

**SOCIOLOGY AND HISTORY OF SCIENCE:
NEWS QUESTIONS, CONTEXTS AND
EPISTEMOLOGICAL PERSPECTIVES
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For historians of sociology , one of the most important problems of the twenty-first century is to replace the discipline in the age of scientific knowledge , thus giving up to the historical, cultural and academic literature which has painted , in fact , the evolution of the sociological studies that incorporate a dualism between paradigmatic history of sociological thought and scientific sociology, a dualism that still persists and affects the relationship between the more established academic historiography and the results in the field of science .

This dichotomy has been able even to produce the idea that scientific sociology was a separate discipline , a ascertained science as well as with historical- epistemological and methodological autonomy in the field of ‘science’ ; so to say it shortly , sociology as a science has always appeared as a story in its own right and not as the product of its interaction with other scientific disciplines.

Now , the fact of seeking a distinctive character in the panorama of historical studies of science, and especially during the nineteenth and twentieth centuries, was able to diffuse the idea that scientific sociology derived from itself , its own truth and themes –problems of foundation and for this reason it did not need to have a place in the history of more accredited scientific subjects, just in the moment when those disciplines opened to the consideration of science as a social issue, as a result of close relationship between material science, structure and social- historical development in some contexts, etc.. The major results based on that last one were produced in Europe from the end of the 70s of XX century, in the opening of the social sciences and sociology in particular, towards the history of science and the philosophy of science. And that is what we are going to talk about.

In fact, a history of scientific sociology devoid of ‘interior’ results of the epistemological debate that is developed in Europe during the second half of the twentieth century, would have now no persistence in the world of modern disciplines.

It could simply not exist, at least as a story of a modern scientific discipline among contemporaries.

And, in fact, this theoretical matter is not yet, or is becoming theoretical logical-empirical, just like sociology knows to be: a science of duty to be valid in certain contexts of development and not in others.

This attempt is in reality very sectorized and grows with the increase of the specializations.

It is different, in my opinion, the concept in the field of interests of the sciences of culture and religion, or in the historiography of civilization; in these areas, sociology states alongside the social history, the history of people and cultural anthropology.

In these areas sociology is a science that derives its consistency by comparison with other disciplines.

This applies similarly to the economic sociology and political phenomena, disciplines that extend historically the legal factors of existence of the big issues-problems of social organization, etc.

And so is in the field of history of science, sociology still does not have those requirements that could make her a participant of a accredited scientific discipline, which are able to pass on historiographical “strong” models, as an expression of their epistemological maturity and progress in the achieved methods. In fact, this seriousness in considering the transmission of this scientific soundness, an irreplaceable attribute for the advancement of knowledge and its own discipline, is less among the ranks of modern sociologists more than is the case of other fields of specialized knowledge. And even among the same social sciences. We take social psychology, for example, which is perpetually attached to the model of experimental science or political economy, which hardly deviates from economic history or development of models of knowledge developed in a certain historical period.

But how do you form the opinion on these issues today? What leaves behind to the modern world, for example, the complete dissolution of

scientism from positivism? And what about the results of the already old positivism? We will try to answer these questions in relation with the studies of some historians and scholars of science subject and we'll use the history of sociology to arrive at answers that a certain epistemological debate of the 70s of the twentieth century has left unresolved.

It should be noted the delay with which the historians of sociology and/or history of sociological thought come to formulate their interest in perspective. Faced with certain questions, very often, these scholars of science do not have the right answers or, more generally, the issues raised do not have the resolution that we would like to find, especially because certain periods of development of sociological science were already stored and/or no longer appear as relevant debates on the foundation of / in science.

In our opinion, this was and is a serious mistake made today by scholars of the history of sociology: the abandoning of these certain crucial moments of the development of sociological science; which would mean admitting that certain issues are now considered outdated and that we must go forward. In this way positivism and scientism disappear from the horizon of sociology, as well as the evolution and other currents of scientific thought of past centuries. But it also seems to be the prospective of the sociology of knowledge, for the theory of social action and the American functionalism, for critical theory and even to methodological individualism, of now orphaned Raymon Boudon. And what about the relationship between sociology and Marxism? It's so that sociology ends up doubting its very existence, not finding a link between his intellectual historians and historians of science of XX-XXI century, or not being able to count on the support of certain discussions born within other disciplines starting from the eighteenth and nineteenth century down to us. For this reason we believe that it is still worthy to discuss the issues that have affected the sociology since its origins: the comparison with natural philosophy, rationalism, positivism of '800 and the dissolution of the conventionalistic scientism in epistemology of Ernst Mach, Jules Henri Poincaré, Pierre Maurice Marie Duhem and constructivism of the twentieth century. And yet, we will discuss about the debate around the Marxism, even that that's

a kind of general demobilization undertaken by about twenty years from now, at least in Europe, about this debate. We will talk about it too.

Now let's discuss the thesis that sociology belongs to the history of science from the moment in which the reform of natural philosophy, begun by Francis Bacon in the seventeenth century, who was interested in those disciplines that can be classified as an encyclopedic knowledge during the Enlightenment and the positivism '800. As is known, by the action of the next Auguste Comte, sociology becomes the "scientia scientiarum" of the alleged modernity, a science of sociality and social organization or social physics. Until then, the method of experimental science had not been introduced in political matters, as stated Henry Saint Simon, in his work *Réorganisation de la société européenne* 1814.

In this period of the nineteenth century, the encyclopedic knowledge gives way to the resolution initiated by the science of society, where, as we saw in Saint Simon, the model of experimental philosophy makes it through various knowledges. Science seems to really master itself, and just as the reason had been in the Enlightenment, the scientific reason was for the natural world.

In fact, from the point of view of the history of science, the investigation of the nature and the empirical world by the social man takes place through the centuries in the manner prescribed by the natural philosophy, where the ancient and medieval tradition left some purposive and vitalistic problems unresolved. In the sixteenth century, and especially in the seventeenth century we see some recovery of raised issues by atomism and mechanism in conjunction with the decline of Aristotelian physics. In the century of Descartes, who rejected the atomism, the search for a theory of matter dominated the scene as well as that of the uniform rectilinear movement which created the state of the rest of the body, as seen in the *Principia philosophiae* of 1644 (published in French in 1647). The principle that the knowledge derived only from the interpretation and commentary of the ancient texts, under some form of *principium potestatis*, was gradually replaced by a philosophy of history of progress embodied in the context of scientific knowledge from the experimental method. The Scientific Revolution culminated in the application of this meth-

odology in natural philosophy, in the life sciences (biology, anatomy, zoology, botany), medicine and chemistry, physics (optics, magnetism, thermodynamics, electricity) as well as the findings of William Harvey on blood pressure, Evangelista Torricelli on atmospheric pressure, Francesco Redi on living bodies and Isaac Newton on the nature of light. The history of science was mainly the result of the joint just illustrated, as expressed by the Baconian science, with the help of the investigation and the mathematical proof of the world, such as Galileo Galilei also expressed his method extending astronomy and cosmology, theoretical physics, mechanics and dynamics. The history of science held out like so to constitute a *notum facere* that could be of interest to various fields of scientific knowledge and much of the philosophy of nature. The watchword of this period, which extends well beyond the end of '50, was that the fight against obscurantism persisted over time, which had trapped the projections of human perceptions about the nature, anchoring them to the prejudices of ancient philosophical doctrines which did nothing but spread the use of incorrect terminology comparing the unfolding of natural phenomena and cultural era.

As is known, the slow decline of positivism of the '80 corresponded in Europe to the advent of logical-empirical resolution that was reflected in the examination of the scientific language, an examination which took the name of 'neopositivism' and was developed in the so-called 'Vienna Circle', including authors, economists, logic and science philosophers, sociologists, etc. The ambitious project of unification of science, clearly outlined the programmatic manifesto of the Wiener Kreis as well as the general anti-metaphysical attitude, two cornerstones of the neoempirical theory, a particular factor around which flowed the Vienna Circle that was the specific focus on logical analysis of language. As it is more or less known, is through this method that you can demonstrate the futility of statements, namely, the absence of metaphysical content of utterances.

The editors of *Wissenschaftliche Weltauffassung. Der Wiener Kreis* in the introduction to their programmatic manifesto devote a not secondary importance to the socio-historical and intellectual context that makes it possible in Vienna in early twentieth century, the development of the new movement of thought. As it is known, towards the

end of the nineteenth century, in Vienna was resumed the political and social unrest, which had damped after the revolutions of 1848; in this context, the Christian Social were in conflict with the German National Party and the Social Democrats of Viktor Adler. But, apart from the sociological and historical reasons, the development of a new modern scientism, is indicated as the only one that should prevail on the scene. Vienna centralizes upon itself an empiricist attitude that could turn into a new scientific revolution, taking place in the context of development that had found the alternative to Kantianism, with a metaphysical final and an anti positivist, utilitarian and pragmatic, materialistic attitude.

The neo-positivists started to discuss general problems closely related to empirical science. They were mainly epistemological and methodological problems of physics; for example, we should mention the conventionalism of Jules Henri Poincare, the conception of the purpose and structure of scientific theories of Pierre Duhem, as well as issues concerning the foundations of mathematics, axiomatic and logistics. Vienna in the early decades of the twentieth century germinated not only the neo-empiricism but also legal psychoanalysis, normativism, twelve-tone music, modern architecture and abstract painting. Neo-positivism started to implant a theory of the scientific conception of the world, so you have to provide a tool and/or a set of tools to help promote a serious social and economic transformation , as well as state Otto Neurath, Hans Hahn and Rudolf Carnap.

One of the cornerstones of the scientific conception of the world, as it is known, consisted on a harsh criticism against any metaphysical pollution of scientific work. The first objective of the scientific neoempiricism was to present a scientific language that would allow to express forecasts and to formulate the conditions to control the so-called 'observation sentences'. The goal was not made only by metaphysics, that is, in its coexistence issues idealistic or rationalistic, but above all by what neoempiric considered metaphysics. As mentioned, the neo-positivism was not originated from the problem of knowledge, but from the examination of the structure of science. We can say that: the scientific conception of the world recognized only the empirical propositions formulated on objects of all sorts and the analytic statements of logic and mathematics.

The fact is that the anti-metaphysical of the neoempirism of the twentieth century was also performing an anti-philosophical attitude, as where is the science, to dictate the meter to the philosophers, and not the other side. The same can be said of the relations that propel the research of sociologists to the redefinition of the discipline. The historical debate of science is done so from within the disciplines, where the analysis shows the limitation of not having to resort the historicity of the sentences, thus resorting to a kind of extended naturalism up to a minimum of logical analysis of language. Sociology, in particular, tends to take care of its existence within more or less verifiable utterances, where the theory of knowledge of neoempirism, concerns the comparison between protocols and experiences, or between facts and propositions themselves, which, ultimately opens the way for every possible dualism and to return to a traditional question.

The concept of sociology as a science of the observed behavior of human groups, was the core of the discipline, at least for some members of the Wiener Kreis as, for example, Otto Neurath, who speaks of propositions that are detectable in the study of groups and extends the concept of sociology in order to reduce the scientific descriptions of the various disciplines in terms of space-time and observable predicates. In this sense, especially the positivism of Otto Neurath draws a sociology of the larger group, which would cease to be a specific science and, like the other, as part of a unique and all-encompassing science, based on assumptions of original physicalism, would come to be part of the so-called "cosmic history." The latter, to the extent that you use the universal language, a language that is physicalist, contains propositions of unified science; thus, the unified science in the Encyclopedia can be understood as a typical language of the story (cosmic). Thus, the results of scientific sociology is measured with the results of an arrangement of the physicalist vocabulary, where also appear some of the programs that address to the plurality of the 'stories' possible to pass, even that neo-positivism can not formulate sociology as an interior of a historical perspective of epistemology, ie, within a epistemological story able to get to us. The effort of neoempirism seems encapsulated in their anti-metaphysical tendency to reduce science in a language game made of verifiable statements, in view of a redefinition of

the demarcation between science and philosophy that will occur mainly through the work of Karl Popper.

The test of Popper's philosophy is Marxism, which Otto Neurath does not ignore at all. We can say that many of the Anglo-Saxon historians of science, Popper mindful lessened in the years '35 -40 of the last century, took the road of mere criticism of totalitarianism and historiographical determinism that would draw once and for all the address of the history and the social sciences around it, without a real epistemological critique about it. Thus, for example, the note discussion of Thomas Samuel Kuhn's of the scientific revolution took place without Karl Marx and was growing support around a dominant paradigm which was less than the pursuit of historicity in the practice of scientists and / or social scientists . In our view, this had an effect on the formation of the generation of historians of science, modern and contemporary, more than positivism and evolutionism had influenced the development of sociological knowledge in the course of the nineteenth century. The fact is that sociology has come increasingly forming within the Western culture without enough thought on concordances and dissonances had with Marxism itself, which always goes through a kind of self-criticism of the knowledge produced, just as among the main of social sciences.

Thus, an excess of criticism has damaged sociology, even outside of their area of research. In part, the transcendentalism in sociological sciences, liked by critics, such as, the Austrian Max Adler, the neo-Kantian school of Baden that gives life to the famous Methodenstreit, helps to make misleading debate - from the slope more 'open' the Marxism.

On this point you can see the critics (ignored, for example, by historians 'official' sociology) of Max Adler against Heinrich Rickert, Wilhelm Windelband, Rudolph Stammler and Hugo Munsternberg, beyond the positions closely Weberian, or better , attributable to the production and scientific books of Max Weber. And not only. There are many examples, more or less known, concerning those who seek in Marxism only tools of sociological explanation of the genesis and development of the ideology and the formation of ideas and even political institutions (the Polish Ludwick Krzywicki, to mention a name) .

There are other examples that lead us to those that trace the genesis of sciences like mathematics and physics through the examination of the structure and ideology. Their theoretical elaborations on training and knowledge production were held along diverse scientific programs. In essence, the basic assumption was that, especially an objective and empirical science of social relations runs the risk of belonging to the ideology.

The problem is also to judge the history of science for the development of scientific sociology. It is not a “matter of words,” as it could be, for example, at the time of the positivism and Italian evolutionism in the context of ideas in which a dispute arose between those Marxists who, inspired by the works of Antonio Gramsci seek the practical usefulness of the philosophy of practice and those positivists in which research and prediction made on the origin of social problems was scientific and therefore uncritically separated from historical practice - what goes ‘over’ the serious intent of the logical positivists of Vienna. It ‘a modern problem, raised by those who have already crossed the threshold of epistemological relativism and therefore those who, instead, are struggling to do so. It’s a question to proceed rationally so to make feasible a road, instead of another. The question is: what is the most convenient way?

If we refer to the research conducted on the genetic blueprint of the scientific procedure, we can assume that the Marxist sociologists have lost and, perhaps rightly, the methodological clue to the problem. So, we can say the same of some cultural historians or historians of ideas known as ‘social scientists’ area of Marxist and then credited to the Marxist tradition of the studies on the production of science. And besides, this may be true for those who have renounced the ‘historical’ studies, preferring to use them only as ‘matter’ needed to develop interests aimed at the sociology of knowledge and the sociology of scientific knowledge. In particular, the sociologists of knowledge, use historians of physics and epistemologists not strictly Marxist (known as the Thomas Samuel Kuhn and Popper and Bachelard already mentioned) to describe the change and the development of science in order to find - finally - a critical and conflictual theory of those same changes. Overall, it is not easy to study the nature and realize the origin of those problems, just as the systematic research on the assimilation of

certain sources and categories of Marxism in contemporary sociology took place in order to make people believe that the genetic explanation of the occurrence of the causal social phenomena, was something different from producing scientific material suitable to explain the genesis of science.

Until proven otherwise, it is sociology in indulging in Marxism; the opposite, simply does not exist.

Conversely, what exists is a certain amount of books and essays that discuss the various non-systematic vocation of sociology to seek in his scientific history an consistent development of methods designed rationally. Not to mention, the confusion generated by the term 'systematic' and 'systematic' and, sometimes, their translation from German to English, caused for example, starting from the antidogmatic lessons estates by Karl Mannheim at the "London School of Economics" - better known among Marxists as acritical to the 'real issues' addressed by Karl Marx -. In fact, many of these 'issues', concern historically sociologists and their particular theoretical-intellectual. Many of them, as is known, were brought to the clarification from the mediation of some sociologists of knowledge or disappeared in front of the proponents of the sociology of scientific knowledge.

What is on the horizon of historians of modern sociology is only an attempt to explore and trace the contributions of scholars belonging to that approach of the sociological study of science known as the sociology of scientific knowledge (abbreviated SSK, English the sociology of scientific knowledge), developed in England in the early 70s of the twentieth century, with particular reference to its first phase, from 1970 to the beginning of the 80s of the same century. In this period in Europe develops between sociologists philosophers and historians of science a strong critical discussion about the Merton paradigm and the refusal of the regulatory model by some scholars that consider it inadequate to explain the social dynamics of science and to understand its importance as a social problem (with respect to its role now clear like institution and social issue and inform about itself other political institutions, economic etc. and, in turn, is affected as it proceeds), thematic that the American sociologist Robert King Merton had brought to the attention of sociology (especially the sociology of knowledge) with the formulation of the paradox that will bear his name. These

scholars, belonging to what at first will be called “Science studies unit”, will build on the debate came as the reception of the work kuhiana by sociologists, philosophers and historians of science who have worked in various capacities of the problem the social dimension of science.

The reference here that can be done, in particular, is what leads analysts to critical reflections built around and on the themes of the work of Thomas Samuel Kuhn and Robert King Merton; it just wants to be a filter in the disposal of works and authors, to narrow the scope of discussion and still give an overview, concise, with a specialization in science sociological otherwise vast and rich contributions also from other authors and scientists from other areas of the social sciences and not. The work of the historian of science Thomas Samuel Kuhn, especially after the critical discussion that came around to *The Structure of Scientific Revolutions*, is here considered only as a turning point, a point after which the sociological reflection on science can find something different . That what here serves to guide a speech in epistemological field is the selection of some authors and some aspects of their thinking and their production, a rationale choice that many historians of sociological thought and science may yet fulfill.

After the criticism developed around *The Structure of Scientific Revolutions*, in fact, many scholars, historians and philosophers of science had to deal with problems more specifically sociological; This will lead, at least from a certain point of view, to consider gradually no longer adequate the model proposed by Robert King Merton and shift the focus on most heterogeneous materials coming precisely from the history of science, also opening a dialogue with the philosophy of science: this is the essential point of the speech. Even the same members of the SSK will have origins from different disciplines.

Following this line, which is that of a very general introduction to the sociology of knowledge, with a hint of its size macro and micro, the many fields of interest of the subject, we shall expand and affect the new task of historians of science in the twenty-first century, which is to pursue the epistemological history. The latter should therefore be able to crop the scope of a particular interest in the sociology of science and scientific knowledge, an increasingly narrower, (so to speak), compared to the same discipline. To do this, historians of so-

ciology and / or historians of sociological thought, will deal, for example, of the paradox of Robert King Merton, who was the first interested in scientific institutions as a social phenomenon and the relationship between science and society. Second, they will be able to describe his approach, functionalist and mold legislation, to the sociology of science, which he formulated as a real paradigm, to the point of making a comparison with its slow decline. The same paradigm can be part of a historiographical reconstruction of science, that will be included in a serious debate about the history of science. After discussing the Merton model, historians of sociology will put more light on the main issues, related to the ethos of science and the remoteness of the regulatory system more affirmed that the reality, deal with the criticism at a theoreticall and empiricall level by scholars of the scientific and cultural, American and European.

At this point it will always be appropriate to introduce the SSK in the history books of sociology and / or history of sociological thought, with its brief history, the change of the name of the department from "Science studies unit" to "Sociology of scientific knowledge"; it can be drawn a list and of its main exponents, with works published from '71 until the early 80s of the twentieth century: the so-called "strong program". You will be able to seriously consider the exponents and the central and most important works. In particular authors like Barnes, Bloor, Mackenzie, but may be considered the contributions of Dolby, Whitley, Mulkay and Shinn. For each of them can be browsed one or more works, chosen from among those that interest science and the relationship between sociology and science, to try to isolate the essential topics, but also some articles, in order to give an idea of the real problems with which engaged in those years, the sociology of scientific knowledge.

At this point, historians of sociology and / or history of sociological thought, after the "strong program", will explore the approach of the sociology of scientific knowledge that spreads outside the of the British borders; you will be able to illustrate the works of some of the authors who contribute to its development in the early 80s of the twentieth century with a mention of the constructivist version.

The challenge of modern scientism occurs with the emergence of conventionalism, ie the philosophical conception according to which cer-

tain principles or propositions, both cognitive and ethical-political conventions are based on an agreement or a choice (even implicitly), not then evaluable in terms of truth or falsity. The appearance of conventionalism which sets new standards for research and for an epistemological perspective of the history of science. In antiquity, the conventionalism was also supported by the sophists for moral and political principles. Much of the legal and political thought of the century. XVII and XVIII supported the conventional character of the fundamental rules of social order: the latter were based on the agreement between the men, according to criteria of general well-being and also utility. Towards the end of the nineteenth century, conventionalism has extended to the field of formal languages. The modern conventionalism can therefore be defined as a school of thought that emphasizes the conventional nature of some fundamental concepts of mathematics and physics. Starts from the discovery of so-called non-Euclidean geometries and the relativization of space and time, determined by the survey physics in the early century XX.

In essence, with the non-Euclidean geometry is called into question the spatial intuition, as it results from common sense and from psychological surveys, understood as a foundation of geometry; was also possible to show the logic of geometry that not only had recourse to this principle, but they were not analyzed in terms of either psychological or perceptual space nor in those of physical space. As for the physical, the objections raised on the absoluteness of space, the basis of Newtonian physics, especially in work of Ernst Mach and Henry Poincaré, would find their realization in the theory of relativity of Einstein. In this context, in which there can be no privileged geometry, or an absolute space, it is the conventionalism which reiterates the fact that the privileged geometry or a system of spatial references, depends, in the end, only to agreements executed by the operator based on scientific criteria of opportunity and convenience. The problem of the affirmation of a scientific orientation is not.

This speech, extended to the question of the foundations of mathematics, and then in all of mathematics, was of this science a set of concepts and theories whose adoption resulted bound only to the conditions of non-contradiction and handling. It is thus denied the existence of a priori knowledge in mathematics is the reference to the evidence,

supported in theory; and this because of the fact that the specification of the meaning of the terms used in this science was made to depend on the sun conventions that were gradually taken out. This position found in the early twentieth century, along with Henry Poincaré, a leading advocate in Maurice Pierre Duhem. In fact, the vast echo of the philosophical works of the first meant that conventionalism serve as a substrate in numerous and disparate philosophical positions, such as, for example, pragmatism or spiritualism French. It should however be noted that, for what concerns the foundations of mathematics and logic, conventionalism in the early decades of the century. XX quickly lost ground in the face of greater wealth and articulation of other currents such as formalism, logicism and intuitionism. Thesis like conventionalist are however present in the work of Rudolf Carnap and more generally in logical positivism. Differently, another fate has known conventionalism in the study of the foundations of physics, where, even more recently, has been the focus of lively debate among epistemologists.

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