

INTRODUCTION

I had just graduated in philosophy in 1957 when I read Suppes' *Introduction to logic* that had been published that same year, and I had my last opportunity of discussing Suppes' theses on causality and probability within a seminar on causality in criminal law in which I participated in 2005. Hence I have been conversant with Suppes' work and ideas for nearly half a century, and this not contingently, but because of a significant affinity of our research interests and intellectual profiles. Indeed the reading of his *Introduction to logic* (a really remarkable volume that does not conform with the usual patterns of logic textbooks but includes a variety of topics relating logic to real reasoning procedures and particular sectors of mathematics) was a substantial part of my teach-yourself training in mathematical logic that I was beginning then, at a time when this discipline was almost totally neglected in Italy; and when I published in 1964 my *Symbolic logic* I pursued a project (that of making the substance of modern logic accessible to general public and especially to philosophers) not very different from the spirit with which Suppes had presented modern logic especially to young mathematicians. The study of logic, however, has always had for me an instrumental value, as a tool for a deeper treatment of philosophically interesting issues and, at that time, such an interest was specifically

directed toward axiomatics, again a field in which Suppes has done extensive and remarkable work. In my first book, *Introduction to the problems of axiomatics* (1961), I did not mention Suppes' *Axiomatic set theory* published the year before, simply because my attention was focused almost entirely on the philosophical implications of formalisms entailed by metatheoretical results and especially by Gödel's theorems. After 1964, however, when I began a long period of teaching mathematical logic, advanced geometry and foundations of mathematics at the Department of Mathematics of the University of Genoa, axiomatic set theory constituted a conspicuous part of my teaching and Suppes' book was very usefully recommended to my students. This teaching experience lasted about ten years and was very positive in my intellectual development because it was for me the opportunity of putting to practice a principle that I often defend, "it is not possible for one to do a philosophy of what one does not know", and in the case of philosophy of science this entails that one can do it seriously only if one is sufficiently conversant with some science (i.e., if it has been able to visit the building of science "from within"). Patrick Suppes has also expressed a similar judgment and, in particular, a precious quality of his production in the philosophy of the different sciences is that he concretely mentions and discusses in detail a great deal of concrete results or data, and does not limit himself to generalities regarding theories or methodology, as so many philosophers of science (even within the empiricist tradition) have done. As a consequence of this intellectual attitude he has worked during several years both in departments or institutes of philosophy and of some science (e.g., statistics, behavioral sciences, social sciences). I too held such a joint appointment for ten years, becoming aware of the great difference existing between teaching non Euclidean geometries, say, or mathematical logic in a faculty of philosophy or at a department of mathematics, but at the same time I directly noted how fruitful it is to inject some philosophical perspective in the teaching of mathematics and, conversely, to make philosophy students aware that certain philosophical issues cannot be properly handled without a minimum of mathematical competence. This invites one to consider the symmetric situation

with respect to the one just mentioned (i.e. the need of scientific competence for doing good philosophy of science), namely that a good philosophy of science cannot rely on scientific competence alone, but requires also a significant philosophical background. This is also a remark that Suppes has often done, noting that many specialists in technical issues of science have tried to philosophize without real philosophical competence, coming in such a way to overlook several questions or aspects of questions that philosophers have been accustomed to scrutinize (he makes the same remark regarding those people that talk about educational problems related to the teaching of scientific contents or the use of sophisticated teaching technologies without a background of educational literacy).

What is recognized as a special merit of Suppes's approach to axiomatization is that he does not limit its application to the standard field of mathematical theories, but extends it to the rigorous study of several empirical theories, both in the domain of the natural sciences, of psychology and of the social sciences. The original feature of his approach is that the spirit of his axiomatizations is quite different from the more traditional view according to which axiomatization is primarily a tool for introducing into an intuitive theory, through a procedure of formalization, a rigorous logical order (something that remains within a logical-linguistic point of view and has the flavour of a metalogical investigation). Suppes, on the contrary, proposes his axiomatizations essentially as translations of the basic features of a disciplinary domain into the form of set-theoretical statements: in such a way set theory provides at the same time the language of the axiomatization and also a series of abstract but rather precise *models* for the theory concerned. As is well known, this model-approach (that was really revolutionary if one considers the dominance of the logical-empiricist epistemology of science at the time it was proposed by Suppes) is rightly considered as the original inspiration of the so-called "structuralist view of theories" whose later developments, due to Sneed, Stegmüller, Balzer, Moulines and others, have also followed different paths with respect to Suppes. The mention of this fact, however, has again to do with an affinity between the intellectual development of Suppes and

myself. Indeed, though I have spent the first decade of my academic career working in logic and philosophy of mathematics, the original impulse that had brought me to a deep study of science, after graduating in philosophy, was in the direction of physics (in which I had followed a regular university formation at an undergraduate level), such that my third book was *Themes and problems of the philosophy of physics* (1969) where I had the opportunity, in particular, to defend the role of axiomatization not precisely according to the lines of Suppes (whose papers in this field I did not know at that time), but in a vein independently convergent with his approach and which consisted in stressing what I called the “semantic purport” of axiomatization. Other topics in that book that were common to Suppes’ chief interests in the philosophy of physics were the problem of measurement and the philosophical interpretation of quantum mechanics, but more important than these particular points is perhaps the general perception we both have of the significance of such studies for the elaboration of a *general* philosophical perspective. Suppes has often maintained that the investigation of particular scientific fields (and physics is perhaps a privileged one in this sense, especially quantum physics) has always been for him the fountainhead of philosophical ideas that have grown up at increasing levels of complexity and generality. I can repeat precisely the same. In particular in that old book on philosophy of physics there are already the first drafts of what has been the fundamental structure of my philosophy of science (i.e. my theory of scientific objectivity) developed along many years and continuously nourished by adding new details derived from similar investigations and reflections encountered in the study of other disciplines, such as psychology, history and education (again something similar to Suppes’ intellectual life).

It would be not very interesting to mention other topics that have been common in our respective research (such as probability, causality, philosophy of language, educational problems), and it would be too long to analyze significant affinities regarding more general philosophical perspectives (for instance, the affinity between Suppes’ “pluralism” and my conception of the “analogical” and not

univocal nature of science; or the insistence that both of us put on the “contextuality” of notions, methods, truth criteria and so on). Moreover there are, after all, obvious differences in what we have cultivated and done (for example, I have done incomparably less technical work than Suppes in the domains of the philosophy of particular sciences, and have devoted much more work to history of science, philosophy of technology, ethics of science, bioethics, philosophical anthropology), not to speak of some more general perspectives (for example, Suppes’ “probabilistic empiricism”, that is an original blend of probabilism and pragmatism and also entails a not less original theory of rationality, is inscribed in the framework of American philosophy, while my perspective retains elements from ancient greek philosophy, Kantianism and other schools of European continental philosophy).

It would also be too strictly biographic to mention how we have become good friends, especially owing to many occasions of personal meeting at congresses and conferences, also as a consequence of a common membership in international institutions such as the International Institute of Philosophy, the International Federation of Philosophical Societies, the International Union of History and Philosophy of Science, the International Academy of Philosophy of Science. I shall simply mention two more salient facts: my stay as a visiting scholar at Stanford in 1997 (where I could teach a seminar for graduate students and profitably work at the development of a book that is still unfinished, having useful discussions with Pat), and the fact that Pat Suppes has been from the foundation a member of the Board of Consulting Editors of *Epistemologia*. These facts explain also the sense of the present initiative of devoting a special issue of *Epistemologia* to honour Patrick Suppes, not as a formal celebration of any particular event or anniversary, but as an expression of deep appreciation and friendship. Indeed he has already received a large share of honours in a variety of official occasions all over the world during the last years of his academic career, and it would not make much sense to add this little detail to such an impressive list. What we want is simply to express our admiration and gratefulness to a scholar that has honoured our journal for almost thirty years.

But how to honour him? It would be meaningless to think to offer a series of studies devoted to the different facets of Suppes' professional work, not only because this has already been done in other prestigious publications, but especially because such a field could not be encompassed even in more than one volume of our journal. In fact, even if one liked to mention not the fields that he has cultivated, but only those where he has produced important and original contributions, and devote one article to each of these topics, the list would be very long indeed: foundations of physics, relativity theory, quantum mechanics, theory of measurement, decision theory, distributive justice, foundation of probability, theory of causality, foundations of psychology, behaviourism, education and computers, probabilistic metaphysics would already constitute a dozen of topics that are, moreover, often intertwined and entail mutual cross-reference. Therefore our choice has been different: a seminar devoted to a survey of *some* of Suppes' major contributions, occasioned by a detailed study of his recent book, *Representation and Invariance of Scientific Structures*, has taken place at the Department of Philosophy of the University of Genoa during one academic year, on the initiative of a group of my direct or indirect former students (a couple of them having also been at Stanford with Suppes) and the papers discussed at that seminar have been then elaborated for publication. They have also had the privilege of being read by Suppes and are published here with his comments. Since these papers concerned only some particular topics of Suppes' contributions, I invited a distinguished colleague, teaching at the University of Bologna, Maria Carla Galavotti (who is well acquainted both professionally and personally with Suppes himself) to contribute a paper containing a synthetic general overview of Suppes' philosophy, and she has done this in a remarkably clear and precise way. A paper written by Luisa Montecucco (also a former student of mine who has studied with Suppes at Stanford and teaches at present at the Department of Philosophy of Genoa University) highlights Suppes' pioneering work in the field of computer assisted education. But the most precious content of this special issue of our journal certainly is a still unpublished paper written by Suppes himself and in which his

“pluralistic” view of science is applied to a rather unusual topic, that of libertarianism and welfare. This paper is an evidence of the originality and versatility of this thinker, who is actually much more than a mere philosopher of science, and it prestigiously opens the contributions of the present volume of *Epistemologia*. The majority of the contributors are young people, and this is also a significant detail, since it testifies the enduring importance and actuality of the achievements of this outstanding philosopher.

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