

# The Scholastics' Neglected Heritage: Thought and Denotation Before the Post-Aristotelian Development of Logic

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## Introduction: Logical Convergence and Metaphysical Rupture

Western intellectual history is vastly grounded in the foundational works of the Greeks, most significantly in metaphysics, epistemology, ethics, and logic. The use of logic is undoubtedly as old as man, connatural, that is, to man's ability to rationally think and communicate. However its formal subject-matter as science of the laws of reasoning can essentially be traced back to the Ancient Greeks, most prominently to Aristotle, who wrote the first treatise on formal logic; but also to Eubulides of Miletus, Diodorus Cronus and his disciple Philo the Dialectician (the two major Megarian contributors to the early development of logic), and the Stoic Chrysippus of Soli—the logical theory elaborated by the Stoics actually rivaled Aristotle's analysis of general propositions by focusing instead on non-syllogistic forms of deductive reasoning summarized in five fundamental “modes” (or **τρόποι**)<sup>1</sup> to account for the validity of complex propositions. The influence of Aristotle's theory of the subject-predicate relation (term logic) and inferential reasoning (syllogistic analysis) remained unparalleled roughly up until the beginning of the second period of the modern era—which marks the dawn of a turning point in the history of logic with the impactful emergence of the works of George Boole, Augustus de Morgan, and Charles Sanders Peirce.

However, it is to the great thinkers of the Middle Ages and their use of logic in philosophy and theology that we owe the development of some of the most rigorous and pertinent discussions regarding subjects matter as complex and relevant today as knowledge, cognition, predication, significance, and being. Very much against the conceited perception of our own age's anti-medieval bias and reconstruction of the Middle Ages as “dark” and “uncritical”, these thinkers—especially St. Anselm of Canterbury, Gilbert of Poitiers, Peter Abelard, John of Salisbury, Henry of Ghent, Roger Bacon, St. Thomas Aquinas, Giles of Rome, Blessed Duns Scotus, Peter of Spain, William of Ockham, Robert Holcot, Albert of Saxony, Blessed Raymond Lully<sup>2</sup>—actually produced some of the most elaborate theories to inventively analyze some of the most enduring and difficult logical and ontological questions in the history of human thought. In contrast with the early post-Scholastic thinkers, representative of a period marked by the decline of logic, the Scholastic giants keenly recognized logical analysis to be critically relevant to philosophical inquiry, ranging from the study of the nature and function of language itself to thought and metaphysics. They indeed keenly recognized and accordingly developed the *analytical* side of their intellectual tradition on the strikingly modern, if not postmodern insight that ontology and semantics critically and unavoidably meet in logic. Thus they viewed the improvement and refinement of their theories of logic as essential to the improvement and refinement of theology, philosophy, natural science, as well as proper communication in general. About a century before St. Thomas Aquinas, John of Salisbury wrote his *Metalogicon* and offered an important defense of the subject of logic as regulator of communication in transmitting true wisdom against mere sophist eloquence and rhetoric. For communication to be endowed with meaning (truth, purpose, and beauty) at all, it must be structured in a rationally shaped language. And for language to supply the proper vehicle to rigorous thinking, it must be founded upon a logic admitted by all.

Indeed we positively need the common basis of reason and its natural propensity to express itself by way of the universal laws of logical reasoning in order to guarantee the viable *ethical* and *epistemological* bases of life and thought in a free society. Thus posing relativistic indifferentism as the principle to guarantee “freedom” for all is not only intrinsically inimical to both reason and freedom itself, but is also necessarily self-defeating—for no man actually thinks rationally without implicitly relying on reality’s inner logos; nor can any man bereft of reason (hardly a man, that is) ever begin to taste real freedom.

Modernity’s founders departed from the Scholastics’ subtle approach to the discipline of logic used as an intellectual instrument capable of renewing linguistic, philosophical, and ontological analyses. The latter had begun to probe the inner ability of logic to lead beyond Aristotle’s combined analysis of predication (grammar) and theory of ontology (metaphysics), however dependent they generally remained on his universal *categories*—i.e. the different kinds of predicates of a subject or ways of being Aristotle established, the differentiation of which yields two main sets of predications: that which represents an  $x$  predicable of  $P$ ; and that which represents a  $y$  found in  $P$ . Instead of pursuing the Scholastic approach and use of logic, the Renaissance era renewed with rhetoric, the art of effective persuasion, which also reintroduced the art of sophistry and its arsenal of logical fallacies. The stress on rhetoric inherited from the Renaissance was passed down to the following era, or early modern period. In accordance with Kant’s restrictive construct of “pure reason”, modernity went on to eventually declare the deductive science of logic to be complete on the grounds and premises of Aristotle’s inferential method. The *weltanschauung* that finally arose with the wake of modernity put the stress exclusively on the world conceived as natural—i.e. as a unified closed physical system without any reference to God. Drawing from the spectacular developments of classical mechanics by way of the extension of its field of application to astronomy (most significantly through the respective works of Galileo, Huyghens, and Newton), the empiricists and rationalists of the early modern era commonly endeavored to provide a completely rational explanation for everything they conceived the world to consist of. By so doing, they resolutely sought to strike the final blow to the medieval worldview—predicated upon the harmony of faith (*fides*) and reason (*ratio*)—so as to secure its downfall once and for all.

Within the past hundred and twenty years the subject of logic has become broader in its scope, departing from the realm of the natural languages in relation to which it was first systematically studied among the Greeks. It slowly grew from what is labeled ‘traditional logic’ to what is known today as symbolic logic. At its early stage, symbolic logic mostly developed as a mathematical extension of traditional logic. Boole’s system, for example, brought about a significant technical progress to classical syllogistic by virtue of being laid out and functioning as a formulaic language governed by algebraic laws. However, Boole’s logic was not conceived to actually depart from the principles of Aristotle’s theory. And so it did not. Instead, it proved capable of bringing together Aristotelian logic of *terms* and Stoic logic of *propositions*—convergence which together gives a measure of the strength and intrinsic weakness characterizing Boole’s calculus; for the symbols it uses to algebraically denote the relationships between terms (Aristotelian general/primary propositions combining a subject-term and a predicate-term) are the same as those used to denote the relationships between complex statements (Stoic-like/secondary propositions).

Overall the Scholastics' wide variety of metaphysical speculations, semantic-noetic theories, and logical analyses have been together unduly forgotten and crudely identified with a generalized conception of "traditional metaphysics". This grave misconception was introduced by the first generations of post-scholasticism during the early modern period and carried on, notably with the gradual development of post-nominalist ontologies and conceptions of language. It was unfortunately fostered at some stages of the history of the post-Tridentine Church, though with good apologetic intentions. While seeking to revive Thomism, which Pope Leo XIII would critically call for in his 1879 encyclical *Aeterni Patris*, a reductionist and uncritical tendency established itself among more casual philosophy instructors and clumsy theologians to simply identify Aquinas' thought with the kind of Thomism put forward in seminary textbooks for the purposes of basic apologetics. From the perspective of the intellectual fashions that eventually arose in the beginning of the twentieth-century, concepts with metaphysical overtones rung very suspicious. The general view that became the basis for the creed of the rising analytic philosophers was that progress in metaphysics could only be made by discarding old concepts and altogether forsaking metaphysical inquiries. Finally, the postmodern susceptibilities associated with the dogmas of positivism that only objects and concepts that are perceptible by sense knowledge and testable by the scientific method are real and meaningful have left a vast majority of educated people today almost entirely unaware of the actual nature and function of metaphysics. Given the still prevalent influence of strong contemporary prejudices inherited from logical positivism's own epistemological and ontological postulates that no statement purporting to refer to a reality irreducible to sense experience can possibly have any real meaning, it is no wonder that the irreducible richness and perennial relevance of scholastic metaphysics and conceptions of the relationship between meaning, reference, and knowledge tends to escape the awareness and interest of the intellectual community at large (including most philosophical and theological circles).

The sophisticated care taken by the great scholastic logicians and theologically-trained masters in semantically and ontologically distinguishing between to mean (*significare*), to refer (*nominare* and/or *denotare*, by way of extensionally referring)<sup>3</sup>, and to know (*cognoscere*) is one of the key features of their complex and correlated analyses of language, logic, and being. While the problem of distinguishing between and relating words, concepts, and things has remained an open field of investigation in both speculative and practical contemporary sciences, the medieval approach offers a quality and depths of perspective lost with the modern construct of an essential separation between the subject matter of knowledge and that of metaphysics. For the great Schoolmen, grammar, noetic, and ontology imply each other, for language is a sort of *speculi verbum* or analogous mirror of the extra-linguistic world, itself viewed as a language or word (*verbum*). Thus reality's inner semantics informs the abstracted semantics of grammar through the knowing mind (**νοῦς**, *intellectus*) providing the concept (*verbum mentis*) of the form of the object it knows by way of intellection. Hence the typically modern confusions born of the constructed opposition between epistemology and metaphysics are absent of their unified considerations and accounts about language, cognition, and that which is (*quod qui est*).

Because reality is spoken into existence, the structure of human speech, by way of the conception (*ratio*) of the thinking mind, echoes the relationship between being (ontology) and word (grammar). Creative divine speech supplies human speech as its ultimate causal exemplar. There lies the latter's non-animalistic ability to speak the intelligibility of that which is the case<sup>4</sup> (reality). As the Scholastics clearly and rightly assumed, the theological and metaphysical

sciences cannot be fruitfully severed from the linguistic, logical, and semantic framework of rational analysis and discourse. Theology, drawing from both instruments of knowledge, faith and reason, endeavors to correctly account for the mystery of the Triune God's revelation. Besides the data of revelation itself, it presupposes a coherent frame of rational intelligibility and semantic reference. Metaphysics, primarily concerned with the study of the first principles of all knowledge, equally presupposes a specifically rational and semantically structured form ("universe") of discourse to meaningfully function as science. Thus on the one hand, scholasticism's speculative sciences and central conception of knowledge suggests a convergence of deep-seated interests, notably of twelfth and thirteenth-century semantics and ontic theories with contemporary semiotic studies, structural linguistics, philosophy of mind, and the cognitive sciences. But on the other, the distinctively anti-metaphysical bias of the modern mind on reality and meaning suggests an insurmountable rupture from the scholastic mind's specific concerns and worldview. Credence given to the latter betrays together much ignorance of the far reaching works of the great Schoolmen and a disturbingly naïve overconfidence in the view that *only* the modern scientific method and its exclusively empirical results can guarantee true knowledge. Whether the positivist *intelligentsia* acknowledges it or not, the modern mind's specific concerns and worldview have themselves very much remained metaphysically conditioned. The scientific metaphysics undergirding the self-certified epistemology and materialistic ontology of much scientific research and philosophical discussions today is indeed quite easy to detect and deserves unrestrained criticism.

It behooves non-medieval interpreters of their works not to misconstrue and underestimate the Scholastics' multifaceted theories of signification, predication, and being on account of modern simplifications and intellectual predispositions. Good grammarians, the pre-modern masters were also good semioticians, and no less good metaphysicians. As such, they ultimately labored as theologians and accordingly endeavored to forge a theological discourse (a language about God) affording them with enough predicative precision to correctly state and explain the truths of divine revelation without falling into the two opposite pitfalls of univocal and equivocal predications (their main means of logical reference and theo-semantic carefulness being the subtle use of analogical predication). Thus their grammatical, logical, and metaphysical insights came to a new level of fruition in relation to the sacred matters under consideration in the theological science, which they rightly understood and held to be the "queen of the sciences" (*regina scientiarum*).

## **Quantification and Logical Ontology: Frege, Peirce, and the Scholastic Masters of the "Dark Ages"**

Much development did eventually follow the progress initiated by Boole and others. The mathematician and philosopher Gottlob Frege, whose groundbreaking contribution was indeed little acknowledged at the time he published his logical works<sup>5</sup>, introduced the subject-matter of contemporary logic. In his 1879 *Begriffsschrift*, Frege introduced his highly innovative ideography. In *Begriffsschrift*, Frege did nothing less than basically achieving Leibniz's project of a *lingua characterica* for pure thought—i.e. of a thoroughly artificial language governed solely by the logical rules of an unadulterated deductive calculus. In addition to the purely logical theory of deduction introduced by his method of notation in *Begriffsschrift*, Frege cemented his pioneering influence in the vast field of post-Aristotelian logic by introducing his theory of quantification. The innovation which had allowed Boole to algebraically analyze syllogistic

arguments relied on the introduction and use of the notion of complementary classes of things— e.g. if  $x$  denotes a class of things under the descriptive constraint of a particular predication, then  $(1 - x)$  denotes the complementary class of things under the descriptive constraint of the negation of that particular predication. But Frege was keen to underscore that the Boolean synthesis of Aristotle’s logic of general terms and the Stoic’s propositional logic, besides confusingly treating of the validity and modes of predication of both term propositions and singular sentences under the same algebraic symbols, fell short of providing an expression for judgments of existence and ultimately lacked the resources of quantification. Frege’s project in *Begriffsschrift* resolutely departed from the twofold limitations together of traditional syllogistic and its Boolean algebraic interpretation. The strictly syllogistic format and focus of Aristotelian logic on general terms did not allow it to account for the non-syllogistic validity of logical arguments expressed in secondary propositions. Likewise Boole’s treatment of syllogistic supplies a method and notation to logically represent, combine, and derive new statements in accordance to the specific rules of his algebra. But these rules do not supply the purely logical framework for non-syllogistic arguments. The referential structure of such arguments, as indicated above, was first investigated and accounted for by the Stoics’ propositional system of logic. By combining propositions, one can derive non-syllogistic forms of deductive reasoning to construct the arguments that constitute the objects of logic. These arguments consist of two premises that include a composed proposition (*if... then...*) and a single proposition asserting the antecedent’s truth value and merging into its composition. The first two Stoic *tropes* were labeled *modus ponens* and *modus tollens* by the Scholastic logicians. They may be expressed in modern notation as follows: (1)  $p \supset q, q \vdash p$ ; and (2)  $p \supset q, \sim q \vdash \sim p$ .

Frege’s original insight and contribution to the post-Aristotelian development of logic can be summed up in his uniquely discerning realization that the syntax of grammarians is unfit to describe the reality of logical relationships. For it confuses the relationships between thoughts with the relationships between judgments, coordination, and inference. Frege, therefore, attempted to separate the strictly logical determinations of thought from the rules associated with the linearity of natural languages upon which logic had historically been elaborated. As with the Scholastics before him, Frege’s logical investigations geared his thoughts toward attempting to grasp the rapport obtaining between linguistic entities and the extra-linguistic world. To do so, he recognized the need to logically account for statements about “all” or “some” things (i.e. statements containing expressions for multiplicity and generality) and move beyond the grammar-based apophantic analysis of propositional logic to an extended analysis of logical predication using *quantifiers*—independently of Charles Sanders Peirce whose own analysis considered universal and existential quantifications from the restricted perspective of propositions using conjunction and disjunction, respectively. Prior to such pioneering figures as Peirce and Frege in the late 19th century though, it is important to remember that the various medieval semantic theories and early “quantificational” analysis in natural language developed by the scholastic masters had already begun to open the way to modern theories of quantification. Frege specifically introduced and refined quantifiers in order to functionally assign (or logically map) attributes to variables semantically denoting mathematical or real-world entities. Such assignments he was therefore able to define as *predicates* in a broader sense than could ever the monadic predicate of classical analysis restricting it to being one/monadic term, namely the one/monadic attribute to the subject. Thus instead of restraining the validity of an argument to the syllogistic format of grammar-based apophantic statements, the extended

conception of the predicate introduced by the Fregean analysis of propositional functions with quantified variables defined the “arity” of a predicate (accordingly conceived as a relation), that is, the number of arguments ( $x, y, z, \dots$ ) which may be assigned to a propositional function ‘ $\Phi ()$ ’ in order that it may meaningfully assume the value of true or false. The arity of a predicate is therefore defined as a function of the number of logical variables (or “subjects”) that may be assigned to that given predicate. Each predicate so conceived thus possesses a particular “domain” comprising monadic, binary, ternary, ...,  $n$ -ary logical variables.

Let us take the following argument ‘ $X$ ’:

( $H_1, p$ ) All multiple of 10 are even

( $H_2, q$ ) 40 is a multiple of 10

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( $C, r$ ) Therefore, 40 is even.

Syllogistically, this is a valid universal affirmative categorical argument wherein ‘40’ stands as the predicated predicate of ‘10’, the monadic subject, to yield a conclusion consistent with the major premise ( $H_1$ ). But if we break up its syllogistic general format, we are left with three discrete statements which can longer be regarded as parts of a valid argument in propositional calculus terms:

$p, q \cdot \cdot r$

A scholastic look at ‘ $X$ ’ using categorematic (*categoremata*) and syncategorematic terms (*syncategoremata*) provides an alternative approach to the modern treatment of the universal quantification of the predicate. The scholastic theory of supposition (or theory of reference), allows for such an alternative to what is now known as modern first-order logic (or quantification theory). This pre-modern theory, which investigates the meaning of words in terms of their different modes of reference (*modi significandi*), specifically distinguishes two main referential functions for terms to assume according to which such terms are themselves distinguished as *categorema* and *syncategorema*. Categorematic terms can assume and functionally be the subject or the predicate of a logical proposition insofar as they, by themselves, have signification (*per se aliquid significant*). Such are names, substantives, adjectives, verbs, which do not necessarily fall under the scope of logic. Syncategorematic terms, on the other hand, cannot be the subject or the predicate of a logical proposition because they do not by themselves have any signification (*non per se aliquid significant*). They can acquire it by association with categorematic terms. Unlike the *categorema*, the *syncategorema* specifically fall under the scope of logic and function like modern logical connectors and quantifiers (*et*/and; *si*/if; *vel*/or; *omnis*/every, any, all; *nonnullus*/some, a few). For example in the proposition “man is mortal”, the word “man” together signifies human nature and “suppositions” for every singular man there is (*suppositio pro omnis homo*, as might technically have said a medieval logician); as for the word “mortal”, it both signifies the abstracted universal characteristic of mortality and “suppositions” for all individual men as subjected to death. Returning to the argument above, setting up  $P_1(x) = M(10)x = “x \text{ is a multiple of } 10”$ , the proposition can be used categorematically to allow for the “universal quantification” of the predicate “ $x$  is a multiple of 10” and conjointly (syncategorematically) refer to the number of values, including  $x = 40$ , for which  $M(10)x$  is

actually true, implying the other predicate  $P_2(x) = "x \text{ is even}"$ . Thus in “ $x$  is a multiple of 10”, “multiple of 10” has categorematic signification and “suppositions” for every singular value of  $x$  with which  $P(x) = M(10)x$  is true (*suppositio pro omnis multiplicatio per decem*); as for the other predicated property of being “even”, it both signifies the abstracted universal characteristic for all individual instances of  $x$  falling outside the set of “not even”.

The quantification approach used in modern logical theorizing can retranslate ‘ $X$ ’ to express it in the predicate logical format of a propositional function as:

$$(\forall x)[M(10)x \rightarrow Ex]$$

Immersed in an extended predicative domain, ‘ $X$ ’ is always formally valid, so far as the predicate variables remain undefined. Thus a propositional function in predicate logic takes on a truth-value on the basis of the set of all objects (mathematical and non-mathematical entities) in the real world as opposed to remaining constrained by the semantically content-free syllogistic format of an argument like ‘ $X$ ’ stated in terms of  $p$ ,  $q$ , and  $r$ . Frege’s ingenious conception of the extended predicate provided a modern solution to logical difficulties the Scholastics had already partially detected in analyzing the semantic confusion arising with the equivocal sense of the copula ‘is’ in referring to existence (*esse*) and use of other verbs, especially intransitive verbs. Frege represents both a turning point and a true continuation of the great medieval logicians: a turning point through his original conceptual analysis and functional theory of predication (‘functional’ in the mathematically modern sense of the concept of a function); a continuation through his philosophical vision and commitment to the view that the axioms of the logical calculi express immanent (unchanging) truths otherwise known intuitively. These truths, the Scholastics held, pertain to the ontological nature of reality and equally constitute the fundamental rules of the thinking mind. Hence logic, together for Frege and the scholastic masters, is properly the science of the truth-value of being and of its intelligibility. Is it any wonder that what most of twentieth-century philosophy taught to the world by way of departing from both logic and reality would eventually translate itself so pervasively at the beginning of the next century in the prevailing trends of a worldwide culture characteristically enamored with the dogmas and slogans of relativism and sentimentalism?

Another significant modern connection with the Scholastics’ ontological worldview, semiology, and plural use of logic is found in the works of the abovementioned American mathematical logician and philosopher Charles Sanders Peirce, especially in his theory of triadic signification and logic of relatives—his calculus of relations<sup>6</sup> and three-valued logic representing one of Peirce’s main contributions to the development of polyadic logics. Peirce specifically analyzed the logical features of  $n$ -adic relations. Along Peirce’s own line of careful inspection, a medieval logician would certainly notice the undergirding triadic logical format grammatically at play between the case of the subject (nominative), the direct object (accusative), and the indirect object (dative). Peirce’s analysis goes further though in that it accounts for the general triadic *relation* obtaining in a proposition involving three logical subjects which cannot be reduced to a dyadic proposition. For example, Peirce regarded a proposition such as:

A makes B hope for/be resentful of C

to be logically fundamental and irreducible to the format of one or more combined dyadic relations. Hence the three logical subjects *A*, *B*, and *C* of an irreducible triadic relation can be permuted in a total of six equally triadic propositions<sup>7</sup>:

*A* {acting upon/*x*<sub>0</sub>-verbs} *B* {to/for/by/with/from} *C*

*B* {acting upon/" } *C* {" } *A*

*C* {acting upon/" } *A* {" } *B*

*C* {acting upon/" } *B* {" } *A*

*B* {acting upon/" } *A* {" } *C*

*A* {acting upon/" } *C* {" } *B*

Pierce conceived of signification as a ternary process, which he called *semiosis*.<sup>8</sup> With his triple correspondence theory of signification, he defined the latter (signification as such) as a triadic relation involving: (1) a sign—which he technically labeled *representamen*; (2) an object of reference encoded in (1)—the *terminus ad quem* of *semiosis*; (3) a sense decoding (1)—what he labeled the *interpretant sign* of (1).

The Scholastics' scattered and intricate theories of 'threefold signification' tie in with broader considerations as to the nature and structure of knowledge in relation to *quod (quid) est*. Once again, medieval semiology cannot be conceived and understood apart from the Scholastics' epistemological and ontological speculations. While signification is subordinate to extra-linguistic reality (*res*), it is so through the medium of understanding (the *emanatio intelligibilis* generating *cognitionem rei exterioris*) and the linguistic expression of that understanding (*dictio*). Gilbert of Poitiers proposed a coherent triadic account of signification in relationship to knowing and naming, dynamically articulating *essentia rerum in se* (the essence of things in themselves), *intellectus in concipiendo* (understanding a thing in its intellectual conception), and *significare per sermo* (to signify by naming). The produced name or discourse (*sermo*) about that which is the case signifies the thing (*res*), though not directly as it exists in itself, but via an intellectual conception of the mind or understanding (*intellectus*). For Gilbert to know and signify what is the case (*quid est*) as known means that the discourse and the reality the latter signifies by way of the intellect mediating between them through understanding have joined together in a rational way (*rationaliter*). Gilbert's summed up triadic theory of knowledge is encapsulated in these following words of his<sup>9</sup>:

**"Tria quipped sunt: res et intellectus et sermo. Res intellectu concipitur, sermone significatur. Sed neque sermonis nota, quicquid res est, potest ostendere neque intelligentie actus in omnia, quecumque sunt eiusdem rei, offendere ideoque nec omnia conceptus tenere." (Expositio Boecium librum primum De Trinitate I, 3)<sup>10</sup>**

The crisis of truth and meaning that began to plague the modern mind from the earliest days of post-scholasticism onward stands in direct relationship to the misunderstanding and loss of this basic model for the fundamental process of signification in terms of the specifically distinct but correlated operations of intellection, conceptualization, and speech. St. Thomas Aquinas, whose approach to logic and semantics is closely connected to his epistemology and ontology, developed one of the most exhaustive and coherent scholastic accounts of intellectual procession

and abstraction in correlation with his conceptualist theories of signification, imposition, and reference, shedding new light on the “triangular” relationships obtaining between language, thought, and object. The theologian’s own tripartite semantic theory represents an integral component of his carefully crafted conception of knowledge as the dynamic union of the known object with the knowing intellect<sup>11</sup> through the act of understanding the former in itself or in another<sup>12</sup>. Aquinas’ explanation of the cognitive process of actualized (meaningful) knowledge specifically hinges around the distinctiveness and proper articulation that must be obtaining between the ultimate objects of the intellect<sup>13</sup>, the immediate universal concepts abstractly formed by the latter<sup>14</sup>, and the order of their designation by means of the actual enunciation of these conceived objects’ names. As with other of the great scholastic masters, one of the key semantic problems for Aquinas resided in the underlying difficulties coming into play with the logical treatment of universal concepts, the determination of their ontological status, and the nature of their relation with singular objects of knowledge in the cognitive process. In his theory of knowledge, the representative content born of the intellect’s act of understanding<sup>15</sup> stands as the immediate and universal object of the mind’s intellection whereby it abstractly conceives of the real, ultimate objects of the intellect—i.e. the individualized essences or *quidditates rerum* of singulars (*supposita*). The way in which the natures of actual individualized things exist in the knowing mind differs from the way in which they exist in themselves. And the way they are universally signified as natures of the individual *supposita* differs from the way they are represented in utterance (*in voce*). The distinction Aquinas draws between the conceptual signifiers of abstracted natures and the vocal signifiers of both the latter and the individual natures of singulars lies at the center of the way he deals with the semantic problem of the meaning attached to universals and the corresponding difficulty of logically handling quantified nomination of common natures. It is through supposition that he solves the confusion that tends to logically obtain between the intelligible species of real abstracted forms and their general terms signifying through nomination:

**“Respondeo dicendum, quod in quolibet nomine est duo considerare: scilicet id a quo imponitur nomen, quod dicitur qualitas nominis; et id cui imponitur, quod dicitur substantia nominis: et nomen, proprie loquendo, dicitur significare formam sive qualitatem, a qua imponitur nomen; dicitur vero supponere pro eo cui imponitur.” (*Super Sent.*, lib. 3, d. 6, q. 1, a. 3, co.)<sup>16</sup>**

For Aquinas a conceptual “imposed” name or term immediately functions as material supposition (oral nomination or written sign) by way of the mind’s original abstraction from individualized natures; whereas it functions as personal supposition by referring to the ultimate objects of knowledge—i.e. the things bearing the real natures signified by universal conception. The concept, the very product of thought, itself becomes the informing *species intelligibilis* insofar as it becomes, by relation of similitude<sup>17</sup>, a form in the knowing mind, the immediate object of thought through which the intellect acquires knowledge of the quiddities of actual individualized things. That known conceptualized form (*conceptio/verbum intellectus*), in turn, becomes the form of the vocal word (*verbum vocis*) designating both the former and the ultimate objective reference (*rei existentis extra animam*) of the conceived form:

**“...conceptio intellectus est media inter intellectum et rem intellectam, quia ea mediante operatio intellectus pertingit ad rem. Et ideo conceptio intellectus non solum est id quod intellectum est, sed etiam id quo res intelligitur; ut sic id quod intelligitur, possit dici et res ipsa, et conceptio intellectus; et similiter id quod dicitur, potest dici et res quae dicitur per**

**verbum, et verbum ipsum; ut etiam in verbo exteriori patet; quia et ipsum nomen dicitur, et res significata per nomen dicitur ipso nomine.” (De Ver., q. 4, a. 2, ad 3)<sup>18</sup>**

Thus Aquinas’ refined vision of meaningful intellection hinges around a process of twofold signification: 1) signification by way of the inner sign (*verbum mentis* or *conceptum*) of a form, denoting<sup>19</sup> it  $F_x$ , which ultimately refers to an actualized knowable nature, the intellect’s proper object or *res extra animam* (denoting it  $r_{ea}$ ); and 2) signification by way of the sign (*signum* or *verbum vocis*) of an object  $x$  (*suppositum*) whose form  $F_x$  it orally and graphically represents. A sign is first produced and intellectually conceived as *res intellecta* (denoting it  $r_i$ ); and it is secondly produced and outwardly expressed as *verbo exteriori* (denoting it  $v_e$ ). Both thoughts and words are signs. The function of language, as of intellectual conception (abstracting thought), is to signify in various degrees of abstraction from the *supposita*. Concepts (essential predicates = the *species* and *genera*) are similitudes or intellectual forms of the things understood (*rerum intellecta*). As for vocal sounds, they are externalized signs of what is intellectually understood (*intellegitur*).

Aquinas’ masterful approach and combined treatment of the cognitive process with the process of signification provides the fundamental structure of a fourfold model of intellection I would summarize on the basis of the following, dynamically connected elements (using the notation introduced above):

- Intellectual Conception:  $F_x \rightarrow r_i$
- Direct Reference:  $r_i \rightarrow r_{ea}$
- Double Signification:  $\left. \begin{matrix} r_i \\ v_e \end{matrix} \right\}$  signify  $r_{ea}$  through  $F_x$  from  $x$
- Basis of Abstraction:  $x$

In a passage from his *Quaestiones disputatae de potentia Dei*, St. Thomas himself offers a brilliant précis of his percipient insights—otherwise vastly developed and dispersed throughout his writings—on understanding and signification:

**“Intelligens autem in intelligendo ad quatuor potest habere ordinem: scilicet ad rem quae intelligitur, ad speciem intelligibilem, qua fit intellectus in actu, ad suum intelligere, et ad conceptionem intellectus. Quae quidem conceptio a tribus praedictis differt. A re quidem intellecta, quia res intellecta est interdum extra intellectum, conceptio autem intellectus non est nisi in intellectu; et iterum conceptio intellectus ordinatur ad rem intellectam sicut ad finem: propter hoc enim intellectus conceptionem rei in se format ut rem intellectam cognoscat. Differt autem a specie intelligibili: nam species intelligibilis, qua fit intellectus in actu, consideratur ut principium actionis intellectus, cum omne agens agat secundum quod est in actu; actu autem fit per aliquam formam, quam oportet esse actionis principium. Differt autem ab actione intellectus: quia praedicta conceptio consideratur ut terminus actionis, et quasi quoddam per ipsam constitutum. Intellectus enim sua actione format rei definitionem, vel etiam propositionem affirmativam seu negativam. Haec autem conceptio intellectus in nobis proprie verbum dicitur: hoc enim est quod verbo exteriori significatur: vox enim exterior neque significat ipsum intellectum, neque speciem intelligibilem, neque actum intellectus, sed intellectus conceptionem qua mediante refertur ad rem. Huiusmodi ergo conceptio, sive verbum, qua intellectus noster intelligit rem aliam a se, ab alio exoritur, et aliud repraesentat. Oritur quidem ab intellectu per suum actum; est vero similitudo rei intellectae.” (De Pot., q. 8, a. 1, co.)<sup>20</sup>**

Modern psycho-cognitive theories and semantics have not proved nearly as penetrating as were

the major scholastic masters, one of the most prominent of whom was St. Thomas Aquinas. So far as they have remained in touch with healthy philosophical foundations, they have essentially been rediscovering for themselves and re-expressing the great scholastic doctrines via modern conceptual features and terminology.

### **Ontological Argument, Modal Propositional Logic, and the Central Theological Equation<sup>21</sup>: Anselm, Gödel, and Aquinas**

We end with a few thoughts which, so far as this paper goes, are only intended to indicate the direction for further investigations regarding the mutual logical and theological implications of three important, yet ordinarily little considered subjects among contemporary professional theologians and philosophers (contemporary logicians and theorists of knowledge), videlicet: St. Anselm's ontological argument, Kurt Gödel's modalized version of the latter, and St. Thomas Aquinas' understanding of the divine simplicity of pure existence itself.

Gödel is rightly renowned as one of the most important logicians of all times and essentially remembered for his far-reaching metamathematical demonstrations known as Incompleteness Theorems<sup>22</sup>. He is considerably less known for his intellectual kinship with some of the great medieval thinkers we have mentioned above and original insights into their core metaphysical concerns. In particular, through Leibniz, he took very seriously the question of the ontological argument for the existence of God, which St. Anselm first laid out in his *Proslogion*, providing a universally admissible nominal definition of God as: "...aliquid quo nihil maius cogitari possit"<sup>23</sup>. The argument entails the following line of logical reasoning: if this definition can be understood, then this something (*aliquid*) must exist in the understanding. But if it so exists in the understanding, that is to say, conceptually, then it follows that it can also be thought of as existing in reality. For "aliquid quo nihil maius cogitari possit" cannot merely exist contingently. If it did, it would contradictorily be possible to conceive of an even greater *aliquid* existing necessarily. In modal logical terms, it is *impossible* (CNE)<sup>24</sup> that something that is so great that no greater can be conceived would exist but in thought alone (i.e. in a contingent fashion only); for, were it the case, then a greater could be conceived, viz. as truly existing beyond the contingent state of mere conceptual existence. Anselm's proof is based on two underlying modal ideas yielding the following two essential features of modal reasoning: 1) the *possibility* (PE) of God's existence ultimately implies its *necessity* (NE); and 2) it is impossible to think of God as nonexistent.

Gödel worked out his own ontological proof by interpreting Anselm's argument through quantified modal logic<sup>25</sup>. His rigorous axiomatized approach, which it is not for this paper to focus on, is aimed at consolidating Anselm's original proof against the subsequent contentions that it unlawfully moves from the idea of the most perfect possible *aliquid* to the necessity of its real existence. The central idea of these contentions is that there is no valid path for inferring that the real existence of the most perfect possible *aliquid* is the necessary condition of the idea we can conceive of it. As Gödel keenly recognized, the weakness of the Anselmian original proof does not lie in its logical core, but in its original formulation: the "cogitari possit" in Anselm's original phrasing seems to limit the actual validity of his argument to one for the mere *possibility* of God's existence. Despite the use of "nihil", the reasoning loses its conclusive force that God must therefore exist both in thought and reality. Gödel's proof introduces and relates (1) the concept of "positive properties", (2) the definition of the essence of a "God-like" individual, and (3) the idea of necessary existence. Using modern modal operators, Anselm's proof can be

restated as saying that it is not possible for the proposition (in *cogitatione*) that God exists not to be the case:

$$\sim\Diamond\sim G \equiv \Box G$$

Hence that the possibility of God's existence actually implies its necessity:

$$\Diamond G \rightarrow \Box G$$

Gödel's proof depends on the definitions of:

(1) Positive properties:

$$\text{Pos}(P) \leftrightarrow \sim\text{Pos}(\sim P)$$

(2) God-like individualness  $G$  as assuming all positive properties that are defined to necessarily pertain to the essence of being God:

$$G(x) \leftrightarrow \forall P[\text{Pos}(P) \rightarrow P(x)]$$

(3) Necessary existence:

$$\text{NE}(x) \equiv \forall P[P \text{ Ess } x \rightarrow \Box \exists x P(x)]$$

as a positive property:

$$\text{Pos}(\text{NE})$$

By the definition of God-like individualness  $G$  (2) and necessary existence  $\text{NE}$  (3), if an individual  $x$  is God-like, then being God-like is the essence of  $x$ .  $Gx$  is therefore true and necessarily has the property  $P$  which is necessarily positive (1) and itself said to be the essence of  $x$ . It follows that  $G \equiv P$  and  $\text{NE} \equiv P$ , which likewise entails  $\text{Pos}(P)$ . Hence  $\Box P(x)$  is the case, which entails  $G \text{ Ess } x$  (a God-like  $x$  whose essence it is to have  $P$ ), or:

$$\Box \exists x G(x)$$

Gödel's conclusion is that of Anselm's: God necessarily exists—there is an  $x$  such that  $x$  has the essential property of necessarily existing, i.e. whose nature it is to exist.

Provided an exhaustive definition of the concept of existence, the development of which would require expanding the limits of this paper, it is my contention that Gödel's modalized ontological argument raises but one slight ambiguity due to its use of 'necessary existence' as a property. Along the lines of Avicenna's conception of God as that whose existence is necessary, it seems to "trap" God within the categorization of existence. To say that something must be the case,  $\Box x$ , i.e. that it is not possible for it not to be the case,  $\sim\Diamond\sim x$ , may not adequately serve the purpose of correctly conceiving of God who, provided we are truly referring to the One true God, is

transcendently other than the modes of existence under which things in the world are found and defined to necessarily or contingently be true or false. For the necessity of  $x$  in  $\Box x$  may not refer to the essence of  $x$ , but only be defined as a contingently necessary property of  $x$ , as would for example the relative necessity of a law (relative to the conditions under which it applies and the number of cases with respect to which it functions as a law). Thus it does not necessarily follow that the modal category of necessity (NE) taken as a positive property of  $x$  actually implies it as inherently pertaining to the essence of  $x$ . For it is only contingently and relative to other states of existence in the world that it may enter the definition (the essence) of  $x$  to be called ‘necessary’.

Gödel’s logically flawless proof nearly says what St. Thomas Aquinas’ “central theological equation” affirms, namely that if the property of existence in God is an essential property, then it is identically His essence. However, the inner theological coherence of the Angelic Doctor’s understanding of the divine simplicity of pure existence itself takes it a step further than can the ontological argument alone. Theologically speaking, Aquinas does not think of existence as a property. The conclusion that God is His own act of existence<sup>26</sup> entails that He must be absolutely simple and whole<sup>27</sup>—i.e. that of Him alone it can be said that He is without any composition and potency, therefore without limitation and change. Thus God does not have properties. For nothing, properly speaking, qualifies the divine essence—other than the divine essence itself. But of course the divine essence is not its own property, and thus does not, properly speaking, qualify itself. God is His own nature, intellect, will, life, blessedness, goodness, etc. None of the  $n$ -predications of God with reference to what He is, is not, or does implies composition or qualifying addition of properties to the divine essence and operations. All in Him is His own supremely undivided substance<sup>28</sup>.

One must therefore begin by endeavoring to properly conceive of what is actually meant by the concept of ‘God’—of the omnipotent, omniscient, omnipresent, and intimately personal (Triune) reality whose very Godhead (*quidditas*) is identically and dynamically the eternal self-subsisting act of being (*esse*) itself. Thus, *quid est Deus?* The only logically consistent answer is: *ipsum esse*—‘to be’ itself, which is tantamount to being self-subsistent. God’s *esse* and His quiddity are identical, which really is beyond our knowledge and grasping in this present life. But while we cannot at present comprehensively know what it finally means, we can correctly conceive of it, so far as the use of sound logic allows us to. The term ‘God’ is, logically speaking, affirmatively predicable precisely because God’s nature and God’s *esse* are one and the same.

In the proposition ‘God exists’, existence is critically not *something* we predicate of the *subject* ‘God’—as we may do of anything else that is said to exist. By way of bi-conditionality, to strip it down to its bare logical form, this unique case may be stated as follows (using my own symbolic notation)<sup>29</sup>:

$$\exists x(x = \Theta) \equiv \Theta = x \dots\dots\dots \text{Eq}(1)$$

Outside the reality of the divine essence’s absolute simplicity, such a statement is but tautologically meaningless. Thus to say with Aquinas that God is the substantially self-subsisting act of existence is identical as saying that God is that unique reality whose essence it is *not* to receive existence. There is therefore an implicit *negation* of modal existence in the very affirmation that God, *per ipsum*, is *esse*.

Finally, God’s absolute unicity cannot be properly conceived of apart from the Catholic understanding of God’s inner—Trinitarian—life. The understanding of God as being the Trinity is vital to properly conceive of God at all. But the modal categories may not strictly speaking apply to God’s transcendentally other intimate life. The property of necessarily existing is indeed meaningful as applied to God in relation to creation. Within the framework of that relation of creation to God, one reasons rightly only to the measure that one conceives of God’s self-existing nature and action as necessarily underlying and permeating the world. Such must absolutely be and is indeed the case insofar as our existence and that of whatever else *ex-ists* is finally unintelligible if it is not grounded in the ultimate self-subsisting, efficient, formal, and final Cause of all non-self-existing life. For the reality of the world is in itself only a possibility contingently actualized. Existence must be bestowed upon the possibility of the world for it to be brought into actuality (contingent act of being), which requires a Cause whose very essence is to exist *per se*—a primal cause whose nature it is to necessarily exist through itself. Existence, it follows, is accidentally (contingently) predicated of every other reality whose essence itself is relative (*per aliud*) to an all-encompassing and incommensurable causality whose essence is its very act of being. However, the relation of God to creation being non-necessary<sup>30</sup>, the inner life of God (*intra Trinitatem*) lies beyond the concept of ‘necessarily existing’ as it nonetheless rightly applies to the conception of God put forward in an ontological argument of the form of Anselm’s and Gödel’s. As the transcendent necessary Cause of all creaturely existence, God does not, by definition, belong within the specific and conditional ontological determination that simultaneously bounds His creation and allows it the ability to generate truly contingent events. God, in Himself and in His operations *ad extra*, transcends the modal categories, together of necessity and contingency, which by definition belong to the being of His creation<sup>31</sup>. Thus the One who is knows no determination, not even that of existing necessarily. Beyond the necessity of divine self-existence as understood from the viewpoint of contingent existence, revelation alone opens the door into the inner dynamics that is divine life itself. God is pure actuality (*actus purus*) whose Godhead is *ipsum esse subsistens* as *relationality*. The revelation of God’s inner life reveals Him to be substantial relationality (essentially relational), which is the same as saying that relationality in God is the divine essence itself.

It is only in the doctrine and theology of the Triune God—which the different versions of the Protestant rebellion have, for the most part, gravely compromised and traded for some varying flavors of monistic deism<sup>32</sup>—that we begin to contemplate that God is His own Godhead in the very act of communicating all He is in, through, and to Himself. Hence divine relationality does not solely obtain as “existing between” the divine Persons. Rather, the divine Persons are themselves the divine essence as Subsistent Relations. Thus the original central theological equation, Eq(1)<sup>33</sup>, must be understood in terms of another equivalent theological equation, calling it Eq(2), which reads as follows: the actions *ad intra*,  $A^{o_{ai}}$ , are the divine essence itself,  $\Theta$ , and equally the same as the four internal divine relations<sup>34</sup>,  $\{R_1, R_2, R_0, R_3\}$ <sup>35</sup>, which equally are the three distinct divine Persons, Father (Y), Son (W), and Holy Ghost (H)<sup>36</sup>:

$$\Theta = A^{o_{ai}} = \{R_1, R_2, R_0, R_3\} = \{Y, W, H\} \dots\dots\dots \text{Eq}(2)^{37}$$

Thus, Eq(1)  $\Leftrightarrow$  Eq(2):

$$\exists x(x = \Theta) \equiv \Theta = x \Leftrightarrow \Theta = A^{o_{ai}} = \{R_1, R_2, R_0, R_3\} = \{Y, W, H\}$$

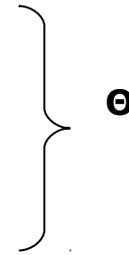
In sum:

Action *ad intra* of generating = {R<sub>1</sub>} = Paternity {Y}

Action *ad intra* of being generated = {R<sub>2</sub>} = Filiation {W}

Action *ad intra* of co-spirating = {R<sub>0</sub>} = Active Spiration {H}

Action *ad intra* of being co-spirated = {R<sub>3</sub>} = Passive Spiration {H}



## Conclusion

Despite its very wide spectrum of topics and expertise, the historiography of medieval philosophy has never been too prone to dive into the nooks and crannies of its own analytic tradition. The reasons for this state of affairs are manifold but I would submit that, besides the field's own internal complexity (given the variety and extent of the issues following within its purview), the overall influence of modern analytical positivism has been and remains one of the primary factors. The prejudice remains indeed very much alive, including among medieval scholars, that scholastic analytical thought is not worth bothering about, given its strong ties to metaphysics and theology—which positivism has supposedly exposed to be driven by mistaken uses of language and immature conceptions of the workings of cognition. Thus the philosophy of modern logical analysis, which as such deeply connects with and continues the work of the greatest scholastic thinkers, has been used and appealed to by the proponents of the positivist theory of meaning to simply relegate most if not all medieval analyses to the domain of meaningless antiquities suited only to outdated metaphysical worldviews. The very brief considerations laid out in this article are meant at least to suggest that modern thought's anti-medieval ideas and biases cannot stand the test of honest intellectual investigation of scholasticism based on critical examination of its primary sources. As has been pointed out in this paper, the Scholastics' distinctively ontological theorizing about the status of concepts and thoughts in relation to logic and the process of signification is connected to some of the most intricate and enduring problems of philosophy, ranging from primary issues in epistemology, the interdisciplinary scientific study of the mind and its operations, semiology, and metaphysics, among other major fields of research. Much remains for contemporary analytic philosophers and cognition theorists to investigate and learn from the Scholastics. That the latter's systems of logic were essentially devised to analyze both language and pure thought with a view to better expressing the subject matter of theology is certainly no good reason for the former to discredit them as irrelevant. The contrary is assuredly true. God, the divine essence, is the end of all speculative inquiry and the supreme Good human nature is ordered to. It therefore behooves new logicians (following in the footsteps of Gödel and others) to address the inherent limitations of rationalism and, in collaboration with new theologians (following in the footsteps of the scholastic masters), to account afresh for the essential place and function of divine revelation in epistemology.

To finish with, I would like to add a few words about the correlation between logic and Catholic orthodoxy, which is one that widespread liberal trends in the post-Vatican II Church tend to dangerously undermine. Blessed John Duns Scotus, the great late medieval theologian left a remarkable example for the whole Church of deep harmonization of the rational demands and concerns of analytical thought with that of true mystical contemplation. Because he was a

remarkably penetrating thinker and deeply loved the Mother of God, the *Doctor Subtilis* also became *Doctor Marianus*. He famously fought to defend the revealed but—in his own days—undefined truth of the preservation of the Blessed Virgin Mary from all stain of Original Sin from the very moment of her conception. Scotus’ truly inspired insights into the pivotal mystery of the Immaculate Conception of the Mother of God unquestionably proved a uniquely crucial development in the traditional history of the Catholic Church’s holy doctrine. It should certainly impress us and fill us with great gratitude that the subtle Scottish scholastic master was granted to see and so keenly articulate the vital truth and role of this prime piece of divine ingenuity within the *opus magnum* of our redemption. And it took both sound logic and deep love of the Most Holy Virgin to devise and articulate the argument he successfully laid out for that great truth to be so defended as to unanimously be recognized and officially declared a dogma of the Catholic Church by Pope Pius IX on December 8, 1854<sup>38</sup>.

The most important thinkers of the Middle Ages viewed and used logic as a tool to improve pure thought and to know the truth. While their many and ingenious philosophical endeavors did prepare and often address with much perspicacity some of the most difficult and gripping problems laying before man’s inquisitive reason, their ultimate concern was the service of revealed Truth through the orthodox defense of the Catholic Faith and the propagation of the *knowledge* of the divine mysteries expressed within it—i.e. the fulfillment of the noble task of the theologian. In sharp contrast with both the counter-religious rationalism characteristic of post-scholastic “Enlightenment” (early modernity) and the impoverished rationality of our current post-Enlightenment relativistic age, the Scholastics held fast to the view that, illuminated and raised from within by supernatural faith, human reason is capable and meant to give its full intellectual assent to the truthfulness of what surpasses its limited natural scope and requirements. Within the context of true Christian thought and life, reason is never depreciated, undermined by the truths of faith. The Catholic tradition characteristically reverses reason (*ratio*) and sees its source in the divine Logos<sup>39</sup> of creation (who is also God’s inner *Verbum sui*), gently and gratuitously speaking all things into being by way of intelligence and love. God’s own Truth and Word provides the measure of human reason, which implies the uttermost dignity of the latter and lays out the supreme path and norm for both intellectual pursuit and moral conduct. Accordingly, from a Christian standpoint, the intellectual and moral life is essentially to be based upon the exercise of right reasoning.

The social and moral collapse into which contemporary Western civilization is now sinking beyond natural recovery means bears dreadful witness to the deeper collapse it suffers from, that of reason onto itself. Despite its many technological achievements and stress on “reason alone”, loss of rationality is indeed one of the distinctive features of our overly secular age. Symptomatically, the general state of things with the influence of reason gradually fading away closely ties in with the general crisis of faith—the overall decline of an objective sense and awareness of God in the shaping of the mind and moral ethos of post-Enlightenment Western societies. The deep symbiosis between faith and reason, which informs and structures the whole Catholic understanding of knowledge (epistemology) and love (charity), implies that the compromising of one is tantamount to the compromising of the other. Hence, to bring salvation to the present cultural situation for us in the West means precisely this: to help it rediscover the *mark of reason* lying at the heart both of reality and man.

## NOTES

<sup>1</sup> The *tropes* (τρόποι) and logotropes (λογότρόποι), “modes”, were structures of inference designed by the Stoics to replace determined elements of reasoning by variables. Unlike Aristotle’s terms, these variables symbolize propositions. The Stoics classified five fundamental unproved modes or tropes.

<sup>2</sup> All of these giant representatives of scholasticism were priests (some bishops) and friars (including Abelard, who eventually became a monk following the tumultuous ending of his romantic affair with Héloïse). The case of Blessed Raymond Lully’s life (1232-1315) and astoundingly diverse works is one that massively rebuts the favorite clichés of low-information twenty-first century academics and other contemporary “religion-free” anti-medieval bigots. Raymond Lully (in Castilian: Raimundo Lulio) began by leading a very worldly life (which included many affairs) while serving as a major-domo and tutor to the future king of Majorca (James II). He eventually married. After his conversion to Catholicism, he became a tertiary (lay) Franciscan friar and lived the life of a hermit for close to a decade, prior to multiplying missions in North Africa he particularly and prayerfully devoted to the conversion of Muslims to the one true Faith. Lully was an extraordinarily accomplished writer (he wrote in several languages, including Arabic), mathematician, logician, philosopher, and theologian, the very rare type of a true polymath. He went on to become a mystic and died a martyr. Pope Pius IX beatified him in 1857. Long before Leibniz and Pascal, he thought of and designed computation theories and devices which he further applied to the development of a voting theory anticipating modern statistics and computer science. Lost manuscripts of his were recently discovered, including his *Ars electionis*. In his main and most ingenious work, *Ars generalis ultima* (1305), Lully designed a method to coherently articulate religious and philosophical propositions by means of combinatorial selection. He originally intended it as a debating instrument for the purpose of winning Mohammedans to the Christian religion through the proper use of logic and reason. He eventually constructed a sophisticated logical machine using various combinatorial devices (letters, geometrical figures, and truth table-like computation charts) and rules to produce all possible logical combinations of the elements and categories of thought he saw to be ingredient to the sound utterance (in the form of logical propositions) of true knowledge.

<sup>3</sup> Cf. Frege’s important distinction and relation between the *sense* (*Sinn*) and the *denotation* (*Bedeutung*) of a name he developed in *Über Sinn und Bedeutung* (1892).

<sup>4</sup> Adam in the Garden (Gen 2:19-20) speaks by way of nominating the quiddity of what is divinely shown to his intellect.

<sup>5</sup> Gottlob Frege, *Collected Papers on Mathematics, Logic and Philosophy*, ed. B. McGuinness, tr. M. Black et al., Blackwell (Oxford, 1984).

<sup>6</sup> C. S. Peirce, *Reasoning and the Logic of Things: The Cambridge Conference Lectures of 1898*, Lecture Three: *The Logic of Relatives*, ed. Kenneth Laine Ketner, with intro. Kenneth Laine Ketner and Hilary Putnam, Harvard Historical Studies (1992), pp. 146-164; C. S. Peirce, *Description of a Notation for the Logic of Relatives, Resulting from an Amplification of the Conceptions of Boole’s Calculus of Logic* (1870), reprinted in *Collected Papers of Charles Sanders Peirce*, vol. 3, ed. Charles Hartshorne and Paul Weiss, Harvard University Press (Cambridge, MA, 1931-1958), pp. 45-149.

<sup>7</sup> The notation below is not Peirce’s. I introduce it here to generically illustrate the notion of logical subject (denoted with a capital variable, such as *A*) and how it functions in Peirce’s logical analysis of triadic propositions.

<sup>8</sup> In *The Essential Peirce, Selected Philosophical Writings*, vol. 2 (1893-1913), *Pragmatism* (1907), ed. the Peirce Edition Project, Indiana University Press (Bloomington, IN, 1998), p. 411.

<sup>9</sup> In *The Commentaries on Boethius by Gilbert of Poitiers*, ed. Nikolaus M. Häring, Studies and Texts 13, Pontifical Institute of Mediaeval Studies (Toronto, 1966), p. 67.

<sup>10</sup> [NB: I provide my own translation of the texts here quoted in the original Latin] “There are three distinct [domains]: factual reality, understanding, and discourse. The understanding of a thing is conceived, while the discourse is signified. But the discourse is like a sign [a medium] enabling the actualization of intelligence into

[knowing] all things, regardless of how things are [in themselves], by which it [intelligence] can hold the proper concept of all things [it knows].”

<sup>11</sup> *ST. I*<sup>a</sup>, q. 27, a. 1, ad 2.

<sup>12</sup> *ST. I*<sup>a</sup>, q. 14, a. 5, co.

<sup>13</sup> Aquinas refers to these as “*naturae in particularibus existentes*” (“natures existing in particulars”), in *ST. I*<sup>a</sup>, q. 84, a. 7, co., which I refer to a little further as individualized essences of singular realities. Insofar as knowledge occurs through a process of signification such as both Aquinas and Peirce described respectively, these individual natures are known as *ultimum significata* of the intelligible species preserved in the passive intellect—the latter understands actually by forming its universal concepts by abstraction from the former.

<sup>14</sup> The medium of knowledge between the meaning of outer words and the ultimate objects of actual knowledge.

<sup>15</sup> *ST. I*<sup>a</sup>, q. 14, a. 5, co.: “[...] *speciem propriam adaequatam ipsi cognoscibili...*” (“[...] the proper species adequate to the knowable [nature]”).

<sup>16</sup> “I answer that for every name there are two things to consider: namely that from which the name is imposed, what is called the quality of the name, and that to which it is imposed, what is called the substance of the name; and the name, properly speaking, is said to signify the form, or quality from which the name is imposed, and is said to stand for the thing to which it is imposed.”

<sup>17</sup> *ST.*, *I*<sup>a</sup>, q. 85, a. 2, ad 2; *ST I*<sup>a</sup>, q. 76, a. 2, ad 3 and 4.

<sup>18</sup> “The intellectual conception is a medium between the intellect and the thing intellectualized, because through its mediation the intellectual operation reaches the thing. For that reason, the intellectual conception is not only that which is understood but also that by which the thing is understood. Thus that which is understood can be said to be both the thing itself and its intellectual conception. And likewise, that which is spoken interiorly can be said to be both the thing expressed by the word and the word itself; as is also true of the exterior word, because both the name and the thing the name signifies are expressed when the name is spoken.”

<sup>19</sup> The notation here introduced is only my own. It is neither conventional nor is it found in Aquinas’ own writings. But it accurately and elegantly captures the key concepts and ideas at work in the Common Doctor’s fine theories of intellection and signification.

<sup>20</sup> “The man of understanding may have a relation to four things in understanding: namely to the thing which is understood, to the intelligible species whereby his intellect is actualized, to his act of understanding, and to his intellectual conception. This concept differs from the above three. It differs from the thing understood, for the latter is sometimes outside the intellect, whereas the intellectual conception is only in the intellect. Moreover the intellectual conception is ordered to the thing understood as its end, inasmuch as the intellect forms its concept thereof so as to know the thing understood. It differs from the intelligible species, because the latter, which actualizes the intellect, is considered to be the principle of the intellect’s act, since every agent acts inasmuch as it is actualized: and it is actualized by a form, which must be a principle of action. And it differs from the act of the intellect, because it is considered as the term of the action, and as something through which it is realized. For the intellect by its action forms a definition of the thing, or even an affirmative or negative proposition. This conception of the intellect in us is called properly a word, for this is what is signified by the exterior [spoken] word. For the external utterance does not signify the intellect itself, nor the intelligible species, nor the act of the intellect, but the concept of the intellect by means of which it mediately refers to the thing. The concept or word of this kind, by which our intellect understands a thing distinct from itself, therefore rises from another and represents another. It rises from the intellect through its act: and it is the true similitude of the thing understood.”

<sup>21</sup> Expression I coined and whose *theo-logical* meaning I explain and symbolically represent further down (see pp. 20-22).

<sup>22</sup> Respectively establishing 1) that in any consistent axiomatized system of arithmetic there are true arithmetic statements that cannot be proved (which is tantamount to proving that it is impossible to prove the completeness of any such system); and 2) that it is impossible to axiomatically prove the consistency of a system of arithmetic within that given system.

<sup>23</sup> "... a something greater than which cannot be thought."

<sup>24</sup> Can never exist.

<sup>25</sup> Modal logic is designed to extend the field of propositional logic by introducing two new categories of existence-based analysis to express the states or modes under which things are necessarily ( $\square$ ) and possibly ( $\diamond$ ) true or false.

<sup>26</sup> *ST. I<sup>a</sup>*, q. 3, a. 4, s. c., Aquinas quotes Hilary of Poitiers: "[...] esse non est accidens in Deo, sed subsistens veritas." ("[...] existence in God is not accidental, but subsisting truth."). He then goes on to say: "Deus non solum est sua essentia [...] sed etiam suum esse." ("God is not only His own essence [...] but also His own existence.").

<sup>27</sup> *ST. I<sup>a</sup>*, q. 3, a. 4 and 7.

<sup>28</sup> *ST. I<sup>a</sup>*, q. 28, a. 2, co.: "[...] quidquid est in Deo, est eius essentia." ("[...] all in God is His essence.").

<sup>29</sup>  $\Theta$  (uppercase Theta) = G, i.e. God's Godhead. This is what I call the "Central Theological Equation", which in plain English reads as follows: there is an  $x$  (existing/esse) such that it is  $\Theta$  (God) if and only if  $\Theta$  (God) itself is affirmatively predicable of  $x$ .

<sup>30</sup> *ST. I<sup>a</sup>*, q. 6, a. 2, ad. 1; *ST. I<sup>a</sup>*, q. 28, a. 1, ad. 3: "[...] ideo in Deo non est realis relatio ad creaturas. Sed in creaturis est realis relatio ad Deum, quia creaturae continentur sub ordine divino, et in earum natura est quod dependeant a Deo." ("[...] therefore there is no real relation to the creature in God. But in creatures there is a real relation to God, because creatures are contained under the divine order, and their very nature entails dependence on God.").

<sup>31</sup> *CG*, lib. 1, cap. 85, n. 1-6: "Sed aliquibus rebus secundum modum suae naturae competit quod sint contingentes, non necessariae [...] Completio autem universi exigit ut sint aliqua contingentia [...] Divina igitur voluntas non excludit a rebus volitis contingentiam." ("But it suits certain things, according to the mode [= modal state of being] of their nature, that they be contingent, not necessary [...] The completeness of the universe requires that there be some contingency [...] The divine will, therefore, does not exclude contingency from the things it wills.").

<sup>32</sup> While most contemporary Catholics seem, very tragically, to have nothing to do with it.

<sup>33</sup> Cf. p. 20.

<sup>34</sup> *De Pot.*, q. 9, a. 9, ad. 27: "[...] in divinis sunt quatuor relationes, nedum duae; sed solum tres ex eis sunt personales, nam una earum, — scilicet communis spiratio, — non est proprietas personalis, cum sit communis duabus personis: et ideo non sunt in divinis nisi tres personae." ("[...] in God there are four relations, not only two; but only three of them are personal, for one of them, — namely common Spiratio, — is not a personal property, since it is common to two Persons: and for this reason there are only three Persons in God."); see also *ST. I<sup>a</sup>*, q. 30, a. 2.

<sup>35</sup> I denote Active Spiration  $R_0$  to signify that it does not constitute a distinct divine Person since it is not distinct from  $R_1$  (Paternity) and  $R_2$  (Filiation) and hence stands in relative opposition to Passive Spiration ( $R_3$ ) only.

<sup>36</sup> I use the capital letters Y, W, H to denote the three distinct subsistent relations in God constituting the three divine Persons (Father/Y, Son/W, and Holy Ghost/H) in transliterated reference to the original Hebraic tetragrammaton, יהוה (Y-H-W-H), which is indeed a revealed hieroglyph of the One true God's Trinitarian life (throughout the whole biblical account).

<sup>37</sup> Like in note <sup>19</sup> above: the notation in use here is only my own. It is neither conventional nor is it found in Aquinas' own writings, but consistently represents his splendidly coherent and flawlessly orthodox Trinitarian theology.

<sup>38</sup> In the Apostolic Constitution *Ineffabilis Deus*.

<sup>39</sup> The term **λόγος/Λόγος** (Word, Reason) as applied to the *Verbum Dei* Himself renders, as close as the Greek language permits, St. John's original choice of the term **מילתא/Miltâ** (the divine Verb, the *Action* of being spoken as "Word" and "Thing"/distinct, solid reality) in his native Aramaic—see the Prologue of his Gospel according to the Aramaic/Syriac text of the *Peshitta*.

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