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# Incidences on the philosophy of science of the historiographical thema “Science and cultural diversity”

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Some remarks for the *Symposium of the International Commission Science and Cultural Diversity* held at Pachuca, Mexico, november 28 th, 2000.

# A Letter from Paris

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1.

Philosophical problems  
in the field of the history of science

History of science and philosophy of science are interrelated despite the separation that predominantly occurred in XX th century, at least in cultural contexts influenced by the "anglo-saxon" philosophy. But, actually, history of science provides a rich field of philosophical problems, and this consideration may powerfully help renewing many "standard" considerations of the philosophy of science, such as, for instance, the changes and evolutions of scientific theories and representations, to take only one example, but which has been significantly related with the structural or systemic character of these theories or representation, with known consequences from the "impossibility solutions" (claimed for rationality) on the debates about the social aspects of science. If, instead, *history and rational concerns are* to be taken together in considering, both philosophically and historically, the problem of *scientific changes*, then the *a priori* impossibility shows no more relevant, as the existence of changes is taken as *factual*, and we have to think deeper to understand *how* they occur.

Also, the question of the relation between *rationality* (preferably to a pure logical concern) and *invention* or *discovery* in science could be more adequately considered by taking true historicized science, which is that on which scientists do work, than his "rational reconstructions" (see, for instance, what a "problem", or a "difficulty" is, for a scientist at work, in a given case study). In particular, the

epistemologico-historical concepts of "scientific style", of "scientific programme", of "scientific tradition" ([1990]),<sup>195</sup> that express a diversity of possible (legitimate) approaches for a same kind of object or of problem in a given time, are useful to understand how science is always in the making and is never *already given* (be it potentially) or "*natural*", as if there were a unique standard response or statement to a only one-way formulable question.

Clearly, such a concept as "objectivity" is doomed to be reconsidered in these circumstances, and other fundamental concepts and categories as well. But this does not mean that they would have to be left out, and that one would have to adopt a purely historicist conception of knowledge and adhere to a "strong relativist" conception with social reductionism, or to a philosophically nominalist position rejecting rational abstraction and generalization. For this would be too cheap a position, and would lead to absurd conclusions about science and rationality, when, on the contrary, the confrontation of both requirements of *real or effective science*, i.e. its dimensions of *knowledge* (meaning contents) on the one hand and of *human practice of knowledge* (which includes sociality and context-dependence, most often casual), on the other hand, is a worthwhile challenge for thought. It is worthwhile, because only from it can we expect to get at some sound, exact and balanced *signification about science*, scientific activity and rational contents.

We could make an inventory of such items of the kind. The question of the "interpretation" itself can be differently seen when it is shifted from a purely logical point of view (as if there was one given compelling *interpretation*, in the philosophical sense), up to a circumstantial, i.e. rational-and-contingent one (see, for example, the importance of the historically situated cultural context for the acceptance of the so-called "Copenhagen interpretation" of quantum mechanics).<sup>196</sup>

For all this, and furthermore, history of science, by making know historical facts about science, i.e. the actual reality of science, as a human, intellectual and social activity considered in the historical time, appears as being essential in knowing better what science is. Philosophy of science can no more ignore this knowledge and stand within an abstract idealization of science (after all, such an idealization has been historically coined and its knowledge is history dependent). We must admit, symmetrically, as accepted (even if not by everybody) that history of science (as history itself) is not merely description of events, nor with purely social concern, and that it has to do with *meanings* that *have to be searched for* (*they*, too, are not immediately given), which implies the use of reasoning, including epistemological analysis, and at least some philosophical reflections on what all this is about.

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<sup>195</sup> I quote in braquest references to some previous works of mine that are correlated with these remarks.

<sup>196</sup> The question of the relation between changes in interpretation and scientific contents will be the subject of a thematic session proposed at the XXIst International Congress of History of Science to be held at Mexico, 8-14 July 2001.

## 2.

### The Anthropological Approach of Science considered through a variety of historical conditions and cultural diversity

The taking into account by history of science, since a few decades, of the variety of the historical conditions (in space and time) under which science has emerged, has developed or has transformed, corresponds to one of the major aspects of the thema "Science and cultural diversity". This "œcumenical" widening of history of science entails new perspectives for the philosophical approach of problems related with science - in an enlarged, dynamical and diverse conception of science. To reflect on science and cultural diversity means :

1. To consider many possible *interrelations* between *science* and *cultural* aspects, some of which are mentioned in Lafuente's document, essentially from a contemporaneous point of view. Clearly, our views on these problems are affected by the fact that we situate ourselves in the context of modern science in the present world, even if from some diversity of origins. Most of *our categories* are rooted in this context. Internationalism and mundialization are our present. But we can always inquire their modalities and their roots, now and in history, and we can reflect also on the lessons of other cultural systems in the history of civilizations, that include forms of knowledge that can be seen as corresponding to what *we call science*. And we are thus led to point 2.
2. To see *science* as an aspect of the various *cultures* considered according to their *diversity in time and space*. The problem is to identify *what "science" is in each culture*, and to analyse its relations with the other cultural components. In such an inquiry, we cannot start from "science" in general, for it would mean to impose an external philosophical scheme onto a given cultural representation ; but we should try to identify which *activities* (and *objects* and *methods*) are to be pertinently compared to what we consider as "*scientific*" (from our own questioning), so as to be qualified as such, though knowing however that there are *different systemic meanings* for knowledge in different cultures. In doing that, we should assume that some *communication* is somewhat *possible and meaningful* between different "*cultural systems*". It entails some changes in the possible *definitions of science*.

Note that there would be similar problems to define *art* as *aesthetics* from the produced objects and forms that we appreciate as such, and for other cultural components as well. Anyhow, if we want to go further than describing mere facts or local situations, and try some deep understanding of them, and of *their meaning, culturally speaking*, be it from a simple *anthropological point of view*, we need to use some categories such as *science, technique, religion, art, aesthetics*,

*philosophy, reasoning, meaning, etc.*, even if we must be ready to find that they are not uniquely and rigidly defined since the start.

We could therefore even consider that they are *our creations* (as well as the notion of *history* is our creation, I mean the creation of a given culture), but they are useful to enlighten what cultural forms are, and we can even ask ourselves from which more complex cultural forms they have been constituted (and separated by our minds). We should consider in this respect the eventual status of *general and abstract knowledges* and of general and abstract *categories*, as well as the *reflexive thought* about these, in various situations of cultural diversity (through comparative studies). And inquire about the communication (as possibility and as modalities) respectively of concrete elements of knowledge and of abstract ones.

### 3.

#### Philosophical problems of science and cultural diversity

On this background, let me formulate some questions of a philosophical nature that would come out afresh from the study of such historical situations. We may consider that they concern the intellectual *conditions of possibility of science and cultural diversity* or, in other words, that they point at philosophical problems emerging from the field of historical facts about science and culture. The following evocation is far from being exhaustive and serve merely as indications and suggestions for further inquiry.

1. Are there *general categories* (from our historical and epistemological analyse) compatible with diversity ? In particular, what is the status of *universality, of rationality, of reason, and even of common sense* ? At least some common intelligibility within cultural diversity has always been the basis of interethnic communication, as testified by many reports by travellers through centuries ; this having to be tempered by the frequent occurrence of misunderstandings, of only partial understandings, and of lack of communication as well... Also, *reasoning*, despite differences in the definitions or premisses, is a common faculty of human beings, as wordly testified. *Universality*, which is at odds with uniformity and uniqueness, shows to be an adequate category when one looks at anthropological and historical facts such as ability to language, to symbolic representation, to social life, to technical realizations, to the invention of forms, ideas and organizations (social one, in particular), to *knowledge* in general : see the "neolithic revolution", the invention and dissemination of writing, the industrial revolution, not to speak of *science*, for our ultimate question is : how (in which sense) can we speak of the *universality of science* ? (See Paty [1997, 1999]).

2. What are the modalities of the *transmissions of knowledges*, either inside a cultural tradition or through different ones, and are there useful epistemological concepts or categories able to give account of them? In this respect, I would oppose to the kuhnian notion of "*paradigm*" another one that seems much more appropriate from the point of view of history of science that includes the consideration of cultural diversity, and less philosophically biased, such as that of *inheritance* (of Styles or *traditions* or *programmes* about knowledge<sup>197</sup>), that leaves all space for creative activity. A "normative conception" would admit creative activity only as an accident or through a revolution, although *scientific creativity* appears to be not extraordinary or "a-normal", but inherent to *science as formation of new knowledge*, with or without *scientific revolutions*, the latter being by definition exceptional.
3. Is the notion of *structural incommensurability* (of the conceptual representations) of some relevance when we must consider that, communication being historically evidenced, *communicability* is possible and factual ? On the other hand, historical understanding needs to respect the systems of *meanings* of the "cultures" considered, which are, at a given state in time, governed by their structurations. This means that we have to relativize the concept of incommensurability for structures in order to let space for communicability. Actually, it is absolute only in an axiomatic acception, when one considers conceptual meanings as fully closed inside theories or representations, but it is not really adequate with respect to the historical point of view on conceptual elaborations. The idea of "*systemic character*" is for sure an interesting one from the historical point of view, when one considers the questions of meaning in knowledge transmissions, but it cannot be identified to incommensurability in the strict sense. This should be developed and enriched with epistemological analysis of exemples taken in the history of science, particularly of transmissions through cultural diversity.
4. What is the interplay between *intelligibility and historicity* ? This question leads inevitably to that of the *transformations* (and widenings) of *rationality*, and to that of the nature of such transformations [forthcoming, a].<sup>198</sup>
5. What can be said about such notions as *problematization, demonstration, proof*, etc., when confronted to the various conceptions of science ? (There are investigations on some of these problems that are already published or in the course of publication).
6. The problem of knowledge's *communication* and of *translation*, that often entails inadequacies ("*traduttore, tradittore*"), leads also to that of *invention* as a possible consequence (although it is not the only way to invention,

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<sup>197</sup> See, for example, the case of d'Alembert, who made his own views and ways of investigation by borrowing or inheriting from three "traditions" : the newtonian, leibnizian and cartesian ones (Paty [in press, b]).

<sup>198</sup> Paty [in press, a].

according to what we have stated above on creativity : through the translation and assimilation process alone it would be more accidental and casual). How does this happen in relation with the insertion of *science* in *cultural contexts* ? (this question joins again that one considered above about the relations between *changes of interpretations and contents*).

There are, of course, many other possible items... Note that philosophical questions of this kind may lead to historical investigations in the form of case studies or of comparative researches, as historical facts are essential, in our perspective, to situate these questions and to test their possible answers (as we have experienced elsewhere with the problem of universality of science [1997, 1999]).

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Remark. This being more a working note than an achieved paper, I omit bibliography, and only include my own papers that are related with this research.

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# **Science and Cultural Diversity**

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of Science**

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