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The Heuristic Potential of the Synergetic Paradigm in Law and Criminology

Abstract. This article delves into the conceptual foundations, perspectives, and ideas surrounding the essence of an interdisciplinary (multidisciplinary) scientific direction termed “synergetics”. The authors posit that synergetic concepts are valuable in criminology both for elucidating the causes of criminal behavior and for structuring systems of crime prevention and legal influence. From a synergetic standpoint, randomness can serve not merely as a manifestation of necessity but also as its complement. In explaining the roots of criminality, employing the principle of subordination in criminology could also prove beneficial. When understanding the causal nexus of criminality, it becomes pivotal to identify overarching indicators that play a primary, defining role within the complex.

Keywords: synergetics, system, paradigm, law, criminology, criminality, mechanism, determination.

Introduction. Considering our modern world which is characterized by information-rich social processes and computerization, it becomes evident that former methodological approaches to modeling complex social phenomena either fail to consider or significantly underestimate the influences of intricate social evolutionary processes and the constructive nature of chaos in evolution. The paradigm of modernism in the early 21st century, wherein technological civilization continually produces local and global problems, is facing a profound theoretical crisis¹. In this regard, Evandro Agazzi notes, “It seems as though society has transitioned from scientism to anti-scientism; in other words, the understanding of science and technology as absolute and unconditional goods has shifted towards viewing them as bearers of evil”².

Given these challenges, the latter half of the 20th century witnessed a surge in interdisciplinary scientific research. Through syncretic synthesis, attempts were made to address “old” and “new” challenges in human development on the contemporary stage. A prime example of this is the emergence of

¹ Дзюбань О.П. Розвиток ідей синергетики як нової парадигми у природничо-науковому і соціальному пізнанні. Вісник Нац. юрид. акад. України ім. Я. Мудрого. Сер.: філософія права, політологія, соціологія: зб. наук. праць. Х.: Право. Вип. 9. С. 3.

² Agazzi E. Responsibility: the Genuine Ground for the Regulation of a Free Science. *Scientists and their Responsibility*. Publishing International, 1989. 235 p.

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Declaration of Competing Interest

The author declare that they have no conflict of interest.

a new scientific paradigm based on an interdisciplinary (or multidisciplinary, as termed by English and German researchers) scientific approach, which came to be known as “synergetics.” It is considered a new (non-classical) or post-non-classical scientific paradigm, originating within natural sciences (in contrast to the classical, Newtonian paradigm of the 17th century and the so-called neoclassical paradigm, which emerged at the turn of the 19th and 20th centuries)³.

Research Literature Review. This approach was grounded with the fundamental research of O. M. Bandurka, O. M. Dzhuzh, I. Pryhozhyn, V. Zanh, R. A. Kaliuzhnyi, O. M. Lytvynov, S. Yu. Lukashevych, I. Lukinov, M. Moiseiev, Yu. Yu. Orlov, N. Ye. Filipenko, H. Khaken ta inshykh and other scholars. Their research established the fundamental stages and formation of the synergetic paradigm in law and criminology. The issue of comprehensive analysis and evaluation of legal development and effectiveness is widely debated and studied in scientific literature and in the practice of applying criminological approaches to crime prevention.

Research Objectives. This research is to assess the synergetic paradigm in law and criminology by relying on research into systemic efficiency and synergy requirements while considering time.

Research Content. Synergetics, derived from the Greek “Synergetikos” meaning “coordinated” or “harmonized,” represents a fresh and pertinent approach to studying global issues and processes. This scientific discipline explores the interconnections among elements (subsystems) within open systems, including biological, physical-chemical, geological-geographical, and potentially global systems. These systems engage in intense exchanges of matter, energy, and information with their surrounding environment, typically in non-equilibrium conditions. Within such systems, we observe the coordinated behavior of subsystems, resulting in increased orderliness and a reduction in entropy—an indication of the self-organizing process. Contemporary synergetics is a conceptual framework for understanding the regularities governing the structure, operation, and evolution of open systems. This framework applies not only to a range of global issues and processes but also to the broader context of the global world system. Furthermore, the fundamental principles of the synergetic self-organization concept can be extended to encompass globalization processes⁴.

However, as a distinct scientific field, synergetics only took shape in the 1970s. Hermann Haken, its founder, defined synergetics as the science of self-organization, a theory of “the collective action of many subsystems resulting in the emergence of structure and corresponding functioning on a macroscopic level.” In the 1970s, Haken, while investigating the presence of general laws of self-organization, proposed to study it as a distinct discipline, which he named synergetics⁵.

The theoretical foundation of the science, later widely recognized as “synergetics” or the “synergetic paradigm,” was laid by private theories within the natural sciences. The underlying principles and methodology of these theories later acquired a metatheoretical and metascientific character. These theories included dissipative structures theory (Illia Pryhozhyn, Grégoire Nicolis, Isabelle Stengers and others), dynamic chaos theory (Henri Poincaré, Hermann Haken and others), unlinear dynamics theory (D. S. Chernavskiy, H. H. Malynetskiy, D. I. Trubetskov, S. P. Kurdiumov

³ Бойко-Бойчук Л. Синергетика як методологічний підхід у дослідженнях соціальних наук. *Людина і політика*. №5. С. 56.

⁴ Рябініна, О. В. (2017) Глобальні проблеми сучасності. глобалізація як предмет філософського аналізу. URL: http://univer.nuczu.edu.ua/tmp_metod/2160/lkc.pdf

⁵ More detailed here: Haken H. *Advanced Synergetics*, Springer Ser. Synergetics, Vol. 20, 2nd corr. printing (Springer, Berlin, Heidelberg 1987); Haken H. *Synergetics, An Introduction*, Springer Ser. Synergetics, Vol. 1, 3rd ed. (Springer, Berlin, Heidelberg 1983); Haken H. *Synergetics: Introduction and Advanced Topics* (Springer, Berlin, Heidelberg 2004).

and others). A significant contribution was made by the development of the methodological and theoretical foundations of the general systems theory (Ludwig von Bertalanffy, Charles Churchman, W. Ross Ashby, I. V. Blauberg, and others).

In addition to Hermann Haken (the Stuttgart school of thought's founder), various other scholars contributed to the synergetics development. For example, as mentioned earlier, Illia Pryhozyn (the founder of the Brussels school of thought), developers of catastrophe theory Vladimir Arnold and René Thom, one of the pioneers of chaos theory from the USA, Mitchell Jay Feigenbaum (dynamic chaos theory), domestic scientists I. Dobronravov, V. Tsykin, O. Dzyoban, and many others. In our own research, we have also sought to define the place and role of the synergetic paradigm as a methodological basis for legal and criminological studies⁶. It should be noted that the scientific exploration of the position, role, and possibilities and limitations of synergetics in law is ongoing.

Regarding contemporary legal methodology changes, some shifts reflect the overarching methodological crisis in domestic social sciences rooted in the crisis of so-called materialistic dialectics (the utopian communist idea collapsed, destabilizing its methodological foundation – dialectics). Others signify revolutionary transformations across the entire sphere of scientific knowledge, particularly those associated with the emergence of a synergetic worldview, which is supplanting dialectical-materialistic concepts. The adoption of these new methodological approaches in legal scholarship is not mere fashion or a superficial update of old, familiar tenets.

As for the holistic study of law, this synergetic methodology is not a superficial borrowing but signifies an intrinsic need to explore law in its evolving forms. These forms are commensurate with humanity's global shift toward self-regulating market processes in economic life, the development of a powerful global information domain, political polycentrism (the rise of multiple major centers), and spontaneous tendencies in international affairs. Materialistic dialectics, which once emphasized the primacy of the inevitable over the incidental, has exhausted its cognitive and predictive potential in the social realm, including the legal sphere, due to new knowledge and historical experiences. In its stead, synergetics, as a philosophical doctrine, offers a renewed perspective on the roles of the inevitable and the incidental in evolutionary processes. That is, synergetics can elucidate a broader range of phenomena than materialistic dialectics and encompasses the latter as a specific instance.

Both O.M. Bandurka and O.M. Lytvynov have noted the potential of using a synergetic approach in legal research⁷. It is worth recalling that synergetics has undergone several developmental stages:

Prior to the 1970s – a stage focused on developing theoretical models to describe specific effects within various unconnected scientific disciplines

⁶ More detailed here: Serhii Lukashevych & Valeriy Obolentsev & Yuriy Ponomarenko (2020) Systematic Transformation Processes of Crime in the Financial and Economic Spheres and the Prevention of Criminal Leadership. Materials VI International Conference on Social, economic and academic leadership (ICSEAL 2019) held during 13th -14th of December 2019 (Prague, Czech Republic). Published by Atlantis Press SARL 2020/5/27. Prague. P. 149-156.; Лукашевич, С. Ю. & Груба, Д. І. (2013) Місце синергетичної парадигми в методології правових й кримінологічних досліджень. *Теорія і практика правознавства*. Випуск 1(3)/2013. URL: http://nauka.jur-academy.kharkov.ua/download/el_zbirnik/1.2013/Gruba.pdf; Лукашевич, С. Ю. & Салаєва, К. А. (2021) Синергетика в кримінології: евристика та лімітація // *Злочинність і протидія їй в умовах сингулярності: тенденції та інновації* : зб. тез доп. наук.-практ. конф., присвяч. пам'яті члена Правління Кримінологічної асоціації України, професора Тетяни Андріївни Денисової (м.Харків, 16 квіт. 2021 р.) / МВС України, ХНУВС, Кримінол. асоц. України. Харків : ХНУВС. 464 с. С. 106-108. URL: <https://visnikkau.webnode.com.ua/news/zlochinnist-i-protidiya-jij-v-umovakh-singulyarnosti-tendentsiji-ta-innovatsiji-ta-in>.

⁷ Bandurka O. M., Lytvynov O. M. Synergetics Approach and Issues of Criminological Science Methodology. URL: <https://dspace.univd.edu.ua/server/api/core/bitstreams/55d6e618-946e-4ba8-a60a-4892acbc67d0/content>

L'article analyse les principes conceptuels, les points de vue et les idées concernant la compréhension de l'essence de la direction scientifique interdisciplinaire (multidisciplinaire), appelée synergie. Les auteurs estiment que les idées synergiques sont utiles en criminologie à la fois pour expliquer les causes du comportement criminel et pour organiser des systèmes d'influence préventive et juridique sur la criminalité. Du point de vue de la synergie, le hasard peut apparaître non seulement comme une manifestation de la nécessité, mais aussi comme un complément à celle-ci. L'utilisation par la criminologie du principe de subordination peut également être utile pour expliquer les causes de la criminalité. Pour comprendre le complexe causal de la criminalité, il serait très important de trouver les indicateurs généralisants qui jouent le rôle principal et déterminant dans le système dudit complexe.

Mots-clés : synergie, système, paradigme, droit, criminologie, crime, mécanisme, détermination.

(e.g., the physical properties of lasers, thermodynamics, catastrophe theory, global ecology, biological system theory, etc.).

From 1970 to 1975 – during which similarities in equations used to describe complex systems of varied natures were discovered, as well as similarities in their behavior. This period saw an intense development in applying self-organization ideas across diverse research domains (like quantum physics, astrophysics, demography, history, linguistics, and etc.).

Post-1975 marked the beginning of the conceptual phase of self-organization, emphasizing the establishment of a concrete interdisciplinary research program. This phase was characterized by a strategy of “globalizing” synergetic concepts⁸.

Founders of this new scientific direction have made multiple attempts to analyze its formation sources: quantum mechanics, thermodynamics, the physics of non-equilibrium states, and the dynamic systems theory. For instance, in biology, there was an understanding of development as a probabilistic process. Charles Darwin's theory elucidated how ordered evolution arises from chaotic, unregulated variability in living nature, leading to the modern biosphere. Due to Darwin, natural science first “encountered” synergetics. Over the recent decades, the evolutionary perspective and probabilistic approach, inherent to biology, began to be actively applied in natural sciences concerning inorganic nature, in physics, chemistry, and in social sciences and cognitive studies⁹.

Quantum physics played a pivotal role in the development of synergetics. It brought about revolutionary transformations in the scientific worldview. Specifically, its principles of uncertainty, complementarity, and probabilistic notions (alongside the theory of relativity) dealt a devastating blow to perceptions based on linear-mechanistic worldviews. Cybernetics also significantly influenced synergetics, particularly by introducing the mechanism of feedback. This is where the behavior of a system can amplify external action (positive feedback). As researchers note, the concept of feedback, introduced by Norbert Wiener, “breaks away from the principle of linear causality and introduces the concept of a causal loop”¹⁰.

As previously noted, beyond the mentioned theories, the theoretical foundations of synergetics were laid by the general systems theory. Ludwig von Bertalanffy, its author, is considered one of the founding fathers of synergetics. Systems theory identifies three core concepts¹¹:

Dynamic system: a system whose parameters and properties change over time due to external or internal influences, including random ones.

System complexity: a concept related to the structure of its elements (system elements can themselves be systems capable of self-organization and, in some cases, co-development or co-evolution).

Bifurcation: a fundamental characteristic of complex systems prone to significant influences and stresses, marking the selection of a new evolutionary path.

The catastrophe theory also warrants attention. This theory developed a mathematical apparatus to describe catastrophic processes, i.e., the abrupt changes in a system's state and structure, be it human-caused, natural, ecological, or social.

⁸ Кримінологічний довідник : довідкове видання / за наук. ред. д-ра юрид. наук, проф., акад. НАПрН України Бандурки О. М. ; за заг. ред. д-ра юрид. наук, проф. Джужі О. М. і д-ра юрид. наук, проф. Литвинова О. М. Харків : Золота миля, 2013. С. 310-311.

⁹ Дзьобань О. П. Розвиток ідей синергетики як нової парадигми у природничо-науковому і соціальному пізнанні. Вісник Нац. юрид. акад. України ім. Ярослава Мудрого. Серія: Філософія, філософія права, політологія, соціологія : зб. наук. пр. Харків : Право. Вип. 9. С. 5.

¹⁰ Wiener Norbert Cybernetics or control and communication in the animal and the machine. second edition the M.I.T. PRESS. Cambridge, Massachusetts. 229 p.

¹¹ Von Bertalanffy Ludwig General System Theory. 1950. URL: http://www.nwlink.com/~donclark/history_isd/bertalanffy.html



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**THE HEURISTIC POTENTIAL OF
THE SYNERGETIC PARADIGM IN
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Abstract. This article delves into the conceptual foundations, perspectives, and ideas surrounding the essence of an interdisciplinary (multidisciplinary) scientific direction termed "synergetics". The authors posit that synergetic concepts are valuable in criminology both for elucidating the causes of criminal behavior and for structuring systems of crime prevention and legal influence. From a synergetic standpoint, randomness can serve not merely as a manifestation of necessity but also as its complement. In explaining the roots of criminality, employing the principle of subordination in criminology could also prove beneficial. When understanding the causal nexus of criminality, it becomes pivotal to identify overarching indicators that play a primary, defining role within the complex.

Keywords: synergetics, system, paradigm, law, criminology, criminality, mechanism, determination.

It is important to approach the scientific and theoretical underpinnings of any emerging scientific paradigm from historical, epistemological, and methodological perspectives. One of the main reasons for the emergence of a new paradigm is new fundamental scientific discoveries. For synergetics, these were the discoveries in exact sciences and the study of dissipative structures by the Brussels scientific school of Illia Prihozyn. The dissipative structures concept was adopted by scientists, applied to other scientific fields, and, gaining traction, spurred interdisciplinary research. However, these scientific discoveries are not the only factors that propelled the emergence and development of the synergetic approach. Other significant factors include social and methodological ones.

Concerning methodological factors, the need for a shift in worldview and the quest for new scientific world models lies, according to renowned American philosopher Alvin Toffler, in the transition from an industrial society with its massive energy, capital, and labor expenditures to a society driven by advanced technology. In this society, critical resources are information and technological innovations, prompting the search for new scientific world models.

Other methodological factors include the pursuit of universal models to explain complex phenomena, systems, and processes; the insufficiency of the positivist paradigm; the inability to explain all phenomena in deterministic terms; and the accumulation in various scientific fields of a critical mass of ideas and research for which the conceptual notions of the synergetic approach became common among many researchers. Synergetics can justifiably be viewed as a logical stage in humanity's evolving understanding of global developmental processes¹². Among the social factors, phenomena and processes of a systemic nature stand out, such as the complexity of social communications, the emergence and evolution of globalization, and the rapid acceleration of social processes combined with the intensifying pace of social change. These processes and phenomena distinctly exhibit attributes typical of dissipative structures: multi-dimensionality, multifunctionality, system openness, and an inherent inclination towards structure formation and development – self-organization.

Synergetics owes its origins to natural science knowledge. Thus, applying it to other disciplines becomes complex, leading to a certain insularity in synergetics and hindering its intensive integration into the realm of socio-philosophical knowledge. The appropriateness of using terms alien to social sciences has often been questioned. Isabelle Stengers pointed out that the "entropy metaphor tempted authors of certain works on social and economic issues. When applying natural science concepts to sociology or economics, caution is necessary"¹³. She highlighted that the language of synergetics is inadequate for constructing a worldview, as it does not encompass the specificities of social objects.

Contrastingly, Haken held a unique perspective on this matter. He was the first to recognize the potential of explaining ecological, social, and economic issues through synergetics. He analyzed the formation of public opinion, the transition from full to partial employment, and the evolution of society from agrarian to industrial. As a result, the productive use of this new terminology became evident over time, especially with the assimilation of its conceptual foundation and the new worldview development.

In the methodology of social cognition, synergetic categories such as instability and stability, attractor, and bifurcation prove productive. They aid in transforming social science from being descriptive to becoming theoretical.

¹² Бойко-Бойчук Л. Синергетика як методологічний підхід у дослідженнях соціальних наук. *Людина і політика*. №5. С. 57-58.

¹³ Ilya Prigogine, Isabelle Stengers *Order Out of Chaos: Man's New Dialogue with Nature*. Bantam Books, 1984. 349 p. C. 369.

This entails assessing the actions of individuals and masses within both their cultural-psychological coordinates and alternative scenarios. Specifically, a synergetically-thinking sociologist, political scientist, or lawyer can no longer evaluate a particular decision merely by comparing its past and future states. Instead, they must compare the actual course of subsequent events with what would have been probable under an alternative key decision. Synergetic concepts are more encompassing and information-rich, facilitating a deeper understanding of social problems in the contemporary post-neoclassical phase of scientific development. Specifically, it is synergetics, with its intricate and seldom-used concepts among sociologists and political scientists, which offers avenues for the productive analysis of large-scale social phenomena such as turmoil, revolution, and restructuring. In other words, synergetic categories provide fresh insights into issues of social development. The contribution of social synergetics in shaping a “flexible and malleable language” that universally describes the system of social nature is undeniable. However, further philosophical consolidation of these insights is required¹⁴.

Currently, the terminological framework of the socio-synergetic paradigm reflects a rapid transition from conceptual (general scientific) to categorical (philosophical) understanding. This transition is feasible as both natural and humanities disciplines analyze the universal process of development as one of organization and self-organization. Synergetic development scenarios are assimilated through interdisciplinary synthesis of various scientific directions (laying the groundwork for further theoretical consolidation), by integrating new specific and general scientific concepts into the established philosophical framework, and by advancing philosophical knowledge itself. In turn, social synergetics, by broadening the scope of understanding and researching social systems, adds depth to traditional socio-philosophical concepts: order and chaos, open and closed societies, alternatively, the wave-like nature of the socio-historical process, and reform as societal self-development.

The study of self-organization processes and its conceptual framework can serve as a starting point for the emergence of new images and notions in both science and its philosophical interpretation.

The development of the socio-synergetic paradigm is progressing rapidly. The influence of socio-synergetic laws is also evident in cultural history—transitioning from one level of organization to a higher one, through coordination of ordered cultural elements that emerge with unregulated patterns, and through the accumulation of entropy in varying system states (alternating states of harmony and chaos, from which new harmony arises).

Considering this, it is evident that social synergetics is in an active, exponential phase, but debates regarding its subject matter and interpretations of social reality persist. Many researchers perceive social synergetics merely as a niche theory. However, social synergetics pursues a broader objective—identifying common ideas and patterns of self-development across various domains of social knowledge. It unveils universal mechanisms of self-organization in social systems. This very reason substantiates the view of synergetics as a unifying direction in scientific research¹⁵.

Several factors underpin the argument for the paradigmatic nature of social synergetics: the existence of multiple divergent trends within synergetics, the philosophical abstraction of synergetic ideas, and the universality of synergetics. The assertion that social synergetics represents a new paradigm in socio-philosophical knowledge aligns with Thomas Samuel Kuhn’s mid-20th century conception of paradigms. There is an emergence of a new research

¹⁴ Дзюбань, О.П. (2011) Розвиток ідей синергетики як нової парадигми у природничо-науковому і соціальному пізнанні. *Вісник Нац. юрид. акад. України ім. Я. Мудрого*. Сер.: філософія права, політологія, соціологія: зб. наук. праць. Х.: Право. Вип. 9. С. 9-10.

¹⁵ Там само.



stance, advancing fundamental theoretical concepts about humans and society. This paradigm signifies the establishment of a novel human perspective on the world and their place within it. However, unlike classical science, synergetics is not anthropocentric; it relies not on human will, but on the Universe's. This new worldview portrays a model of human self-development in a self-organizing world¹⁶.

Thus, it is possible to articulate three critical points: first, in this new methodology, society is viewed as a complex (even supercomplex) open nonlinear system that exchanges energy, matter, and information with its external environment and, in bifurcating states, acquires the potential for self-development. Such a perspective profoundly alters traditional views on the nature of social processes.

Secondly, synergetics allows us to move away from the rigid binary evaluation of social process outcomes as "black-white" or "chaos-order." This shift leads to an understanding of the dual nature of practice and recognizes the ambivalent nature of chaos, which can be both destructive and creative, "propelling" a system at a bifurcation point to establish a new order.

Thirdly, imposing a specific order on a social system that contradicts its inherent nature inevitably leads to the disintegration of the envisioned framework in the future. This point deserves emphasis¹⁷.

In conclusion, the methodological superiority of social synergetics over the previously mentioned theories becomes apparent. This advantage stems from its comprehensive examination of ordering and organization processes, rather than from a specific research perspective. Social synergetics encompasses all stages of the universal process of society's self-organization as an evolution of order: its emergence, growth, self-complexification, and disintegration, covering the entire developmental cycle of the system in terms of its structural arrangement. In other words, synergetics can be regarded as the most holistic and integrated theory of order and chaos since it explores various phases (levels) of order and identifies the varying roles of chaos at these stages of order formation. The philosophical and worldview significance of synergetics is comparable to the impacts of the greatest scientific revolutions¹⁸.

The relevance of examining the role of the synergetic paradigm in jurisprudence arises from the contemporary methodological and theoretical context in social-humanitarian and legal studies. These fields primarily operate within a linear paradigm that typically portrays social evolution as a singular and unalterable progression. Such notions about social dynamics necessitate change. Today, there is an urgent issue of adapting to global transformations and establishing a worldview that aligns with modern times, enhancing our understanding of various legal phenomena and processes¹⁹.

Synergetics, as a philosophical cognition method, offers fundamentally original approaches to understanding reality. By employing synergetics, scholars anticipate significant positive outcomes in the form of novel scientific theories across diverse domains of human knowledge. These theories aim to elucidate the mechanisms behind the emergence and development of various phenomena in both the tangible world and the realm of ideas. It is synergetics that can provide fresh insights into age-old philosophical questions about the relationship between the tangible and intangible, the origins and forms

¹⁶ Ibid. P. 11

¹⁷ Бойко-Бойчук, Л. (2003) Синергетика як методологічний підхід у дослідженнях соціальних наук. *Людина і політика*. №5. С. 62.

¹⁸ Дзьобань, О.П. (2011) Розвиток ідей синергетики як нової парадигми у природничо-науковому і соціальному пізнанні. *Вісник Нац. юрид. акад. України ім. Я. Мудрого*. Сер.: філософія права, політологія, соціологія: зб. наук. праць. Х.: Право. Вип. 9. С. 14.

¹⁹ Корунчук, Л.А. (2011) Проблеми використання синергетичного підходу при дослідженні правових явищ. *Часопис Київського університету права*. №3. С. 58.

of matter's existence, the unity of the micro-, macro, and megaworlds, the mechanisms of life and intellect's emergence, the boundaries of cognition, and the directions of societal development.

A fundamental distinction between synergetics and other traditional scientific methodologies is that while it studies complex systems, it does not primarily examine the essence of the constituent parts (elements) of these systems (which is the focus of "classical" scientific analysis). Instead, it prioritizes the nature of systemic connections between these elements. Such an approach yields unique results. The most significant of these is the discovery of universal laws that apply equally to all systemic formations, regardless of the complexity level of their constituent elements, whether they be physical, chemical, biological, psychological, social, or technical. This universality and isomorphism of synergetic laws pave the way for the gradual development of a "general scientific", interdisciplinary language, fostering better understanding between representatives of exact and humanities-based sciences, such as physicists and sociologists, or engineers and lawyers.

It is worth noting that the potential to explain social (including legal) phenomena from the natural-science perspective of synergetics is revolutionary from a methodological standpoint. This makes it quite appealing to researchers, promising to yield unexpected and progressive results²⁰.

Synergetics represents a new scientific direction, serving as the methodological foundation for elucidating the self-organization theory in contemporary jurisprudence. It seeks to identify universal laws governing the evolution and self-construction of intricate legal systems and the evolution of open, non-equilibrium systems of any nature. The relevance of the synergetic methodology in legal theory arises due to the increasing number of legislative acts, their expanding scope, and their encompassing of diverse, sometimes conflicting societal interests. This synergetic approach in legal theory advances the self-organization concept, highlighting the escalating risk of disorganization. It sheds light on the unforeseen reactions of entities within the operational realm of legal relations.

The synergetic approach offers a fresh perspective on resolving contradictions within normative and other legal documents. A structural-systematic approach aids studies within state and legal theories. The distinctiveness of the synergetic approach lies in its substantial focus on examining the inconsistencies within the legal system. Thus, introducing and justifying the need for a synergetic approach in law is a critical and relevant scientific endeavor. Moreover, employing synergetic ideas permits the adoption of a novel set of research methods and principles in legal theory. Synergetic concepts can unlock substantial potential to enhance the effectiveness of legal regulation.

Before applying synergetic methodology in jurisprudence, comprehensive research must precede, aimed at defining its appropriate scope of application. In other words, it is imperative to first determine which legal phenomena can be studied using the laws and principles of synergetics while ensuring the scientific integrity necessary for obtaining objective results.

To address the posed question, let us first note that only systems, defined as collections of elements with internal (or intra-systemic) connections, can be studied using the specific categorical-methodological tools of synergetics. It is recognized that all legal phenomena can be viewed as elements of a single system, referred to in academia as the legal system. The legal system is a symbolic system that mirrors the reality of a particular society so closely that it is inseparable from it. When studying this symbolic system, legal science

²⁰ Джужа О. М., Орлов Ю. Ю., Каложний Р. А. Щодо можливості вивчення правових явищ з позицій синергетики. *Право і суспільство*: Вип. 2: Наук. журнал/ Гол. ред. М.В. Корнієнко. Дніпропетровськ. С. 3-4.

can base its approach on the premise that the legal system represents the life of the respective society or an aspect of international relations. Furthermore, it can examine the legal system as an independent symbolic system with its own inherent logic, distinct from the underlying social phenomena it is based upon²¹.

As scholars point out, the legal system consists of legal concepts and their interrelations, which abstractly mirror specific aspects of the real world. Legal concepts represent the juridical significance of real-world facts, while the connections between these concepts reflect the legal relevance of relationships among such facts. This stems from humanity's ability to abstract. However, the linguistic or other symbols used to denote real-world facts are not absolutely standardized, permanent, or purely logical. Symbols rely on consensus or widespread practice among people or nations. Moreover, they are not constant; symbols representing certain realities may vary across historical epochs or societies and evolve over time. Although the legal system arises from abstracting certain real-world aspects, as a sign system, it exists independently of that world. The ongoing dialogue between law and reality represents the interaction between the legal system and society. The legal system evolves due to the cumulative influence of society on the law and vice versa. Law can function as a potent mechanism for society's self-organization. In various processes involving law, such as social change, maintaining social order, and conflict resolution, the multifaceted social reality is represented within the confines of the legal system. In this format, they can be clearly grasped by their intended audience. Thus, society creates a subsystem like the legal system, representing a specific self-organized system²².

For a system to exhibit synergistic principles, it must be sufficiently complex. The phenomenon of self-organization (the structures formation) can only be observed in systems with a considerable number of elements; otherwise, there would be nothing to participate in the structuring processes at the "macro level." Known elements of the legal system include positive law, law-making, legal relations, justice, legal regulation, legal institutions, legal consciousness, and more. There is no exhaustive list of the legal system's elements due to the lack of clear criteria for categorizing various social phenomena²³. Thus, one can conclude that the legal system is a highly intricate formation, making its examination through the lens of synergistic methodology and using synergistic scientific tools not only possible but also essential.

Synergistic principles manifest only in open systems, meaning those that interact with their surrounding environment. The legal system, born from society, is an integral component and aspect of its operation. It evolves based on the need to regulate specific social relations by legal norms. Thus, society serves as the external environment for the legal system. In other words, the legal system is a component or subsystem of a higher-level entity – the social system. Continuous processes of energy and information exchange occur between society and the legal system. In the language of synergetics, information about societal needs acts as a "pump," leading to the formation of structures within the legal system (like legal phenomena, legal institutions, and legal relations). In turn, the legal system significantly influences the state of society, altering its energy and information characteristics, either aiding or hindering its progression. It is essential to recognize that the social system also encompasses other subsystems—economic, political, ideological, etc.—

²¹ Tamanaha B. Z. Law and society. *Legal Studies Research Paper Series Paper*. №09-0167. P. 12.

²² Kawaguchi, K. R. (2003) A Social Theory of International Law International Relations as a Complex System / Kazuko R. Kawaguchi. Springer-Science+Business Media. B. V. P. 73.

²³ Джужа, О. М. & Орлов, Ю. Ю. & Калюжний, Р. А. (2009) Щодо можливості вивчення правових явищ з позицій синергетики. *Право і суспільство*: Вип. 2: Наук. журнал/ Гол. ред. М.В. Корнієнко. Дніпропетровськ. С. 4-5.

which maintain close ties with the legal system and significantly influence it. Therefore, to identify and study synergistic principles within the legal system, researchers must consider it in conjunction with other societal subsystems²⁴.

It is worth noting that today's approach to studying legal phenomena rarely takes a comprehensive stance. Legal professionals remain largely unaware of the real mechanisms connecting legal and non-legal aspects within the intricately organized system of public life. While many researchers acknowledge the close interrelation of law with economics, politics, morality, and the like at a doctrinal level, they often sidestep dedicated exploration of these issues in their works. Furthermore, a prevailing sentiment among legal scholars advocates for preserving the "purity" of their discipline. This mindset tends to decisively overlook questions extending beyond purely legal concerns. One might agree with this perspective if the process of legal regulation resembled some static laboratory procedure, operating under constant and unchanging conditions, where variations are negligible. However, reality presents a stark contrast: it exemplifies a highly unsteady and open process, with its development and outcomes shaped by external factors. Without examining these factors, lawyers' understanding of their research subject becomes a crude abstraction, significantly impoverishing and simplifying the actual scenario.

The lack of a comprehensive, interdisciplinary approach to studying legal phenomena is clearly a significant reason for the questionable adequacy of legal documents and their insufficient effectiveness in application.

Beyond this, it is essential to recognize that the principles of synergetics are observable primarily in dynamic systems. Movement in such a system, philosophically speaking, represents its development. From a synergetic standpoint, this is seen as a sequence of processes involving organization and chaotic disintegration. Additionally, it is important to note that a system's development can occur not just over time but also spatially, manifesting as spatial distribution or expansion.

The legal system and its components are in a state of continuous evolution, influenced by a range of factors. The primary driver of this evolution is the need to organize societal relations. Furthermore, the development of legal systems varies across different nations²⁵.

In conclusion, it is evident that legal phenomena can be studied from a synergetic perspective, given their systemic, complex, open, and dynamic nature. It is within such systems that self-organization processes occur, representing the interaction (either opposition or coordinated movement) of system elements under external environmental influences.

To conclude, it is worthwhile to briefly explore potential avenues for researching legal phenomena using synergetic principles. When considering promising directions, one could focus on the study of legal acts and contracts. Investigating judicial precedents, legal customs, the process of law-making, legal relations, legal consciousness, and many other components of the legal system also holds promise.

Research on regulatory acts and normative agreements should be distinguished by the issues that arise regarding specific types of social relations they govern. Additionally, such research can be conducted either retrospectively (across time), across various legal systems (spatially), or simultaneously in both time and space. Its aim could be, for instance, to determine the potential for extending the human rights paradigm to all legal systems (e.g., "Is the oppression of one nation a condition for another's

²⁴ Джужа, О. М. & Орлов, Ю. Ю. & Калужний, Р. А. (2009) Щодо можливості вивчення правових явищ з позицій синергетики. *Право і суспільство*. Вип. 2: Наук. журнал/ Гол. ред. М.В. Корнієнко. Дніпропетровськ. С. 5.

²⁵ Там само. С. 6.



freedom?”) or to explore the transformation pathways of Muslim law towards European legal traditions, among others.

Studying judicial precedents proves promising as they directly reflect the processes of social self-organization. A court's decision on a specific case, being a legislative act, simultaneously orchestrates particular social relations. A judge's choice from rulings can be viewed as a bifurcation point (a system's decision on its future direction), while the factual circumstances influencing the judge's decision function as fluctuations (random processes affecting that choice). Therefore, the system of legal norms based on judicial precedents directly emerges from processes of self-organization in society.

One can also surmise that legal customs arise because of social self-organization processes, naturally forming as an expression of public opinion on certain behavioral actions. It is worth noting that the mechanism by which public opinion forms has been well-studied from a synergetic perspective. Therefore, applying synergetic approaches to study the genesis of law is aptly started by examining the mechanisms that shape societal morals and legal customs as sources of law.

The study of creativity in general, and law-making in our context, is intriguing. When it comes to legislative acts, they are passed by a representative body based on discussions in specialized committees and debates during plenary sessions. Throughout this process, the content of the legislative proposal continually evolves due to opposing views, mutual persuasion, and the advocacy of representatives from different political parties about each legal norm. As a result, a primary idea for the legislative proposal emerges, subsequently acting as a guiding parameter that dictates the ensuing law-making process. This central idea gives rise to cause-and-effect conditions that become the substantive content of the future law.

Synergetic principles are also evident in the processes of refining current regulatory acts, aligning them with changing societal needs by amending and supplementing them. In this scenario, the content of a regulatory act tends toward a state of maximum alignment with current societal needs—or, in synergetic terms, toward a state of least potential energy. A distinctive feature of this process is its stepwise (discrete) progression. In contrast, the formation of societal needs can be considered as continuous. Therefore, a gap always exists between societal relations requiring legal regulation and the corresponding legal norms. This gap signifies the law's lag social realities and tends to widen at the local level over time, leading to unstable bifurcations and chaotic phenomena in society. This gap primarily drives law-making as an activity to organize societal relations.

Using synergetic constructs in criminology can invigorate the study of issues that were previously on the periphery of legal research or not addressed at all: the instability of the legal order, the interplay of regularity and randomness in criminogenic determination, threshold, crisis, and transitional states of social processes, and the cyclicity of criminalization, among others. Moreover, viewing socio-legal reality through the lens of synergetic concepts and laws offers an opportunity to substantially reshape or at least adjust criminologists' understanding of various fundamental issues, especially those foundational to criminological research, such as the mechanisms of criminogenic determination, the establishment of a socio-legal order and legal regulation, criminological activity, and the effectiveness of exerting criminological influence²⁶.

Within the scope of criminology, the unique synergetic notions of multi-variability and unpredictability, types of randomness, the deep interconnection of chaos and order, processes, and mechanisms of self-organization in

²⁶ Bandurka O. M., Lytvynov O. M. Synergetics Approach and Issues of Criminological Science Methodology. P. 77. URL: <https://dspace.univd.edu.ua/server/api/core/bitstreams/55d6e618-946e-4ba8-a60a-4892acbc67d0/content>

nature and society, and the specifics of open (non-linear) systems are intriguing, constructive, and deserving of application. Synergetic ideas would benefit criminology both for explaining the causes of criminal behavior and for organizing systems of crime prevention and legal influence on criminality. From a synergetic perspective, randomness can serve not only as a manifestation of necessity but also as its complement.

For understanding the causes of criminality, criminology could also find the principle of subordination useful. In synergetics, this principle suggests that a complex problem can be reduced—without oversimplifying—to a solution involving a limited number of variables (or “order parameters”) that dictate all others. When discerning the causal matrix of criminality, it would be crucial to identify those overarching indicators that play a primary, defining role within the said matrix.

It is possible that a synergetic approach could form the basis for a fundamentally new concept of crime prevention and counteraction. Indeed, synergetic principles allow us to explain why often an extraordinarily strong external influence on a system proves far less effective than an influence that is a thousand times weaker, and vice versa. According to traditional approaches, the controlling influence on any entity depends on the magnitude of the expended energy and effort. However, the real influence should not necessarily be strong, but rather resonant, meaning it should align closely with the properties of the system being controlled. It is well known that an inclination towards extreme controllability, centralization, and forceful restructuring of everything has already led our society into a profound crisis. The efforts of the ruling powers proved futile as they went against the inherent tendencies of societal self-development. In this light, one of the most critical tasks of criminology is to identify the “pain points” of the social organism; influencing these could significantly promote the moral rejuvenation and social progress of society and more effectively counteract crime. Synergetics can help elucidate how individual crimes (at the micro-level) impact the change in a broader social phenomenon like criminality (at the macro-level). All this calls for a paradigm shift in crime research.

The field of criminological practice, which encompasses the implementation and application of legal normative models, represents a domain of self-organization within society’s legal system. It is evident that purposeful legal regulation is just one element in the complex multifaceted mechanism that determines legally relevant behavior. Such behavior, at the micro-level, is often more influenced by non-legal normative and institutional factors, such as societal morals, customs, traditions, mindset, culture, and political expediency. At the macro-level, this behavior results in the emergence of synergetic effects, evident in the dominance of certain types of social communication. These effects can sometimes greatly deviate from legislative expectations. Nonetheless, they always manifest as the predictable outcomes of a self-organized process in the society’s legal life²⁷.

Discussing the study of legal relations from a synergetic perspective, it is essential to recognize that this study is integral to understanding self-organization processes within social relations because legal relations are social relations governed by law. Through these legal relations, the legal system intertwines closely with other components of the social system, such as economic and political ones. The enhancement of democracy, the depoliticization of public life, and the growth of market relations underscore the increasing activation of the self-organization processes of society, marking their most significant current forms. Consequently, the importance of the synergetic method for studying legal phenomena is rising.

Social relations, as elements of society as a system, are in constant flux, forming structures. These structures emerge somewhat chaotically

²⁷ Ibid. P. 78

and don't always promote the movement of society towards a desired state. Their organization arises from intentional human action and has traditionally taken the form of law. However, not every form of organization promotes societal progress. For centuries, lawmakers have tried to externally introduce an "order parameter" into the social system, based on rulers' ambitions or ideological doctrines. Such an approach does not align with the core principles of synergetics and can be viewed as voluntaristic, stemming from an overemphasis on individual will's pivotal role in societal development.

Conclusions. In conclusion, it is probable that the continued development of synergetics in law will follow two primary paths. The first involves applying a new methodological foundation initially to general legal sciences (such as the theory of state and law, philosophy of law), and gradually extending it to specialized and sector-specific legal sciences. This stems from the logic of scientific research: one must understand the whole before grasping its parts. Otherwise, while exploring specific issues, researchers will continuously encounter unresolved general problems. The second path focuses on the gradual integration of synergetic methodology, moving from understanding social and socio-legal phenomena to purely legal ones.

These trajectories for implementing synergetics in law are taking shape today. It is recognized that scholars who employ dogmatic approaches to legal studies approach synergetic methods with caution. This refers to theories of sectoral substantive and procedural law. However, recent academic work in the theory of state and law attempts to comprehend and apply synergetics as a novel method in legal science. Additionally, the use of synergetics appears promising in fields such as sociology of law, theory of public administration, and criminology.

It is essential to emphasize that modern legal science cannot remain detached from the main trends of philosophical thought. Incorporating the insights of synergetics into jurisprudence will enable us to view legal phenomena in unconventional ways, specifically as complex systemic formations. Their stability depends on how well they align with societal needs, and their development adheres to certain patterns, which can aid in addressing societal development objectives.

References

- Bandurka O. M., Lytvynov O. M. Synerhetychnyi pidkhhid i pytannia metodolohii kryminolohichnoi nauky. URL: <https://dspace.univd.edu.ua/server/api/core/bitstreams/55d6e618-946e-4ba8-a60a-4892acbc67d0/content>Бойко-Бойчук Л.) [in Ukrainian].
- Synerhetyka yak metodolohichnyi pidkhhid u doslidzhenniakh sotsialnykh nauk. *Liudyna i polityka*. №5. С. 56-63. [in Ukrainian].
- Dzhuzha O. M., Orlov Yu. Yu., Kaliuzhnyi, R. A. Shchodo mozhyvosti vyvchennia pravovykh yavyskh z pozytsii synerhetyky. *Pravo i suspilstvo*: Vyp. 2: Nauk. zhurnal/ Hol. red. M.V. Korniienko. Dnipropetrovsk. S. 3-12. [in Ukrainian].
- Dzoban O. P. Rozvytok idei synerhetyky yak novoi paradyhmy u pryrodnycho-naukovomu i sotsialnomu piznanni. *Visnyk Nats. yuryd. akad. Ukrainy im. Yaroslava Mudroho*. Serii: Filosofiia, filosofiia prava, politolohiia, sotsiolohiia : zb. nauk. pr. Kharkiv : Pravo. Vyp. 9. S. 3-16. [in Ukrainian].
- Korunchuk L. A. Problemy vykorystannia synerhetychnoho pidkhhodu pry doslidzhenni pravovykh yavyskh. *Chasopys Kyivskoho universytetu prava*. №3. S. 58-62. [in Ukrainian].
- Kryminolohichni dovidnyk: dovidkove vydannia / za nauk. red. d-ra yuryd. nauk, prof., akad. NAPrN Ukrainy Bandurky O. M.; za zah. red. d-ra yuryd. nauk, prof. Dzhuzhi O. M. i d-ra yuryd. nauk, prof. Lytvynova O. M. Kharkiv : Zolota mylia, 2013. S. 310-311. [in Ukrainian].
- Лукашевич С. Ю., Груба, Д. І. Місце синергетичної парадигми в методології правових й кримінологічних досліджень. *Теорія і практика правознавства*.

- Випуск 1(3)/2013. URL: http://nauka.jur-academy.kharkov.ua/download/el_zbirnik/1.2013/Gruba.pdf [in Ukrainian].
- Lukashevych S. Yu., Salaieva, K. A. Synerhetyka v kryminolohii: evrystyka ta limitatsiia // Zlochynnist i protydiia yii v umovakh synhuliarnosti: tendentsii ta innovatsii: zb. tez dop. nauk.-prakt. konf., prysviach. pamiati chlena Pravlinnia Kryminolohichnoi asotsiatsii Ukrainy, profesora Tetiany Andriivny Denysovoi (m.Kharkiv, 16 kvit. 2021 r.) / MVS Ukrainy, KhNUVS, Kryminol. asots. Ukrainy. Kharkiv: KhNUVS. 464 s. S. 106-108. URL: <https://visnikkau.webnode.com.ua/news/zlochinnist-i-protidiya-jij-v-umovakh-singulyarnosti-tendentsiji-ta-innovatsiji> [in Ukrainian].
- Riabinina O. V. Hlobalni problemy suchasnosti. hlobalizatsiia yak predmet filosofskoho analizu. URL: http://univer.nuczu.edu.ua/tmp_metod/2160/lkc.pdf
- Agazzi E. Responsibility: the Genuine Ground for the regulation of a Free Science [Text] / E. Agazzi // Scientists and their Responsibility. Publishing International, 1989. 235 p. [in Ukrainian].
- Ilya Prigogine, Isabelle Stengers Order Out of Chaos: Man's New Dialogue with Nature. Bantam Books, 1984. 349 p.
- Haken H. Advanced Synergetics, Springer Ser. Synergetics, Vol. 20, 2nd corr. printing (Springer, Berlin, Heidelberg).
- Haken H. Synergetics, An Introduction, Springer Ser. Synergetics, Vol. 1, 3rd ed. (Springer, Berlin, Heidelberg).
- Haken H. Synergetics: Introduction and Advanced Topics (Springer, Berlin, Heidelberg).
- Kawaguchi K. R. A Social Theory of International Law International Relations as a Complex System / Kazuko R. Kawaguchi. Springer-Science+Business Media. B. V. 317 p.
- Serhii Lukashevych, Valeriy Obolentsev, Yuriy Ponomarenko Systematic Transformation Processes of Crime in the Financial and Economic Spheres and the Prevention of Criminal Leadership. Materials VI International Conference on Social, economic and academic leadership (ICSEAL 2019) held during 13th-14th of December 2019 (Prague, Czech Republic). Published by Atlantis Press SARL 2020/5/27. Prague. P. 149-156. [in Ukrainian].
- Tamanaha B. Z. Law and society. *Legal Studies Research Paper Series Paper*. №09-0167. 24 p.
- Von Bertalanffy Ludwig General System Theory. URL: http://www.nwlink.com/~donclark/history_isd/bertalanffy.html
- Wiener Norbert Cybernetics or control and communication in the animal and the machine. second edition the M.I.T. PRESS. Cambridge, Massachusetts. 229 p.

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