998). So in order to describe and explain this movement, they exploited its similarity to fluid motion. Until then, the concept of similar systems may not have been defined, but the case of imperceptible fluids leads to the inference that scientists had understood the role of similarity in the process of drawing scientific conclusions and had incorporated it into their scientific methodology when they considered that it would be useful.

In late 17th century Newton in his 2nd Book of Principia, defined the concept of similar systems for first time in the history of the concept, as follows:

> Suppose two similar systems of bodies consisting of an equal number of particles, and let the correspondent particles be similar and proportional, each in one system to each in the other, and have a like situation among themselves, and the same given ratio of density to each other; and let them begin to move among themselves in proportional times, and with like motions (that is, those in one system among one another, and those in the other among one another.) And if the particles that are in the same system do not touch one another, except in the moments of reflection; nor attract, nor repel each other, except with accelerative forces that are inversely as the diameters of the correspondent particles, and directly as the squares of the velocities: I say, that the particles of those systems will continue to move among themselves with like motions and in proportional times." (Sterrett, 2017 (b)).

Newton focused on the geometrical similarity, the similarity of structure (mass, density) of the two systems of bodies, the proportion of the movement between particles, and the time of movement in order to consider two systems similar (Sterrett, 2002). In contrast to Galileo, who used the idea of similar systems as a specialized method aimed at explaining exclusively pendulum's behaviors, Newton presents the idea of similar systems as a general method (Sterrett, 2002), (Sterrett, 2017 (b)). Newton's approach was the starting point for the examination of the concept of similar systems, sparking a series of theories from researchers coming mainly from the fields of natural sciences and engineering. The term "similar systems" introduced by Newton was a reference point until the early 20th century.

The year of 1914 was an important year for the development of the concept of similar systems, as Edgar Buckingham, an American physicist, proposed the term "physically similar systems" in order to replace Newton's previously accepted term "similar systems". His approach was:

> Let S be a physical system, and let a relation subsist among a number of quantities Q which pertain to S. Let us imagine S to be transformed into another system S' so that S' "corresponds" to S as regards the essential quantities. There is no point of the transformation at which we can suppose that the quantities cease to be dependent on one another: hence we must suppose that some relation will sub-

> sist among the quantities Q' in S' which correspond to the quantities Q in S. If this relation in S' is of the same form as the relation in S and is describable by the same equation, the two systems are 'physically similar' as regards this relation. (Sterrett, 2017 (b)).

A common characteristic of these two approaches to the concept of similar systems was the identification of ratio between physical quantities or relations of physical quantities. While Newton defined similar systems on the basis of their similar structural characteristics (mass and density), Buckingham defined them on the basis of the proportional relations observed between specific physical quantities of interest. Since 1914 the term ''physically similar systems'' that induced by Buckingham, has been widely accepted and used up to this day.

The systematic utilization of the similarity extended significantly after the 19th century mainly to the fields of Engineering and Physics. An interesting approach focusing on utilizing the similarity mechanism for ship design and construction was that of William Froude. William Froude was an English engineer who get involved in hydrodynamics and ship design during early 19^{th} century. He utilized the concept of similar systems to solve major problems encountered in the construction of ships for the English Navy, which were related to stability, speed of ships and their interaction with water in motion or stillness (Sterrett, 2017 (b)). In Froude's case, as in Newton's too, the idea of similar systems related to the idea of correlating quantities of one situation with corresponding quantities of another situation (Sterrett, 2002). In particular, Froude carried out experiments with ship's scale models and extended the inferences of his experiments, through the appropriate calculations, to full-size ships (Sterrett, 2017 (b)).

THE CONCEPTS OF SIMILARITY AND SCIENTIFIC MODELS IN SUSAN G. STERRET'S THOUGHT

Susan G. Sterrett is a Professor of History and Philosophy of Science at Wichita State University in Kansas. She began her studies in the field of Mechanics, but her research interest focused on the field of History and Philosophy of Science. Her arthrography focuses on issues related to the methodology of science with her major contribution to highlighting the importance of concepts of similarity and scientific models in the field of Philosophy of Science, concepts whose significance had already recognized in natural sciences and engineering.

According to Sterrett, the concept of similarity is a powerful concept in the field of natural sciences, which should be further developed in other fields and examined more intensively in the field of the Philosophy of Science. Sterrett accepts the idea that the concept of similarity is related to the concept of ratio. She understands the concept of physical similarity as a generalization of the concept of geometrical similarity, which has its roots in Thalis theorems and is related to the similarity of geometric shapes. While geometrical similarity is defined by the ratio of shapes or distance between two points, physical similarity is defined by the proportion of physical quantities concerning the similar systems, such as time, mass, and force. In order to generalize the notion of similarity from geometry to natural sciences, the concepts of proportion and shape also had to be generalized, in order to complete the transition from the similarity of geometric shapes to similarity of natural systems (Sterrett, 2010). According to Sterrett, the concept of similarity in physics is summed up in the idea of existing proportional relations between specific quantities of interest from model to phenomenon of interest. So two systems can be characterized as physically similar when there is an analogy between specific relations of corresponding physical quantities (Sterrett, 2006).

Another important issue concerned Sterrett was in what methodologies the similarity's mechanism is used and how the criteria that determine the similarity between two bodies or systems are selected. As she points out, since the beginning of the 19th century the mechanism of similarity has been related to the concept of the scientific model.

The majority of scientists working in the field of philosophy of science perceive scientific models as theoretical tools, which are an intermediate stage between theory and real world. These tools are formed by theory, laws, and principles that relate to the subject under consideration and they are used to draw conclusions about real-world situations (Sterrett, 2005), (Sterrett, 2002). Sterrett considers this approach is fragmentary, as it does not include a wide range of models which are not theoretical tools of an intermediate stage, but they are parts of real world, for example scale models in physics and mechanics or animal models in biology. She proposes the classification of scientific models in the categories of "realm of thought" and "using one piece of the world to tell about another". The first category includes models of abstract, mathematical structures, algorithms or mechanism descriptions. These tools are considered models in virtue of their relation to some equations or formal scientific proposals (Sterrett, 2005). Models that fall into the second category are parts of the real world. These models are commonly known as analogue models (Sterrett, 2017(a)). Analogue models are physical set-ups that are utilized as models of other physical set-ups, which researchers cannot observe because of their size, space or time distance of them, or we could add because of ethical reasons. Their basic function mechanism is similarity which is validated by a ratio of physical quantities or by a ratio of relations observed between physical quantities of two phenomena or objects (Sterrett, 2005). The analogue relations between the model and the system is selected based on the direction and purpose of the research (Sterrett, 2005), (Sterrett, 2002), (Sterrett, 2017(a)).

Similarity is defined by criteria that are determined by the phenomenon of interest and the problem to be solved. Sterrett' s contribution to the development of the concept of similarity is precisely identified in her observation in which similarity is always defined in the light of a scientific hypothesis. Therefore, the similarity between the model and the object of interest is usually not absolute, as it is defined with respect to particular characteristics.

Examples of analogue models are scale models that are extensively used in engineering and physics. Scale Models are physical objects or systems which are used to control or predict the behavior of a machine, an object or a system of different dimensions. They are constructed in such a way that there is a certain proportion to an object in physical world, which is usually described by a mathematical relation. The relation between the model and the system is selected according to the direction and purpose of the research (Sterrett, 2005), (Sterrett, 2002), (Sterrett, 2017(a)).

Sterrett described the operation stages of scale models in order to present the utilization of similarity mechanism in the context of this scientific technique's tool. She said that in the first stage the researcher should study the physical quantities related to the phenomenon of interest. Then he constructs a physical state S2, which is similar to state S1, in the areas of his research's interest. In other words, the researcher chooses the proportional relation which could respond to his scientific hypothesis and he constructs the model based on this relation. This way he defines the similarity in the light of his specific research hypotheses. Then he develops the rules for transferring prices of quantities of S2 to S1 (principles, laws, equations).

Once the S2 model is constructed, he measures the quantities, he observes the behavior of the physical state, and draws inferences about the S1 state (Sterrett, 2005), (Sterrett, 2002).

In this context, the mechanism of similarity could be understood as a set of rules, laws, principles or mathematical relations utilized by the experimental technique of analogue models in their selection or construction and in the process of extending model's inferences to the object, system or phenomenon of interest.

CONCLUSIONS

This historical review of the concept of similarity and similar systems reveals the continuous effort of understanding, defining the term similarity and exploiting the mechanism of similarity in natural sciences in post Enlightenment era. The changes occurred in science after the Scientific Revolution and the Enlightenment played a decisive role to the evolution of the concept of similarity. These changes resulted in the formation of these conditions which allowed the multifaceted approach, the understanding, the definition of the concept of similarity and through all these its evolution: from the concept of Newton's geometrical similarity to the concept of Buckingham's physical similarity, and finally to the concept of physical similarity in the light of a specific research hypothesis in Sterrett' s approach.

Susan G. Sterrett' s important addition contributes to a clearer definition of terms of similarity and similar systems. The emergence of the significance of the scientific hypothesis during the process of defining the similarity between two systems, rightly places her theory between the important stations of evolution of concepts of similarity and similar systems.

In addition, the Scientific Revolution and the Enlightenment movement formed a new way of thinking that caused a change in the way scientists research the natural world. The incorporation of systematic experimentation into scientific methodology had as a result the need of developing new scientific practices including measuring instruments, systematic exploitation of mechanisms and scientific models capable of contributing to the explanation and the prediction of phenomena. These conditions contributed to the immediate adoption of the mechanism of similarity and to its systematic utilization through the technique of scientific models, which was greatly expanded from the 18th century onwards.

Virginia Grigoriadou, National Technical University of Athens
Frank A. Coutelieris, University of Patras
Kostas Theologou, National Technical University of Athens
Antonios Kanavouras, Agricultural University of Athens

REFERENCES

Butterfield H., *Η καταγωγή της σύγχρονης επιστήμης (1300-1800)*, Αθήνα: ΜΙΕΤ, 1983.

Hankins L. Th., *Επιστήμη και Διαφωτισμός*, Ηράκλειο: Πανεπιστημιακές Εκδόσεις Κρήτης, 1998.

Outram, D., *The Enlightenment*, New York: Cambridge University Press, 1995.

Sterrett G. S., "Physical Models and Fundamental Laws: Using One Piece of the World to Tell About Another" *Mind and Society* 5, Vol. 3, pp. 51-66., 2002.

Sterrett G. S., "Kinds of Models": based on a talk presented at an STS Interdisciplinary roundtable: "The Multiple Meanings of Models", Duke University: John Hope Franklin Center, 2005.

Sterrett G. S., "Models of Machines and Models of Phenomena." *International Studies in the Philosophy of Science* Vol. 20, No. 1, pp. 69-80., 2006.

Sterrett G. S., "Similarity and Dimensional Analysis" (Invited Handbook Article) *Handbook of the Philosophy of Science, Volume 9: Philosophy of Technology and the Engineering Sciences*, edited by Anthonie Meijers (Series editors: Dov Gabbay, Paul Thagard, and John Woods). pp. 799 – 824, 2010.

Sterrett G. S., "Experimentation on Analogue Models". In L. Magnani and T. Bertolotti (eds.), *Springer Handbook of Model-Based Science*, Switzerland: Springer, 2017(a).

Sterrett G. S., "Physically Similar Systems — A History of the Concept." In L. Magnani and T. Bertolotti (eds.), *Springer Handbook of Model-Based Science*, Switzerland: Springer, 2017(b).

Westfall S. R., *Η συγκρότηση της σύγχρονης επιστήμης*, Ηράκλειο: Πανεπιστημιακές Εκδόσεις Κρήτης, 2008.