

# Alternatives to Positivism: Gaston Bachelard and Hélène Metzger

Arcangelo Rossi, Dipartimento di Matematica e Fisica “Ennio De Giorgi”,  
Università del Salento, Lecce, Italy - arcangelo.rossi@unisalento.it

Abstract: Philosophy of science influences science either through ‘epistemological obstacles’, or through ‘epistemological breaks’, sometimes even through a ‘psychoanalysis of scientific knowledge’ in order to reveal these epistemological factors. The great French historians-epistemologists Gaston Bachelard and Hélène Metzger, affirm this. Nevertheless, their common anti-positivistic agreement finds its limit in Bachelard’s ‘progressivism’ implying the overcoming, by falsification practices, of every epistemological obstacles. Consistently with her more historiographical perspective, Hélène Metzger denies that there is a guarantee of safe progress. According to her, Bachelard, the French epistemologist who more than others assumed a critical stance towards positivism, shows a certain incoherence: if for him it is necessary to assume an active critical attitude towards common sense devoid of true empirical justifications, it is also necessary to be critical towards undue generalizations, unjustly taken for granted, conscious of the active character of knowledge and of the limits of any reification and absolutism. This will avoid the error of shutting itself in a restricted cage made of numbers and measures. It will instead recognize the approximated character of the knowledge of a reality which does not let itself exhausted in our provisional schemata, through an error rectifying recalling Karl Popper’s falsification approach. Metzger, though sharing this perspective, yet requires a further clarification and refinement. According to her, there is in Bachelard an excessively ‘progressive’ interpretation of the perspective, relegating the whole scientific past previous to the XX Century in a pre-scientific phase, laden with errors and prejudices. Metzger was instead convinced of the necessity of avoiding to flatten the past in trivially ‘modernist’ schemata.

*Keywords:* Philosophy and history of science, Falsificationism, Positivism, Bachelard, Metzger.

Philosophy of science influences science either through the ‘epistemological obstacles’ which hamper its development or through the ‘epistemological breaks’ which instead accelerate it. Sometimes even a true psychoanalysis of scientific knowledge is required in order to reveal these either negative or positive epistemological factors which would otherwise remain hidden or even unsuspected and then uncontrollable. This peculiar form of psychoanalysis would have in fact as its main aim to free mind from a certain number of prejudices, childishnesses and true errors accepted without reflections.

Great French historians-epistemologists, Gaston Bachelard (Bachelard 1951) and Hélène Metzger (Metzger 2009) quoted by Thomas S. Kuhn (Kuhn 1969) as his main inspirer, affirm it in their common aversion to positivism meant as mere unproblematic factuality, though deeply rooted, as is known, in scientific-epistemological French tradition.

Nevertheless, their anti-positivistic agreement finds its limit in G. Bachelard's 'progressivism', tense to evidenciate creative breakings, as non-Euclidean revolution in geometry, or quantum and relativity in physics. In fact it would imply the total and irreversible overcoming of any epistemological obstacle in the direction of a true modernizing effort, arriving, thanks to falsification procedures, at realizing in the present, beyond the past, a new 'scientific spirit' more and more cleaned up from errors and approximated to the truth. (Bachelard 1978)

Hélèn Metzger instead affirms, consistently with the historiographical perspective she applies in particular to the history of XVIII Century's chemistry (Metzger 1930), that there is no guarantee of safe progress, as the present itself is subject to ever new or renewable errors and deceits, eventually revealing themselves only in the future. Then, even if, also according to Metzger, Bachelard is the French epistemologist who more than others assumed an original critical stance towards positivism by insisting on the epistemological obstacles implied by the empiricist naive uncritical conception of knowledge disowning the active role of reason reduced to a passive and purely registrative one, there is a certain incoherence in Bachelard's attitude. (Bachelard 1951)

In fact, in the effective synthesis done by Hélèn Metzger herself (Metzger 2009), he shows through both epistemological analysis and the study of episodes of history of science, in particular of the XVIII Century's chemistry, that empiricist prejudices play a role as epistemological obstacles to knowledge. Then it is necessary to assume an active critical attitude towards common sense devoid of true empirical justifications, even at the level of apparently most evolved and founded science, mathematical physics. (Castellana 2004)

Anyway, for Bachelard it is also necessary to be critical towards undue generalizations unjustly taken for granted, conscious of the active character of the knowledge, and of the limits of any reification and absolutism, both materialist and animist, in a critical and auto-critical development of knowledge in general. This will then avoid the error of shutting itself in a restricted cage made of numbers and measures so avoiding to make absolute the quantitative method itself.

It will instead recognize the approximated character of the knowledge of a reality which, though progressively rationalized, does not let itself exhausted in our provisional, though open and dynamic schemata in a neverending objectifying effort through error rectifying recalling Karl Popper's falsificationist perspective.

Hélèn Metzger (Metzger 1938) then supplies a long list of the obstacles evidenciated by the study of the historical cases pertaining to the birth of modern chemistry, from the most obvious empiricist prejudices to the most expected generalisations, to deceptively familiar analogies and images as, for example, the sponge, most practiced in the study of chemical phenomena at the origin of modern chemistry, until the most complex substantialist or animist obstacles to be criticized and

deepened, so practicing in a new, more critical and less dogmatic vision, the so called ‘realist’s psychoanalysis’, where the substantialistic delusion is even connected to the need to literally possess the ontological reality.

Anyway Hélèn Metzger, though sharing the falsificationist perspective in the outline, yet requires – in particular criticizing its historiographical application by Bachelard to the development of XVIII Century’s chemistry – a further refinement and clarification. According to her, there is in Bachelard an excessively ‘progressive’ interpretation of that perspective, identifying the present with the inescapable result of a growth of knowledge relegating the whole scientific past previous to the XX Century in a pre-scientific phase more laden with errors and prejudices. This contradicts Bachelard’s himself effort to try to relive the proper activity of the researcher, to be understood in its specific dynamics. In fact, according to H. Metzger (Metzger 1938), in order to attain this goal, it is necessary to avoid to flatten it in trivially ‘modernist’ schemata, according to which only in the present epoch prejudices and errors would be surely overcome and would not instead live together, in complex and concrete forms, with truth and knowledge, to mould the experienced reality of science. It was so not only in the past but will surely be also in the future, for the adventure of science is, in its fallibility and creativity, irreducible to every rigid falsification methodology unavoidably objectivist and then unavoidably ‘progressive’. (Vinti 1997)

## References

- Bachelard G. (1951). *La formazione dello spirito scientifico*. Bari: Laterza.
- Bachelard G. (1978). *Il nuovo spirito scientifico*. Bari: Laterza.
- Castellana M. (2004). *Razionalismo senza dogmi. Per un’epistemologia della fisica-matematica*. Soveria Mannelli: Rubbettino.
- Kuhn T.S. (1969). *La struttura delle rivoluzioni scientifiche*. Torino: Einaudi.
- Metzger H. (1930). *Newton, Stahl, Boerhaave et la doctrine chimique*, Paris: Hermann.
- Metzger H. (1938). “Gaston Bachelard, La formation de l’esprit scientifique. Contribution a une psychanalyse de la connaissance objective”. *Archeion*, 1938, 1, pp. 162-165.
- Metzger H. (2009). *Il metodo filosofico nella storia delle scienze*. Manduria: Barbieri Selvaggi.
- Vinti C. (1997). *Il soggetto qualunque. Gaston Bachelard fenomenologo della soggettività epistemica*. Napoli: Edizioni Scientifiche Italiane.