

INTRODUCTION

The readers are presented the 18th number of the annual set of „Studies In Logic Grammar and Rhetoric”, which is the fifth consecutive volume complying with the joint thematic pivot. The methodology of social sciences and, in particular, its tasks resulting from the development of mathematics and informatics research constitute the above-mentioned pivot now.

The ‘new’ paradigm of social sciences methodology, even if it is still *in statu nascendi*, requires including the issues connected with undecidability, computational complexity or computational intractability in the set of tools and concept categories of empirical sciences. The above-mentioned problems developed on the ground of mathematics seem to relate directly to social sciences anywhere algorithmic methods of modelling or simulating of social processes are applied.

By means of this annual set we would like to celebrate the contribution of one of the most outstanding thinkers of 20th century – Friedrich von Hayek, the creator of modern liberal philosophy – to the development of social sciences methodology in the 10th anniversary of his death. Liberalism is, in his opinion, the only philosophy which is in agreement with the latest theories in the domains of physics, chemistry and biology, and especially with the science of chaos, formalized by Illya Prigogine. In free market economy like in nature, order arises from chaos; spontaneous action of million of decisions taken and million pieces of information received does not lead to disorder but to a certain higher order. Nobody is able to know, as Hayeck claims, how to plan an economic growth as we do not really know anything about the mechanisms governing the economic growth. There is a great number of decisions on the market that no computer, no matter how powerful it would be, could register and process.

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The question about the adequacy of constructive depiction of social phenomena, especially in the context of the decidability problem and algorithmic tractability of these phenomena, seems to be legitimate. Witold Marciszewski's essay, which opens the volume, describes the challenges for social sciences methodology in the context of complexity issues. In the first part of his essay the impact of logic and information technology on the current paradigm of social science is analysed. Then the degrees of complexity and their poor awareness in practice of social science are discussed. The author also presents the theoretical models as the example of modelling in social science as well as the concept of rationality. The starting point of the considerations is the issue of intelligence understood as rationality with inventiveness and which as a whole can be marked, in the author's opinion, as hypercomputational complexity.

Wiesław Banach presents the idea of self-organization developed by Friedrich von Hayek, which constitutes the basis for his critique of the methodological assumption of constructivist rationalism. Hayek's idea of self-organization is the heart of his socioeconomics doctrine. The author points at two intellectual traditions of individualism in the European thought – an empirical or evolutionary tradition typical for Britain and a rationalistic French tradition which are the subject of Hayek's critique. For Hayek, it is the former tradition that bears the name of true individualism. The latter accounts for false individualism which leads to socialism or collectivism, i.e. inclined to oppose freedom. The historical context explains, as Banach shows, Hayek's critique of the constructivistic utopia and social planning.

However, the points criticized by Hayek were defended by some eminent authors, hence they are worth being presented to help a better understanding of Hayek's arguments. To some extent, this is done by Anna Zalewska who hints at some links between early mathematical economics, as represented by Pareto, and an appreciation of planned economy. Andrzej Malec, in turn focusses on the idea of central planning in its various versions to conclude that it is not necessarily confined to the doctrine of socialism.

Dariusz Surowik's paper is to hint at certain possibilities of mathematical modelling on economics with the use of a theory of rational choice; this is exemplified with the classical approach of Leonard Savage.

Tadeusz Tyszka's remarks provide some empirical support for the idea of self-organization and spontaneous order. The psychologists emphasize the fact that people have a limited capacity to process information. Consequently, human beings have to adopt a set of simplified rules of decision making. Additionally, an excess of information can deteriorate the quality of human

decision. Tyszka notes that the ideas of Hayek support perfectly such concepts of human mind describing the mechanism of its acting in the terms of data processing with its non-objective character.

The paper entitled “Mathematical methods on commodity exchange” concerns a case study prepared by Bolesław Borkowski and Arkadiusz Orłowski. The authors concentrate on some mathematical models and methods that can be applied to rational option pricing on commodity exchange. They present this mechanism with the example of Polish economical institutions, such as Poznań Exchange and Warsaw Commodity Exchange.

The last essay in this volume presents deep insights into the theory of chaos, which change a scientific way of looking at the dynamics of natural and social systems. Michał Tempczyk leads the reader towards the main methodological assumptions of the theory, pointing at their applications in the field of social sciences.

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