

Review of: "Induction: an Afterthought"

Abderrazak Belabes¹

¹ King Abdul Aziz University

Potential competing interests: No potential competing interests to declare.

A Contribution to the Debate on Induction Inspired by Bruno's Philosophy of Connection

Abderrazak Belabes

Professor of Economics, Islamic Economics Institute, King Abdulaziz University, Jeddah, Saudi Arabia, abelabes@kau.edu.sa

Abstract

The problem of induction, addressed in the 18th century by Hume, is at the source of the philosophy of science as it developed in the 20th century. The objective of Saint-Mont (2020) was to provide a fairly general answer to Hume's problem. To this end, induction has been treated within the framework of several connected levels of abstraction. In a recent note, he performs an archaeology that deepens this framework to its very essence – a simple fourfold table (Saint-Mont, 2023). Through this contribution, I enrich the debate by drawing inspiration from Bruno's Philosophy of Connection. The association between several levels of abstraction opens the field to bifurcation. It then appears that the inference from the particular to the general is not a simple linear extension.

Keywords: Hume's Problem; Induction; Bruno's Philosophy of Connection; Bifurcation.

The problem of induction is the tendency to make a general prediction, and therefore for the future, based on a sample of past events. David Hume (1711-1776) was one of the first to show that induction was not reliable reasoning and should be considered an unwise gamble. For the Scottish philosopher, induction is not founded logically, but psychologically by the feeling of habit, which assumes that science is based exclusively on logic. However, as Henri Poincaré (1947: 137) points out: "*It is with logic that we prove and with intuition that we find*".

Qualitative generalization, such as 'the sun rises every morning', provides the most basic example of induction. It allows us to pose Hume's problem as simply as possible: how can we guarantee that the Sun will continue to rise every morning in the future?

In this regard, the key underlying ideas are limitation and information (Saint-Mont, 2022); i.e., the fact that the sample of past events on the sun is limited, and that the knowledge gathered about the sun is psychologically founded by the feeling of habit, which recalls the Gaussian curve that concentrates the majority of the information on its central fringe.

This conceptual association has the merit of drawing our attention to the fact that any inference from the particular to the

general must be accompanied by a degree of uncertainty and imprecision. This does not prevent us from admitting that such an inference is rigorous (Saint-Mont, 2023), as long as we keep our feet on the ground by remaining careful to confront theories with reality (Allais, 2010). This prevents us from underestimating the occurrence of extreme events (Taleb, 2007).

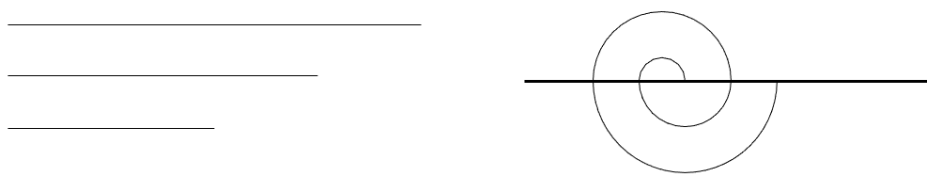
This epistemological framing, fully aware of the limits assigned to any inference from the particular to the general, has the merit of reminding us that research in mathematics is a matter of becoming, always unfinished, always in the process of being done, and which goes beyond all collected material. This renovating power that is within us is none other than the innocence of the child who is not afraid of making mistakes (Grothendieck, 2020).

Treating induction within the framework of a simple formal paradigm, that is, several connected levels of abstraction, is not easy. It has the merit of reminding us that the pleasure of mathematics is based on rising to a level that allows us to do things that machines cannot do, in particular by exploring connections that quantitative models cannot. As the Italian philosopher Giordano Bruno (1548-1600) wrote:

“The primary reason why everything can be connected is that there is in it the appetite to preserve itself in its present being on the one hand, and on the other hand, the appetite to fulfill oneself perfectly according to oneself” (Bruno, 2010: 43).

The connection between several levels of abstraction shown in Figure 1 illustrates the importance of a layered structure, with hierarchical lines that can be represented in a variety of ways, including spirals.

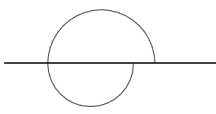
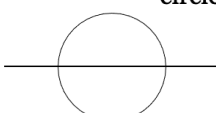
Figure 1. A hierarchical and a partially recursive structure



Source: Saint-Mont (2023)

Table 1 has the merit of illustrating the limits of Hume's interpretation, which equates induction with a viciously circular tendency whose course involves a return to the starting point. In this respect, it is essential to distinguish between the problem of induction, which is in the first line, and circular reasoning without value, which is in the second line.

Table 1. Induction treatment through a simple fourfold table

1.	$d > 0$	hierarchy	spiral
	↓	_____	
2.	$d = 0$	two lines of equal length	circle
	↕	_____	

Source: Saint-Mont (2023)

From an epistemological point of view, such a distinction resulting from the connection between several levels of abstraction opens the field to bifurcation, i.e., to a variety of modes of existence (Souriau, 1943; Latour, 2015). In other words, through the strata-shaped structure, it appears that the inference from the particular to the general is not a simple linear extension. This brings us closer to the world of Évariste Galois (1811-1832), who was capable of understanding without having to do the calculations (Galois, 1906: 256).

Conclusion

Hume's problem is underpinned by binary logic and linear reading to go from the singular to the general. The interest of Saint-Mont's contribution (2020; 2023) is to promote a philosophy of mathematics that allows connections to be made in the form of strata, relying on his academic profile which strives to make a synergy between statistics and computer sciences.

Such an epistemological posture opens the field to the exploration of several connected levels of abstraction through which the general is not assimilated to a simple extension of the singular. This then made it possible to explore a deeper strata, leading to the development of a simple fourfold table.

This promising way could prove particularly fruitful if it is properly exploited. The work of Giordano Bruno could be of great use in this matter because it constitutes the broadest philosophical attempt to think from connection, to the point where everything, from the smallest to the largest, can only be understood through what connects it (Del Prete, Berns, 2016).

References

- Allais, R. (2010). Une interview de Maurice Allais. Lise Bourdeau-Lepage, Leïla Kebir. *Géographie, économie, société*, 12(2), 225–231.
- Bruno, G. (2010). Des liens. Paris: Editions Allia.
- Del Prete, A. and Berns, T. (2016). Giordano Bruno: Une philosophie des liens et de la relation. Bruxelles: Editions de l'Université de Bruxelles.
- Galois, E. (1906). Manuscrits et papiers inédits de Galois. *Bulletin des sciences mathématiques*, 30, 255-258.
- Grothendieck, A. (2020). Récoltes et Semailles. Paris: Gallimard.
- Latour, B. (1943). An Inquiry into Modes of Existence: An Anthropology of the Moderns. Cambridge, MA: Harvard

University Press.

- Poincaré, H. (1947). *Science et Méthode*. Paris: Flammarion.
- Saint-Mont, U. (2020). Induction: a logical analysis. *Foundations of Science*, 27, 455–487.
- Saint-Mont, U. (2023). Induction: an Afterthought. *Qeios*, doi:10.32388/224LPV
- Souriau, E. (1943). *Les différents modes d'existence*. Paris: PUF.
- Taleb, N. (2007). *The Black Swan*. New York: Random House.