



THE PHILOSOPHY OF LOGIC

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Francisco Bonnin Aguilo (1982), quoting Józef Maria Bocheński (1966), states in a short essay that in the history of thought there is perhaps no other philosophical and scientific term that has adopted as many meanings throughout history as that of Logic. This is not surprising, he says, since it is one of the core categories of Western philosophy—a trajectory that goes from Aristotelian logic, through Stoic logic, medieval logic, Kantian logic, Hegelian logic, Marxist dialectical logic, to contemporary mathematical logic with its diversity of variants and nuances.

Following Aguilo's work, "El concepto de la lógica a lo largo de la historia de la filosofía" ["The concept of logic throughout the history of philosophy"], the approach of W. & M. Kneale (1972) is complemented, particularly in his other work entitled, "El Desarrollo de la Lógica" ["The Development of Logic"], which gives a brief description of the evolution of the conceptual treatment of Logic, this being one of the starting points of the Philosophy of Logic, or what is the same thing, the answer to the question, "What is Logic?" In this sense, we may briefly note, for example, that the bases of Aristotelian logic, which took as a reference the previous logical tradition, were the first great systematization of Logic.

Thus, it is correct to point out that we owe to Aristotle the very foundational act of this branch of knowledge. For Aristotle, logic is the analysis of the principles according to which reality is articulated. The syllogism, therefore, is the central pillar of Aristotelian logic, being nothing more than a form of reasoning of deductive character, formed by two propositions that are in turn the premises from which the syllogism starts and a third as a conclusion that includes the latter two. Deductive reasoning or deduction is an argumentation in which the conclusion is necessarily inferred from the previously stated premises; and this became the basis of scientific reasoning from then on, since it contributed to the demonstration of scientific knowledge. Therefore, in Aristotle, Logic is, according to Aguilo, the science of discourse.

Stoic logic complemented Aristotelian logic in the sense that it could be understood, with its use of truth tables of propositions, as the science of what is true, what is false and what is neither true nor false; that is, the science of the famous paradoxes.

For its part, medieval logic has its own treatment, which for the brevity of this paper we will not be able to cover, insofar as it can be divided into three stages, namely: (i) *logica vetus*, (ii) *logica nova* and (iii) *logica modernorum*. Notwithstanding this, for the medievalists, without taking into account the broad nuances, the conception of logic as *scientia recte judicandi* prevailed, which can be understood in two

ways—as the act or as the process. As the act per se of judging rightly; that is, as the act that leads to correct or true knowledge; or as the process by which it can be obtained.

With the advent of the Renaissance, mathematics began to be considered as the most perfect expression of logic (Aguilo, 1982: 24). This opened two approaches to logic—understood as calculus and as epistemology. Subsequently, Leibniz came to be considered the creator of mathematical logic, while Descartes came to represent the epistemological approach. Regarding the latter approach, the following may be stated: Kant, although in line with Aristotelian logic, ultimately proposed a different logic that ended up opposing the formal logic of Aristotle, which he called transcendental logic, which was also distinguished from the later logic of Hegel, in the following sense:

"It is the application of logic within the realm of epistemology, leading to the delimitation of human knowledge. This is what Kant calls "transcendental logic" ... This presupposes, as Descartes had established, conceiving reason as "*Cogito*," that is, not as Platonic idea nor as Aristotelian definition, but as "thinking substance," that is, thought assumed, not as formal content but as an act, as a spontaneous action or activity of the spirit on which human freedom is founded" (Mora, 2000).

With Marx, the "idea" of Hegelian logic (of a spiritualist metaphysical nature) becomes "matter." For his part, and continuing with Aguilo's exposition (1982), Lenin summarized the logical laws as three: unity of opposites; mutual convertibility of quantity and quality; and negation of negation. But for Aguilo, as a footnote, this Marxist dialectical logic would be logic by mere pareidolia, in the sense that it has more in common with an ordering of matter than with a science of reason or logos.

As for mathematical logic, as mentioned, Leibniz, although considered its creator, did not succeed in his project of systematizing logic as universal logic, as calculus ratiocinator universalis; that is, as a system that could be understood by all, like music and mathematics, based on absolute principles applicable to all possible worlds (Aguilo, 1982:2). Without detriment to this, these contributions served for later parallel developments, such as the work of Boole (1854), Gottlob Frege (1879), and so on, along with that of [Weierstrass](#), [Dedekind](#), [Cantor](#), [Peano](#), etc.

According to what we have seen, we understand that there are two types of Logic: a Philosophical Logic with its origin in Aristotle, and a Mathematical Logic with its origin in Leibniz. What is the common stroma, without blurring in any way their differences, of both, which may allow us to propose a unitary conceptualization of Logic? This common stroma, according to Aguilo, Bochenski, Kneale and

Lukasiewicz, is in the process of formalization (by formalization we mean—to produce a model, a proposition, an argument, an equation or rule, in order to better explain or understand properties and relations relative to objects or phenomena that are the subject of study). In other words, Logic, from the philosophical to the mathematical, is the progressive formalization of the deductive process, i.e., Logic is the formal theory of deduction.

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[Featured](#): "When the Lights were Out," by Rob Gonsalves; painted in 2013.

