



## The Notion of Formal Logic

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## The Notion of Formal Logic

The term «Formal Logic» is rather common among modern authors, both scholastic and non-scholastic. In spite of the frequent use of this term, Formal Logic seems to be a science whose nature has not been made clear, as is evident from the various meanings attributed to it by different authors and from the variety of subjects which one can find treated under the heading of Formal Logic. While it is usually held to be distinct from Material Logic, it is difficult, if not impossible, to find a clear and precise statement of the nature of this distinction.

In the *Critique of Pure Reason*<sup>1</sup> Immanuel Kant writes of Formal Logic as follows: «General Logic, as we have seen, makes abstraction of all content of cognition, that is, of all relation of cognition to its object, and regards only the logical form in the relation of cognitions to each other, that is, the form of thought in general». Kant, then, considered Formal Logic as being a science of pure form—a form conceived as bearing no relation to the content of knowledge. This same doctrine is found repeated in some of the present-day manuals of Logic.

Although Kant seems to have been quite confident that his own conception of Logic was the traditional one, it implies a notion of the nature of Logic which is contrary to Aristotelian and Thomistic teaching. It is only after agreement has been reached on the nature of Logic and its formal object that we can discuss a division within the science of Logic. It is common scholastic doctrine that the formal object of Logic is second intention. Second intentions are relations which are formed by the mind through comparison of objects and which, therefore, have their foundations in first intentions—in known objects: «relationes quae attribuuntur ab intellectu rebus intellectis, prout sunt intellectae», as St. Thomas explains<sup>2</sup>. Since relations are known only through their foundations, it is impossible for any part of Logic to treat of forms which have no reference to what is now usually called the content of thought.

It appears that this concept of Formal Logic as a science of empty forms—i.e., forms having no relation to objects—arises from the fact that some parts of Formal Logic contain rules which have a universal validity. This is especially true of the rules of the syllogism, which are treated in the *Prior Analytics*. However, this universality of Formal Logic can be explained without an appeal to empty forms. The rules of the syllogism can have universal application not because they prescind from objects, but because they prescind from certain differences in the objects about which we reason. In so far as these objects all have something in common, they can all be signified by nouns. Because all nouns signify *sine tempore*,

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1. Everyman's Library, E. P. Dutton and Co., N. Y., p.65.

2. *Q. D. de Potentia*, q.7, a.11.

they can be used as subject and predicate in the syllogism. But subject and predicate are precisely syllogistic terms<sup>1</sup>. Therefore, since the terms of the syllogism are all nouns, and since all nouns are second intentions founded on first intentions, the syllogism cannot base its validity on empty forms. It is valid only because it has a foundation in objects.

There are other objections to Kant's position regarding the nature of Formal Logic. Logic is a science. Since science is science strictly only in so far as it is true<sup>2</sup>, Logic must contain truth. But there can be no truth in *entia rationis* apart from their foundations in things because truth in us is an *adaequatio intellectus ad rem*. If the intellect possessed truth in knowing *entia rationis* which have no foundation in reality, truth would become *adaequatio intellectus ad seipsum*.

Secondly, Logic is an art whose purpose is to direct the acts of reason. But these acts are always concerned with objects; they imply a transcendental ordering of the mind to the object. If the whole being of the acts of knowledge is to be ordered to objects, the science which is concerned with these acts cannot disregard that which the act is about. Therefore, to say that Logic is concerned with acts of reason is to say that it cannot prescind from objects. Logic, therefore, must be concerned with objects.

John of St. Thomas in the *Praeludium secundum* of his *Ars Logica* makes a comparison between the art of Logic and the practical arts. Both practical and speculative art have matter and form. «Materia sunt res seu objecta, quae volumus recte cognoscere. Forma autem est ipse modus seu dispositio, qua connectuntur objecta cognita». Although John of St. Thomas throughout his writing carefully observes the Aristotelian distinction between Material and Formal Logic, it is not clear in this text that he has designated exactly the basis for the distinction between the two parts of the science. The form which is the mode in which, or the disposition according to which, known objects are conjoined is second intention, which is the formal object of Logic in its entirety and cannot, therefore, be used to distinguish one part of Logic from another. Hence, a division of the art of Logic must be based on a difference in second intentions. Since second intentions are relations, and since relations are diversified according to their foundations, we must search for differences in their foundations. We follow this same procedure when we divide Logic on the basis of the three acts of the intellect.

The first intentions which are the foundations of second intentions contain within themselves a matter and a form, as can be best known from the fact that the immanent act of knowing has a term. This term is the concept or *species expressa*. It is called term because it is a form perfecting the intellect. Just as the accidental form of a material object terminates the quantity, this form terminates the act of knowing because it represents to the intellect the object as it is in the state of being known. The form

1. *Prior Analytics*, I, chap.1, 24b16. Cf. also ST. THOMAS, *In I Perihermeneias*, lect.1, n.5.

2. *In II Posteriorum Analyticorum*, lect.20, n.15.

thus understood is the object existing intentionally in the intellect. As form it is a formal sign representing the known object<sup>1</sup>. The form will vary with the mode of conceiving the object.

The second intentions based on this *species expressa*, this formal sign, are the object of Formal Logic. The logician distinguishes them first according to their mode of signification because they are founded on a sign. Following upon this he considers these second intentions as parts or wholes of logical entities. For example, the noun and verb are distinguished first because of their different modes of signification. The noun signifies *sine tempore*, whereas the verb signifies *cum tempore*. Because of this difference in mode of signification the noun and verb play different roles in the composition of the enunciation.

The second intentions of Material Logic are those which are founded, not on the formal sign, but on the signified object, i.e., the object as it is in the state of being known. Material Logic must not be confused with Metaphysics or Philosophy of Nature, both of which study real beings as they are in reality. Material Logic, like Formal Logic, studies second intentions, but the second intentions of Material Logic have their foundations in the known object and are of such a nature that they cannot belong to the object except as it is in the state of being known. For instance, the logical universal is a second intention which belongs to the subject of Material Logic. It has its foundation in the known object, not as this object exists apart from the mind, but only as it is in the state of being known, i.e., the logical universal is founded on the metaphysical universal.

Aristotle treated Formal Logic in the *Perihermeneias* and in the *Prior Analytics*. The subject of the *Perihermeneias* is the enunciation, which is the sign of the judgment. The *Prior Analytics* treats of the syllogism in general, i.e., in abstraction from differences in objects. The books of Material Logic are the *Categories*, the *Posterior Analytics*, and the *Topics*. The *Categories* is concerned with the ten supreme genera into which we divide finite being. The *Posterior Analytics* treats of demonstration, the use of the syllogism in necessary matter, which issues in science or certain knowledge. The books of the *Topics* have as their subject the syllogism as used in probable reasoning. The *Sophistics* is the only part of Logic which treats of both Material and Formal Logic. It discusses defects in reasoning, which can be found in both the form and the matter of Logic.

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1. «Signum formale est formalis notitia, quae seipsa, non mediante alio, repraesentat».—JOHN OF ST. THOMAS, *Cursus philosophicus* (ed. REISER), t.1, p.10a4.