

Arts, Linguistics, Literature and Language Research Journal

Acceptance date: 21/01/2025

GASTON BACHELARD AND THE QUESTION OF GRAMMATICAL INCOMMENSURABILITY

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Abstract: The article presents the question of grammatical incommensurability in Gaston Bachelard's epistemology, exploring the tension between common knowledge and scientific knowledge. Based on the notion of discontinuity of knowledge, it is argued that there is no tacit agreement between these two domains, since their linguistic structures and epistemological presuppositions are radically different. Based on the Bachelardian approach, it is shown that the grammar of scientific knowledge is structured on formal abstractions and methodological rigor, making it sometimes unintelligible to common sense. Grammatical incommensurability is not reduced to a simple difficulty in translating between language registers, but manifests an ontological and cognitive rupture. The article thus discusses the implications of this discontinuity for the construction of knowledge and the relationship between philosophy and science, emphasizing the need to understand the epistemological specificity of each domain without subordinating one to the other.

Keywords: Gaston Bachelard; Grammatical incommensurability; Epistemology.

Everything is the same. That's the way it is. Anything, I'll talk. Drinking a cup of coffee, pressing the ignition button on the car, opening a door, saying a prayer, humming a tune, getting tripped up, and laughing with the drunken senator (or union for short) who says anything is the same or there's nothing to it, but there is. It may seem peaceful, and it is, until a character from the *Addams* family appears, a hand without a body, which is called a 'little hand' or a 'thing' (*Thing*). The quotation marks already indicate a degree of difficulty that is not necessarily in the ordinary.

They already make up certain grammatical modalities that indicate the significance of the use and mention of the word. For example, if we say: "nevertheless and nevertheless, but not also, have the same meaning as but, however, no, not" it is different from "nevertheless' and 'nevertheless', but 'not' also, have the same meaning as 'but', however, 'not', not. We are already talking in the field of an artificial language, which is therefore distinct from a language that arises and evolves with a group of individuals and which is always changing, altering over time. "Since an artificial language has a precise grammar, it can always be said whether an expression of the language is grammatical or not (which is difficult with natural languages). (Mortari, 2006, p.36) Our question is to identify, in the context of Bachelard's thesis on the discontinuous nature of knowledge, a possible contradiction in access to certain trivial certainties of common sense. If we were to shift the focus from profound agreements to Bachelard's analysis of the relationship between common knowledge and scientific knowledge, would it be possible to identify a negative in this relationship? There would be no tacit agreement. There would be no common ground that would provide safe ground for exchange. In this way, we endorse the request for a methodological concession: "From philosophers we will claim the right to use philosophical elements detached from the systems in which they were born." (Bachelard, 1994, p. 11)

The theoretical environment of the formal sciences, which form part of the analysis of Bachelard's work, can, to a certain extent, suggest a condition of possibility for the constitution of meaning in the elementary data of experience¹. Notions that are familiar to us, such as the outer layers of reason, in other words, sensible intuition, as well as our usual notions of space and time, and notions of a fundamen-

1. See Pariente, J.-C., *Rationalisme et ontologie chez Gaston Bachelard*, in Lafrance, G. (ed.), *Gaston Bachelard. Profils épistémologiques*, Ottawa, Presses de l'Université d'Ottawa, 1987, p. 25-46.

tally intellectual nature linked to the categories of cause and substance, as well as purely logical principles, would be fundamental to patterns of intelligibility. It would be unfair to defend the idea that common sense needs such a formative nature to understand the obvious. That's not the point. What is at issue is how Bachelard presents the difficulties, and most importantly, the incommensurability between the environment of common knowledge and that of scientific knowledge with regard to the data of experience. If we push Bachelard's thesis further, we could say that tacit agreements are not possible. In other words, there is no agreement without both parties understanding each other and following what has been discussed or formalized beforehand. "Experience cannot be contradicted by experience, but experience at the level of common sense is liable to be contradicted by experience at another level of knowledge, by a more refined and more evolved experience." (Bachelard, 1935-1936, p. 448)

It's curious to imagine a scenario in which sounds from nature, normally inaudible to us due to the limitations of our hearing range, suddenly became audible. Suppose we invented a device capable of allowing us to hear these hidden sounds, making them accessible to our hearing, something similar to what the microscope does for sight. This would give rise to the *habit* of listening to these new sounds. If we tried to introduce an *a priori* element into this phenomenon, we would see that our senses offer both possibilities and limits for our interactions with nature. The cat (Pharaoh), for example, who is here beside me as I write, has different senses to mine and therefore has its own possibilities and limits, capturing reality according to its mediations. "That's what men are like. Just show them an object and they're satisfied: it has a name and

they'll never forget it." (Boschére, 1991, p. 63) The only thing that makes it possible to designate two objects with the same term is the fact that they both fulfill the same function. In order to bring them together and name them with a single term, they are transformed into objects of everyday behavior. However, this unity is only achieved in the thinking of those who focus exclusively on this goal.

Different ways of thinking can be so different that mutual understanding becomes, to some extent, difficult or even impossible. The fundamental differences between grammars create significant barriers. The incommensurability between common knowledge and scientific knowledge refers to the difficulties, or even impossibility, of directly translating or comparing concepts between these two domains, due to the essential distinctions in their linguistic structures and assumptions. In this context, it is important to understand how Bachelard would approach this issue

Of course, in everyday life, the 'world' unfolds without the need for reflection.² On the other hand, scientific explanations are supported by theories, interpretative systems and descriptions. However, the aim here is not to systematize common knowledge or to make scientific concepts accessible to the public in a pedagogical way. The problem lies in the very notion of reality. In Bachelard's view, immediate intuitions, linked to the practice of the world and simple perceptual evidence, when confronted with phenomena that require abstraction or rigorous reasoning, become complex, if not incomprehensible. Using an analogy and asking permission from the philosopher of necessity, we can say that, just as reason is an abyss that "usually fails in the face of the extreme tensions it often produces" and, at the same time, is the path, the "means of possible or necessary encounters" (Salles, 2024, p. 121;

2. As Riobaldo notes: "The sertão is the size of the world. I know that inside us the world is big too. But I don't know about me, I don't know about the world. I explain: We live, because we can't always see each other." ROSA, João Guimarães. *Grande Sertão: Veredas*. Rio de Janeiro: Nova Fronteira, 1986, p.22

195-196), I suppose in my heart of hearts, like two porcupines wanting to warm themselves in the intense cold, that Alice and the Unicorn *will never believe* each other.

The difference between common knowledge and scientific knowledge doesn't lie in the fact that the former is accumulated randomly throughout life, while the latter is organized into a system, because common knowledge also has its own systematicity. The real distinction is that common knowledge is the direct expression of everyday practice, while scientific knowledge distances itself from this practice and rejects certain theses. It may sound strange, but it's this particularity that makes grammar inaccessible, since in order to understand it, you have to already be immersed in that environment.

It will be necessary to prove that abstraction clears the mind, that it makes it lighter and more dynamic. We will provide this proof by studying the *difficulties* of correct abstractions more closely, by pointing out the insufficiency of the first sketches, the weight of the first schemes, by also underlining the discursive nature of abstract and essential coherence, which never achieves its goal in one fell swoop. And, in order to show that the process of abstraction is not uniform, we will even use a polemical tone about the interdiction of all experience that pretends to be concrete and real, natural and immediate. (Bachelard, 1999, p. 6)

This environment is based on a formal, logical and axiomatic structure, which often distances itself from direct experience. Topologically abstract concepts exemplify ideas that have no equivalent in common sense. Curiously, these concepts are part of the environment, but the ways of conceiving them result from an ontological contrast. A physicist, as a dear professor once tried to justify to the contrary, cannot simply leave his advanced laboratory and get down on his knees to pray an 'Our Father', unless he does so merely as an act.

A rigid and finely formalized grammar makes it difficult to understand common knowledge, because it uses language that is more ambiguous and open to interpretation. This grammatical difference creates barriers of effective incommensurability, where formalized notions are incomprehensible. It belongs to a level of reality that is very different and difficult to imagine, because we don't follow the same rules that we are used to following in our daily lives. The rigorous derivation of a formalized argument contrasts with arguments based on simple observation, customary and informal experimentation and heuristic reasoning. The idea that space can be curved or that parallel lines can meet may seem absurd.

The electric light bulb doesn't correspond to our idea of a light bulb. It is a light bulb by metaphor and does not really deserve to be called a light bulb. The only characteristic that allows both objects to be referred to by the same term is their function, that they both light up the room when night comes. There is a unity of purpose, not a unity of thought. This unity of purpose only becomes a unity of thought for those who see nothing but the objective (to illuminate). (Bachelard, 1998, pp. 105-106)

Grammatical incommensurability reveals the difficulty or even impossibility of directly translating or comparing a concept between different language systems or grammars, especially when these are founded on distinct epistemological or cultural principles. This implies that linguistic structures and underlying assumptions can be so divergent that effective communication between them becomes an impediment. Communication between different systems of thought can be complex, especially when linguistic structures and cultural assumptions do not align.

What can we say about concentric waves in the structures in a polysemiotic micro-tonal meta-chorus, as reported by the beloved Tom Zé out there? It may sound like playful sati-

re, but it's not. Microtonality refers to musical comas that are apparently not between sharp and flat. It refers to a system of tuning or organizing sounds that uses smaller intervals than the semitones of the standard Western tempered system. In the traditional Western system, the smallest distance between two adjacent notes is the semitone, such as between C and C sharp, or between E and F. In a microtonal scale, however, intervals can be divided into fractions smaller than the semitone, such as quarter tones, eighth tones, or other even smaller intervals. Microtonal music exploits these finer divisions of the interval between notes, allowing the creation of sounds and harmonics that are not possible within the standard tempered tuning system. This type of music may sound strange or "out of tune" to ears accustomed to the Western system, but it is a common practice in various musical traditions around the world, as well as in works by contemporary composers seeking new forms of musical expression

In Jonathan Swift's *Gulliver's Travels* (2005)³ - chapter IV - *A Voyage to the Country of the Houyhnhnms*, in the passage in which Gulliver visits the land of the Houyhnhnms, rational beings in the shape of horses, Swift explores the difficulty of communication between Gulliver and the Houyhnhnms due to the absence of common concepts and words. In the language of the Houyhnhnms, there was no word for 'lie'; the closest translation Gulliver could find was something like 'to say what is not'. For them, it was difficult to understand how something that isn't true could be said intentionally.⁴ Swift not only suggests the difference between languages, but also addresses the idea that certain concepts (such as lying, something common among humans) are incomprehensible or untranslatable in the

3. First published in 1726.

4. Also, and curiously, the term 'lie' is fundamental in the development of LIU, Cixin's book. From the introduction of this term, the whole context of the narrative is thrown into turmoil. Mainly in the difficulty of explaining the distinction between literary fiction and reality. The book is *The Three-Body Problem*. Translated by Ken Liu. New York: Tor Books, 2014.

5. See PRAVICA, Sandra. *Bachelards tentative Wissenschaftsphilosophie*. Wien: Passagen Verlag, 2015.

cultural and linguistic context of the Houyhnhnms. This alludes to grammatical incommensurability, where different linguistic and cultural systems can make communication and understanding mutually exclusive

For Bachelard, the risky game of thought without a stable experimental support, constantly disturbed by the objections of reason and continually questioning the right to abstraction, ensures that abstraction is a duty, a purified conquest of thought over the world. The task of philosophy is to overthrow any form of utilitarianism, however disguised or elevated. The exercise consists of directing the mind from the real to the artificial, from the natural to the human, from representation to abstraction. Bachelard invites us to reflect on the role of abstraction as an essential tool for the evolution of thought, especially when it moves away from immediate appearances and intuitive certainties. By rejecting utilitarianism, which often tries to subordinate knowledge to practical interests, Bachelard defends the autonomy of philosophy and science⁵ in its search for deeper truths, those that are not content with the obvious or the useful. The real task of thought, according to him, is precisely this: to transcend the concrete, the given, and venture into the realm of the artificial, where the real is subjected to new interpretations and possibilities. In this sense, abstraction is not just a duty, but a liberation from the bonds of common sense, allowing the human spirit to reach new dimensions of understanding, where reality can be recreated in the light of critical reason and scientific rigor. Thus, thought is not limited to reflecting the world as it is, but strives to reformulate it, to make it more accessible to the mind through abstraction and systematic analysis

This critical method requires an expectant attitude that is almost as prudent in relation to the known as it is to the unknown, always on the alert in the face of habitual knowledge, without much respect for scholastic truths. It is therefore understandable that a philosopher who follows the evolution of scientific ideas, whether in bad or good authors, whether in naturalists or mathematicians, cannot escape the impression of systematic incredulity and adopts a skeptical tone that is in poor agreement with his faith, so solid on the other hand, in the progress of human thought. (Bachelard, 1999, p. 11)

In common knowledge, there is a tendency to accept and perpetuate truths without question, relying on the assumptions shared by the community. In contrast, scientific knowledge requires a break with these tacit agreements, promoting an approach that challenges consolidated certainties and refuses to accept truths without rigorous investigation. Bachelard suggests that the philosopher, in following the evolution of scientific ideas, inevitably adopts a posture of discontinuity, which clashes with the tendency of common knowledge to rely on tacit and unproblematized beliefs. Thus, the lack of tacit agreements between these two forms of knowledge reflects the tension between the stability of common sense and the strangeness of scientific thought. Like the non-intuitive conception of time; that is, time as a flexible dimension, interconnected to space and affected by gravity and speed. People don't directly experience the effects of time dilation or the curvature of space-time. Therefore, the idea that time can pass slower or faster depending on the speed of an object or local gravity is counter-intuitive and difficult to reconcile with personal experience. Of course, we're pushing it, or perhaps being rude to common knowledge. But in Bachelard's environment, this movement is essential. This tension is precisely the lack of a possibility of agreement based on common ballasts.

Drawing an analogy with Comte, Bachelard talks about the fourth age. And this is where he develops his arguments. As a result, it is difficult to assess the psychological scope of the contrast between natural thoughts and formally organized thoughts. This organization, which in no way resembles a mathematical substitute for philosophy, is very restricted. This restriction presents itself, for Bachelard, in behaviors that are completely different from ordinary or common thought. The impediment is one of discontinuity between the new and the old. Says Bachelard:

Scientific history itself, when presented in a short preamble as the preparation of the new by the old, emphasizes the evidence of continuity. In such an atmosphere of psychological confusion, it will therefore always be difficult to clarify the specific features of the new scientific spirit. The three stages designated by Auguste Comte have permanent characteristics in every spirit. The superimposition of a fourth stage - so fragmentary, so special, so little rooted - is therefore not likely to interfere with the values of conviction. But it is perhaps in an opposition of the values of culture to the values of conviction that the value of scientific thought can best be determined. (Bachelard, 1998, p. 105)

Common sense tends to value the continuity and linearity of ideas, seeing the history of thought as a logical and coherent progression. However, the fourth stage represents a rupture, an introduction of new and often counter-intuitive elements that don't easily fit into the traditional molds of knowledge. This stage, due to its lack of roots and because it is so specific, challenges established cognitive structures and requires a paradigm shift, something that common sense, more accustomed to stability and consensus, finds difficult to assimilate. In this way, the opposition between cultural values and values of conviction becomes a significant obstacle to accepting and understanding this new perspective. This rupture creates a cognitive chasm between

en the two domains, where common sense seeks constancy and cohesion, and modern scientific knowledge advances through paradoxes, complexities and constant revisions. The lack of agreement, both in structure and in the values that underpin these modes of thought, prevents there from being an implicit understanding or mutual comprehension, making the dialog between them difficult and, dare I say it, incommensurable; since it cannot be adequately measured. The act of knowing does not have the value of constitution or creation *ex nihilo*, but of reorganization. Knowledge operates not on objects, but on itself; the real is only given to us in the form of knowledge, as if it were pointless to want to leave the order of knowledge and of knowledge already received. Thus, the real is a mass of objections to constituted reason, in other words, the relationship with the real describes the overcoming of a rationality found there by a higher rationality.

Thus, the disappearance of concrete images in the theories of the natural sciences, in the course of mathematical abstraction, signifies an epistemological achievement in the sense of the *nouvel esprit* of the natural sciences that Bachelard elaborated. He also highlights as positive the elimination of imagery in the historically verifiable physical “atomic model”. Bachelard welcomes the fact that the scientific object, with contemporary micro-physics, has achieved the status of a “non-image”. (Pravica, 2011, p.16)

Furthermore, still making use of our request for permission and pushing Bachelard’s thinking a little further in the proposed theme, we are in favor of the inversion that it is better to sin by excess than by lack. The extent of the variants that we have not committed ourselves to, out of methodological and, of course, philosophical caution, makes us act within the scope of the notes and suggestions for notes on the problem of interchange be-

tween the grammars in question. In any case, we have indicated a path, perhaps not very clear, of clues that Bachelard shows us in some moments of his work that suggest the development of the problem of agreements. Or the lack of them. For example, in chronological order, in book IV of the *Essay on approximate knowledge* (1928), *Atomistic intuitions* (1933), *Temporal continuity and multiplicity* (1937), “Preliminary discourse” in *Formation of the scientific spirit* (1938), chapter VI in *Applied rationalism* (1949) and in the chapters “The modern systematics of simple bodies”, “The rationalism of color” and “Common knowledge and scientific knowledge” in *Rational materialism* (1953).

In addressing these questions, Bachelard challenges us to consider how common knowledge, exemplified by Goethe’s color theory, and Newton’s theory can complement or conflict with each other. He suggests that while common knowledge and phenomenological approaches offer valuable *insights* into the human experience of color, it is through systematic composition that we can transcend the limitations of these approaches and achieve a more complete understanding of the nature of color. However, this systematization would not be able to completely unify these different perspectives, as it would not fully accommodate the subjectivity of perception nor the objectivity of scientific explanations. In contrast, the environment of Bachelard’s argument⁶ in the development of the relationship between grammars, sees color as a manifestation of the physical properties of light and objects. The distinction between the theory of pigments and the theory of light exemplifies this difference. The former treats colors as material properties of objects, which absorb and reflect light in specific ways, while the latter, formulated by Newton, explains colors as different wavelengths of light, perceived differently by

6. It should be noted that, more precisely, the development of Bachelard’s argument goes more directly to the quantum theory of color and Maxwell’s color theories. In this case, the incommensurability of grammar with common knowledge is much more evident.

the human eye. This distinction raises the question of how to reconcile the direct experience of colors (as pigments) with the scientific explanation (as light). In this regard, it is especially relevant to consider how different cultures and eras have developed concepts of color that are not entirely based on scientific discoveries, but on cultural and artistic conventions. However, would it be possible to reach an agreement?

In Lewis Carroll's *Alice Through the Looking Glass*, the dialog between Alice and *Humpty Dumpty* perhaps illustrates our idea of incommensurability. In this passage, *Humpty Dumpty* redefines words in an arbitrary way, which creates a disconnect between the meanings Alice knows and those *Humpty Dumpty* imposes. This reflects how, within different grammatical structures or systems of meaning, words can have incommensurable meanings

"When I use a word," said Humpty Dumpty, in a dismissive tone, "it means exactly what I choose it to mean - no more and no less." "The question," said Alice, "is whether you can make words mean so many different things." "The question," said Humpty Dumpty, "is who's in charge - that's all." (Carroll, 2009, pp. 114-115)

The idea that a word can mean something completely different depending on who uses it, and the context, shows the incommensurability between different language systems or points of view. *Humpty Dumpty* creates a grammatical and semantic system of his own, incommensurable with the system shared by Alice and others, illustrating how communication can fail when the rules are not common or mutually understood. "The new scientific language is difficult to understand because it is both rigorous and non-imaginative, because it imposes on the mind a new grammar, a new conceptual construction that often escapes the ordinary classifications of language." (Bachelard, 1999, p. 244)

塞翁失马，焉知非福

The old man on the border lost his horse;
who knows if that's a blessing?

REFERENCES

- BACHELARD, G. Hans Reichenbach. Wahrscheinlichkeits-Lehre. *Recherches philosophiques*. V. Paris, 1935-1936.
- BACHELARD, G. *Le rationalisme appliqué*. 3^e édition, Paris: PUF, 1998.
- BACHELARD, G. *La formation de l'esprit scientifique. Contribution à une psychanalyse de la connaissance*. Seizième tirage. Paris: Vrin, 1999.
- BOSCHÈRE, Jean de. *L'Obscur à Paris*. Paris : Éd. de la Différence, 1991.
- CARROLL, Lewis. *Alice Através do Espelho e o que Ela Encontrou Por Lá*. Traduzido por Sebastião Uchoa Leite, 1^a edição, São Paulo: Cosac Naify, 2009.
- PRAVICA, Sandra. Gaston Bachelard. In: DÄRMANN, Iris; BUSCH, Kathrin (Hg.). *Bildtheorien aus Frankreich: Ein Handbuch*. München: Wilhelm Fink Verlag, 2011. S. 15-21.
- SALLES, João Carlos. *Gatos, peixes e elefantes: a gramática dos acordos profundos*. 1. ed. São Paulo: Aretê Editora e Comunicação, 2024.
- SWIFTS, Jonathan. *Gulliver's Travels*. Edited with an introduction by Claude Rawson and notes by Ian Higgins. Oxford World's Classics, Oxford University Press, 2005.