THE PHILOSOPHY OF SCIENCE IN A
EUROPEAN PERSPECTIVE (PSE)

Scientific report
Workshop on "The Sciences of the Artificial vs. The Cultural and Social Sciences"

National School of Political Studies and Public Administration,
15-16 September 2011

1. Summary

Within the general framework of "the sciences that philosophy has neglected", Team C organized a workshop on "the sciences of the artificial vs. the cultural and social sciences", trying to enlarge the field with new reflections on the sciences of design as well as with new analyses of the social sciences, which include the considerations on complexity in the former and the applied aspects in the latter.

Commonly, the sciences of the artificial — in the sense proposed by Herbert Simon — have been neglected by philosophy (at least, in the mainstream philosophy of science), yet they have relevant links with the cultural and social sciences that should be analyzed. In addition, an important part of what is usually called "social sciences" belongs, *de facto*, to the realm of the "sciences of the artificial" (e.g., library science or economics).

In many ways, the novelty regarding the realm of the topics discussed was clear; it includes reflections on information science and communication sciences. These were among the contents of the Workshop, whose structure followed three main lines: 1) the *Geisteswissenschaften* and the social sciences; 2) from applied social sciences to the sciences of the artificial; and 3) philosophy of the sciences of the artificial. In addition, there was the Junior Meeting that contributed to complete the picture of the topics discussed in the previous sections.

Following the differences and similitude between the sciences of the artificial and the cultural and social sciences, in this fourth year of research new light was shed on relevant aspects: a) historicity and complexity in the sciences of design, including their epistemic and methodological specificity; b) the distinction between "human activity" and "human behavior" as key category for the analysis of complexity and historicity of sciences such as economics; c) the different kinds of complexity available in the sciences of the artificial (structural and dynamic, ontological and epistemological, etc.); d) the need for a coexistence of explanations — oriented towards causes — and reasons or intentions in the social sciences; e) the important role of interpretation and understanding in the archeological explanation, which might be extended to the social explanation; etc.

The overall quality of the papers was excellent. Each speaker provided a written version of his or her paper. This made the Workshop more valuable and facilitated the discussions, which were very lively from the first paper on. The number of participants was 20, which was very commendable for this kind of discussions. Moreover, the amicable atmosphere during the days of the workshop spread the discussions to additional moments outside the conference center.

2. Description of the scientific content and discussion at the event

There have been two main realms for the philosophical analysis in the days of the Workshop: on the one hand, the topics related to the cultural and social sciences, with particular emphasis on the latter; and, on the other, the issues concerning the sciences of the artificial, with particular attention to the sciences of design. The contents of the conference moved smoothly from the first area to the second. The transition was through the topic of applied social sciences.

Until now, the topics related to the cultural and social sciences have received more attention than the issues on the sciences of the artificial. The discussions during the Workshop have tried to introduce novelty regarding the "traditional" field and the more recent one, related to the human-made context. In this regard, an example has been the approximation between "explanation" and "understanding" in the sphere of the social sciences, as can be seen in archeology, and another example has been the development of the dynamic dimension of complexity in the sciences of design, which involves the historicity of the human activity.

2.1. Contents

Basically, the contents can be integrated into four main lines of research: (i) the interweaving between the social sciences and the cultural sciences; (ii) some central topics of the philosophy of the social sciences; (iii) the characterization of applied sciences in these domains (social and artificial); and (iv) the analysis of sciences of the artificial from the point of view of sciences of design.

There is some interweaving between the social sciences and the cultural sciences. According to this first line of research, components discussed by the cultural sciences are in the interpretative approaches related to social events, such as the phenomena considered by archeology. Amparo Gomez pointed out the existence of relevant points of epistemological and methodological convergence between the cultural sciences and the social sciences. This was considered within the framework of three main possibilities concerning scientific explanation in archeology: naturalism, interpretativism and "a third way". The convergence between explanation and understanding can be seen as an example of unity and diversity of science (Gomez).

A second line of contents focused on central topics of the philosophy of the social sciences, such as the formation of conceptual systems (Bengt Hansson), the role of idealization in modeling (Demetris Portides) and the interpretation of the assumptions connected to rationality in the social sphere (Mihai Ungureanu). Abstraction was seen as the essence of theorizing. Every science focuses on some aspect of reality and the task of any scientific theory is to abstract away from traits of that reality that fall outside its scope and to retain only what is essential for its purposes (Bengt Hansson).

Regarding idealization in modeling, “decomposition” appears as a kind of assumption available in models of neoclassical models in economics (production, transportation and distribution, etc.). This presence of decomposition gives rise to problems regarding the truth of the propositions that may be extracted from scientific models (Portides). Meanwhile, the idealization of the assumptions of the rational choice theory might be the main problem of the public choice theory. The unrealisticness of assumptions affects the predictive scope of this theory, the problem of voting behavior and the social responsibility (Ungureanu).

The characterization of applied sciences in the domains of the social sciences and the sciences of the artificial was the third line of research (Ilkka Niiniluoto, Arto Siitonen and Paolo Garbolino). Basic science and applied science have different kinds of utilities — epistemic and practical —, which can be seen in descriptive sciences and design sciences. In this regard, design sciences can be used for rational planning and decision-making, when the end A is accepted as a basis of social action (Niiniluoto).

Through the analysis of two sciences as case-studies (information science and forensic science) new light was shed on applied sciences. In the library science there is *de facto* a “paradigm shift” through means of the use of the Internet and the digitalization (Siitonen). In the forensic practice the changes have also been very noticeable. Following a historical analysis, the forensic practice has had "scientification", i.e., a process to change a professional practice into a scientific discipline. Thus, it comes from a social practice that requires scientific support in the form of a design. The recent developments of this discipline (e.g., the problem of a perfect identification) move in this direction (Garbolino).

On the fourth line of research — the analysis of sciences of the artificial from the point of view of sciences of design — there were several papers (Wenceslao J. Gonzalez, Subrata Dasgupta, María José Arrojo and Gregory Wheeler). Initially, the main interest was in the dynamic trait of the sciences of design understood as sciences of complexity. In his paper, Gonzalez followed several steps: a) the relation between structural complexity and dynamic complexity; b) the change in complex dynamics in terms of process, evolution and historicity; c) the need for historicity in human-made disciplines, taking into account the differences between behavior and activity; d) the main general obstacles to predictors from the angle of

complexity; and e) prediction in economics from the perspective of complexity.

Epistemic complexity and systemic complexity in the sciences of the artificial was the axis of Dasgupta's paper. The systemic complexity was understood through Simon's views, whereas the epistemic complexity was seen as "the richness of the knowledge that is embedded in an artifact." This involves the knowledge that contributes to the creation of an artifact and the knowledge that is generated as a result of that creation. Meanwhile, Arrojo focused complexity in the case of communication sciences as a science of the artificial. She took into account the ontological complexity as well as the epistemological complexity, which she analyzed in the recent Digital Terrestrial Television.

Another angle of the sciences of the artificial was in Wheeler, who studied artificial intelligence from the point of view of epistemology (understood as a research program that involves several thematic realms). In this regard, a substantial part of artificial intelligence is a branch of formal epistemology.

2.2. Discussion

Each line of research developed quite interesting points of discussion, seeking new aspects of the topics discussed both in the sciences of the artificial and in the social sciences. In this regard, some ideas should be emphasized following the four main groups of research indicated.

(i) There are cases of an epistemological and methodological interweaving between the social sciences and the cultural sciences. From the methodological point of view, the discussion illustrated two main features: a) the convergence between explanation (*Erklären*) and understanding (*Verstehen*) is particularly relevant in the case of archeology; and b) the comparison between the empirical testing in the realm of the social sciences and the empirical evaluation in the sphere of the cultural sciences is useful.

(ii) On modeling in the social sciences and the connected topics of abstraction and idealization, central problems from the perspective of conceptual systems are universality (if the sciences altogether can jointly cover all the aspects of reality at hand) and compatibility (if there might be several sciences studying the same domain of the reality). The first idea seems debatable whereas the second one is positively accepted.

About the idealizations related to models (undelimitation, isolation, and decomposition), two elements drew attention: on the one hand, the boundaries of undelimitation (the conceptual act of omitting some of the naturally occurring component parts from a particular factor); and, on other hand, the possibility the improvement of idealization made through decomposition in comparison with the same process developed through isolation.

(iii) Although there is a conceptual distinction between basic research and applied research, the recent developments in science made this

difference more difficult to establish. The existence of epistemic utilities and practical utilities is accepted but there are difficulties in distinguishing them in scientific evaluation of social sciences. These difficulties might be seen in the forensic practice, mainly when the statistical theory is applied to the decision-making on identification.

(iv) Complexity is a central feature of many sciences and especially of the sciences of design. This factor affects problems, methods and results of scientific research. This characteristic is twofold: complexity concerns the structure and the dynamics of a given science. Dynamic complexity requires a deep analysis, and this can be made in terms of historicity rather than as an evolution or a revolution. In addition, the sciences of design are better characterized as a human activity than as a behavior.

Besides the ontological complexity, in the sciences of the artificial epistemic complexity has a special relevance. This has a role in the "normal design" of artifacts. In this regard, the discussion opened the door to the use of epistemic complexity regarding artistic artifacts, where innovation is a consequence of the creativity in human designs.

3) An Assessment of the Results and Impact of the Event on the Future Direction of the Field

This workshop on "The Sciences of the Artificial vs. the Cultural and Social Sciences" has offered us quite interesting results that can have a clear impact in future analyses in this field.

— Until now the study of complexity in the sciences of the artificial has been focused mainly on the structural complexity and has paid little attention to the dynamic complexity. This is particularly relevant insofar as the sciences of design are associated to creativity. In this regard, the approach to them should be based on the idea of "historicity" rather than the mere "evolution" or the view of "revolution".

— Certainly, the sciences of design are among those disciplines that the mainstream philosophy of science has commonly neglected. They have developed by Herbert Simon, and although he has made many contributions in this realm, his view is narrow minded, insofar as his analysis is made in terms of "behavior" instead of being as a "human activity", an approach that connects it with historicity and dynamic complexity.

— Epistemic complexity should have an important role in the sciences of design, because the influential study in terms of ontological complexity is not good enough to grasp the main components of the sciences of the artificial. From the perspective of epistemic complexity, there are new possibilities to understand more human artifacts, including the artistic ones.

— There are some sciences that should be analyzed in dual terms, insofar as they are at the same time sciences of the artificial and social sciences. This is the case of the communication sciences, because they enlarge the human possibilities using new designs and they are rooted in human needs of the use of language and other ways of human expressivity.

— By means of the ontological complexity and the epistemic complexity new light is shed on the analysis of the Digital Terrestrial Television. In this regard, when using ideas of complexity developed by Nicholas Rescher, the different aspects of the communication sciences seem clearer in philosophical terms.

— Library science (and, in general, information science), which is also a science of design, has epistemological and methodological problems like applied sciences. These problems are not purely cognitive, because they involve other values (social, cultural, economic, etc.) that should be considered. In this field the need to combine prediction and prescription seems clear.

— Applied research has specific problems and utilities that are not the same as those of basic research. This feature is relevant in order to study them, because traditionally philosophy of science has focused on basic science rather than on applied science. In this regard, the analysis of applied social sciences gives new aspects to be considered, where the contextual elements (institutions, culture, etc.) also have a role.

— New advancements can be made concerning scientific models. The idealization made in terms of "decomposition" is useful to grasp models of the social sciences, particularly in the case of economics. This decomposition has a task in the level of theory application, which has consequences in an applied science such as economics.

— Between social sciences and cultural sciences there are confluences. Archeology has shown the existence of epistemological and methodological components that are useful in order to have a new perspective that overcomes old disputes. The possibility of a "third way" between the positions of naturalism and hermeneutics goes in this novel direction in this well-known field.

4) Program

THURSDAY, 15 SEPTEMBER 2011

Opening Addresses:

9:15 — 9:30 Wenceslao J. Gonzalez (Leader of Team C), Maria Carla Galavotti (Chair of the Steering Committee of the Program ESF-PSE), and Adrian Miroiu (President of National School of Political Studies and Public Administration).

1) THE *GEISTESWISSENSCHAFTEN* AND THE SOCIAL SCIENCES

Chairperson: Wenceslao J. Gonzalez

9:30 — 10:15 "The Scientific Status of the *Geisteswissenschaften*," James W. McAllister, (University of Leiden, The Netherlands).

10:15 — 11:00, "Concept Formation in Emerging Sciences," Bengt Hansson (University of Lund, Sweden).

11:30 — 12:15, "Archeology and Scientific Explanation: Naturalism, Interpretivism and 'A Third Way'," Amparo Gomez (University of La Laguna,

Spain).

12:15 — 13:00 “Idealization and Theory Application: The Case of Economics,” Demetris Portides (University of Cyprus, Cyprus).

2) FROM APPLIED SOCIAL SCIENCES TO THE SCIENCES OF THE ARTIFICIAL

Chairperson: Maria Carla Galavotti

16:00 — 16:45 “On the Philosophy of Applied Social Sciences,” Ilkka Niiniluoto (University of Helsinki, Finland).

16:45 — 17:30 “The Status of Library Science: From Classification to Digitalization,” Arto Siitonen (University of Helsinki, Finland).

18:00 — 18:45 “The Scientification of Forensic Practice,” Paolo Garbolino (University of Venice, Italy).

FRIDAY, 16 SEPTEMBER 2011

3) PHILOSOPHY OF THE SCIENCES OF THE ARTIFICIAL

Chairperson: Amparo Gomez

9:30 — 10:15 “The Sciences of Design as Sciences of Complexity: The Dynamic Trait and its Repercussion for Economic Predictions,” Wenceslao J. Gonzalez (University of A Coruña, Spain).

10:15 — 11:00 “Epistemic Complexity and the Sciences of the Artificial,” Subrata Dasgupta (University of Lousiana at Lafayette, USA).

11:30 — 12:15 “Artificial Intelligence and Epistemology,” Gregory Wheeler (Centre for AI Research, CENTRIA, Portugal).

4) JUNIOR MEETING

Chairperson: Wenceslao J. Gonzalez

16:00 — 16:45 “Communication Sciences as Sciences of the Artificial: An Analysis of the Digital Terrestrial Television,” María José Arrojo (University of A Coruña, Spain).

16:45 — 17:30 “On Rationality in Political Science,” Mihai Ungureanu (National School of Political Studies and Public Administration, Bucharest, Romania).

Scientific Committee:

Steering Committee of the Program ESF=PSE, Leader and Co-leader of Team C (“Philosophy of the Cultural and Social Sciences”).

Organizing Committee:

Andrian Miroiu, Wenceslao J. Gonzalez, Amparo Gomez.

Conference Center:

National School of Political and Administrative Studies.
Povernei Street, n. 6, sector 1,
Bucharest.

Venue:

Room 111. Building of the National School of Political and Administrative Studies, Povernei Street, n. 6, sector 1, Bucharest (Romania).

Name and professional affiliation of speakers and participants

Invited Speakers:

Amparo Gomez, University of La Laguna, Spain.
Arto Siitonen, University of Helsinki, Finland.
Bengt Hansson, University of Lund, Sweden.
Demetris Portides, University of Cyprus, Cyprus.
Gregory Wheeler, Centre for AI Research, CENTRIA, Portugal.
Ilkka Niiniluoto, University of Helsinki, Finland.
Paolo Garbolino, University of Venice, Italy.
Subrata Dasgupta, University of Lousiana at Lafayette, USA.
Wenceslao J. Gonzalez, University of A Coruña, Spain.

Junior Meeting:

María José Arrojo, University of A Coruña, Spain.
Mihai Ungureanu, National School of Political Studies and Public Administration, Bucharest, Romania.

Other Participants:

Maria Carla Galavotti, University of Bologna, Italy.
Adrian Miroiu, National School of Political Studies and Public Administration, Bucharest, Romania.
Ilie Parvu, University of Bucharest, Romania.
Mirela Cerkez, National School of Political Studies and Public Administration, Bucharest, Romania.
Dinu Gutu, National School of Political Studies and Public Administration, Bucharest, Romania.
Dana Irina Ioniță, National School of Political Studies and Public Administration, Bucharest, Romania.
Valentin Quintus Nicolescu, National School of Political Studies and Public Administration, Bucharest, Romania.
Andrei Vlăducu, National School of Political Studies and Public Administration, Bucharest, Romania.
Andra-Maria Roescu, National School of Political Studies and Public Administration, Bucharest, Romania.