

Presentation

"This is precisely what for sure constitutes human knowledge (...): not claiming to know what in fact I do not."

The apology of Socrates, Plato

Since 1990, an interdisciplinary group of professors who joined together in a meeting of the Section of Advanced Studies of the Forum of Science and Culture of the Federal University of Rio de Janeiro — UFRJ, has been investigating the question of the limits of human knowledge.

Scientific knowledge grows parallel to the awareness that ignorance grows even faster. Thus, the temporality (Popper) and partiality (Heisenberg) of theories were among the main topics studied, and assimilating them led the scientist to the realization that the little he knows is almost nothing. This Socratic attitude is what chases off technocracies.

One specific focus of current attention is the "theory of chaos", which has escaped from mathematics and physics to invade the other sciences, and economics in particular. Unpredictability is seen to be a feature of determinate phenomena. Ignorance is shown where solid knowledge (Popper) was presumed, as if in a reproduction of Socrates in his search.

The first national congress on Chaos, Chance and Determinism in the Sciences, Arts and Philosophy was held on 12-13 November, 1992. There were 14 sessions with over 30 papers. The philosophy of science, economics and physics were the areas best represented, followed by sociology, engineering and many others such as mathematics, history and fine arts.

This special issue of the *RBE* reveals, albeit incompletely, the presence and plurality of the activity of economists. Araujo explores applications of the mathematical theory of chaos to pure economic theory, identifies the theory of prices of financial assets as a pioneering field, and also presents theorems in general equilibrium and the theory of capital.

Damásio raises questions that include non-linearity and feedback in economic theories and proposes some general lines for a research programme on the possibility of chaotic behaviour. The following contributions by Carvalho, de Paula and Silveira are of a quite different nature.

Carvalho discusses the dilemma between individual freedom and social order throughout the history of economic thought, and shows how the theory of chaos modifies the terms of the dilemma. While Carvalho maintains indetermination in the Keynesian solution, de Paula seeks to redeem it in Marx's work. Determinism in Marxist thought is related to Illuminism and the II International.

Recalling Marx's origins in the historic German school, de Paula reviews the theories of value and wages, the schism with political economy and the so-called materialistic concept of history while showing indetermination in the centrality of dialectics, in the unpredictability of the class struggle, in political mediations or in cultural-institutional instances.

Silveira discusses the indetermination derived from the incompleteness of scientific knowledge both in its purest or more abstract sphere (where the logic of hypothetical-deductive models prevails) and its applied sphere (where the dialogic of interdisciplinary formulations proves indispensable). The Ricardian vice of the economists, as shown by Schumpeter, is the habit of ignoring this indetermination, which is named after Senior.

For several reasons, the written or final versions of the contributions by colleagues such as Fred Katz, Valdir Ramalho, Gilson Schwartz, Mario Henrique Simonsen and Paul Singer, as well as by students such as Marcos de Bustamante Monteiro, are not available. The satisfaction of reproducing four communications is all the greater because two students who were still only undergraduates at the time (Fernandes and Gleiser) deserved to have their work published here.

Barbosa and others confront Friedman's "The Methodology of Positive Economics" with the indeterminateness of Senior, claiming that the author reduces science to pure economics. The unreality of the hypothesis is glorified — Samuelson coined the expression *F.Twist* for the vaingloriousness.

The objective of science is reduced to predictions regarding the real world. (The theory of chaos now shows the extension of reductionism.) We have an abstract science (pure economics) like physics, with attributes of applied science (social economics) like the engineering sciences: *F-schizophrenia* would be the term, if the authors followed Samuelson.

Fuks discusses entropic indeterminateness, which in physics would be a given for economic science, which it precedes — indeterminateness is located in the degrees of freedom of the process's time evolution. However, the phenomenon is not perceived by pure economic theories. The neo-classic position typically represented by Solow is harshly criticized in the review by Georgescu-Rögen and Kenneth Boulding.

In his reading of Mises' classic *Human action*, Lopes perceives two constructs of the human being: the nominal (complex and broad in scope) and the operational (the economic man). Only the latter substantiates the analysis, characterizing it as pure and on the highest level of abstraction. Mises nonetheless feels at ease to talk of reality and derive innumerable normative propositions. The examples quoted give an idea of the amazing extent to which the Ricardian vice is to be found.

Finally, Fernandes and Gleiser return to the theme of the theory of chaos and its application to economics in the analysis of the prices of financial assets. The confrontation is between stochastic and chaotic processes, and the issues include such matters as the efficiency of the market. The authors review the tests that reveal deterministic chaos in time series and show their use in successful empirical work.

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