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THE HISTORY OF THE CHRONOTOPE RESEARCH

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The article examines the concept of the chronotope and its significance in the field of philological research. It offers a historical perspective on the study of space-time, starting from ancient Greek scientists and extending to influential thinkers of our time. The interdisciplinary nature of the study of time and space is investigated by exploring the contributions of renowned philosophers (Zeno of Elea, R. Descartes, I. Kant), mathematicians (H. Poincaré, B. Russell), physicists (G. Galilei, A. Einstein), and geographers (Ptolemy, Eratosthenes) who considered these aspects prior to the introduction of the term by M. Bakhtin in philological discourse and O.Ukhtomskyi in the biological scientific field.

Considerable contributions are noted from Western philologists such as T. Adorno, G.Prince, E. Said, J.-F. Lyotard, E. Auerbach, and J. Derrida, who studied the artistic chronotope as an aesthetic, philosophical, political, social, historical, and cultural category. The article emphasizes additional objects of investigation connected to artistic space-time, which have been explored by these scholars. They include aesthetic perception, textual community, simulacrum, and archival material.

The article presents research and analysis conducted by Ukrainian literary experts, including I. Silvestrova, I. Kushnir, O. Horpynych, and N. Kopystianska, who focused on the peculiarities of time and space organization in Ukrainian postmodern literature. They emphasized the importance of depicting the chronotope through specific images, scenes, and dialogues to construct the inner world of the text. The main features of the artistic space-time highlighted in the works of these renowned scholars also include its utilization in various literary genres and cultural contexts.

Key words: space-time (chronotope), scientific fields, philological discourse, artistic world, organizing tool, historical and cultural contexts.

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У статті розглядається поняття хронотопу та його значення у галузі філологічних досліджень. Пропонується історична перспектива вивчення часопростору, починаючи з давньогрецьких вчених і закінчуючи впливовими мислителями сучасності. Досліджується міждисциплінарний характер вивчення часу та простору шляхом дослідження внесків відомих філософів (Зенон з Елеї, Р. Декарт, І. Кант), математиків (А. Пуанкаре, Б. Рассел), фізиків (Г. Галілей, А. Ейнштейн) і географів (Птолемей, Ератосфен), які розглядали ці аспекти задовго до введення дефініції М. Бахтіним у філологічний дискурс і О.Ухтомським у біологічну наукову галузь.



Розглядається значний внесок західних філологів, таких як Т. Адорно, Г. Прінс, Е.Саїд, Ж.-Ф. Ліотар, Е. Ауербах і Ж. Дерріда, які досліджували художній хронотоп як естетичну, філософську, політичну, соціальну, історичну та культурну категорію. В статті також висвітлюються інші об'єкти дослідження, пов'язані з художнім часопростором, які були розглянуті цими вченими, такі як естетичне сприйняття, текстова спільнота, симулякр та архівний матеріал.

У статті також представлено дослідження та аналіз українських літературознавців, серед яких І. Сільвестрова, І. Кушнір, О. Горпинич та Н. Копистянська, які зосередили увагу на особливостях організації часопростору в українській постмодерністській літературі. Вони визначили важливість відображення хронотопу через конкретні образи, сцени та діалоги для побудови внутрішнього світу тексту. Основними особливостями художнього часопростору, які були висвітлені в роботах відомих вчених, є також його використання в різних літературних жанрах і культурних контекстах.

Ключові слова: часопоростір (хронотоп), наукові галузі, філологічний дискурс, художній світ, організуючий інструмент, історичний та культурний контексти.

Introduction. The concept of the chronotopic continuum is of particular importance to philologists because time and space serve as constructive principles for organizing literary works. They represent specific forms of aesthetic reality and function as essential tools for modeling the artistic world. The chronotope also plays an important role in reflecting historical, cultural, and political phenomena of the narrative's era, allowing us to explore writers' universal ideas about existence and humanity, as well as their perspectives on the relationships between humans and the surrounding world.

Although the study of the close relationship between time and space has a history of over 2000 years, the development of space-time research across various scientific fields has not been consistently followed. Therefore, the investigation of this problem remains relevant.

The purpose of this article is to trace the history of space-time research, addressing various scientific objectives. They include defining the concept of chronotope, tracing its emergence, examining the origins of space-time in disciplines such as philosophy, physics, mathematics, and geography, as well as exploring its presence in philological discourse through the works of renowned Western and Ukrainian researchers.

The inductive-deductive method, involving the analysis of scientific works by famous researchers in the fields of philology, natural sciences, and mathematics, is employed to achieve the purpose.

The emergence of the term. M. Bakhtin was the first to interpret artistic space-time in his monumental work "Forms of Time and Chronotope in the Novel. Essays on Historical Poetics", published in 1932. It is based on the unity of artistic space and time, which the scholar defines as "chronotope" (from the Greek "chronos" (time) and "topos" (place)) – space-time. In the "Philosophical Encyclopedic Dictionary" the chronotope is defined by V. Lukianets as "an

inseparable connection of spatial and temporal relations" (Lukianets, 2002: 234).

However, the philological field was not the origin of the definition, since its roots can be traced back to the natural sciences. Thus, the term "chronotope" was initially proposed by the biologist O. Ukhtomsky in his article "Dominant", where he acknowledged the influence H.Minkowski's physical concept of space-time on his theory. In his lecture "Space and Time", delivered on September 8, 1908, at the University of Stuttgart, the German mathematician explained the concept of "fourdimensional space", which includes three spatial dimensions (length, width, and height) and one temporal dimension, and proposed a new approach to measuring the latter one. On this basis, the study of space-time within other scientific fields began much earlier than the emergence of the definition "chronotope" (Minkowski, 1909: 104 – 111).

The space-time investigation in the natural-mathematical scientific fields. It should be pointed out that the history of the study of time and space encompasses many different scientific disciplines, including philosophy, physics, mathematics, geography, and others.

In philosophy, the exploration of time and space has its roots in ancient times. In the 5th century BC, the ancient Greek philosopher Zeno of Elea formulated the Achilles and the Tortoise paradox, which explores the relativity of motion and time. This paradoxical judgment, known as an aporia, asserts that the slowest runner will never be overtaken by the fastest one, because, before the pursuer can catch up, he must first reach the point from which the pursued started. As a result, the slowest runner will always remain slightly ahead. Through this paradox, Zeno demonstrated the logical difficulties that arise when assuming the indivisibility of time and space (Torful, 1999: 143 – 145).

In the middle of the 17th century, the philosopher R. Descartes proposed the theory of dualism, asserting that time and space are absolute

and independent of matter. This perspective challenged the views of Aristotle, who believed that time and space are abstract realities that arise from movement and change in the material world (Descartes, 1902: 25-28).

I. Kant made an equally significant contribution to the study of the chronotope from a philosophical standpoint. He posited that time and space are a priori forms of perception that structure our understanding of the world, although they cannot be directly perceived. In his work "The Critique of Pure Reason", published in 1781, I. Kant introduced the concept of the "transcendental unity of space and time", which serves as a precondition for our experiences, and their "empirical interaction" arising from it (Kant, 1986: 695 – 703).

In physics, the study of time and space began in the 16th century with G. Galilei, who formulated the laws of motion and developed the concept of geometric space. He introduced a new method for measuring distances and establishing geometric shapes based on the use of geometric proportions and the idea of proportionality between distances and time (Galilei, 2014: 250 – 298).

Space and time are unified into a single continuum in A. Einstein's special theory of relativity. It was described in the work "To the electrodynamics of moving bodies", published in 1905. The central idea of the theory is that space and time elements significantly influence each other. When an object moves at speeds close to the speed of light, time slows down relative to an observer, while space contracts (Einstein, 2005:891-921).

A little earlier than A. Einstein, the French mathematician H. Poincaré also developed a similar theory. His ideas were formed during a period of groundbreaking discoveries challenged conventional notions about the nature of mathematical knowledge. In 1902, H. Poincaré published the work "Science and Hypothesis", where he posited that time is a relative concept dependent on the observational context and distinct from three-dimensional space (Poincaré, 1917: 148 – 150).

B. Russell made a significant contribution to the study of space-time in the mathematical scientific field. In the work "The Principles of Mathematics", published in 1903, the scholar examined fundamental mathematical and logical concepts and attempted to construct a system based on logical principles. In the part "The Investigation of Time and Space", B. Russell proposed the idea that time and space are not absolute and independent of matter, but rather

depend on the movement and interaction of objects within them. He also delved the question of the possibility of measuring these aspects and explored their concepts put forth by renowned philosophers and scientists (Russell, 1996: 376 - 427).

In the field of geography, the study of space and time can be traced back to the investigations of Ptolemy in the 2^{nd} century, who created the first world atlas, which featured detailed maps of the globe and was based on his own observations (Ptolemy, 1843: 10-54).

Another ancient Greek geographer who made significant contributions to the study of space was Eratosthenes, who lived in the 3rd century BC. In the work "Geography", he hypothesized that the Earth is a sphere and calculated its volume by measuring the distance between two cities with known coordinates and using the angular distance between them. He also developed a system of geographic coordinates and divided the Earth's surface into latitudinal and longitudinal bands, which allowed him to create the first globe map (Geus, 2002: 67 – 107).

During the Middle Ages, geography was closely associated with mythology and religion, primarily focusing on describing countries and cities in terms of their cultural and religious aspects. However, with the arrival of the Renaissance and the Scientific Revolution, geography began to adopt more scientific approaches, including the utilization of mathematical models of space and time.

It should be noted that when terms transition from the natural and mathematical sciences to the humanities, they often become metaphorical in nature. However, this was not the case with the definition of "chronotope". Despite moving between fields, its meaning remained largely unchanged.

The space-time research in the philological discourse. The study of the artistic chronotope extends beyond the works of M. Bakhtin. Numerous renowned scholars have contributed to our understanding of this term by applying it to various types of literature and cultural contexts.

One of the most famous researchers of the artistic chronotope is T. Adorno, who explored the interaction between time and space in art and literature in his work "Aesthetic Theory". He placed particular emphasis on the role of space-time in shaping individuality and cultural identity. T. Adorno believed that the chronotope could serve as a crucial tool in shaping worldviews, highlighting its significance not only as an aesthetic category but also as a political one, as it influences our understanding



and evaluation of culture. Recognizing the procedural nature of aesthetic perception, he stated, "Artistic works synthesize incompatible, non-identical elements that collide with each other; they procedurally strive for the identity of the identical and non-identical because even their unity is only an element, not a magic formula for the whole" (Adorno, 2002: 240).

Another significant contributor to the study of the chronotope is the American literary critic G. Prince. In his notable work "Geographical Narratology", he provided a definition of the term and analyzed its role in the creation of literary works. G. Prince emphasized that the chronotope is not merely a description of space and time within a narrative but a more intricate category that encompasses cultural and historical contexts that influence the creation and perception of a work. He also proposed that space-time analysis can be applied to various literary genres, from novels to poems, as each genre possesses its own unique chronotope that reflects its specificity and societal functions (Prince, 2018: 175 – 177).

The study of the artistic chronotope was also pursued by the famous American literary critic and anthropologist E. Said. In his book "Culture and Imperialism", he analyzed the impact of imperialism on cultural processes and examined how imperial structures influence literary works. E.Said introduced the term of "textual community", which describes the relationship between a cultural and literary text and its social and historical context. According to this concept, every literary work is connected to a specific cultural group or "textual community" that it represents. This community may be associated with a particular historical era, geographical region, or cultural tradition, and the literary work reflects its cultural values, attitudes, and ideology. One important aspect of the "textual community" concept is the role of the artistic chronotope in shaping cultural and historical processes. The space-time in literature is also essential for understanding social and political phenomena (Said, 1994: 145 – 196).

The French poststructuralist-philosopher and literary theorist J.-F. Lyotard in his work "The Postmodern Condition: A Report on Knowledge" analyzed postmodern literature and culture, arguing that they are characterized by the absence of a dominant time and space, as they consist of numerous intertextual layers that interact with each other. J.-F. Lyotard introduced the term "simulacrum" to describe this phenomenon. He also highlighted that the chronotope in postmodern culture is unstable and ambiguous,

as time and space become dynamic and multiple, reflecting the diversity found in literary works (Lyotard, 1984: 96 - 105).

E. Auerbach, a German literary critic, philologist, and writer, is also famous for his study of the artistic chronotope in his work "Mimesis: The Representation of Reality in Western European Literature". In this research, he analyzed various textual chronotopes, in particular, in ancient Greek, biblical, and Renaissance literature. E. Auerbach argued that time is an integral part of a literary work, shaping its characteristics and imbuing it with meaning. He further observed that the emergence of the realistic genre in the Middle Ages was a result of a shift in the chronotope, as the historical world of individuals became more complex and multifaceted (Auerbach, 2003: 260 – 338).

J. Derrida, a French philosopher and one of the pioneers of postmodernism, also delved into the study of the chronotope. In his work "Archive Fever: A Freudian Impression", he focused on the term "archive" and its relationship with time and memory. Through his examination of archival materials, J. Derrida discovered that they embody a specific chronotope that is contingent upon the historical era and cultural context in which they were produced. Employing the concepts of deconstruction and fragmentation in his research, the philosopher sought to demonstrate that space and time are unstable and constantly shifting, influenced by historical and cultural transformations (Derrida, 1995: 9-63).

The study of the chronotope in philological discourse has also been the focus of Ukrainian literary scholars, who have made significant contributions to its research and analysis in literary works.

One such scholar is I. Silvestrova, a Ukrainian literary scholar and professor at the Ivan Franko National University of Lviv. Throughout her research career, she has dedicated a significant portion of her work to studying the theory of the chronotope and its application in the context of Ukrainian literature. In her works, she explores the interplay between space and time in literary texts and utilizes the theory of the chronotope to analyze the specificities of Ukrainian literature. One of her notable studies is the monograph "The Reflection of Time in Ukrainian Literature: Chronotope", in which she analyzes the distinct features of the chronotope in the literature of Ukraine, establishes the connection between time and space in the works of Ukrainian writers. and identifies the unique manifestations of spacetime in literary works overall. She emphasizes that "the chronotope can encompass multiple levels, which are reflected in the particular sequence of actions, varying depths of psychological analysis of the characters, their life experiences, and historical time" (Silvestrova, 2011: 22).

Kushnir, a Ukrainian culturologist and researcher of modern Ukrainian literature literary theory, has also examined the issues of the chronotope. One of his renowned works is "The Chronotopes of Ukrainian Postmodern Prose", published in 2012, in which the scholar investigates the specific characteristics of the chronotope in Ukrainian literature from the second half of the 20th century to the beginning of the 21st century. The author draws attention to the fact that the chronotope is not only an object of literary criticism but also a fundamental concept of literary theory that helps to understand the construction of the artistic world. I. Kushnir views the chronotope as the fusion of space and time within a literary work, which is reflected through specific images, scenes, and dialogues. He also highlights that "the chronotope can reflect both the historical, social, political, and philosophical realities of the time, as well as the mythological, psychological, world" and other components of the (Kushnir, 2012: 56).

O. Horpynych, a Ukrainian literary scholar and Candidate of Philology, has extensively studied various aspects of literature, including the chronotope. In the article "The Chronotope of Ukrainian Literature of the Second Half of the Twentieth Century", he explored the role and significance of space-time in Ukrainian literature of Modernism and Postmodernism. He analyzed numerous literary works, particularly those written after World War II, and examined how the chronotope influenced their structure and content. O. Horpynych emphasized that the space-time in Ukrainian literature of the second half of the 20th century is a complex and multifaceted phenomenon that cannot be reduced to a single specific function. The researcher viewed the chronotope as a dynamic element that continually changes and adapts to shifts in the social, political, and cultural landscape (Horpynych, 2011: 34 - 37).

Anotherinfluential researcher of the chronotope is N. Kopystianska, a Ukrainian literary critic. In the work "The Chronotope of Ukrainian Literature: Literary Space and Time", she explored the concept of the chronotope not only as a unique way of portraying time and space in literature but also as a fundamental literary

tool that enables writers to reflect the intricate realities of the world, delve into the psychology of characters, and convey the significance of events. N.Kopystianska delved into important aspects of the chronotope, including the historical and social factors that influence its creation, as well as the aesthetic and moral dimensions. She emphasized the inseparable nature of spatial and temporal organization, stating: "According to M. Bakhtin, the chronotope opens up new perspectives for interpreting culture because it holds the key to discovering the meaning of space and time as the primary categories of the artistic world. One crucial characteristic of the chronotope is that it is a specific instance of an image that cannot be dissected or separated into individual parts containing fragmented spatial or temporal elements. The chronotope is unity" (Kopystianska, 2006: 20).

Conclusion. Thus, by analyzing the prehistory of the term "chronotope", it becomes evident that the study of time and space began long before the emergence of the definition in fields such as philosophy, mathematics, physics, geography, and other branches of knowledge, reaching its zenith in literature. Each scientific discipline approached space-time from different perspectives and developed its own concepts. In turn, the artistic chronotope, as investigated by renowned scholars such as T. Adorno, G. Prince, J.-F. Lyotard, E. Auerbach, E. Said, J. Derrida, I. Silvestrova, I.Kushnir, O. Horpynych, and N. Kopystianska, utilized the concepts of time and space to create the authors' artistic images, reflect social, philosophical, and psychological aspects, and convey meaning to readers.

Conducting additional studies on the history of the chronotope research is necessary because the scientific legacy of scholars who investigate the spatio-temporal organization of works is continuously growing.

BIBLIOGRAPHY:

- 1. Адорно Т. Теорія естетики. Київ: Видавництво Соломії Павличко «Основи», 2002. 518 с.
- 2. Горпинич О. В. Хронотоп української літератури другої половини XX століття. *Літературний процес: український контекст.* Київ: Київський університет імені Бориса Грінченка, 2011. С. 34 37.
- 3. Копистянська Н. Х. (2006). Хронотоп української літератури: літературний простір і час. Київ: Фенікс, 2006. 208 с.
- Кушнір І. В. Хронотопи української постмодерністської прози. Наукові записки Національного університету «Острозька академія». Серія «Філологічні науки». Острог: Видавництво Національного університету «Острозька академія», 2012. С. 55 62.



- 5. Лук'янець В. С. Хронотоп. *Філософський енциклопе- дичний словник*. Київ: Інститут філософії імені Григорія Сковороди НАН України: Абрис, 2002. 742 с.
- 6. Сільвестрова І. В. Відображення часу в українській літературі: хронотоп. Київ: Дух і літера, 2011. 240 с.
- 7. Торфул М. Г. Логіка. *Енциклопедія Сучасної України*. Київ: Академія, 1999. С. 131 – 179.
- 8. Auerbach E. Mimesis: The Representation of Reality in Western Literature. Princeton: Princeton University Press, 2003. 616 p.
- Derrida J. Archive Fever: A Freudian Impression. Diacritics. Baltimore: The Johns Hopkins University Press, 1995. Vol. 25 № 2. Pp. 9 – 63.
- Descartes R. Discours de la méthode. Paris: L. Cerf, 1902.
 78 p.
- Einstein A. Zur Elektrodynamik bewegter Körper. Annalen der Physik. Leipzig: Wiley-VCH, 2005. Band 17. S. 891 – 921.
- 12. Galilei G. Dialogo sopra i due massimi sistemi del mondo. Milan: Rizzoli, 2014. 907 p.
- Geus K. Eratosthenes von Kyrene. Studien zur hellenistischen Kultur- und Wissenschaftgeschichte. München: Verlag C.H. Beck, 2002. 412 S.
- 14. Kant I. Kritik der reinen Vernunft. Ditzingen: Reclam, Philipp, jun. GmbH, Verlag, 1986. 1011 S.
- Lyotard J.-F. The Postmodern Condition: A Report on Knowledge. Minneapolis: University Of Minnesota Press, 1984. 144 p.
- 16. Minkowski H. Raum und Zeit. *Physikalische Zeitschrift*. Leipzig: S. Hirzel Verlag, 1909. Vol. 10. S. 104 111.
- 17. Poincaré H. La Science et l'Hypothèse. Paris: Ernest Flammarion, 1917. 292 p.
- Prince G. Geographical Narratology. Frontiers of Narrative Studies. Berlin: Walter de Gruyter GmbH, 2018. Vol 4. 392 p.
- 19. Ptolemaei C. Geographia. Lipsiae: Sumptibus et typis Caroli Tauchnitii, 1843. 284 p.
- Russell B. The Principles of Mathematics. New York:
 W. W. Norton & Company, 1996. 576 p.
- Said E. Culture and Imperialism. New York: Vintage, 1994.
 380 p.

REFERENCES:

- Adorno T. (2002) Teoriia estetyky [Aesthetic Theory]. Kyiv: Vydavnytstvo Solomii Pavlychko «Osnovy», 518 p. [in Ukrainian]
- 2. Horpynych O. V. (2011) Khronotop ukrainskoi literatury druhoi polovyny XX stolittia [Chronotope of Ukrainian literature of the second half of the 20th century]. Literaturnyi protses: ukrainskyi kontekst. Kyiv: Kyivskyi universytet imeni Borysa Hrinchenka, pp. 34 37. [in Ukrainian]
- imeni Borysa Hrinchenka, pp. 34 37. [in Ukrainian]
 3. Kopystianska N. Kh. (2006). Khronotop ukrainskoi literatury: literaturnyi prostir i chas [Chronotope of Ukrainian literature: literary space and time]. Kyiv: Feniks, 208 p. [in Ukrainian]

- Kushnir I. V. (2012) Khronotopy ukrainskoi postmodernistskoi prozy [Chronotopes of Ukrainian postmodern prose]. Naukovi zapysky Natsionalnoho universytetu «Ostrozka akademiia». Seriia «Filolohichni nauky». Ostroh: Vydavnytstvo Natsionalnoho universytetu «Ostrozka akademiia», pp. 55 – 62. [in Ukrainian]
- Lukianets V. S. (2002) Khronotop [Chronotope]. Filosofskyi entsyklopedychnyi slovnyk. Kyiv: Instytut filosofii imeni Hryhoriia Skovorody NAN Ukrainy: Abrys, 742 p. [in Ukrainian]
- Silvestrova I. V. (2011) Vidobrazhennia chasu v ukrainskii literaturi: khronotop [Representation of time in Ukrainian literature: chronotope]. Kyiv: Dukh i litera, 240 p. [in Ukrainian]
- Torful M. H. (1999) Lohika [Logic]. Entsyklopediia Suchasnoi Ukrainy. Kyiv: Akademiia, pp. 131 – 179. [in Ukrainian]
- Auerbach E. (2003) Mimesis: The Representation of Reality in Western Literature. Princeton: Princeton University Press, 616 p.
- 9. Derrida J. (1995) Archive Fever: A Freudian Impression.
 Diacritics. Baltimore: The Johns Hopkins University
 Press, Vol. 25 № 2, pp. 9 63.
- Descartes R. (1902) Discours de la méthode [Discourse on Method]. Paris: L. Cerf, 78 p. [in French]
- Einstein A. (2005) Zur Elektrodynamik bewegter Körper [To the electrodynamics of moving bodies]. Annalen der Physik. Leipzig: Wiley-VCH, Band 17, pp. 891 – 921. [in German]
- 12. Galilei G. (2014) Dialogo sopra i due massimi sistemi del mondo [Dialogue Concerning the Two Chief World Systems]. Milan: Rizzoli, 907 p. [in German]
- Geus K. (2002) Eratosthenes von Kyrene. Studien zur hellenistischen Kultur- und Wissenschaftgeschichte [Eratosthenes of Cyrene. Studies in Hellenistic cultural and scientific history]. München: Verlag C.H. Beck, 412 p. [in German]
- 14. Kant I. (1986) Kritik der reinen Vernunft [The Critique of Pure Reason]. Ditzingen: Reclam, Philipp, jun. GmbH, Verlag, 1011 p. [in German]
- 15. Lyotard J.-F. (1984) The Postmodern Condition: A Report on Knowledge. Minneapolis: University Of Minnesota Press, 144 p.
- Minkowski H. (1909) Raum und Zeit [Space and Time]. Physikalische Zeitschrift. Leipzig: S. Hirzel Verlag, Vol. 10, pp. 104 – 111. [in German]
- 17. Poincaré H. (1917) La Science et l'Hypothèse [Science and Hypothesis]. Paris: Ernest Flammarion, 292 p. [in French]
- Prince G. (2018) Geographical Narratology. Frontiers of Narrative Studies. Berlin: Walter de Gruyter GmbH, Vol 4, 392 p.
- 19. Ptolemaei C. (1843) Geographia [Geography]. Lipsiae: Sumptibus et typis Caroli Tauchnitii, 284 p. [in Latin]
- Russell B. (1996) The Principles of Mathematics. New York: W. W. Norton & Company, 576 p.
- 21. Said E. (1994) Culture and Imperialism. New York: Vintage, 380 p.