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We are All Rationalists, but it is not Enough: Ways of Explaining the Social Acceptance of a Theory

Pablo A. Pellegrini[1]

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Abstract
This article discusses explanations behind theory choice, that is, ultimately, what leads people to accept a certain claim as valid. There has been a recent debate as to how closure was achieved in the continental-drift discussion. The controversy had found its usual explanation under rationalist terms: Wegener's 1912 continental-drift theory was accepted 50 years later only after the plate tectonic theory had provided more evidence or a more in-depth problem-solving capacity. Nevertheless, a re-examination of the controversy under constructivist terms argued that closure was achieved by a change in the style of thought. This analysis prompted some authors to react calling to a 'defence of rationalism' and insisting on explaining that the continental-drift theory was only accepted because of epistemic reasons. As the debate impacts on the way to explain scientific controversies, in this article I analyze rationalist and constructivist approaches with respect to ways to explain the social acceptance or rejection of a theory. The analytical perspectives will be contextualized within a broader theoretical discussion in philosophy and social sciences about the role of different factors that condition knowledge, which will also include an empirical approximation in the analysis of GMO and continental-drift controversies. Ultimately, the debate with rationalism is situated in a broader context about the ways of explaining the social acceptance of a theory, arguing that the problem with the rationalism that confuses a purely logical explanation with a sociological one is that it tends to judge rather than understand.

Keywords Rationalism · Constructivism · Scientific controversies · Continental drift

✉ Pablo A. Pellegrini
ppellegrini@unq.edu.ar

[1] CONICET (National Scientific and Technological Research Council, Argentina) / Max Planck Institute for the History of Science / Instituto de Estudios sobre la Ciencia y la Tecnología, Universidad Nacional de Quilmes-CIC-BA, Roque Sáenz Peña 352, B1876BXD Bernal, Buenos Aires, Argentina

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1 Introduction

Alfred Wegener is the acknowledged precursor of the continental-drift theory, which revolutionized the then dominant ideas about how the Earth worked, but 50 years had to pass before his ideas (about the movement of the continents) were vindicated. Why did it take so long for his thought to be accepted? For many authors—which we will group here under rationalists-, the answer is that there was something missing in his theory to convince his colleagues: some point out to irrefutable evidence that appeared only later, others argue that the theory itself could be improved. In a previous article I argued that it was the cultural background that received theories as acceptable or inacceptable. That changed, while no inherent element of the theory or empirical evidence resolved the controversy by itself (Pellegrini, 2019). In any case, the controversy in continental-drift theory is not only interesting for its geoscientific implications, but also for providing a case for rationalists and constructivists to debate why it was so hard for scientists to accept that the landmasses were actually moving. Therefore, the recent debate about the interpretation of the continental-drift controversy serves as a unique opportunity for the philosophy and sociology of science to revise its recurrent discussions about theory choice, that is, what leads people to accept a theory. In that sense, traditional interpretations of the continental-drift controversy stand almost exclusively in epistemic issues. In this article, I will analyze the theoretical assumptions behind those rationalist and constructivist approaches to the continental-drift case, presenting different ways in which the social acceptance of a theory is conceived.

The most antagonistic debates in the philosophy of science are usually characterized as relativist versus absolutist (or anti-relativist). Indeed, David Bloor has argued that there is no third way here, as it can ultimately be understood as an alternate form of relativism or absolutism (Bloor, 2020, 394). Although each philosophical current has developed its own trajectory with little dialogue with the other, from time-to-time intense discussions emerge confronting these perspectives. In recent years these debates have been renewed, encouraged by works like that of Paul Boghossian (2006, 2011), which is an attack on the relativism of the sociology of scientific knowledge. Both perspectives have ancient roots in the history of thought: in Ancient Greece, Protagoras is considered the first voice of relativism, a position later taken by Pyrrhonian skeptics; while Plato and Aristotle are described as Protagoras' main opponents (Baghramian & Coliva, 2020, 27–32).[1] According to Bloor, the relativist and anti-relativist debate needs to be understood as a sort of continuation of traditional, theological disputes: while David Hume argued that there are no absolute standards for cognitive and moral basis, Hume's critics of the eighteen century replied that God is the absolute instance to discern truth and perceive the distinction between right and wrong (Bloor, 2020; Lenz, 2020).

A recent trend in the philosophy of science argues that many philosophical positions can be better understood as 'stances' rather than specific doctrines (Kusch, 2020; Veigl, 2021). Following van Fraassen proposition, stances are characterized as sets or bundles of

[1] Nevertheless, the influence of ancient authors in these perspectives may be wide and it is a matter of discussion. Some relativists, for instance, prefer to find their origins in the insights of the Ancient Indian Jain epistemology (Ganeri, 2019). Moreover, aside from some common features, skepticism is not the same as relativism: while both may agree that it is not possible to justify a definitive, universal and objective choice among differing criteria for knowledge, the skeptic thinks that there could be no criterion, while the relativist claims that there could be many equally good, but incompatible, criteria (Baghramian & Coliva, 2020, 32).

values, emotions, policies, and preferences (van Fraassen, 2002). This would enable us to see what kind of commitments and values are involved in a philosophical position towards knowledge. In that sense, relativism in the sociology of knowledge can be defined by its rebellion against any kind of absolutes, and by its commitment to empirically study the contextual dependencies of knowledge (Kusch, 2020). Anti-relativism, on the contrary, claims that at least some truths or values 'apply to all times, places, or social and cultural frameworks, that such truths are universal and in some relevant sense objective in that they are not bound by historical or social conditions (…) and are given independently of our individual viewpoints and biases' (Baghramian & Coliva, 2020, 6).[2]

This article engages with such debates by questioning the absolutist stance of rationalist perspectives involved in the study of scientific controversies. As I will argue, rationalist perspectives can be considered absolutist stances, since they assume that there are intrinsic virtues in theories that lead them to be socially accepted. Through a joint of theoretical and empirical analysis, I explore the theory choice implied in the philosophical explanations of knowledge. In that sense, the objective of this article is to discuss the way rationalist claims about the validity of a theory involve a reductionist explanation of its social acceptance. To that end, I analyze the sociological implications of such philosophical perspectives.

First, I will begin by demonstrating that the mode of explaining what drives people into accepting a certain knowledge is part of a broader discussion that involves different disciplines in the social sciences. Having situated the analytical perspectives of both rationalists and constructivists within this broader debate, I shall then indicate how these perspectives explain the adoption of scientific knowledge in particular. Then I will expound the relevance of the mode in which the question is formulated regarding the acceptance of a theory. The empirical analysis begins in a fourth section, where I will argue how the analysis of the social conditioning of knowledge needs an empirical approximation. Here I revise some controversies around genetically modified (GM) crops to illustrate how the reaction to different aspects of GM crops, even cognitive ones, is also mediated by social processes. After presenting the theoretical elements underlying the discussion on the adoption of a theory, I will review the recent debate about the continental-drift controversy and its objections, arguing that, while the distinction among rationalist currents is valid, this does not challenge the argument against rationalist explanations around the adoption of a theory. Finally, I will resume the argument that the problem with rationalism as used to explain the social acceptance of a theory is that it confuses a purely logical explanation with a sociological one, and in turn, that tends to judge rather than understand social phenomena.

In summary, the main arguments of this article are:

- Rationalist interpretations of scientific knowledge (the idea that there are intrinsic virtues in theories that lead them to be socially accepted) can be framed in a broader absolutist tradition, which frames them as absolute truths. In contrast, relativism is a long tradition that strives to think of knowledge in relation to the context that produces it

[2] Some authors engage in giving a list of different conditions that should appear to define what a relativist or anti-relativist is. But for Bloor is much simpler: 'To be a relativist is to deny that there is such a thing as absolute knowledge and absolute truth' (Bloor, 2011a, 436). According to Bloor, more complex definitions tend to confuse the argument between relativists and absolutists with other dichotomies, such as the argument between idealists and materialists. But these are different issues, as a relativist can be idealist or materialist. Also, empiricism (formulated as the claim that experience is the only source of information about the world) is certainly not opposed to relativism, as constructive empiricism shows (Bueno, 2003, 2018). Therefore, the central question that separates relativism and absolutism can be made clear.

and gives it meaning. These two ways of thinking knowledge imply opposite ways of explaining what leads people to accept a certain claim as valid.

- When seeking an explanation for the social acceptance of a theory, the question asked conditions the explanation to be found. If the question is what a theory has to be accepted, one will look for inherent elements of the theory already accepted. But if the question is why a social group accepts a theory, one may take into account social aspects.
- Empirical studies on scientific controversies and disputes over truths show that although it may be simple to distinguish those who are for a theory from those against it, the arguments and resources each part mobilizes are multiple and heterogeneous. Hence, rationalist explanations tend to avoid empirical studies, assuming instead that scientists accepted a theory because it was the logical consequence in view of a better theory.
- Rationalist explanations of why people embrace a certain theory is fundamentally judgement that seeks to label some people as rational, and other as irrational or misguided.

2 The Dispute Over Reason

When two different positions are in conflict over a common subject, a habitual resource throughout history has been to attribute one of those stances to reason (or truth) and the other to a lack of it. This attitude was historically frequent in anthropology up until and including the early twentieth century, a period in which the studies attributed a primitive and prerational mentality to the tribal societies compared to the rationality of Western (and particularly European) civilization. Evans-Pritchard skillfully opposed such characterizations, presenting detailed and marvelous ethnographic studies that proved those other cultures were neither less rational nor primitive. For Evans-Pritchard, the key was to understand each culture's system of beliefs in order to fully grasp their sense of reality and, in that way, understand that their postulates were completely rational in terms of the conventions within that belief system.

An example of Evans-Pritchard's observation can be found in the Nuer tribe, who assert that twins are birds. For an outsider, this statement might serve to label the Nuer as primitive for being incapable of distinguishing a person from a feathered creature. Nevertheless, Evans-Pritchard showed that the Nuer did not characterize birds by their physical attributes, such as feathers or wings, in the manner we would, but rather they saw other characteristics in them -and consequently in twins (Evans-Pritchard, 1936). Thus, a *bird* for the Nuer was not simply a creature with feathers and a beak, but above all it was a *divine being*, endowed with a spirituality that was invisible but there. For the Nuer, twins were an incursion of the divine in human affairs. In general, and given its extraordinariness, every multiple birth was the mark of that divinity. Although in many aspects of the daily routine, twins spent their lives just like any other person, in certain social rituals the Nuer would give them a different treatment because of the divine immanence attributed to them. In this way, being both a person *and* a bird represented no contradiction whatsoever. Thus,

although a given phrase may be contradictory in one culture, it can make perfect sense in another.

In his classic study of the Azande African tribe, Evans-Pritchard *provoked* them by offering them his own rational explanations to situations that the Azande consider magical (Evans-Pritchard, 1937). Evans-Pritchard ended up demonstrating how the belief system of the Azande enabled them to give an equally acceptable but opposing explanation to ours to the same phenomena. Their belief in witchcraft—which for the Azande could become manifest under specific conditions, such as within defined physical distances, and which they furthermore could corroborate through different tests—resulted in such an ordering of their lives that keeping a prudent distance from neighbors when constructing dwellings became significant in order to avoid potential acts of witchcraft on their part. What is notable about Evans-Pritchard is that he did not choose to characterize other cultures by relegating them to a lower status of rationality, but rather tried to explain the logic behind their thinking. Moreover, the link that Evans-Pritchard established between a belief system and a community's mode of organizing its social life was especially revealing because that association ended up pointing out that if the Azande, for example, understood reality as he himself did then they should be forced not only to discard certain assumptions for others, but also to reorganize their entire lives. In the same way, for Evans Pritchard, the life in England would become reorganized totally if the English happened to adopt the beliefs of the Azande.

In a strict sense, the existence of a unique or universal episteme was questioned by a great diversity of authors from Heraclitus down to Ludwig Wittgenstein (Smith, 2005, 18). The notion that a determined form of knowledge corresponded to a particular type of social structure or institution—that is, knowledge as a product of society—was developed by Auguste Comte, Karl Marx, and Friedrich Engels and later by Émile Durkheim, to mention a few. Afterwards, Karl Mannheim argued the necessity to study the social situatedness and perspective of all knowledge, opening the way for a sociology of knowledge. Peter Berger and Thomas Luckmann, in their treatise *The Social Construction of Reality* (1966), applied this point of view to the object of investigating the way any type of knowledge would be able to socially be established as a reality (Keller, 2011, 44–46).

A rationalistic philosopher of science could concede the above, but still believe that this sort of argument does not apply to science because science wouldn't be just one more culture, rather science would be the very space of rationality *par excellence*. Is it indeed so? It may be difficult to assert that science is the ultimate expression of rationality and at the same time to acknowledge that other cultures may also be rational. At all events, the question most centrally relevant to our analysis is: what if we can, in fact, find subcultures within science itself, each one having its own style of thinking? The very idea of a universal pattern of rationality in science would be dismissed in that scenario.

Although the interest of the earlier authors was usually directed at understanding the 'common sense' of a society, nothing prevented their ideas on the situatedness and the contextualization of knowledge to be applied to science. This is what in fact happened. Rethinking rationality in terms of a single culture and its conventions did not stop at the boundaries of science. In a book from 1937, Ludwick Fleck considered that within science there were different thought-collectives, each one with its own thought-style. Nevertheless, these views of science gained more acceptance after Thomas Kuhn (1962), whose ideas on the existence of different scientific communities—each one with its own paradigm that

assigned specific sense to reality, being these paradigms incommensurable among themselves—gave way to more extensive debates on the rationality in science.[3]

3 Explaining Scientific Knowledge: Universal Logic or Contextual Reasons

The idea that science is exclusively ruled by universal logical criteria allows different variants in terms of how to distinguish that presumably pure rationality, but what remains a common feature among those variants is precisely that which is not allowed—namely, that social phenomena may shape each and every form of scientific development.

The main antagonism in explaining science is usually stated in terms of rationalists or absolutists *versus* relativists and/or constructivists.[4] I personally do not agree with the terminology used to name these perspectives, since they sound substantially more indulgent with rationalists. If rationalists stand on the side of 'reason', that means the others are on the opposite side, that of irrationality, and this is certainly not the case. Anyway, the dispute is over the type of reasons that are at play when explaining knowledge. Nevertheless, since these terms have been used for decades, we will keep them to focus on the more important aspect which is the arguments both sides deploy to explain knowledge.

Rationalists argue that the development of science (the discoveries and the acquisition of new theories) is strictly attributable to empirical, rational, logical, or cognitive elements. For them, social phenomena are only useful to explain issues regarding the context of science or, at the most, to explain *deviations* within science—i.e. erroneous theories that were supported. Reichenbach's famous distinction between context of discovery and context of justification alludes to the expulsion of the social explanation to the margins of science. Reichenbach posited that diverse social phenomena could condition investigators in the formation of a hypothesis, but once they had a hypothesis, the theory could only be explained based on epistemic factors. Our perspective is, however, that this distinction is based solely on an *ex post* imputation that naturalizes a scientific fact by hiding the social framework. Multiple social conditionings predispose a social actor, even a scientist, to formulate or adopt one theory over another. To understand the advent of a scientific theory within the field of science, one needs to precisely examine those social conditionings. The problem of cognitive order *is* the problem of social order (Bloor, 2011b, 4); epistemological conflicts are always—and inseparably so—political conflicts (Bourdieu, 1976, 90).

[3] According to Kuhn, scientists with discrepant paradigms view the world differently, since different paradigms make use of different evaluation criteria and refer to different sets of scientific problems (Gattei, 2008, 75). The idea of the incommensurability of paradigms is complex and goes beyond the scope of this article. Paul Feyerabend mostly worked on the notion that in the same manner that there is incommensurability in the modes of cognition of a society, incommensurability can be found within science itself. For his part, Ian Hacking (2010, 64–74) referred to incommensurability as posing three distinct questions: incommensurability of subject-matters (a theory could follow another using new concepts and applications, ignoring the earlier one, and also involving a complete change in the explanation of phenomena), incommensurability through dissociation (a paradigm might imply a mode of thinking that was dissociated from the earlier one with no reference in common and involving distinct forms of reasoning), and incommensurability of meaning (the same theoretical terms could signify different things, thus making a comparison of the two theories impossible since they have no meaning elements in common).

[4] Stephen Turner considers relativism to be the basic phenomenon of the social sciences, but describes distinct senses of relativism in its history. Epistemic relativism is the main feature of social constructivism and science studies, according to Turner (2020).

The dispute between rationalists and constructivists is sometimes couched in terms of internalists versus externalists (Shapin, 1992). The formers hold science is developed on the basis of ideas, experiments, and observations—those being internal elements of science—and any change in those elements must be exclusively explained by the advent of an intrinsically superior or improved theory, experiment, or observation. By contrast, the externalists resort to ample social changes to explain the development of new scientific elements. The problem is that this distinction is not satisfactory enough for those, like us, who are not internalists. Although examples of purely externalist inputs may be found, their existence is customarily framed as a caricature by internalism in order to avoid taking the criticism seriously. For an analysis that claims to explain scientific development on the basis of social causes, while ignoring the production and circulation of theories, experiments, arguments, publications, and other scientific elements, would be just as hasty as the—more frequent—analysis that claims to explain scientific development according to 'purely' scientific elements (Bourdieu, 1976, 90).

Rationalists seem to fear that if one yields to the demands to find social causes in theories and proofs, the world of reason will see its end. Here resides the argument that the rationalists first mobilize epistemologically (a theory can be then demonstrated to be superior to another and, from that point on, it is adopted for its intrinsic superiority); and as a last resort they argue normatively (no other cause can exist for which the theory is adopted, since that existence would imply a negation of reason; and thus, since the theory is indicated as superior, it *must be* adopted). Even subtler rationalist viewpoints, such as that of Larry Laudan, include this argumentative shift. Laudan (1977, 130) concedes that the parameters that constitute rationality are time- and culture-dependent. This assertion would appear to cut a generous opening for those social explanations of knowledge. Nevertheless, Laudan then adds that in every historical moment an intrinsically superior theory can be identified that overrules the previous one. He ultimately concludes that if this were not the dynamic, where one theory was not proved to be superior to another, but still chosen by the scientific community to replace the previous one, the only possible explanation would be irrationality.[5] Note that the rationalists can differ with respect to what they consider essential for rationality—e.g., whether the proofs are objective, whether the theories are superior, if they have a greater problem-solving capability, and so on—but they nonetheless agree that a nucleus of pure rationality must exist, and on the basis of which choices are made.

The rationalist way of arguing includes a normative and an epistemological element, each deserving a response. As to the normative question, what interests us is how science *really* functions, how scientists in fact behave, how ideas and evidence circulate in concrete debates; and, ultimately, what people believe and why. We seek to comprehend the reality of how science functions, and that leads us to undertake empirical studies, to observe concrete cases, and not to simply ignore the real because of an idea of what science ought to be. With respect to the epistemological argument of rationalists, the problem resides in the display of the sociological ambitions that are, however, quite poorly grounded. In other words, if rationalists just made an abstract comparison of theories, they would probably receive no complains in this sense. Let us analyze a rationalist proposal: 'The investigators A, B, and C want to solve the problem X, and to that end, they resort to the theory T, but it does not solve X completely. One of them then modifies the theory into T* and this does

[5] For a more detailed critique of Laudan, see Barnes (1979).

solve X entirely. Rationally, all three of them—A, B, and C—must adopt the theory T*'. I would not object to this proposition, since it is logical and I have nothing against pure logic per se. However, what must be kept clear is that the rationalist's proposition is deployed by means of a combination of signals in abstract terms—that is, as a formal proposition. The investigators A, B, and C are mutually interchangeable; the problem X has a univocal definition, the same as the capability of resolving T and T*. In the real world, things are not normally that way: scientists can have different interests and divergent interpretations, come from opposing traditions, have differing definitions of the problem that is to be solved, and therefore harbor diverging preferences regarding what they consider to be a better theory. In each and every instance, those things should be determined empirically. Rationalists lay out a formal proposition and then assume it functions socially as an imperative, forgetting nothing more and nothing less than the social conditionings arising from the real. In other words, one thing is to maintain that a problem can be explained better by one theory than by another; yet another thing is to claim that a theory is socially accepted because of that formal proposition. The problem is not that rationalists put forth a rational proposition, but rather that they claim that science, as a historical and social product, is limited to a strictly rational issue and, what is worse, it has only one universal way of understanding rationality.

Before referring to these social conditionings with concrete examples, I would like to examine the fear of irrationality that rationalists manifest. To maintain that science is shaped by social elements to the point that even the choices of the scientists have social causes does not signify that reason has no place, nor that any scientific theory or any proof gives the same.[6] Admitting that a relationship between a theory and facts exists is possible without claiming that the relationship is linear and univocal. Theories can be underdetermined by facts, which can imply that the same fact can give way to more than one theory (though not just any theory). Likewise, the same experiment can be interpreted in diverse ways although not simply in whatever manner. Natural facts exert strong conditioning, but they are not the only elements that condition; nor they do so in a univocal manner. Finally, in a debate, all the contestants continuously mobilize arguments, reasons, and evidence and look for errors and contradictions to be cited in the arguments of the opponents. Rationality occupies a central place. Nevertheless, if we admit that rationality is maintained by means of previous definitions (e.g. of what we understand as a given problem, what we understand as its solution, what we understand from every one of those terms that we make use of), we must admit that the rules of rationality require previous conventions that are specific for each culture. It is comforting to think that those who disagree with us reason defectively, as Douglas (1996) points out; but the effort in examining the different styles of thinking enables us to understand us better. If there are different manners to define rationality criteria,

[6] In any case, this argument involves a point of view characteristic of a certain postmodern relativism that assumes an infinity of equivalent accounts and the absence of facts, which nowadays is strongly associated with the notion of post-truth. But this is not the case of my point of view. In fact, the 'symmetrical' posture taken toward scientific controversies in science and technology studies is not an anti-science stance: as Lynch has recently argued, 'symmetry' was originally set up to encourage research on controversies, but that should not serve to infer that science is no different from any other system of belief (Lynch, 2020). In a similar way, Angermuller (2018)—who adapts the Strong Programme of STS to Discourse Studies- argues that embracing a constructivist orientation does not lead to an 'anything goes' view. Though I do not have space here to discuss these questions, nor to demonstrate the possibility of delineating a constructivist conception and at the same time appreciating the development of science, I need to stress here that showing that different positions and rationalities can be adopted towards the same facts is not equivalent to assuming that the facts do not exist or that an infinity of positions are therefore possible.

we therefore must go deep into the different cultures to understand how these define the elements, and thus see how rationality unfolds there. In any debate—including a scientific one—we cannot presume that all the contestants share the exact same definitions because they can come from different subcultures.[7]

4 It's not About You, It's About Your Question

This type of debate is sometimes presented as a dispute between the philosophers of science as one faction, and the sociologists and historians of science as the other.[8] I am not interested in proposing the discussion in those terms because such a display usually serves as a rhetorical strategy to separate areas of professional competence, and the truth is that the diversity of approaches in conflict pervades the disciplines. Conceivably, a given posture prevailing in a particular discipline is indeed worth investigating by virtue of its own tradition. Nonetheless, I completely agree with Laudan when he states that 'The philosophy of science is not, and should not be conceived as, an exclusively or even principally epistemic activity. This is because science is neither exclusively nor principally epistemic' (Laudan, 2004, 15). Certainly, this statement does not solve the differences because we must then consider what is the social and what the epistemic in the explanation. As a general principle, however, Laudan's approach serves as a good start and shows that there is no need to regard these debates as a confrontation between disciplines.

The concern that motivated my article on the continental drift was to understand why the theory of Wegener was not socially accepted in 1912 but was only reconsidered decades later. Now, in this wider theoretical discussion, we can relate that concern to why any theory would ever be accepted. Those perspectives that we label as rationalist tend to offer an answer when stating that a theory is accepted because it is true or because it includes enough evidence. However, there are also other rationalist approaches that notice that some theories that were accepted at the time are today considered incorrect, so they hold that theories are accepted because they offer better explanations than those available now or they have better problem-solving capacities. Moreover, certain rationalists affirm that values can play a significant role in scientific development, but these are far from the social issues that we here refer to as conditioning elements of scientific knowledge. Laudan, for example, warned that the scientist is not necessarily in search of a theory for its truth value, but perhaps for some other attribute, such as its ability to capture the facts it chose to explain, its degree of generality, or its ability to focus on the things we are particularly interested in understanding. He called these properties 'cognitive values' (Laudan, 2004). Lacey, for his part, considered that social values play a role in adopting a given strategy and applying

[7] In similar terms, Pierre Bourdieu maintained that 'Epistemological rules are nothing other than the social rules and regularities inscribed in structures and/or in *habitus*, particularly as regards the way of conducting a discussion (the rules of argumentation) and settling a conflict' (Bourdieu, 2004, 71). Knorr Cetina has argued that there is a disunity in science, as it is formed by a diversity of epistemic cultures; the conflict and possibility of consensus formation depends on the elements of each epistemic culture (Knorr Cetina, 1999).

[8] Thus, for example, David Bloor considered that: 'Philosophers of science actively encourage historians to distinguish between, on the one side, "cognitive", "epistemic", or "rational" factors and, on the other side, "social" factors. They enjoin the sociologist to "disentangle" scientific reasoning from "social influences" and to distinguish what is truly "internal" to science from what is truly "external". These recommendations are treated as if they were preconditions of mental hygiene and based on self-evident truths' (Bloor, 2011b, 4).

scientific knowledge, but that 'social values have no legitimate role alongside the cognitive values' (Lacey, 2004, 26). He also added that 'it follows that *v* [value] is a *cv* [cognitive value] only if it is a characteristic of theories' (Lacey, 2004, 31). In other words, these perspectives recognize the existence of values, but as intrinsic features of a theory, placing social issues as mere contributors or hinderers of the general framework of scientific development. This type of assertion proves nearer to Reichenbach's thinking with respect to the separation between the epistemic content of a theory—being essential to the functioning of science—and the social aspects—involving the context of science. Ultimately, these standpoints are not very different from those of Robert Merton, who believed in the existence of a set of values proper to all scientists (*ethos* of science) that serve to ensure its 'correct' development, but that at the same time the very production of scientific knowledge, according to Merton, responded to elements that were exclusively epistemic. In short, all these approaches, beyond their differences, share the common idea that social issues play a limited role in the development of scientific knowledge, remaining as contextual elements that serve to either lubricate the epistemic gears or hinder their functioning. This perspective is in keeping with the discourse on 'social influences' that Barnes questioned, because it implies the notion of science as something distinct and separate from the 'social' realm (Barnes, 2004). For these rationalists, the social exerts an 'influence', but the core of science remains exclusively epistemic/cognitive.

The rationalists wonder about the acceptance of a scientific theory and seek the answer within said theory; what the theory (intrinsically) has that makes it valuable and accepted. They will go in search of the golden fleece, the fundamental epistemic element that holds the value of the theory and induces the scientific community to accept it—e.g., its trait of truth or cognitive virtues, such as range, explanatory unification, or superior problem-solving capability. This question fatally conditions rationalists, though. Let me clarify this: a theory does not need to have anything special to be accepted. Of course, this statement does not mean that every theory has equal chances of being accepted; some general criteria do follow: for example, in order to qualify as acceptable, a theory must agree with the expectations of the scientific community of the time (unless it seeks to disrupt the existing order).[9] This means that one must not seek the fundamental reason in the theory itself, but instead in the behavior of the scientific community. Why does the scientific community accept something in a specific moment but not before? What has changed in that community? The theory does not impose on the community; rather it is the community that ends up constructing the theory.

Once a question is posed, the (type of) answer found is highly conditioned.[10] Inquiring about what a theory has to be accepted will result in cognitive and epistemic elements. [11] Inquiring about why the community accepts said theory will allow delving into that given

[9] In this sense, Pickering stressed the importance of prior social agreements which consider certain concepts as socially acceptable. A concept needs to be first socially acceptable, for only then can it be socially accepted (Pickering, 1981).

[10] This is also the stand of Ian Hacking, who argues that 'Once a question does make sense, its answer is determinate' (Hacking, 1999, 165). From there on, Hacking defines himself as a contingentist about the questions in science, but he finds hard to be a contingentist about the content of science, as the content depends on the questions previously assumed.

[11] Fully engaged in those questions, Šešelja and Weber (2012) wonder '*Was the hypothesis of continental drift worthy of pursuit?*'. As they find some merits in Wegener's theory, they answer 'that it was rational to consider Drift as worthy of pursuit, and that it was irrational to reject its pursuit as unworthy' (Šešelja & Weber, 2012, 156).

community. It would be interesting to know why many philosophers of science get attached to the first question. Is it the question with the most intrinsic epistemic value? Is it the true question? Or is it just a question that was passed on from generation to generation down through the processes of socialization of that community? In any case, if the question is *what a theory must have to be accepted*, the answer will probably be looked inside the theory—that is, satisfaction will come from finding cognitive/epistemic elements as an explanation of why scientists adopt a theory. However, if the question is changed to *why scientists adopt a theory* or even *why a theory is accepted*, the complexity of the social will become a bit more within one's grasp.

5 Social Conditionings of Knowledge: An Empirical Approximation

Since the 1970s, various tendencies can be distinguished in the social studies of science aimed at comprehending the dynamics of science by analyzing cognitive content according to social, political, cultural, and economic dimensions (Dubois, 2001). The tendency that pervaded a large part of those emerging currents was to observe the scientific actions and practices empirically. This methodological displacement to focus on the ambience of the actor being studied enabled, among other questions, a reappraisal of the study of scientific controversies, those being understood as an ideal scenario for the analysis of the production of scientific knowledge, since those disputes show the mechanisms through which alliances are knitted and consensuses among scientists constructed—namely, what they consider a valid test and what an invalid one, how they interpret data, how they argue, and finally what the intervening actors do to reach closure in the controversy (Collins, 1981; Pinch, 1986). In other words, by means of those scientific conflicts, the social practices of science can be explored in action: if we can see how scientists behave when clearly there is no imminent agreement, but they manage to achieve consensus, we will be closer to understanding the workings of science.

In order to explore the role of social conditioning in the formulation of scientific knowledge, we need to avoid ascribing explanations to what is true, rational, successful, or progressive (Collins, 1981, 217; Bloor, 1976, 5; Barnes, 1974). Those ascriptions only result in a tautological circle: true knowledge would be explained by its truth. The truth of a scientific fact is the trophy scientists dispute, but the consensus is not known while it is being formed. Therefore, the objective is to describe the mechanisms through which the cognitive proposals become established, and a consensus is formed through observing how the controversy over its status developed in order to find the social explanations that resulted in the adoption of the knowledge.

It is in the empirical where the expectations of a purely rational debate between actors that share the same meanings fade because what stands out is a web of local meanings that give a particular sense to cognitive statements. In that sense, empirical investigations become necessary in order to find the underlying local causes for the credibility of cognitive statements (Barnes & Bloor, 1982, 23).

Let us now address the issue of transgenic crops, also generally referred to as genetically modified organisms (GMOs). Frequently, those who delve into what the public perception is regarding this topic consider that the opponents of GMOs lack adequate scientific information. This type of explanation is known as '*deficit model*' and is similar to the rationalist approach, since part of the premise is the reality of a nucleus of correct knowledge, labeling those in disagreement as simply wrong. At the moment, I was interested in the

strong opposition to transgenic crops by a large social movement, the Landless Movement of Brazil (MST). I decided that if I truly wanted to understand the rationality behind their point of view, I had to get acquainted with their way of living and thinking. In doing so, I learned that in the '70s a major modernizing project was developed in Brazil that implied the construction of a dam, which meant displacement for many farmers, who had to abandon their lands. Out of that circumstance the Landless Movement was born. Years later, a new wave of modernization in agriculture arose due to the massive acquisition of machinery, but once again for certain rural workers, this development signified a loss of work until they were able to seek refuge in the Landless Movement. Then came the transgenic crops and with them a new promise of agricultural modernization. The MST had already worked out a form of production based on small family agriculture. The first transgenic crops in the late twentieth century came in the form of a technological package that required vast resources and extensions of land in order to make a profit, which was not only beyond the means of the MST, but also called for the modification of their form of production. These are just some of the explanations I found (Pellegrini, 2009), but nevertheless serve to present an idea: when the MST considered that transgenic crops were fraught with risks, the notion of risk here also encompassed the Movement's own history and cultural context. That point of view does not involve an irrational discourse, but rather it makes sense for the MST. This does not signify that one should agree with each of their arguments, but one should understand that rationality is culturally situated and this enables a deeper dialogue because one can find the causes behind a cognitive statement, why it is accepted or rejected in a given social space.

A rationalist might not be receptive to this explanation for considering that the field of science is special and only shared rationality reigns. For certain, science is a particular field, but the constituent members are also persons and as such are necessarily imbued with social and cultural determinants.[12] Between 1999 and 2000, when the scientific community was debating the risks of transgenic crops, a very specific controversy arose about the presence of transgenic elements in Mexican maize (Pellegrini, 2013a, 241–243; Delborne, 2008; Kinchy, 2010). A research group from Berkeley University published a paper in *Nature* in which they described that they had found genetic sequences that were specific for the Bt maize in the mountains of Oaxaca, Mexico. The findings were presented as evidence that transgenic plants represented a severe genetic-flow risk—i.e., the engineered genes deliberately introduced in one crop could spread into other crops unintentionally—while

[12] This approach implies a close proximity between the notion of theory choice and of social acceptance of a theory. Nevertheless, it must be said that the notion of theory choice is usually employed within rationalist perspectives, as a way to explain how scientists choose between competing theories through rational deliberation. Although resorting to the concept of theory choice, Kuhn has argued that while scientists often cite some general criteria for evaluating the adequacy of a theory (namely accuracy, consistency, scope, simplicity, and fruitfulness), there is always the possibility that scientists define these criteria in different ways and weight them differently; so ultimately, according to Kuhn, there are no standard criteria that actually determine theory choice, since those criteria do not function as rules (there is no such thing as an algorithm of choice), but rather as general values (Kuhn, 1977). Kuhn's claim on this subject has generated some debate about the extent to which he defies rationality in theory choice (see, for instance: Morreau, 2015; Okasha, 2011, 2015). In our approach, we can consider theory choice (how scientists choose between theories) as a special case within social acceptance (how a theory becomes socially accepted). Special in the sense that it mobilizes arguments, traditions, techniques, values from science, and that is not a minor issue following our concerns expressed in footnote 6. But in a general way theory choice can be considered as part of the social acceptance of a theory, because in a scientific controversy those special scientific attributes are usually not enough to reach consensus and it is necessary to consider broader cultural and social elements to understand what ultimately leads to the social acceptance of the theory.

in Mexico, the cradle of maize-plant diversity, the use of transgenic crops was prohibited. That paper prompted a rapid response. Other scientists retorted that the study was flawed, since they had incorrectly interpreted one of the results from the technique involving the polymerase-chain reaction, attributing those genetic sequences to part of a transgene when the likelihood was that the latter were, in fact, present in the wild-type genome of the plant. The first group, for their part, defended their article, arguing that they could have detected the presence of a transgene by means of another assay that they had included in the article. The debate had various exchanges for and against and, in the beginning, there appeared to be an argument that was exquisitely technical among scientists who were highly specialized. Nevertheless, at a given moment the discussion sidetracked, and the authors of the publication began accusing those criticizing them of having links with the agri-biotechnological multinational Monsanto for having questioned their results. For their part, the others responded that the authors now arguing about the inevitability of transgene contamination were in the past militant exponents of the environmental organization Greenpeace. That delicate technical deliberation among the gentlemen of science turned into something more the likes of a *hooligans'* fight. This transformation, however, is not accidental: scientific controversies are never solved by the enunciation of a winning argument or by the citation of overwhelming evidence. For this reason, in the thick of the dispute, scientists frequently resorted to challenge the competence of the other researchers (Collins & Pinch, 1998, 114).

The way a controversy reaches closure involves processes, such as the support in favor of one of the positions on the part of the editor of a scientific journal or other actors. What almost never happens is that one of the parties admits that the other one is right and that they are wrong. Such an admission is an extraordinarily strange phenomenon in any field of human dispute, including science.

The matrix of a scientific controversy may reside in different forms of interpreting a result or of considering the validity of the evidence at hand or the type of experiment designed to elucidate a phenomenon, among other aspects. The argument that one theory can solve a cognitive problem better than another can be demonstrable in formal terms but does not serve as a sociological explanation for the social adoption of a theory. The reason is that those involved in the debate must previously agree on certain claims, such as the meaning that they give to the problem in question. Furthermore, this process involves cultural conditioning. What scientists see when they envisage a problem, when they regard a theory or its derivations can be very different things.

Let us take the example of Mary-Dell Chilton's paper of 1983, where she reported the engineering of the first transgenic tobacco plant through transfection with a bacterial gene. Chilton's article describes the methodology employed and the results obtained with composure, something interesting, however, unfolds towards the end of the paper. The authors were delighted to obtain an intact plant that contained the inserted gene in its genome, but they also recognized that they hadn't found the bacterial protein corresponding to that gene expression. This absence was recognized with great honesty, but with complete disinterest. The article affirms that the failure to find the transgenic protein was unexpected, but that it should be attributed to a technical problem that would be easily resolved. At the time, it was already a well-known fact that genomic DNA is transcribed to RNA and that encoded information is translated into a protein (since Francis Crick proposed the mechanism in 1958 and then reformulated in 1970). This basic process did not seem to occur in that transgenic plant with a transfected gene, which was recognized as a problem, albeit insignificant, technical and transitory. What is notable is that this form of viewing that problem was not simply through individual eyes, but rather constituted a common viewpoint shared

by the then specialized scientific community: indeed, the entire cover of that issue of *Cell* was devoted to that article, and no one questioned the absence of expression of that protein. Nevertheless, the cognitive elements pointing at this fact were there: everyone knew that a gene was supposed to give rise to a protein. In fact, some years later, certain researchers (among them, former students of Chilton) would regard this absence as a great problem. In that regard, that issue—far from being insignificant, technical, and certainly transitory—would lead to the understanding of the regulation that plants can effect on the expression of genes, in this instance blocking them. Accordingly, this new insight prompted interest in the emerging field of epigenetics. The selfsame problem—the absence of expression of a transfected bacterial gene in a plant cell—can be regarded completely different, even if all those involved recognize that that lack of expression is a problem. The explanation can lie in the fact that the transgenic plant was interesting at the time as a triumph for demonstrating the successful transfection of a bacterial gene into that eukaryotic genome because such a plant had opened the doors to each and every form of symbolic and material reward for the incipient agri-biotechnological industry. A few years later, the scientific capital had to be sought elsewhere, for those laurels were already bestowed. Something else must become the focus of relevance to obtain scientific capital (Pellegrini, 2013b).[13] In essence, the importance attributed to a cognitive phenomenon is also a social process: different scientists can value the very same phenomenon in diverse manners.

6 The Case of the Continental-Drift Theory

For a long time, the Earth was conceived as a rather stable structure although some scientists like Wegener proposed theories about continental drift. For rationalists, the reason why these theories were not accepted in their time is because something was missing in the theories: more evidence, a more refined series of postulates, or some epistemic issues alike. In a previous publication (Pellegrini, 2019), I re-examined the continental-drift debate proposing a different explanation, describing the styles of thought around the debate. I demonstrated the necessity to look at cultural patterns to understand the changes in the social acceptance of the theory, not because of an alleged intrinsic value of its rationality.

The notion of *styles of thought* was used by Mannheim to show that ideas and reactions to them are not to be explained as merely individual responses, as those individual attitudes are conditioned by pre-theoretical worldviews of structurally located social groups (Nelson, 1992, 31). Many authors (such as Wright Mills, Ludwik Fleck, Jonathan Harwood, Ian Hacking, among others) have given the notion of styles of thought their own imprint.[14] A

[13] This case, indeed, can show how a same scientific fact can be seen in very different ways, depending on where the scientists place the importance: 'Chilton's experiment could be considered a success because it achieved a whole plant containing a transgene, or a failure because it did not express the transgene's proteins. If at the time it was seen as the former, it was because scientists' prime interest lay in obtaining the scientific capital linked to obtaining a transgenic plant. And when theories of gene silencing were developed a few years later, it was because the scientific capital in transgenesis had already been won by other researchers, so that scientists new to the field needed to differentiate themselves if they wished to gain significant recognition' (Pellegrini, 2013b).

[14] Many other authors have also resorted to the notion of styles in science as well, but in a rather different approach than the one here. This is the case of Gilbert and Loveridge (2020), as they refer to styles in a narrower sense: they allude to diverse 'attitudes of working' in science in relation to the epistemic virtue of objectivity as defined by Daston and Galison (2007).

central common idea is that different styles of thought may coexist, one in each community. Each style of thought may be conceived as a closed system of beliefs with its own validity criteria, defended with tenacity by its supporters (Giedymin, 1986, 179). By employing the notion of *styles of thought*, the problem of the acceptance or rejection of a scientific theory must be understood within a broader cultural context which defines what is acceptable or not. The central idea is that in debating the continental-drift theory the geologists were manifesting two styles of thought in confrontation, mobilism and fixism (Pellegrini, 2019). While mobilists tended to promote rather dynamic and evolutionist postulates, proponents of fixism promoted creationist ideas. Both fixists and mobilists deployed proofs, theories, arguments and critiques that supported their position and rejected their opponents' postulates. In the 1970s mobilists displaced fixists in different social spaces such as in the universities. When discussing continental-drift theories throughout the centuries, each point of view was part of a more extensive tradition, and the resolution of the confrontation was attributable to the changes in the social spaces that were occupied by the parties in conflict.

Weber and Šešelja (2020) reacted to this rather sociological interpretation of the continental-drift controversy and call for a 'defence of rationality'. They argued that certain rationalistic perspectives that they referred to as 'crude empiricism' may be criticized for their narrow interpretation of the controversy, but not the 'sophisticated rationalism' which focuses on the problem-solving capacity of a theory. For them, this kind of rationalism is the proper mode of explaining the acceptance of a scientific theory. In such terms Weber and Šešelja explains that in the 1960s a new continental-drift theory was developed by Harry Hess which 'quickly came to be generally accepted' (Weber & Šešelja, 2020, 484) as it 'contains substantial improvements compared to what Wegener proposed' (Weber & Šešelja, 2020, 486). It is important to remark that this didn't take place empirically, Hess's theory wasn't accepted quickly, but a usual operation in this kind of explanation is to logically assume what the behavior of the scientific community should have been (Pellegrini, 2022). Continuing with their argument, they state that in 1912 the scientific community did not accept Wegener's proposal because it had unresolved conceptual issues. Again, empirically one can see a lot of different reasons deployed by opponents of Wegener's theory; but in the rationalist interpretation of the case the scientific community is presented as with a single argument and a straight rationale. Similar affirmations can be found in Laudan, when he assures that 'Plate tectonic theory triumphed in the 1960s over stable continent geologies principally because the former, but not the latter, could explain long-familiar patterns of continental fit and similarities of fauna and flora between the Old World and the new' (Laudan, 2004, 17). It is always assumed that scientists rejected a theory for some reason to finally accept another one because it solved a particular problem. The reality, however, is that opponents of mobilist theories remained so with the plate tectonics theory. In 1964, the Royal Society of London held a symposium where a group of distinguished scientists manifested their strong rejection to Hess's theory. Some years later, Paul Wesson collected 74 objections to continental drift and plate tectonics, in order to state that 'the continents have almost certainly not moved with respect to each other' (Wesson, 1972, 185). But the most significant testimony of the complex behavior of the scientific community is reflected in a survey that Nicketi et al. (1978) conducted on geologists in the 1960 and 1970 s. The authors describe that among geologists there was a 'relative independence of acceptance from degree of familiarity with the literature' (Nicketi et al. 1978, 664). Those who already were convinced of the theory of continental drift viewed Hess's findings with favorable eyes, while those that opposed it rejected those same findings. In the same way, Wegener's theory was not rejected in 1912 because of conceptual problems

since it enjoyed a certain enthusiastic support, and those who criticized it did so with all manner of diverse arguments.

I do not intend to equalize the theory as presented by Hess in 1962 with that of Wegener published in 1912, or to ignore the fact that, in terms of logic, one theory can solve a particular problem better than another. What I criticize is rationalism as a sociological reductionist argument: the idea that by demonstrating in abstract terms that a theory is better than another is what explains its acceptance within the scientific community.

Every time someone tries to explain the acceptance or rejection of a scientific theory in purely epistemic terms—e.g., in view of the argument that the theory was rejected because it didn't solve X problem, or did not properly correspond to evidence Y—one should react with empirical skepticism and continue searching for the real argument behind the debate over a theory (and how scientific actions can generally be explained in terms of its social context). That suspicion is furthermore supported on a rational basis: if one agrees that social and cultural contexts condition the way one deals with cognitive postulates, one will suspect that controversies centered on a single argument are not usual. Empirically, that sort of occurrence is quite strange: controversies can originate from a publication or the results of an investigation, but they also include a great diversity of arguments and resources, not of just one kind. One can observe positions both in favor and against, but there are many arguments -not a single one- put forward in rejecting a theory X or adopting Y. Even if one were to look into the motives mobilized by the actors in a conflict, one would find a great diversity of reasons. Whenever the explanation of a controversy states that 'the theory was not accepted at the moment because X was lacking', it is most probably because the social rejection is being attributed to a purely epistemic explanation of the conflict, whose basis of reasoning is obvious to the authors because they find that fault in the theory. That point of view, though, doesn't reflect the real social conflict. By contrast, if one analyzes what those scientists were really arguing about, what traditions rooted their thinking, what type of research they were doing—that is, reconstructing the historical and social context around the conflict in question—one can find an explanation that also includes the reason why they had gathered the arguments they used. Were they attached to different styles of thinking, were they expressing conflictive cognitive interests, or even social interests? The explanation very likely varies with each case; but if one manages to put together a relationship between the position those scientists were assuming in the debate, their arguments, and elements from their sociohistorical ambience, an explanation will most certainly arise that is more convincing than the one that otherwise distorts the behavior of those scientists in the controversy.

7 Conclusion: To Judge or to Understand

Theories can be compared and analyzed in logical terms. But inquiring into their social acceptance implies going beyond logical issues and embracing social phenomena. Rationalism in this matter can thus be defined as the explanations of the social acceptance of a scientific fact as the logical consequence of an intrinsic trait of that scientific fact—be it a more thorough theory, with greater problem-solving capability, more thorough evidence, or findings more closely related to a theory.[15] These explanations ignore the cultural and

[15] This definition is very close to others that had defined the rationalist perspective as one that 'favors internal understandings of what knowledge is' (Hacking, 1999, 91–92), or that assumes 'universal, context-independent criteria of truth and rationality' (Barnes & Bloor, 1982, 35).

historical contexts that give meaning to a scientific postulate, and thus denying social and cultural conditioning stands as an absolutist approach to knowledge.

My arguments should not be construed as an attack on reason or a eulogy of irrationality. We all argue in favor of certain postulates and believe in the existence of some reasons being more convincing or evidence, more solid than other—in this general sense, we are all rationalists.[16] In addition, within this area the majority of us support the same scientific theories. What differentiates us is the explanation of that choice. Some attribute that agreement exclusively to a form of rational mentality, others to the existence of certain values and traditions that predispose us to accept certain theories and question others. The problem with the rationalism that confuses a purely logical explanation with a sociological one is that it tends to judge rather than understand. In case it is not yet clear that analyzing how a theory is received by the scientific community from the social elements that underlie it is far from standing in judgement of that theory, Weber and Šešelja (2020) synthesize their preference for the latter option: 'The precise story is that Wegener turned out to be partially right but also partially (and significantly) wrong' (Weber & Šešelja, 2020, 484). To label theories—e.g. as right, true, or sophisticated—is not the same as understanding why those theories are being accepted or rejected.[17]

The central and almost unique role that rationalists give to reason (or cognitive elements) when explaining the social acceptance of theories put controversial issues in a very difficult position. If a theory needs to be socially accepted because it is inherently superior to another, then those who do not accept the theory are considered irrational or something alike: what class might be the scientist that accepts a theory that is wrong or has lower problem-solving capabilities? If reason only stands on one side, the opposite one is considered inferior, and it is very difficult to understand someone whom you deemed irrational. Moreover, when rationalists wish to distinguish currents within rationalism itself, they refer to themselves as 'sophisticated rationalists'. Everybody wants to be rational and sophisticated, no one wants to be on the side of irrationality and vulgarity. Those labels only categorize behavior as laudatory (the insiders) and contemptuous (the outsiders). For that reason, although I have maintained the usual terminology that distinguishes rationalists from constructivists or relativists, I believe that the nerve of the question here is how one reacts toward those who have different beliefs—both scientists and non-scientists who adhere to a theory and those who do not—namely, by judging or, alternatively, by understanding.

Those who put reason on a pedestal, only accepting the existence of a single version, which in turn they use as a yardstick to measure social behavior, do not favor rationality as

[16] Kukla (2000, 152) indicated that if rationalism can be refuted rationally, then rationalism is demonstrated to be true. But this apparent paradox is just a simple pun that confuses two different meanings of rationalism. To refute something rationally means that we are employing reasons to support a criticism (this sense of rationalism is what I employ only here in order to state that all of us are rationalists inasmuch as we argue rationally); but to affirm that a unique form of universal and independent rationality exists in any and all contexts is entirely different, with the latter being the sense of rationalism as an explanation of the behavior—'correct or deviant'—of the scientists in relation to the adoption of a theory that I am questioning throughout this article.

[17] Evidently, we are constantly making judgments, even when we seek to understand. What I refer to here as a judgmental attitude is the tendency to avoid complex social explanations by labeling decisions as right or wrong, rational or irrational, as in the example above. In this sense, Barnes and Bloor (1982, 23) argued that to evaluate a belief as true or rational, or as false and irrational, is different from searching for the causes of its credibility. This is the distinction that I am recovering in terms of judging as different from understanding.

it could receive a criticism similar to the one that the Marquis de Sade put, in 1782, into the mouth of a dying man in his dialogue with a priest:

'My friend, if it were true that the god which you preach existed, would he need miracles, martyrs, and prophets to establish his empire? And if, as you say, the human heart were his work, would that not have been the sanctuary he would have chosen for his law? (…) Everyone would have only one way to love him; everyone would have only one way to adore him or to serve him; and it would be as impossible for them not to recognize this god as to resist the secret inclination toward his worship. What do I see in place of this in the universe? As many gods as there are nations; as many ways to serve these gods as there are different heads or different imaginations. And this multiplicity of opinions which make it physically impossible for me to choose, would be, according to you, the work of a just god? Go ahead, preacher—you outrage him, your god, in presenting him to me in this way. Let me deny him outright, for if he exists, at least I outrage him a lot less with my unbelief than you do with your blasphemies.' (Sade, 1782, 353–354).

Rephrasing Sade, those of us who deny that reason is a unique god that serves to separate the faithful from the pagans to focus instead on the concrete historical circumstances that condition each culture into adopting a particular style of reasoning do greater justice to reason itself. Because by shedding light on the social elements that condition beliefs, reason shows its more human and real face. And therefore, we may enable a far richer understanding of how to address rationality.

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Pablo A. Pellegrini is a researcher at CONICET (National Scientific and Technological Research Council, Argentina) and professor at the National University of Quilmes, Argentina. He holds a PhD in Social Sciences and Philosophy of Knowledge (Sorbonne - Paris IV and FLACSO Argentina); a Master's degree in Science, Technology and Society; and a Bachelor's degree in Biotechnology. He has done research stays at Columbia University, New York (as a Fulbright scholar, 2019), Max Planck Institute for the History of Science, Berlin (as a Max Planck visiting scholar, 2016), and Maison des Sciences de l'Homme, Paris (as an Alβan scholar, 2008–2009). His work explores the social aspects that influence the diversity of conflicts linked to science and technology, the styles of thought and the role of experts in the dynamics of production and use of scientific knowledge.