

Determinism: Collision of Natural and Social Sciences' Interpretations

Georgy Borisovich Orlanov

Doctor of Sociology,
Head of the Department of Philosophy and Sociology
Academy of labor and social relation
Moscow, Russia
e-mail: orlanovgb@yandex.ru

Anna Ivanovna Orlanova

Candidate of Philosophical Sciences, Professor of the
Department of Philosophy and Sociology
Academy of labor and social relation
Moscow, Russia
e-mail: orlanovgb@yandex.ru

Abstract — The article substantiates the thesis that the category of determinism retains its methodological significance in modern social sciences and natural sciences. The appeal to the category of determinism is relevant in the context of its contemporary criticism. A categorical rejection of determinism is present in many publications by M. Wiewiorka, P. Bourdieu, I. Prigogine, I. Stengers, and other researchers. The critical position is dictated by the identification of some interpretation disadvantages of the "determinism" concept. The article substantiates the critic's insufficiency to send a cognitive tool such as determinism to the archive. Consideration should be given to the possibility of updating the concept of determinism, given the fundamental nature of this philosophical concept. The study outlines the contours of a methodological approach that allows preservation of determinism in the arsenal of practical categorical tools in the sciences of nature and society. The essence of this approach is expressed in the introduced concepts of reflexive determinism and case determinism. The content of these concepts is considered from the standpoint of the activity of the subject of knowledge.

Keywords — *conditionality of phenomena and processes, reformation, determinism, reflective determinism, case-determinism.*

I. INTRODUCTION

The organizers of the XXII World Sociological Congress (Sweden, Gothenburg, 2010 – "Sociology on the move") in the very first sentence regarding the purpose of this forum stated: "Determinism is dead in the social sciences" [1]. Here the "death of determinism" is regarded as one of the most significant "movements" in the categorical apparatus of the social sciences. Naturally, this entails the loss and fundamental role of the category as a methodological basis for the study of social processes and the construction of scientific explanations and forecasts.

The critical attitude to the concept of determinism is well known, both in the social sciences and in the natural sciences. The main rebuke to determinism is that the classical understanding of determination reflects the position of naive realism, which allows reification. That is, the classical concept of determinism allows the identification of our ideas about real-world relations with the very relations of the objects of study. This naivety is manifested especially clearly in the interpretation of the uniqueness of the relations of determination.

The article aims to indicate the basis of a methodological approach that allows preserving determinism in the arsenal of useful categorical tools in the sciences of nature and society.

The article shows that determinism in modern sociological theory has methodological significance and is necessary for studies of social reality if this concept is interpreted reflectively. Concerning natural-science interpretations, the possibility of moving along the path of development of the content of determinism in modern natural-science theories is shown. A positive interpretation of determinism is based on the constructive role of chance in synergetics, and the modern interpretation of "autopoiesis" in the natural sciences.

II. METHODOLOGY

The study of determinism from a heuristic point of view is based on the ideas:

- the need to overcome the ambiguous understanding of determinism from the position of the classical interpretation of determinism associated with Laplacean determinism;
- generalization of different forms of conditioning processes and phenomena is best suited just the category of determinism;
- determinism in modern sociological theory is necessary for studies of social reality;
- modern natural science theories are substantively related to the category of "determinism."

III. RESULTS AND DISCUSSIONS

According to P. Bourdieu, society cannot be interpreted either with the help of the determinism of structures or with the help of the determinism of subjective actions. Hence the understandable desire of P. Bourdieu to use sociology to try to clear his work of social determinists. Bourdieu was convinced that he was completely free from social determinists [2]. There are quite a few such estimates in the scientific literature. Their more detailed analysis concerning the position of postmodernism is presented in [3, 4].

One can agree with the categorical nature of such estimates only if they relate to the classical interpretation of determinism, which is traditionally associated with Laplacean

determinism. However, an alternative train of thought is possible – not a refusal, but a meaningful rethinking of the very concept of determinism.

In this context, it is appropriate to recall two classics of sociology – P. Sorokin and M. Weber. They also doubted the methodological potential of classical determinism, but they did not lose sight of the real problem of the conditionality of historical processes and phenomena.

So, P. Sorokin believed that the concept of “aimless historical fluctuations” is an adequate position than the classical idea of the progressive development of history (which is based on the idea of determinism) [5]. At the same time, P. Sorokin sought to link into a single picture the recognition of “aimless historical fluctuations” and the natural demand of science to identify certain regularities (“patterns”) of social life, which is impossible without recognizing the idea of conditionality of events and processes in any form.

The position of M. Weber is also known, which explained the formation of capitalism not by a regular movement of the historical process, but by a combination of random coincidences (“fateful constellation” of factors). Moreover, at the same time, he insisted on a causal approach in any scientific research that was somehow built into the relationship of conditionality. M. Weber believed that in order to discern actual causal connections, we construct invalid ones [6]. This idea is linked with the author’s interpretation of “ideal types,” “attribution to values,” and other principles of “understanding sociology,” which contain the intention to exclude reification.

The “death of determinism” is stated not in the social sciences only. A similar position is present in natural science, where the consent of the scientific community regarding the interpretation of many essential concepts is considered a prerequisite for active scientific research. At least, this refers, according to T. Kuhn, to periods of the healthy development of science itself [7].

In natural science, the debate about the viability of determinism intensified as the theoretical apparatus of statistical physics, genetics, quantum mechanics, synergetics, and other sciences developed. Probably, the most succinct final critical arguments were formulated by Nobel Prize laureate I. Prigogine, who spoke about the determinism correspondence only to a limited class of physical systems – stable classical and quantum systems. It is important to note that I. Prigogine also outlines an alternative to determinism, drawing the general contours of the new philosophy and methodology of scientific knowledge. He believes that today an intermediate picture of the world is being formed between the two opposites – the deterministic world and the arbitrary world of real events. Prigogine believes that the real world is governed not by deterministic laws, nor by absolute randomness [8]. Science begins to move along the “narrow path” between blind laws and arbitrary events. By the example of specific scientific theories, I. Prigogine shows that in more complex cases of nonlinear development of systems, familiar determinism does not work [9, 10].

In fact, in the natural sciences, the same alternative arises for re-evaluating determinism. Somebody can send this concept to the archive, but he can try to revive it. To revive the concept of “determinism,” it is necessary to take into account that just the category of determinism is best suited to generalize the different forms of conditionality of processes and phenomena. A general analysis of determinism as an epistemological problem is the main epistemological issue [11].

There are not so few attempts in the scientific literature to talk about new forms of determinism, about non-determinism and overcoming of classical path determinism [12, 13, 14]. Besides, philosophy should take into account not only purely rational arguments, but also value judgments, which, it seems, are not taken into account at all in the refutation of determinism and its crucial link – causality. In this regard, the position of those authors who, like R. Collins, for example, knowing all the counter-arguments, still find the causality category useful, seems very constructive. Firstly, because it gives us a mechanism that tells what kind of process we are talking about and when precisely these and not other, concrete results can be expected. Secondly, because it saves us from reification, as well as from ideological justifications disguised as the appearance of explanations [15].

Some modern authors accept determinism, although they may not use this term. For example, W. Beck is talking about the cosmopolitan determination of society. In his opinion, an adequate idea of the current stage of development of civilization can give a cosmopolitan vision of the decisive determinants of social processes. Cosmopolitanization means the erosion of the rigid boundaries dividing the states, markets, cultures, and life-worlds of people. Cosmopolitanization has become the defining feature of the new era of reflexive modernism, in which national boundaries and differences are erased [16].

Moreover, cosmopolitanization is a process, takes place in the everyday life of individuals. This process is “everyday cosmopolitanization” that determines the mutual dependence of people in any communications, flows, networks, in a situation of increasing risks and threats [17, 18].

The contours of the approach to rethinking determinism, in particular in sociology, can be outlined in the following theses.

1. The arguments of the supporters of the thesis “the death of determinism” should be considered valid, but only in the part that shows the “helplessness” of classical determinism in describing the behavior of complex systems.

2. Determinism is a philosophical concept that has a complex structure. It is legitimate to distinguish at least two levels of its values:

- a) recognition of the general conditionality of the process;
- b) an indication of the nature of the relationship of specific events.

If the events are connected ambiguously, it does not mean that there are no general conditions under which this or that random factor is manifested. Other general conditions may correspond to a different range of random factors.

3. Critics of determinism, insisting on its archaism, have in mind the second aspect of the meaning of this concept – an indication of the nature of the connection of specific events. It was here that a scientific reappraisal of the situation took place, as a result of which the unambiguous connection lost its universality. However, the first level of the determinism meaning is recognized by these researchers, although it is called in other words, such as "defines," "leads to," "produce." That is, critics of determinism, as a rule, do not abandon the idea of conditionality in general. Nevertheless, the minus is that this position is associated with the loss of a category that could fix the whole variety of types and forms of conditionality, including not yet open. In methodological terms, the preservation of such a category (determinism) would be a more economical cognitive position than the "spraying" of the whole variety of forms and types into different conceptual niches.

4. In sociology, that position that aims to preserve and rethink determinism can be called reflexive determinism. The essence of this position is expressed by the thesis of the dual subject-object conditioning of social phenomena and processes. Here the theory of structure of A. Giddens can come to the rescue [19]. Furthermore, although this sociologist does not seem to use the term "reflexive determinism," his understanding of duality helps to build such an interpretation. A. Giddens is talking about the "duality" of the structure. A commensurate understanding of structure allows avoiding erroneous reductionism, namely, reducing social dynamics to either objective (structuralism, functionalism) or subjective (hermeneutics, phenomenology) factors. The bottom line is that the moment of producing the action of the subject is at the same time the moment of constructing a particular social practice as part of social relations [20, 21].

5. Man is into the precedent, statistical order of the universe, he forms the precedent environment of his habitat – a society with corresponding changing institutions. Such conditionality (determination) of social life means that there is no predetermined path for the development of society, no "master plan" of history that any genius could discover, thereby drawing the only real project for the future of all civilization. Coordinated and trust-based actions of social actors at any time can give a different direction to the historical process. In this regard, the idea of E.N. Knyazeva and S.P. Kurdyumova, according to which the modern worldview defines a "new image of determinism," which directly connects determinism with governance. Management begins to be based on a combination of human intervention with the essence of interior trends in developing systems. This determinism is an understanding of the ambiguity of the future and the possibility of reaching the desired future. This is determinism that enhances the role of man, and it is the highest type of determinism [22].

6. The conditionality of social processes is increasingly associated with the culturalist turn in sociological theories, the central link of which is the trust system. At present, the interpretation of the trust system goes far beyond the framework of personal attitudes beyond the framework of psychology in general. This circumstance is due to the conditions of increasing interdependence of all structures of

society. Modern society is characterized by the expansion of the sphere of unpredictability and uncertainty, threats and risks of human activity. In these conditions, trust begins to be seen as a characteristic of interpersonal relations, as a cultural resource that changes the approach to all issues of our time.

7. Trust can rightfully be presented as a significant paramount element of the model of determination of social dynamics, which allows isolating in the chaos of social phenomena and processes the most important points of application of the activity of social actors. Trust determines the viability of society as a whole, as well as the socio-economic competitiveness of individual communities and states, the success of management systems, the pace of development of society, the objective and subjective level of well-being of citizens [23; 24]. For F. Fukuyama, the concept of trust allows a deeper understanding of the essence of social F. Fukuyama refers to the concept of trust as preceding the analysis of society by researching a person and his personality traits to substantiate the economic concept of social existence [23]. P. Sztompka demonstrates the possibility of using a theoretical model to explain the confidence of social reality and historical events [24]. One of the crucial issues in connection with the concept of trust is the question of the social-legal organization of society [25; 26; 27]. The modern period of development of society is a time of rapid social change. This time lets visually explore the processes of emergence and destruction culture of trust.

As a result, it can be argued that determinism in modern sociological theory can play its methodological role in the study of social reality. The basis of this position is a reflective understanding of the concept of "determinism." In any case, such a conclusion seems more reasoned than the thesis of "the death of determinism."

In natural science, it is also possible to move along the path of development of the content of determinism. The first three points of the above are legitimately attributed to the natural sciences. It is appropriate to mention the revolutionary idea of C. Darwin [28], which, in fact, in contrast to the idea of a linear predetermination of events, puts forward a development hypothesis based on precedents and cases. Thus, Darwin laid the foundations of a new approach to determinism – as a stochastic, through random mutations, selection of species evolution trajectories [29, 30, 31]. At the same time, these are revolutionary changes in the methodology of science, which is rarely paid attention to, as some researchers note [32]. Biological evolution was shown, which has a precedent character, i.e., due to precedents (cases) of individual deviations from species characteristics.

The modern interpretation of "autopoiesis" in the natural sciences is pushing for a new interpretation of determinism. In the context of clarification of the correlation of external and internal factors of the system, F. Varela, in particular, notes that cognition is active participation, an in-depth co-determination of what seems external and what seems internal [33]. Moreover, Maturana states that the autopoietic system lives as a closed structurally determined system in the closed dynamics of structural changes [34].

The problem of the relationship between the physical system of an individual and his personal properties is one of the urgent for modern cognitive science [35; 36]. In the framework of functional and neuroreductionist studies, consciousness is understood as an area of subjective experience and is eliminated in the process of explanation itself [37]. F. Varela notes that the connection between the objective and subjective spheres cannot be studied without consciousness. Consciousness is a real object of study for F. Varela; therefore, explanatory theory should take into account the unique properties of consciousness [33].

It is noteworthy that the emergence of these ideas in the natural sciences coincides in time with the development of ideas of autopoiesis in sociology by N. Luhmann [38]. It is legitimate to say that in general, in modern social sciences, the understanding of the fundamental nature of the precedent development itself, the fundamental nature of the corresponding "procedural" and "procedural" conditionality of phenomena and processes is being strengthened. Such an approach was already noticeable in the well-known works of T. Kuhn [39; 40], I. Lakatos [41; 42], P. Feyerabend [42; 43], representatives of the constructivist trend in the philosophy of science and sociology. In the same vein, an analysis is also being carried out in relatively recent works. For example, M. Ronzoni and L. Valentini study the constructivist worldview concept as a statistical with an appropriate interpretation of the conditionality [44].

Michelle Vevierca is a representative of the integrative multiculturalism of French sociology. M. Vevierca believes that abstract universalism distorts the idea of reality [45]. For universalism, the public sphere is the ideal with the desired coverage only of individuals; specific identities are reduced to minorities subject to destruction, assimilation, or confrontation. Concerning the issue of determinism, M. Vevierca's concept of interns is that foundations, where either the denial of individuals or collective identities act, are unstable. Therefore, we must learn to stop contrasting the general with the special and begin, on the contrary, to express them. Vevecier offers integrative multiculturalism. This theory combines the cultural recognition requirement with the struggle against social inequality.

IV. CONCLUSION

In the last century, determinism continuously came across the limits of its applicability in statistical physics, genetics, quantum mechanics, synergetics, sociology, and other sciences, which undermined its status as a "creed" of any scientific research. The tendency toward the interpretation of determinism as a peripheral concept, useful only in certain areas of scientific research – in the range of objects that allow significant coarsening of characteristics, intensified. And that is at best. At worst, a complete rejection of the block of deterministic concepts in various versions of postmodernism and indeterminism followed. However, both in the social sciences and in natural science, the contours of a new approach to determinism are visible. This approach does not lead to a radical denial of the concept of "determinism." The new task is to expand the philosophical concept of determinism, adequate to the modern problems of science.

It is stated that modern research in modern physics and especially in synergetics, revealed the constructive role of chance. This circumstance confirms the profound idea of ancient philosophers that without the occurrence of accidents, it is impossible to form new structures and order in the world. It seems that such a position could be expanded in the direction of socio-humanitarian issues if we try to evaluate the philosophical prospects of determinism nevertheless.

References

- [1] M. Wiewiorka, *Priorities. Sociology on the move. XVII ISA World Congress of Sociology, "Sociology on the Move Gothenburg, Sweden 11 – 17 July 2010.* [Electronic resource]. Access mode: <http://www.isa-sociology.org/congress2010>.
- [2] P. Bourdieu, "Structures, habitus, practices," *Modern Social Theory: Bourdieu, Giddens, Habermas.* Novosibirsk Publishing House of Novosibirsk University, 1995, pp. 16-31.
- [3] G. B. Orlanov, "Postmodernism versus determinism: is it possible to abandon the idea of determinism in sociology," *Labor and Social Relations*, 2015, No. 6, pp. 63-74.
- [4] I.A. Chudova, "Postmodernism and sociological theory," *SOTSIOLOGICHESKIE ISSLEDOVANIYA*, issue 5, pp. 33-41.
- [5] P. Sorokin, *Man. Civilization. Society.* Moscow: Politizdat, 1992.
- [6] M. Weber, *Gesammelte Aufsätze zur Wissenschaftslehre.* Tübingen, 1951.
- [7] S. Kuhn, *Structure Des révolutions Scientifiques.* Manchecourt: Flammarion, 1962.
- [8] I. Prigogine, I. Stengers. *Time, chaos, quantum. To the solution of the paradox of time.* Moscow: Editorial URSS, 2000.
- [9] V. Yakimov, "Analytic overlook of the methodology of synergetics in postnonclassical science," *BALTIC JOURNAL OF ECONOMIC STUDIES*, 2018, vol. 4 (2), pp. 254-260.
- [10] L.O. Chua, "Local activity is the origin of complexity," *INTERNATIONAL JOURNAL OF BIFURCATION AND CHAOS*, 2005, vol. 15 (11), pp. 3435-3456.
- [11] G.B. Orlanov, "Determinism as an Epistemological Problem," *Epistemology and Philosophy of Science*, 2011, No. 3, pp. 99-118.
- [12] A. Krawietz, "On failure of determinism in classical mechanics," *Technische Mechanik*, 2019, vol. 39 (2), pp. 186-189.
- [13] J. Mills, "Freedom and Determinism," *Humanistic Psychologist*, 2013, vol. 41 (2), pp. 101-118.
- [14] S. Dylus, J. Christiansen, F. Teegen, "Implementing a Library for Probabilistic Programming Using Non-strict Non-determinism," *THEORY AND PRACTICE OF LOGIC PROGRAMMING*, 2020, vol. 20 (1), pp. 147-175.
- [15] R. Collins, "Sociology: Prescience or Antiscience?" *American Sociological Review*, 1989, vol. 54, pp. 124-139.
- [16] U. Beck, *Cosmopolitan Version.* Cambridge: Polity Press, 2007, pp. 17-44.
- [17] E. Mendieta, "From imperial to dialogical cosmopolitanism," *Ethics and Global Politics*, 2009, vol. 2 (3), pp. 241-258.
- [18] W.D. Mignolo, "The many faces of cosmo-polis: Border thinking and critical cosmopolitanism," *Public Culture*, 2000, vol. 12 (3), pp. 721-748.
- [19] A. Giddens, *Central Problems in Social Theory.* Macmillan, London, 1979.
- [20] A. Giddens, *Essential Concepts in Sociology.* Polity, Cambridge, 2014.
- [21] A. Giddens, *The Constitution of Society: Outline of the Theory of Structuration.* University of California Press, Berkeley, 1984.
- [22] E.N. Knyazeva, S.P. Kurdyumov, *Synergetic paradigm. Basic concepts in the context of cultural history.* [Electronic resource]. Electronic library of the International Center of the Roerichs. Access Mode: <http://lib.icr.su/node/1247>.

- [23] F. Fukuyama, *Trust: The Social Virtues and the Creation of Prosperity*, Hamish Hamilton, London, 1995.
- [24] P. Sztompka, *Trust: A Sociological Theory*. Cambridge University Press, 1999.
- [25] B. Bradford, J. Milani, J. Jackson, "Identity, legitimacy and " making sense "of police use of force," *Policing*, 2017, vol. 40 (3), pp. 614-627.
- [26] D.H. Bayley, *Police for the future*. New York: Oxford University Press, 1994.
- [27] O. Tomyuk, A. Shutaleva, M. Dyachkova, N. Smolina, A. Novgorodtseva, "Legal Culture and Human Rights System in the Era of Globalization," *Proceedings of the International Conference on "Humanities and Social Sciences: Novations, Problems, Prospects "(HSSNPP 2019)*. *Advances in Social Science, Education and Humanities Research*, vol. 333, pp. 148-153.
- [28] Ch. Darwin, *On the Origin of Species*. London: John Murray. 1859.
- [29] K. Neander, "What Does Natural Selection Explain? Correction to Sober," *Philosophy of Science*, 1988, vol. 55 (3), pp. 422-426.
- [30] D. B. Barros, "Natural Selection as a Mechanism," *Philosophy of Science*, 2008, vol. 75 (3), pp. 306-322.
- [31] J. Birch, "The Negative View of Natural Selection," *Studies in History and Philosophy of Science Part C: Studies in History and Philosophy of Biological and Biomedical Sciences*, 2012, vol. 43 (2), pp. 569-573.
- [32] J. Forrester, "Thinking in Cases," *History of the Human Sciences. L. etc.*, 1996, vol. 9 (3), pp. 1-25.
- [33] F. Varela, "Quatre phares pour l'avenir des sciences cognitives," *Théorie - Littérature - Enseignement*, 1999, No. 17, *Dynamique et cognition: nouvelles approches*, pp. 7-23.
- [34] H.R. Maturana, "Self-consciousness: How? When? Where?," *Constructivist Foundations*, 2006, vol. 1 (3), pp. 91-102.
- [35] C. Vazquez, M. Jimena, "Two challenges to the accomplished version of the autopoietic theory," *ADAPTIVE BEHAVIOR*, 2020, vol. 28 (1), pp. 41-42.
- [36] M. Villalobos, "Living beings as autopoietic bodies," *ADAPTIVE BEHAVIOR*, vol. 28 (1), pp. 51-58.
- [37] A.V. Shutaleva, "The fundamental problem of subjectivity in Francisco Valera's neurophenomenology," *Vestnik tomskogo gosudarstvennogo universiteta-filosofiya-sotsiologiya-politologiya - Tomsk state university journal of philosophy sociology and political science*, 2019, vol. 48, pp. 84-90.
- [38] N. Luhmann, *Die Gesellschaft der Gesellschaft*. Frankfurt. M.: Suhrkamp, 1997.
- [39] T.S. Kuhn, *The Structure of Scientific Revolutions*. Chicago: University of Chicago Press, 1962.
- [40] T.S. Kuhn, *The Road Since Structure: Philosophical Essays, 1970-1993*. Chicago: University of Chicago Press, 2000.
- [41] I. Lakatos, *The Methodology of Scientific Research Programs: Philosophical Papers Volume 1*. Cambridge: Cambridge University Press, 1978.
- [42] I. Lakatos, P. Feyerabend, *For and Against Method: including Lakatos's Lectures on Scientific Method and the Lakatos-Feyerabend Correspondence*, ed. by Matteo Motterlini, Chicago University Press, 1999.
- [43] P. Feyerabend, "Materialism and the mind-body signal," *Review of Metaphysics*, 1963, vol. 17 (1), pp. 49-66.
- [44] M. Ronzoni, L. Valentini, "On the Meta-ethical Status of Constructivism: Reflections on G.A. Cohen "Facts and Principles," *Politics, Philosophy & Economics. L.*, 2009. vol. 7 (4), pp. 403-423.
- [45] M. Wiewiorka, "The Formation of Differences," *Social*, 2005, No. 8, pp. 13-24.