



# Contribution of Ockham's logic to fourteenth century's philosophy

*Contribuições da lógica de Ockham para Filosofia do século XIV*

*Contribution de la logique d'Ockham à la philosophie du XIV siècle*

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## Abstract

William of Ockham was an English philosopher of the fourteenth century with contributions to the logic of terms and the nominalist movement, marked by the critical sense of the Early Middle Ages by post-Thomism. In the Middle Ages, the conceptualist discourse of Peter Abelard generated problems of use of beings and universals, with Ockham being the philosopher who advocated the method of not using entities for generalizations or hasty conclusions, known as Ockham's razor. This article presents the contributions of the logic of terms and objectivity in Ockham's philosophy. As specific analyses of the stages presented in the article, we have the contribution to the scientific method by the use of the concept of incomplex knowledge, formed by intuition and abstraction in the singularity. The emphasis of the logic of terms structured in the work *Summa of Logic*, developed the parsimonious language by propositions, whose philosopher defends the terms in the school of nominalism. In the development of the logic of terms, Ockham presents the theory of assumption, being considered a position by some other object, and can be classified into: personal, determined, confusing or distributive. The use of logic with objectivity ensured the criticism of the universals that were used at the time as innate ideas, synthesizing an objective method to avoid repetitions of terms called by contemporaries by razor. Despite being against the

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repetition of terms in the medieval discourse of universals, Ockham considers the need for repetition of experienced facts to record events, the future of which can be predicted by the possibility of repetition of events that occurred in the past. In summary, Ockham's contribution to the logic of the late Middle Ages is incontrovertible.

**Keywords:** Intuition. Logic of terms. Singular.

## Resumo

*William de Ockham foi um filósofo inglês do século XIV com contribuições à lógica dos termos e ao movimento nominalista, marcado pelo senso crítico da Baixa Idade Média pelo pós-tomismo. Na Idade Média, o discurso conceitualista de Pedro Abelardo gerou problemas de uso dos entes e dos universais, sendo Ockham o filósofo defensor do método de não uso de entes para generalizações ou conclusões precipitadas, conhecido como navalha de Ockham. Este artigo apresenta as contribuições da lógica dos termos e objetividade na filosofia de Ockham. Como análises específicas das etapas apresentadas no artigo, temos a contribuição para o método científico pelo uso do conceito de conhecimento incompleto, formado pela intuição e abstração na singularidade. A ênfase da lógica dos termos estruturada na obra Suma da Lógica, desenvolveu a linguagem parcimoniosa pelas proposições, cujo filósofo defende os termos na escola do nominalismo. No desenvolvimento da lógica dos termos, Ockham apresenta a teoria da suposição, sendo considerada uma posição por algum outro objeto, podendo ser classificada em: pessoal, determinada, confusa ou distributiva. O uso da lógica com objetividade garantiu a crítica aos universais que eram utilizados na época como ideias inatas, sintetizando um método objetivo para evitar repetições de termos denominado pelos contemporâneos por navalha. Apesar de ser contra a repetição dos termos no discurso medieval dos universais, Ockham considera a necessidade de repetição de fatos experimentados para registrar os acontecimentos, cujo futuro pode ser previsto pela possibilidade de repetição dos fatos ocorridos no passado. Em síntese, a contribuição de Ockham para a lógica do final da Idade Média é incontestável.*

**Palavras-chave:** Intuição. Lógica dos termos. Singular.

## Rèsumè

*William de Ockham était un philosophe anglais du XIV<sup>e</sup> siècle avec des contributions à la logique des termes et au mouvement nominaliste, marqué par le sens critique du haut Moyen Âge par le post-thomisme. Au Moyen Âge, le discours conceptualiste de Pierre Abélard a généré des problèmes d'utilisation des êtres et des universaux, Ockham étant le philosophe qui préconisait la méthode de ne pas utiliser d'entités pour des généralisations ou des conclusions hâtives, connue sous le nom de rasoir d'Ockham. Cet article présente les apports de la logique des termes et de l'objectivité dans la philosophie d'Ockham. En tant qu'analyses spécifiques des étapes présentées dans l'article, nous avons la contribution à la méthode scientifique par l'utilisation du concept de connaissance incomplète, formée par l'intuition et l'abstraction dans la singularité. L'accent de la logique des termes structurés dans l'ouvrage Résumer de Lógica, a développé le langage parcimonieux par propositions, dont le philosophe défend les termes dans l'école du nominalisme. Dans le développement de la logique des termes, Ockham présente la théorie de l'hypothèse, étant considérée comme une position par un autre objet, et peut être classée en: personnel, déterminé, déroutant ou distributif. L'utilisation de la logique avec objectivité a assuré la critique des universaux qui étaient utilisés à l'époque comme idées innées, synthétisant une méthode objective pour éviter les répétitions de termes appelés par les contemporains par le rasoir. Bien qu'il soit contre la répétition des termes dans le discours médiéval des universaux, Ockham considère la nécessité de répéter des faits expérimentés pour*

*enregistrer des événements, dont l'avenir peut être prédit par la possibilité de répétition d'événements qui se sont produits dans le passé. En résumé, la contribution d'Ockham à la logique de la fin du Moyen Âge est incontestable.*

**Mots-clés :** *Intuition. Logique des termes. Unique.*

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## Introduction

William de Ockham (1280–1347) was a Franciscan philosopher at the University of Oxford. About the biography, he was known by the name of the nearby London village (Occan) where he was born, and several spellings were used: Ockham, Occam, Auquam, Hotham and Ollram. He became known as William, a common name among the Germans, because he lived the last years in a convent in Munich, Germany. William de Ockham was a pupil of Blessed John Duns Scotus (1266-1308), who possessed logic and rhetoric of the most improved for his time. Regarding Ockham's background in scholasticism, John Roscelinus (1050-1121) was the founder of nominalism, a method of language during scholasticism that denies the existence of the universal as a concept that defines several particular entities.

Roscelino was the teacher of Peter Abelard (1100-1160), who created conceptualism, a school that considers neither the negation of universals nor Platonic realism; since concepts are expressions created from the logic not only of ideas, but also by the existence of entities. Occam, according to Russell (1965) was a nominalist: "in logic, though not, apparently, in metaphysics, Occam was a nominalist; the nominalists of the fifteenth century considered him the founder of their school" (RUSSELL, 1965, p. 411).

The use of rhetoric was part of the debates in universities between the twelfth and thirteenth centuries and with this the use of logic in sentences was improved. During the Middle Ages, the authority of teachers, almost entirely by religious, could not be questioned by skepticisms, the concepts being established by Christian precepts and not being questioned by the results of experiments. The intense use of rhetoric and universals, with general concepts existing only in the theoretical field and by the influence of Platonism at the time, created strictly conceptual debates.

The Franciscan friars created an experimental school at the University of Oxford, starting with Robert Grosseteste (1175-1253) for the remarkable development of optics from the experiments of light reflection, already evidenced by the Arab Al Hazen (965-1040). Subsequently, Roger Bacon (1214-1294) philosopher and mathematician who developed astrological descriptions with the use of instruments such as the astrolabe and acquired knowledge about various areas of the natural sciences at the University of Paris.

The Aristotelianism, of the religious in the thirteenth century, influenced the development of the scientific method, with experimental analyses for records of natural phenomena. These results of the Aristotelian method of observation and subsequent experimentation brought criticism to the speculative philosophy of the universals of Platonism, which were used as innate ideas. Russell (1965) presents a debate as to whether Ockham was really the cause of the breakup of scholasticism and whether humanism was introduced:

There is a tendency, in those who write about the history of philosophy, to interpret men in the light of their successors, but this is, in general, a mistake. Occam has been regarded as the cause of the collapse of scholasticism, as a forerunner of Descartes, Kant, or whoever may be the favorite among modern philosophers of the commentator. According to Moody, with whom I agree, all this is wrong. Occam, he claims, was primarily interested in restoring a pure Aristotle, freed from both Augustinian and Arab influences (RUSSELL, 1965, p. 411).

Ockham, was a theologian and philosopher who became known in the fourteenth century for presenting questions about the tyranny of medieval popes, publishing the works *Breviloquy on the Tyrannical Principality* and *Eight Questions on the Power of the Pope*. Being a Franciscan friar, he had progressive ideas in the face of the theocratic conceptions of the Catholic Church. Augustine of Hippo's dualistic thesis on spiritual power and temporary power (Pope and the European nobles) was questioned by Ockham considering that spiritual power would not be subordinate to the earth, but would only serve as an advisor.

From his nominalist logic, Ockham created a method of language known to commentators of his "Ockham's razor" work. According to Russell (1965, p. 411) "Entities should not be unnecessarily multiplied." For Ockham, the concepts formed in the intellect are theoretical entities capable of making thought abstract and provoking dependence on this plane in the mind, possibly creating misconceptions in a future projection. In this sense, the

concepts need to be presented in the texts in the objective form, that is, they need to seek the principle of the Lex Parcimoniae. The "razor" is the method of language adopted to follow the parsimonious (economic) use of premises for logical explanations.

Ockham (1973a) defends the (scientific) method of investigation as a habit, that is, a sequence of repetitions of acts produced by the scientist to verify the evidence of the facts analyzed.

Subsequently, empiricists such as Francis Bacon (1561-1626) consider that the scientific method based on induction seeks to prevent previous and unquestionable ideas (idols) from influencing the conclusions of the scientist (BACON, 1979).

William de Ockham acquired logical knowledge from the debates at Oxford University brought by academics visiting the University of Paris in the fourteenth century. Ockham migrated to the University of Munich, after being accused of heresy and receiving support from the Holy Roman Emperor, dying of the bubonic plague in 1349. Regarding Ockham's biography, the contemporary philosopher Bertrand Russell (1965) states "William of Occam is, after St. Thomas, the most important scholastic [...] Occam's work stimulated scientific research" (RUSSELL, 1965, p. 408-409).

The path of opening, for the possibility of human placing himself at the center of the questions of philosophy, was important in the search for resolution of the problems faced in the Late Middle Ages, including the Black Death. The pandemic of the fourteenth century, which decimated more than 30 million lives in Europe, including Ockham himself, provoked the need for the implementation of basic sanitation and hygiene conditions in the newly cities of the Renaissance.

## The method of Ockham and the division of knowledge

William de Ockham was a philosopher of logic who advocated the need to divide knowledge into parts for a better understanding of reality. The trend of specializations of knowledge itself has only been defended with greater emphasis by Modern Philosophy. Regarding the relationship between subject and object of knowledge, Ockham (1973b) presents a scale of method from the singular to the universal.

It influenced by the Aristotelian syllogism, the method proposed by Ockham (1973b) divides knowledge into: complex, of terms and propositions, and incomplex knowledge, of interpretations of singulars and particulars. For Ockham (1973b), incomplex knowledge is divided into intuitive (simple) knowledge and abstract knowledge.

In analyzing Ockham's logic, Russell (1965, p. 413) states "abstract knowledge presupposes an 'intuitive' (i.e., perception) knowledge, and this is produced by individual things".

The way the philosopher analyzes objects is called intention, being the first interpretation of the subject of knowledge in relation to the object, called intuitive knowledge. This intuition occurs after considering the object as a thing, in "there are not singular a written expression, nor a concept, nor the significant spoken word, but only a thing that is not a common sign" (OCKHAM, 1973a, p. 352). After considering the singular as a thing and not a sign produced by apprehension, Ockham (1973b) proceeds to the second stage of the method:

With regard to the second point, supposing that it is the knowledge proper to the singular, I say first that the singular thus understood is the first thing known as a simple knowledge and that it is proper to it [...] The simple knowledge, proper to the singular and the first in this respect is intuitive knowledge. That this knowledge is the first, is seen by the fact that the abstract knowledge of the singular presupposes intuition about the same object, and not opposite (OCKHAM, 1973b, p. 352-353).

From intuitive knowledge arises the intention of experience and experimental knowledge is produced, in the methodological logic of Ockham (1973b). The philosopher states:

And all complex knowledge of the terms or things signified is ultimately reduced to the knowledge of the incomplex terms. Therefore, these terms or things can be known by other knowledge than that by virtue of which such contingent truths cannot be known, namely, intuitive knowledge. And it is from him that experiential knowledge begins, because in general, he who can have the experience of some contingent truth, and through it of a necessary truth, has some incomplex knowledge of some term or thing, who has no one who cannot have such experience (OCKHAM, 1973b, p. 350-351).

The experience for Ockham as a theologian is not only restricted to the material of things apprehended by the senses (bodily intuition), for God exists and is not material. For the theologian: "Every effect which God can produce by means of a second cause, can do it immediately by himself; Now, it can produce bodily intuition by means of an object; therefore, you can do it immediately for yourself [...] God can realize the vision without the created object" (OCKHAM, 1973b, p. 351).

The abstract knowledge, as the second instance of Ockham's method, considers what exists in its singularity and the analyses of the intellect, and therefore is knowledge of probability, historically developed by the Cartesians in the exact sciences (DESCARTES, 2001). In this sense, according to Ockham (1973b), abstract knowledge is a bridge between intuition and complex knowledge of terms. The philosopher differentiates intuitive knowledge from abstract knowledge in the statement:

In a sense, with respect to something, it [abstract knowledge] abstracts from many singulars, and so abstract knowledge is no more than the knowledge of some universal that can be abstracted from many. If the universal constitutes a true quality existing subjectively in the soul, as can be held with probability, it should be conceded that this universal can be seen intuitively and that the same knowledge is intuitive and abstract, when the expression 'abstract knowledge' is formed, which then does not oppose 'intuitive' [...] Abstract knowledge is that by virtue of which one cannot know with evidence whether a contingent thing exists or not. Therefore, abstract knowledge abstracts from existence and non-existence (OCKHAM, 1973b, p. 350).

Regarding complex knowledge and its relationship with science, Ockham (1973a, p. 345) considers that "all science refers to a complex or complexes. And just as complexes are knowledge by science, the incomplex, of which they are composed, constitute what a particular science considers."

For the medieval philosopher, "science means evident knowledge of something necessary. The contingent things aren't known in this way, but the principles and conclusions that follow from them" (OCKHAM, 1973a, p. 342).

Thus, when it comes to science, Ockham (1973a) considers the need for a habit to reach the testimonies of others and the evidence of the facts, stating:

The potency that has nothing but what it had before, has no greater ability for the act than before, but to experience clearly that after many thoughts a person finds himself with greater ability and inclination to similar ideas than was found before [...] the habit that is science is a quality of the soul [...] In another sense, it becomes science as self-evident knowledge, that is, when it is said that we know not only due to the testimony of others, but also assist, mediately or immediately, without anyone telling it, by some incomplex knowledge of certain terms (OCKHAM, 1973 a, p. 342).

On the classification of scientific knowledge, Ockham considers the distinction between natural science and real science. For the philosopher, "natural science deals with corruptible and mobile things" (OCKHAM, 1973a, p. 345); whereas "real science is not about things, but about the intentions that represent things, because the terms of the known propositions represent things" (OCKHAM, 1973a, p. 345).

In short, things are considered in terms by the intention of the philosopher, refers to the representation of analysis about things, through a language of propositions in syllogistic reasoning.

## The logic of terms and the theory of assumption

Ockham's main work was *Logic's Abstract*, manuscript of 1341 with 72 chapters, presents the structure of the logic of terms and propositions with the search for parsimonious language (OCKHAM, 1995). According with Russell (1965):

For Occam, logic is an instrument for the philosophy of nature, which can be independent of metaphysics. Logic is the analysis of discursive science; Science refers to things, but logic does not. Things are individual, but among the terms there are those that are universal; logic deals with universals, while science employs them without discussion (RUSSELL, 1965, p. 412).

The logic of language by propositions was developed by both Duns Scot and Ockham. The scholastic philosophers, in continuing the logical work of the Greek classics, enhanced the concept of Aristotelian syllogism, breaking with the notion of rhetorical relativism of the sophists. For Perin (2005, p. 122):

Ockham proposed several ways to interpret assumptions. However, it should be noted that Ockham, in seeking to prove the direct connection of the singularity of the real, postulated that this knowledge was an unknown reality and it would be up to men to try to understand its singular substance through experience or the requirements necessary for the truth of a singular proposition.

Ockham, an adherent of nominalism, advocates the use of propositions by terms. In term's logic, Ockham considers the term as "everything that can be summit or extreme of the categorical proposition [...] every incomplex [...] that which is taken significantly can be the subject or predicate of the proposition" (OCKHAM, 1973c, p. 362). Relying on Aristotle's *Categories*, Ockham classifies the terms into equivocal, univocal and denominational. The terms equivocation have several meanings and are not subordinate to a single concept (OCKHAM, 1973c). For the philosopher of logic, univocal is: "everything that is subordinated to a concept, whether it means many things or not" (OCKHAM, 1973c, p. 367). The denominative term is: "that which begins, like the abstract term, but does not have a similar end, meaning an accident" (OCKHAM, 1973c, p. 368).

Ockham (1973d) presents the use of the term "supposes" in the way the subject constructs propositions. For the philosopher, assumption (*suppositio*) is a "position for something else" (OCKHAM, 1973d, p. 369), or "being in the place of something" (*positive pro alio*). As an example, the theologian presents the proposition: "A man is God", and "man" is in the place of "Son of God": "man truly has the assumption of the Son of God, because the Son of God is truly man" (OCKHAM, 1973d, p. 369).

For better understanding, when following the method of division, Ockham (1973d) classifies the assumption into: personal, simple and material; presenting the Platonic explanation by the "intention of the soul". According to Ockham (1973d, p. 370):

The personal assumption is usually one in which the term has as its assumption its meaning, whether this is an external thing, a spoken word, an intention of the soul, a writing, or anything imaginable [...] The simple assumption is when a term 'supposes' by the intention of the soul, but is not used in function of the significant [...] Material assumption is when a term does not 'assume' significantly, but has as its assumption the spoken or written word.

Ockham distinguishes personal assumption into discrete and common. The discrete personal assumption is "one in which it 'supposes' a proper name of someone or something or a demonstrative pronoun taken significantly" (OCKHAM, 1973d, p. 372). The common personal assumption is "when a term 'supposes' [...] and divides into confused and determined" (OCKHAM, 1973d, p. 372).

For the philosopher "determined assumption is when one passes from some disjunctive to particular cases [...] denotes that a proposition of this kind is true if applied to some particular singular proposition, which by itself,

without the truth of that proposition" (OCKHAM, 1973d, p. 372). The only confusing assumption is "when a term 'supposes' personally and cannot be passed to the singulars by means of a disjunctive, without any modification of the other extreme, but by means of a proposition as a disjunctive predicate" (OCKHAM, 1973d, p. 373).

The confusing and distributive assumption is: "when one can somehow deduce a copulative proposition, if the term has many inferiors, but cannot formally infer from any proposition" (OCKHAM, 1973d, p. 373).

The assumption in relation to the affirmation was an advance in the syllogism brought by Ockham, because the search for the truth presented in the logical propositions by the possibility of doubt of the subject before the affirmations of innate ideas.

## The razor of Ockham and the "advent" of empiricism

Ockham identified the problem of dependence of the debate of ideas on ideas in Platonic metaphysics, for the problems of realism do not classify the objects of nature, nor do they seek a utility to accumulated knowledge.

In this sense, Ockham presents a logic with objectivity for terms and the search for intuition and probability, not innate ideas. Through the statement "do not multiply entities unnecessarily", Ockham breaks the dependence on the metaphysics of universals and seeks the understanding of objects (things), by examining science from experiences.

Through the logic of intention and assumption, Ockham develops the critique of universals as innate ideas. The content to be formally known by the educational process, especially since the Middle Ages, has become a mere memorization and repetition of terms employed by authors, whose realities differ historically from contemporary contexts. For Perin (2005, p. 127):

According to Ockham, man should have the freedom to know the world, things in their entirety, really aiming at their meaning and importance. The exploration of everything and, consequently, the empirical experience for the knowledge of reality [...] of this freedom of the individual to be able to know the true, the visible, Ockham prioritized reason, showing that by reflection, by the use of the intellect as the foundation of understanding the propositions could be evaluated in their entirety and be conferred as true or false, thus favoring the empirical knowledge of nature.

Perin (2005) considers that in the fourteenth century, during the Early Middle Ages, there were significant changes in society and education, because the urban renaissance brought new ideas from other cultures and the need for a viable path to freedom of expression. According to Perin (2005, p. 129):

The individuals began to compose laws and instruments that were plausible to their interests and that established a viable path to their ideals. Thus, explanation by divine means was no longer possible to satisfy the yearnings of society. A new explanation was needed, that is, something that would prove the unexplained, everything that had not previously been understood by the eyes of reason, of experimental reflection.

Ockham brought an important debate to the theory of knowledge, because he considers that the subject produces knowledge by analyzing the object in several attempts through experience, being the repetition of the events found (experienced) in the past, which guarantees the possible prediction of future events.

In the method proposed by Ockham, the intellect is able to capture and reflect information through the repetition of facts. The assumption of the terms previously analyzed by the references is questioned by the particular facts verified and can generate new knowledge.

Through repeated experiments it was possible to create a scientific method, based on empiricism, data collection and standardization of records (catalogs), thus being the fundamental idea for the experimentalism of Roger Bacon and Francis Bacon.



## Conclusions

Ockham's logic contributes to the use of terms by the method of division and analysis of particular facts. While metaphysics seeks the understanding of universals by being, one, true and good; Ockham considers that human knowledge must begin logical reasoning by apprehending particular things. From the intuitive knowledge of perception is proposed the method in the direction of the abstract knowledge of the universals, that is, the theory of knowledge proposed by Ockham starts from the particulars towards the universals.

The need for apprehension by the senses in the analysis of particular objects and constitution of ideas by the repetition of events created a foundation for the inductive method of the empiricists. The logic of intention and assumption contributes to the doubt before the facts presented by the senses, with rupture of the dependencies of general and innate ideas.

Ockham was a Franciscan philosopher who possessed the critical sense at a time without the possibility of freedom of expression. The Franciscans of Oxford University brought an important shift to medieval knowledge in the quest to end humanity's dependence on rhetoric and understanding of nature.

The understanding of beings and things in their particularity, divine creatures, by the use of the logic of terms, introduced empiricism by experimental reflection. The search for understanding the reality of visible things, rather than the ideas innate only in the theoretical field, brought a paradigmatic shift between the medieval world and modernity.

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