History of Logic from Aristotle to Gödel

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## Selected Bibliography on the History of Renaissance and Modern Logic

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      "The aim of this paper is to outline tentatively some aspects of the techniques of disputation in their history, on the basis of some texts. Modern logic ("mathematical" logic) was conceived *more geometrico* by Frege, who intended to improve upon Euclid essentially by adding an explicit list of rules of inference (*Grundgesetze* I, p. VI). Thus, the notion of *dialectica* in the sense of "speech between two," so important in the past, could hardly be found relevant by modern historians of logic, who were guided by the new model. These, in fact, have so far neglected to investigate this portion of the logical heritage.(1) Only recently there has been an increasing interest in the *Topica*, not extended, however, to the medieval and post-medieval developments. Good old Prantl seems to be still the best source in this respect. Historical works of a more general nature are of very little help even when they abundantly refer to disputation, because the formal aspects are usually overlooked. For example, a direct examination of the sources mentioned by Thurot would be very rewarding, but what Thurot himself says on disputation is simply useless from a technical point of view.(2)
      The dialogical logic developed in the last ten years by Paul Lorenzen and his school provides the needed "modern" motivation to go back to the *ars disputandi*.(3) Sources for antiquity and for medieval *obligationes* (a form of disputation) are known. Before 1800 disputation was considered by a very large number of books on logic; after 1800 at least by most neoscholastic treatises. Fortunately, in recent years bibliographical research in the history of logic has increased so much (4) that now we also know of a small, yet interesting list of postmedieval (second-scholastic) works especially devoted to the theory of disputation."
      (1) There are hardly any references in the most distinguished works on the history of logic. In E. Moody's *The Logic of William of Ockham* (London: Sheed & Ward, 1935), the topic of obligations is considered "not very relevant to logic" 294.
      (2) Charles Thurot, *De l'Organisation de l'enseignement dans l'Universiteé de Paris au Moyen Age* (Paris: E. Magdeleine, 1850); pp. 87-90 for the *disputes.*
      (3) Paul Lorenzen, *Normative Logic and Ethics* (Mannheim: Bibliographisches Institut, 1967); Kuno Lorenz. "Dialogspiele als Semantische Grundlage von Logik-kalkulen," *Archiv fur mathematische Logik und Grundlagenforschung* (1966).
      (4) Above all W. Risse, *Bibliographia logica* (Hildesheim: 0lms, 1965). Additions in W. Redmond, *Bibliography of Philosophy in the Spanish-Portuguese Colonies* (The Hague: Nijhoff, forthcoming) [publlished in 1972 wit the title: *Bibliography of the philosophy in the Iberian colonies of America*]; L. Hickman, *Late Scholastic Logic: Another Look;* to appear in *Journal of the History of Philosophy* [1971,

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"This essay aims, first, at describing the conflict between the theory of predication (classical, Aristotelian) prevailing in philosophy until the end of the 19th century, and the theory arisen with the new logic (modern, Fregean). Three features characterize the pre- Fregean period: 1) conflation of predication and subordination (extensionally: membership and class-inclusion), 2) conflation of identity and predication, 3) the view of quantificational phrases (e.g. "some men") as denoting phrases. A possible fourth feature is suggested by the consideration of the so-called Locke's "general triangle". Most of the paper is devoted to the first feature, also called the "principal" one, stated by Aristotle. Frege seems to be the first, in 1884, to reject the first feature; he E ISO rejected, not less vehemently, the second and the third features. Fregean predication theory became standard, and just taken for granted in the subsequent developments of logic as well as in the mainstream of philosophy. The second aim of this paper is to evaluate- relative to the notion of predication submitted in section I - the conflict between the two traditions, and to determine if both are somehow right, or one is right and the other wrong. The main result is that the Fregean revolution in predication theory is, at least with regard to the first and second features of the classical view, a clarification that would probably be welcomed by the classical authors themselves *(pace* Hintikka's "logic of being")."

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This book is the first attempt to provide a general introduction to the type of logical inquiry pursued in Europe after 1429 by means of a systematic presentation of the doctrines which were actually written about and taught. It radically alters traditional views of the period by demonstrating that not only were medieval doctrines still of overriding importance at the beginning of the sixteenth century, but that they continued to be discussed in many European universities at least until the mid-seventeenth century. TABLE OF CONTENTS; PREFACE IX; NOTE ABOUT ABBREVIATIONS XIII; ACKNOWLEDGEMENTS XV; CHAPTER I - HISTORICAL INTRODUCTION 1; l. The Publication of Medieval Works 2; 2. Scholasticism in Italy and Germany 4; 3. Scholasticism in France and Spain 5; 4.Humanism 8; 5. Rudolph Agricola and His Influence 10; 6. Petrus Ramus and His Influence 15; 7. Seventeenth Century Logic: Eclecticism 17; 8. Humanism and Late Scholasticism in Spain 19; 9. Other Schools of Logic 20; 10. A Note on Terminology 22; CHAPTER II / MEANING AND REFERENCE 26; I. The Nature of Logic 26; 1. The Contents of Logical Text-books 26; 2. The Definition of Logic 29; 3. The Object of Logic 32; II. Problems of Language 37; 1. Terms: Their Definition and Their Main Divisions 38; 2. The Relationship between Mental, Spoken and Written Terms 42; 3. Other Divisions of Terms 45; 4. Sense and Reference 47; 5. Propositions and their Parts 49; 6. Sentence-Types and Sentence-Tokens 52; 7. Complex Signifiables and Truth 55; 8. Other Approaches to Truth 62; 9. Possibility and Necessity 66; III. SUPPOSITION THEORY 77; 1. Supposition, Acceptance and Verification 78; 2. Proper, Improper, Relative and Absolute Supposition 82; 3. Material Supposition 83; 4. Simple Supposition 84; 5. Natural Personal Supposition 88; 6. Ampliation 89; 7. Appellation 92; IV. SEMANTIC PARADOXES 101; 1. Problems Arising from Self-Reference 101; 2. Solution One: Self-Reference Is Illegitimate 104; 3. Solution Two: All Propositions Imply Their Own Truth 106; 4. Solution Three: Insolubles Assert Their Own Falsity 108; 5. Solution Four: Two Kinds of Meaning 110; 6. Solution Five: Two Truth-Conditions 112; 7. Later Writing on Insolubles 114; CHAPTER III / FORMAL LOGIC. PART ONE: UNANALYZED PROPOSITIONS 118; I. THE THEORY OF CONSEQUENCE 120; 1. The Definition of Consequence 120; 2. The Definition of Valid Consequence 121; 3.Formal and Material Consequence 128; 4. 'Ut Nunc' Consequence 130; 5. The Paradoxes of Strict Implication 133; 6. Rules of Valid Consequence 136; II. PROPOSITIONAL CONNECTIVES 147; 1. Compound Propositions in General 147; 2. Conditional Propositions 149; 3A. Rules for Illative Conditionals 154; 3B. Rules for Promissory Conditionals 156; 4. Biconditionals 156; 5. Conjunctions 157; 6. Disjunctions 161; 7. De Morgan's Laws 166; 8. Other Propositional Connectives 177; III. AN ANALYSIS OF THE RULES FOUND IN SOME INDIVIDUAL AUTHORS 171; 1. Paris in the Early Sixteenth Century 171; 2. Oxford in the Early Sixteenth Century 181; 3. Germany in the Early Sixteenth Century 183; 4. Spain in the Third Decade of the Sixteenth Century 184; 5. Spain in the Second Part of the Sixteenth Century 184; 6. Germany in the Early Seventeenth Century 185; CHAPTER IV / FORMAL LOGIC. PART TWO: THE LOGIC OF ANALYZED PROPOSITIONS 187; I. The Relationships Between Propositions 189; 1. The Quality and Quantity of Propositions 189; 2. Opposition 192; 3. Equipollence 194; 4. Simple and

Accidental Conversion 195; 5. Conversion by Contraposition 199; II. Supposition Theory and Quantification 207; 1. The Divisions of Personal Supposition 207; 2. Descent and Ascent 213; III. Categorical Syllogisms 223; 1. Figures and Modes 224; 2. How to Test the Validity of a Syllogism 230; 3. Proof by Reduction 239; 4. Syllogisms with Singular Terms 247; APPENDIX / LATIN TEXTS 253; BIBLIOGRAPHY 282; 1. Primary Sources 282; 2. Secondary Sources on the History of Logic 1400-1650 291; INDEX OF NAMES 297.

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"I outline the developments and changes in logic and logic teaching between 1350 and 1600, paying attention to the survival of medieval doctrines and to the renewed Aristotelianism of the sixteenth century. I also discuss the philosophy of language in the same period, paying attention to speculative grammar, to the doctrines of signs and signification, and to the clash between medieval doctrines of conventional signification and the new renaissance interest in the idea of a naturally significant spoken language."

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"To understand the significance of these developments for the logician, we have to consider three questions. First, how much of the medieval logic described in the previous chapters survived? Second, insofar as medieval logic survived, were there any interesting new development in tit? Third, does humanist logic offer an interesting alternative to medieval logic?
In Part One of this chapter I shall consider the first two questions in the context of a historical overview in which I trace developments in logic from the later middle ages thorough to 1606, the year in which the Jesuits of Coimbra published their great commentary on Aristotle's logical works, the *Commentarii Conimbricenses in Dialecticam Aristotelis.* I shall begin by considering the Aristotelian logical corpus, the six books of the *Organon*, and the production of commentaries on this work. I shall the examine the fate of the specifically medieval contributions to logic. Finally, I shall discuss the textbook tradition, and the ways in which textbooks changes and developed during the sixteenth century. I shall argue that the medieval tradition in logic co-existed for some time with the new humanism, that sixteenth century is dominated by Aristotelianism, and that what emerged at the end of the sixteenth century was not so much a humanist logic as a simplified Aristotelian logic.
In Part Two of this chapter, I shall ask whether the claims made about humanist logic and its novel contributions to probabilistic and informal logic have nay foundation. I shall argue that insofar as there is any principled discussion of such matters, it is to be found among writers in the Aristotelian tradition." p. 610

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"The first Scot to have a book of his printed while he was yet alive was James Liddell (Jacobus Ledelh) from Aberdeen. The book came out in 1495, and was sufficiently well received to go through several further editions during the author's lifetime. In view of the chief historical thesis I am concerned to defend here, Liddell's book is a fitting place at which to start the defence, for Liddell, though in his latter days a physician of note, was first and foremost a philosopher and logician, and the book itself was a work of epistemology entitled *Treatise on Concepts and Signs*. Liddell matriculated at the University of Paris, a very common choice of university for young Scots of that period. He took his master's degree there in 1483 and in the following year began teaching in Paris. Two years later he was appointed examiner of Scottish students working for their bachelor's degree.
In 1491 or 1492 that substantial contingent of Scottish students at Paris was joined by John Mair from the village of Gleghornie near Haddington in East Lothian. Mair rose quickly up the academic ladder. He took his master's degree in 1494 and the following year became a lecturer in arts, while also beginning his studies in theology in the College of Montaigu. He published his first book in 1499, a work on exponible propositions, and by 1506, when he received his doctorate of theology and began teaching theology at the College of Sorbonne, he had already published numerous volumes on logic. In 1517 Mair returned to Scotland to take up the post of principal of the University of Glasgow, though while there he also taught in the Faculties of Arts and Theology. His very full timetable at Glasgow did not however prevent him returning to Paris in 1521 to see through the presses his enormous *History of Greater Britain,* a book motivated at least in part by a desire to further the cause of the union of England and Scotland in a single country, a 'Greater Britain'. In 1523 Mair transferred to the University of St Andrews where he continued his teaching in arts and theological subjects though also actively involved in important administrative roles in that university. Three years later he returned to Paris where he remained teaching theology till 1531 when, for reasons which remain obscure, he again took up a post at the University of St Andrews, and this time he stayed in Scotland. In 1530 he published a critical edition, with extensive commentary, of Aristotle's *Nicomachean Ethics*. It proved to be his last book, though he lived for a further twenty years, dying an octogenarian in 1550.
Among the pupils of Mair at Paris were several Scots whose writings I shall be examining in the succeeding chapters. They were David Cranston, George Lokert, Robert Caubraith, and William Manderston. David Cranston, a priest of the Glasgow Diocese, arrived in Paris in 1495, studied under Mair at the College of Montaigu, and himself began to teach in that college in 1499. Within thirteen years, having completed a number of books of his own and also edited works by Mair and Martin le Maitre, Cranston had died. We shall be studying his *Terminorum* in some detail." pp. 2-3
"Chapter 8. Conclusion.
The discussion of rules of valid syllogistic inference completes our survey of the formal logic presented in the textbooks of John Mair and his circle. The survey has not dealt with all the main areas of concern represented in those textbooks. We have not, for example, discussed insoluble propositions, that is, paradoxical propositions where typically the paradoxicality is generated by a self-referential element in the proposition. The Liar Paradox 'I now speak falsely' is the most famous, though numerous other paradoxes were investigated. And the problem of the analysis of future contingent propositions, an important subject in which present-day philosophers are taking a lively interest, has not been discussed in the foregoing pages, though both Lokert and Manderston wrote treatises on the subject.
However a great deal of ground has been covered, enough to show that the poor opinion many have of medieval logic is unjustified. There are many philosophers and logicians who believe that medieval logic constituted not so much an advance on the Aristotelian system from which it emerged, as an inflation of that system by endless definitions and divisions all made in a hopeless attempt to provide, from within the resources of natural language, rules for making valid inferences from propositions expressed in natural

language to other propositions likewise expressed.

But the reputation of medieval logic as Aristotle's logic become obese is based on a travesty. And the negative purpose of this book has been to show up that travesty. The first point that has to be made is that the logic we have been examining marks an immense advance on Aristotle's system with respect to the area of *proprietates logicales,* the logical properties of terms. The single most distinctive contribution of medieval logic was the doctrine of supposition, with the attendant notions of descent to and ascent from singulars, and the consequent ability to give a detailed account of the way quantifier expressions signify. It was in virtue of the doctrine of supposition and its associated rules of order of descent under terms with different sorts of supposition, that the late-scholastic logicians were able to give a detailed exposition of such fallacies as that of the quantifier shift. And it enabled them also to give an account of the validity of inferences involving propositions in which crucially one term stands in genitival relation to another.

The doctrines of ampliation, restriction, and alienation are also characteristically medieval doctrines, not investigated by Aristotle, but clearly of the greatest logical importance in view of the need to be able to state, for example, the truth conditions of past- and future-tensed propositions, an area which has been within the fold of modern formal logic since the late Arthur Prior's seminal work on tense logic. Certainly his employment of tense operators operating on (temporally or timelessly) present-tense propositions accords with the scholastic technique of expressing the tensed element of a non-present-tensed proposition in a predicate whose argument place is to be filled by a present-tense proposition.

The examination of exponible propositions is also a distinctively medieval contribution to logic. It should not be forgotten that the medieval logicians at all times stayed close to natural language and sought to formulate rules of valid inference for propositions in natural language. And given that propositions expressing, say, something's being the only member of a given class, or being an exception to a rule, or being different from something else, or coming to be or ceasing to be, can imply other propositions, the late-scholastic logicians considered there to be a real problem concerning the identification of the associated rules of inference. And if it was not within the remit of the logicians themselves to identify and formulate those rules then whose job was it? The recent interest in this field shown by E. J. Ashworth, Norman Kretzmann, and others, is not merely antiquarian; it reflects a concern with concepts which are of current philosophical interest.

In the field of syllogistic itself the late-scholastics made important advances. Two areas that we considered in which advances were made were, first, the validity conditions of syllogisms in which the middle term does not constitute the whole extreme in each premiss, and secondly the validity conditions of syllogisms whose premisses and conclusion are non all present-tensed. Once again it has to be noted that the medieval logicians were concerned to formulate rules of inference applicable to the kinds of argument that ordinary people using ordinary language commonly formulate.

In the late fifteenth and early sixteenth centuries there was a glorious flowering of logic. It was the last major achievement of the terminist tradition, and the circle of John Mair was especially prominent in that final flourish. Why the fortunes of logic suddenly foundered is a matter for speculation, but there is no good reason to suppose that the explanation is that there was suddenly nothing interesting left to say in that tradition. It would itself be even more in need of explanation why a tradition, which until the third decade of the sixteenth century had been finding so many interesting things in what had proved such a rich seam, should suddenly strike clay. But it should be said that whatever the reason for a dead hand falling on logic at the time of the Reformation, and whether or not logic itself was a casualty of the Reformation, it remains true that many matters dealt with in the terminist textbooks of the late-scholastics have an immediate bearing on matters of current concern to logicians working within the tradition created by Frege, the man who prised off that dead hand. The logical writings of John Mair and his circle bore little fruit, and gradually slipped away into nearly total oblivion. Perhaps after five centuries those writings will at last come into their own."

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"Lorenzo Valla's rhetorical reform of logic resulted in important changes in sixteenth-century mathematical sciences, and not only in mathematical education and in the use of mathematics in other sciences, but also in mathematical theory itself. Logic came to be identified with dialectic, syllogisms with enthymemes and necessary truth with the limit case of probable truth. Two main ancient authorities mediated between logical and mathematical concerns: Cicero and Proclus. Cicero's 'common notions' were identified with Euclid's axioms, so that mathematics could be viewed as core knowledge shared by

all human kind. Proclus' interpretation of Euclid's axioms gave rise to the idea of a universal human natural light of reasoning and of a *mathesis universalis* as a basic mathematics common to both arithmetic and geometry and as an art of thinking interpretable as algebra. "

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Table of Contents: Lorne Falkenstein and Patricia Easton: Preface I-II; I. Introduction. Frederick S. Michael: Why logic became epistemology: Gassendi, Port Royal and the reformation in logic 1; Gary Hatfield: The workings of the intellect: mind and psychology 21; IIa. The Logic of Ideas in early modern philosophy. E. Jennifer Ashworth: Petrus Fonseca on objective concepts and the Analogy of Being 47; Elmar J. Kremer: Arnauld on the nature of ideas as a topic in logic: the *Port-Royal Logic* and *On True and False Ideas* 65; Emily Michael: Francis Hutcheson's *Logicae Compendium* and the Glasgow School of logic 83; IIb. The Logic of relations in early modern philosophy. Jill Vance Buroker: The priority of thought to language in Cartesian philosophy 97; Fred Wilson: Berkeley's metaphysics and Ramist logic 109; IIc. The logic of inference in early modern philosophy. Charles Echelbarger: Hume and the logicians 137; David Owen: Hume on demonstration 153; Patricia Kitcher: Kant on logic and self-consciousness 175; ll.d. Modal themes in early modern philosophy. François Duchesneau: Leibniz and the model for contingent truths 191; Phillip D. Cummins: Hume on possible objects and impossible ideas 211; Manfred Kuehn: The Wolffian background of Kant's transcendental deduction 229; III. Faculty psychology in early modern logic and methodology. Catherine Wilson: Between Medicina Mentis and medical materialism 251; Eric Palmer: Descartes's *Rules* and the workings of the mind 269; Louis E. Loeb: Causal inference, associationism, and skepticism in Part III of Book I of Hume's *Treatise* 283; Robert E. Butts: Kant's Dialectic and the logic of illusion 307; Anthony Larivierère and Thomas Teufel: Bibliography 319; Index 329; List of Contributors 339-343.
"The papers collected in this volume address two closely related themes: the faculty psychology and the logic of the early modern period. The themes are related because, firstly, early modern logic-especially the early modern "logic of ideas" was explicitly psychologistic. It dealt with "concepts" rather than terms, "judgments" rather than propositions, and "reasoning" rather than arguments, and it saw all of these fundamental explanatory categories as grounded in contents or operations of the mind. And secondly, the lines of influence ran in the other direction as well. The higher cognitive faculties identified by early modern (and, indeed, by medieval and ancient) psychology were determined by logical and even grammatical considerations. Each cognitive faculty was understood relative to the notion that reasoning consists of arguments and that judgments assert relations between concepts. The intellect was understood as the faculty for abstracting universal concepts from the deliverances of sense; judgment, as the faculty for compounding and dividing concepts or as the faculty for inventing the middle term for a syllogism; and finally, reasoning was understood as the faculty for drawing inferences from previously made judgments. Faculty psychology cannot, therefore, be completely understood independently of traditional logic, and early modern logic certainly cannot be understood independently of faculty psychology.
For most of this century both of these themes have been neglected by philosophers and historians of logic, philosophy, and psychology. The explanatory categories of traditional faculty psychology now seem naive and ill-founded. And the notion that a normative discipline like logic might be grounded on purely descriptive facts of our psychology, or on the arbitrary and conventional features of the grammar of a particular natural language, is rejected as an instance of the naturalistic fallacy. The early modern period has accordingly been judged to be the dark age of logic-a time when the advances of the Middle Ages were forgotten and the entire discipline was turned down the wrong path.
But, as Fred Michael observes in one of the introductory essays to this volume, although early modern logic made virtually no contribution to the history of logic, it was a central part of early modern epistemology and metaphysics. One does not have to look far into the standard early modern logic textbook, with its four-part treatment of ideas or concepts, judgments, reasoning, and method, to find themes of crucial importance to early modern philosophy. It was obligatory that a textbook of early modern logic discuss the notions of conceptual clarity, distinctness and adequacy-notions that played a key role in the epistemology of Descartes, Locke, Leibniz, and Wolff, to name but a few. And in early modern logic, a discussion of general terms could no more be separated from the issues of abstraction and abstract ideas-issues that were to become of central importance for later British empiricism-than a medieval treatment of the same topic could be separated from the issue of the nature of universals. Similarly, the early modern logic of propositions, because it could not be separated from the operation of judgment, dealt not just with the concept of relation, but with the act of relating, and referred crucially to

the basis of that act in the (rationalist) analysis of concepts and the (empiricist) evidence of experience. Again, syllogistic reasoning, based as it is on categorical propositions (out of which the paradigmatic syllogistic forms are constructed), carried with it an implicit ontology of substance and property (the subject and the predicate of the categorical proposition)-an ontology that continued to dominate early modern metaphysics and epistemology long after substantial forms and real qualities had been banished from early modern philosophy of nature. Furthermore, such popular principles of early modern ontology as the notion that whatever is conceivable is a possible object of experience, are obviously parasitic on notions of logical and real possibility. And the analytic and synthetic methods discussed in the fourth part of most early logic textbooks have an obvious relation to the opposed Cartesian and Newtonian paradigms for scientific research." pp. I-II.

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28.    Frisch, Joseph C. 1969. *Extension and Comprehension in Logic*. New York: Philosophical Library.
Contents: Foreword by John R. Gallup VII; Introduction XV-XVI; Part I. Historical survey. Chapter I. Modern logicians (1662-1966) 1; Chapter II. Medieval and ancient logicians (1658-530 B.C.) 78; General summary of Chapter I and II 124; Part II: A doctrinal survey. Chapter III. An essay in doctrine 129; 1. Non-logical meanings of 'extension' 129; 2. Non-logical meanings of 'comprehension' 135; 3. Extension and comprehension with reference to the theory of knowledge 142; 4. Extension and comprehension in logic 149; 5. General summary of Chapter III 172; Epilogue 177; Appendix I. Grammatical sources 179; Appendix II: Different terminology and meanings 183; Bibliography 215; Footnotes 243-293.
"The purpose of this work is to analyze what has been frequently described by logicians as the extension and comprehension of concepts. Even if there is a justification for extension and comprehension in logic, it may be questioned whether there are any concomitant dangers since one historian of logic claims that this distinction has done more harm than good. Can it be said that the importance of extension and comprehension has been magnified out of proportion to the other parts of logic? Would it be more advantageous to correlate extension and comprehension with the predicables, or would it be better to try to eliminate the distinction altogether?
It is the aim of this study to explore the distinction existing between extension and comprehension, to ascertain whether such distinction is justifiable, where it should be placed in a treatise on logic, and how it should be presented. These are questions which should be answered if one intends to have a thorough grasp of logic.
This treatise will be divided into two parts. The first part will be subdivided into two chapters. Chapter I will examine the writings of modern logicians starting from 1662. Chapter II will treat of the works of classical and ancient authors in a reverse order of time starting from 1658. The second part will present an evaluation of extension and comprehension as a doctrine of logic.
It might be stated briefly here that the conclusion of this treatise hopes to present as probable the following declarations: (1) Extension and comprehension are basically an Aristotelian distinction. (2) Extension and comprehension are closely allied with the predicables. A logician cannot have a proper understanding of the former without a thorough understanding of the latter. (3) Any well-organized treatise on logic should begin with a study of the predicables.
The method of the first part which will be employed in this research is the empirical, or *a posteriori*, method. This particular mode is characteristic of all historical research. On the other hand, the deductive, or a priori, method is unsound because it would oblige one to posit a principle according to which all subsequent facts ought to correspond. There is a constant danger associated with such procedure, namely, the tendency to misstate or distort historical facts for the sake of preserving a methodic balance. However, inasmuch as the second part involves an evaluation, both the a posteriori and a priori methods will be utilized.
Perhaps it will seem strange to the reader to discover that in the initial historical research, the philosophical works of modern logicians will be examined in a chronological order, whereas, when attention is turned to the classical and ancient authors, the order of time will be reversed for this historical research. This mode of procedure was not adopted in any haphazard manner, nor was it introduced merely for the sake of adding variety to the presentation of the study. Inasmuch as the historical evidence on the distinction of extension and comprehension is limited and oftentimes confusing, it was not deemed feasible to begin the investigation at the very moment when the reality underlying the distinction was first discovered and introduced into logic so as to trace its development in one chronological direction. Instead it seemed more reasonable to select one source of information to which many modern authors had recourse and by which they were greatly influenced. It was not difficult to make such a choice. The text which was cited most frequently and which influenced modern logicians was none other than the *Port Royal Logic* (1662)." (pp. XV-XVI).

29.    Gabbay, Dov, and Woods, John, eds. 2004. *The Rise of Modern Logic: From Leibniz to Frege*. Amsterdam: Elsevier.
Handbook of the History of Logic: vol. 3.

Contents: Dov M. Gabbay and John Woods: Preface VII; List of Contributors IX-X; Wolfgang Lenzen: Leibniz's logic 1; Mary Tiles: Kant: From General to Transcendental Logic 85; John W. Burbidge: Hegel's logic 131; Paul Rusnock and Rolf George; Bolzano as logician 177; Richard Tieszen: Husserl's logic 207; Theodore Hailperin: Algebraical logic 1685-1900 323; Victor Sanchez Valencia: The algebra of logic 389; Ivor Grattan-Guinness: The mathematical turn in logic 545; Volker Peckhaus: Schröder's logic 557; Risto Hilpinen: Peirce's logic 611; Peter M. Sullivan: Frege's Logic 659; Index 751-770.

30.    ———, eds. 2008. *Mediaeval and Renaissance Logic*. Amsterdam: Elsevier.
Handbook of the History of Logic: vol. 2.
Contents: Dov M. Gabbay and John Woods: Preface VII; List of Contributors IX; John Marenbon: Logic before 1100: the Latin tradition 65; Ian Wilks: Peter Abelard and his contemporaries 83; Terence Parsons: The development of Supposition Theory in the later 12th through 14th centuries 157; Henrik Lagerlund: The assimilation of Aristotelian and Arabic logic up to the later thirteenth century 281; Ria van der Lecq: Logic and theories of meaning in the late 13th and early 14th century including the Modistae 347; Gyula Klima: The nominalist semantic of Ockham and Buridan: a 'rational reconstruction' 389; Catarina Dutilh Novaes: Logic in the 14th century after Ockham 433; Simo Knuuttila: Medieval modal theories and modal logic 505; Mikko Yrjönsuuri: Treatments of the paradoxes of self-reference 579; E. Jennifer Ashworth: Developments in the fifteenth and sixteenth centuries 609; Peter Dvorák: Relational logic of Juan Caramuel 645; Russell Wahl: Port-Royal: the stirrings of modernity 667; index 701.

31.    ———, eds. 2008. *British Logic in the Nineteenth Century*. Amsterdam: Elsevier.
Handbook of the History of Logic: vol. 4.
Contents: Dov M. Gabbay and John Woods: Preface VII; List of Contributors XIII-XIV; Gordon R. McOuat and Charissa S. Varma: Bentham's logic 1; Tim Manes: Coleridge's logic 33; James Van Evra: Richard Whately and logical lheory 75; Ralph Jessop: The logic of Sir William Hamilton: tunnelling through sand to place the keystone in the Aristotelic arch 93; Laurta J. Snyder:
"The whole box of tools": William Whewell and the logic of induction 163; Fred Wilson: The logic of John Stuart Mill 229; Michael E. Hobart and Joan L. Richards: De Morgan's logic 283; Dale Jacquette: Boole's logic 331; Maria Panteki: French 'Logique' and British 'Logic': on the origins of Augustus de Morgan's early logical enquiries, 1805-1835 381; Amirouche Moktefi: Lewis Carroll's logic 457; James Van Evra: John Venn and logical theory 507; Bert Mosselmans and Ard van Moer: William Stanley Jevons and the substitution of similars 515; Shahid Rahman and Juan Redmond: Hugh McColl and the birth of logical pluralism 533; David Sullivan: The Idealists 605; William J. Mander: Bradley's logic 663; Index 719-735.

32.    Gens, Jean-Claude, ed. 2010. *La Logique Herméneutique Du Xviie Siècle. J. C. Dannhauer Et J. Clauberg*. Argenteuil: Le Cercle Herméneutique Éditeur.

33.    Ghisalberti, Alessandro. 2005. "Étapes De La Logique. De La Voie Moderne À La Logique De Port-Royal." *Les Études Philosophiques*:521-536.

34.    Giard, Luce. 1984. "Du Latin Médiéval Au Pluriel Des Langues, Le Tournant De La Renaissance in Logique Et Grammaire." *Histoire, Epistémologie, Langage* no. 6:35-55.
"L'Auteur étudie la manière dont, dans l'Europe de la Renaissance, les relations entre langue, logique et grammaire se sont modifiées, passant de l'étude du latin et des modèles logiques d'analyse à la pluralité des approches des langues vernaculaires prônées par les Humanistes."

35.    ———. 1985. "La Production Logique De L'angleterre Au Xvi Siècle in Bacon." *Études Philosophiques*:303-324.
"La production logique éditée en Angleterre, majoritairement rédigée en latin, est analysée en quatre blocs: l'héritage médiéval de grammaire modiste et de logique, le renouveau aristotélicien progressif, la querelle ramiste, enfin les premiers traités en anglais."

36.    Grandt, François de. 2001. "Response to Jonathan Barnes." In *Whose Aristotle? Whose Aristotelianism?*, edited by Sharples, Robert W., 133-134. Aldershot: Ashgate.
Reply to J. Barnes - *Locke and syllogism* - in the same volume pp. 105-132

37.    Hailperin, Theodore. 1988. "The Development of Probability Logic from Leibniz to Maccoll." *History and Philosophy of Logic* no. 9:131-191.

38.    Heath, Terence. 1971. "Logical Grammar, Grammatical Logic, and Humanism in Three German Universities." *Studies in the Renaissance* no. 18:9-64.

39.    Hickman, Larry. 1971. "Late Scholastics Logics: Another Look." *Journal of the History of Philosophy* no. 9:226-234.

40.    ———. 1980. *Modern Theories of Higher Level Predicates. Second Intentions in the Neuzeit*. München: Philosophia Verlag.
Table of Contents: Foreword by Ignacio Angelelli 7; Introduction 9; Part One 15; Chapter One: Predication 17; Chapter Two: Logical concepts 32; Part Two 57; Chapter Three: Higher level predicates

"The theory of higher predicates (predicates of predicates) contained in the traditional discussions on second intentions has been largely ignored, even by historians of logic, who as a rule have concentrated on nominalism, a scholastic trend so fruitful in formal logic yet so poor in this particular topic.

Larry Hickman's work makes available for modern readers many of the riches related to higher predication, that have been so far buried in rather unknown authors mainly from the post-medieval or "second" scholasticism.

Hickman not merely shows us selected "pictures" of the unfamiliar territories he has been exploring: his inquiry, although primarily historical, is analytical and systematically oriented.

Bochenski wrote about twenty years ago: "Logic shows no linear continuity of evolution. Its history resembles rather a broken line. From modest beginnings it usually raises itself to a notable height very quickly -- within about a century -- but then the decline follows as fast. Former gains are forgotten; the problems are no longer found interesting, or the very possibility of carrying on the study is destroyed by political and cultural events. Then, after centuries, the search begins anew. Nothing of the old wealth remains but a few fragments; building on those, logic rises again." (1)

Obviously during the cycle of so-called modern philosophy (Descartes to Kant, roughly) the problem of higher predication was not found interesting and this explains why Frege may have believed that the distinction of proper ties of the second and first level *(zweiter and erster Stufe)* was *his* ("meine, Unterscheidung"). At any rate, one can hardly find a better example of the "broken line" character of the history of logic than in this issue of iterated predication and properties of properties.

Predication is perhaps one of the very few topics in which most if not all philosophical schools seem to have something in common. This should be sufficient as a hint at the significance of Hickman's historical investigations, not merely for the logical historiography but for philosophy in general." (from the Foreword).

(1) I. M. Bochenski: *A History of Formal Logic*, Notre Dame, 1961 Introduction § 3.

41.     Howell, Wilbur Samuel. 1956. *Logic and Rhetoric in England, 1500-1700*. Princeton: Princeton University Press.

Contents: Prefgace V-VII;m 1. Introduction 3; 2. Scholastic logic 12; 3. Traditional rhetoric: the three patterns 64; 4. The English Ramists 146; 5. Counterreform: systematics an neo-Ciceronians 282; 6. New horizons in logic and rhetoric 342; Index 399-411.

"Logic, conceived today as the science of validity of thought, and as the term for the canons and criteria that explain trustworthy inferences, was in the English Renaissance a theory not so much of thought as of statement. For all practical purposes, the distinction between thoughts and statements is not a very real distinction, since the latter are merely the reflection of the former, and the former cannot be examined without recourse to the latter. But what distinction there is consists in a differentiation between mental phenomena and linguistic phenomena, the assumption being that the thing to which either set of phenomena refers is reality Itself. Logicians of the twentieth century are primarily interested in mental phenomena as an interpretation of the realities of man's environment, and in that part of mental phenomena which we call valid or invalid inference. Logicians of the English Renaissance were primarily interested in statements as a reflection of man's inferences, and in the problem of the valid and invalid statement. Thus Renaissance logic concerned itself chiefly with the statements made by men in their efforts to achieve a valid verbalization of reality. Since such statements were the work of scholars and science, not of laymen, Renaissance logic founded itself upon scholarly and scientific discourse and was in fact the theory of communication in the world of learning. The data upon which this theory rested were all learned tractates of that and earlier times. The theory itself attempted on the one hand to explain the nature of these tractates, as to language, sentence structure, and organization, and on the other to offer assistance to the learner in his effort to master learned communication, as part of his entrance fee to the scientific and philosophical world." p. 3

42.     ———. 1971. *Eighteenth-Century British Logic and Rhetoric*. Princeton: Princeton University Press.

Contents: Preface VII-IX; 1. Introduction 5; 2. The Aristotelian inheritance in logic (1615-1825). I. Some Seventeenth-century Peripatetics 13; II. Bishop Sanderson and the attack on Ramus 16; III. Crakanthorp's *Logicae Libri Quinque* 22; IV. John Wallis's *Institutio Logicae* 29; V. Dean Aldrich's famous *Artis Logicae Compendium* 42; VI. Syllogisms and science: John Sergeant's view 61; 3 The Eighteenth-century Ciceronians (1700-1759). 1. Rhetoric as the counterpart of logic 75; II. John Ward's Lectures at Gresham College 83; III. John Holmes's *The Art of Rhetoric Made Easy* 125; IV. Separative tensions in rhetoric: a retrospect 142; 4 The British elocutionary movement (1702-1806). I. Rhetorical delivery adopts a new name 145; II. Some reflections on a semantic problem 147; III: Why delivery aroused urgent interest 152; IV. Continental backgrounds of British elocution 160; V. Le Faucheur's *Traitté* in England 164; VI. Betterton: Major actor as minor elocutionist 182; VII. Some rules for speaking and action 190; VIII. Orator Henley: preacher, elocutionist, merry-andrew 193; IX. Mason's *Essay on Elocution* 204; X. Action

"This book undertakes to present an analysis of the major eighteenth-century British writings on logic and rhetoric and to place those writings in a chronological perspective, so that the reader may see them in relation to their antecedents in the seventeenth and their consequents in the nineteenth centuries and also in relation to their influences upon each other. Moreover, this book undertakes, as part of these two objectives, to introduce the reader to the authors of these writings and to make them and their works stand together as partners in an intellectual effort of appreciable size and duration. If history, as Carl Becker observed, is the memory of things said and done, then the present history is an attempt to tell our modern world what the chief British logicians and rhetoricians of the 1700's said when they wrote about their specialties, and what their works mean within the context of their particular time.

The main conclusion to be drawn from this history is that the changes which took place in logical and rhetorical doctrine between 1700 and i 800 are perhaps best interpreted as responses to the emergence of the new science.

The old science, as the disciples of Aristotle conceived of it at the end of the seventeenth century, had considered its function to be that of subjecting traditional truths to syllogistic examination, and of accepting as new truth only what could be proved to be consistent with the old. Under that kind of arrangement, traditional logic had taught the methods of deductive analysis, had perfected itself in the machinery of testing propositions for consistency, and had served at the same time as the instrument by which truths could be arranged so as to become intelligible and convincing to other learned men. In short, traditional logic prided itself upon being a theory of learned enquiry and of learned communication. Meanwhile, traditional rhetoric also prided itself upon having a share in these same two offices, its special purpose being to communicate truths through a process which, on the one hand, blended scientific conclusions with popular opinions and manners, and, on the other hand, transmitted that blend to the general populace. For all practical purposes, the differences between logic and rhetoric, within the context of the old science, were derived from the differences between the learned and the popular audience. A good statement of the concepts which governed this view of the relations of these disciplines to each other is contained in the epigraph at the head of this chapter.

The new science, as envisioned by its founder, Francis Bacon, considered its function to be that of subjecting physical and human facts to observation and experiment, and of accepting as new truth only what could be shown to conform to the realities behind it. Bacon's vision became that of the Royal Society of London, and of similar organizations throughout Europe. The intoxicating novelty and enormous productivity of the new methods of investigation led young scientists and scholars to practice them with increasing sophistication; and logic, which had always claimed anyway to be the theory of enquiry, began to incorporate the new methods into its doctrines and ended by becoming so enamored of them that it allowed them to crowd out its waning interest in the methods of learned communication. Meanwhile, rhetoric began to see itself as the rightful claimant to the methods of learned communication and as the still unrivaled master of the arts of popular discourse; and by making these two activities its new concern, it came ultimately to think of itself as the art which governed all forms of verbal expression, whether popular or learned, persuasive or didactic, utilitarian or aesthetic. Thus in the context of eighteenth-century learning, rhetoric became the sole art of communication by means of language, and logic moved towards the realization that it was destined to become the science of scientific enquiry. A good statement of the concept which controlled these emerging relations of logic and rhetoric to each other was made by John Stuart Mill in the first half of the nineteenth century, and I have quoted it as the epigraph of Chapter 7, although in a real sense it also belongs to this Introduction." pp. 5-6

43.     Jardine, Lisa. 1974. "The Place of Dialectic Teaching in Sixteenth Century Cambridge." *Studies in the Renaissance* no. 21:31-62.

44.     ———. 1976. "Humanism and Dialectic in Sixteenth Century Cambridge: A Preliminary Investigation." In *Classical Influences on European Culture, Ad 1500-1700*, edited by Bolgar, Robert Raplh, 141-154. Cambridge: Cambridge University Press.

45.     ———. 1982. "Humanism and the Theaching of Logic." In *The Cambridge History of Later Medieval Philosophy*, edited by Kretzmann, Norman, Kenny, Anthony P. and Pinborg, Jan, 797-807. Cambridge: Cambridge University Press.

46.     ———. 1988. "Humanistic Logic." In *The Cambridge History of Renaissance Philosophy*, edited by Schmitt, Charles B. and Skinner, Quentin, 173-198. Cambridge: Cambridge University Press.

"The history of medieval and Renaissance logic has traditionally been the history of the great medieval syllogistic logicians and the *fortuna* of their innovatory treatments down through the fifteenth and sixteenth centuries. When historians of logic characterise humanist dialectic as a misguided and non-rigorous intervention which disrupted the smooth development of medieval syllogistic logic, they confirm their own commitment to the interests and techniques pioneered by logicians like William of Sherwood. It is not surprising, then, if these scholars find the very different approach of the humanists trying. They hold up against the `non-rigorous' humanist treatment of ratiocination, the 'rigour' of a commitment to formal validity as the central focus for the study of logic - a commitment, that is to say, to those fixed patterns of argumentation which guarantee that from any true premises whatsoever one can only infer a true conclusion Humanist treatments of logic, on the other hand, have a good deal in common with the interests of some recent, modern logicians, who have chosen to give a good deal of attention to non-deductive inference, and to 'good' arguments (arguments which can be counted on to win in debate), and the problematic nature of their validity. Like modern logicians they are interested, above all, in 'good' arguments.

A humanist treatment of logic is characterised by the fundamental assumption that *oratio* may be persuasive, even compelling, without its being formally valid (or without the formal validity of the argument being ascertainable). It takes the view, therefore, that any significant study of argument (the subject-matter of logic/dialectic) must concern itself equally with argument (strictly, argumentation) which is compelling but not amenable to analysis within traditional formal logic.' It is this fundamental difference of opinion over what is meant by 'compelling' argument which accounts for the dogmatic insistence (on ideological grounds) of the scholastic (and of the historian of scholasticism) that the humanist is a 'grammarian' or a 'rhetorician'. Either term announces that what the humanist is concerned with is not 'rigorous' in the restricted scholastic sense: all discourse not amenable to such 'rigorous' analysis is, for the scholastic, a matter for the grammarian (to parse and construe) or the rhetorician (to catalogue its persuasive devices). It is in the same spirit that humanists always refer to their study of ratiocination as 'dialectic' (reasoning conducted between two interlocutors), rather than as 'logic', to emphasise the active, pragmatic nature of the argumentation which captures their interest." (pp. 175-176, notes omitted)

47.    Kessler, Eckhard. 2002. "*Logica Universalis* Und *Hermeneutica Universalis*." In *La Presenza Dell'aristotelismo Padovano Nella Filosofia Della Prima Modernità*, edited by Piaia, Gregorio, 133-171. Padova: Antenore.

48.    Lolli, Gabriele. 1983. "Quasi Alphabetum. Logic and Encyclopedia in G. Peano." In *Atti Del Convegno Internazionale Di Storia Della Logica*, edited by Abrusci, Michele, Casari, Ettore and Mugnai, Massimo, 133-155. Bologna: CLUEB.

49.    Maat, Jaap. 2006. "The Status of Logic in the Seventeenth Century." In *Foundations of the Formal Sciences Iv. The History of the Concept of the Formal Sciences*, edited by Löwe, Benedikt, Peckhaus, Volker and Rasch, Thomas, 157-167. London: College Publications.

50.    Mangione, Corrado, and Bozzi, Silvio. 1983. "About Some Problems in the History of Mathematical Logic." In *Atti Del Convegno Internazionale Di Storia Della Logica*, edited by Abrusci, Michele, Casari, Ettore and Mugnai, Massimo, 157-174. Bologna: CLUEB.

51.    Michael, Frederick S. 1997. "Why Logic Become Epistemology: Gassendi, Port Royal and the Reformation in Logic." In *Logic and the Workings of the Mind. The Logic of Ideas and Faculty Psychology in Early Modern Philosophy*, edited by Easton, Patricia A., 1-20. Atascadero: Ridgeview.
"Introduction.
It is quite obvious that epistemology permeates most of the logic texts written from a period beginning in the late seventeenth century and continuing into the beginning of the contemporary era in logic at the end of the nineteenth century. The model of this kind of logic appears to be the *Port Royal Logic.* Since this is a work suffused throughout with Cartesian doctrine, it is natural to conclude that this kind of logic is of Cartesian inspiration. Even though Descartes himself did not think of logic in this way, indeed he appears to have viewed logic, and abstract thought generally, with suspicion, the epistemological approach to logic taken in the *Port Royal Logic* can be seen to be a natural outgrowth of Cartesian philosophy. The problem with this judgment is that there had been an earlier logic of this same type and its author, Pierre Gassendi, not only was not Cartesian, but was Descartes's principal rival among the moderns. His *Institutio Logica,* published not as a separate work, but as part of the *Syntagma Philosophica,* which itself is available only as the first two volumes of Gassendi's posthumous *Opera Omnia,* was, as I will try to show, both conceptually and structurally, the *Port Royal Logic's* principal model.
Inasmuch as each of these logics has as its foundation a theory of ideas, it seems appropriate to call this kind of logic, the logic of ideas. Historians of logic do not look with much favour upon this kind of logic. In the introduction to his English translation of Gassendi's *Institutio Logica,* Howard Jones states that this work is "not a revolutionary logic which rejects all that the logical tradition has to offer, but a logic which Gassendi renders contemporary by selecting from that tradition only what is appropriate to seventeenth

century needs."(1) Wilhelm Risse's assessment of the *Port Royal Logic* is similar. He says of this work, that it is historically one of the high points of logic, comparable in influence to that of Aristotle, Peter of Spain, Ramus and Wolff. But he adds: "This logic is certainly not original. Its extraordinary success is due to its elegance and its pedagogically effective manner of presentation."(2) With respect to logic after the medieval period, which includes the humanist logics of the Renaissance period in addition to the logic of ideas, William and Martha Kneale in their *The Development of Logic* remark that "from the 400 years between the middle of the fifteenth and the middle of the nineteenth century we have...scores of textbooks but few works that contain anything at once new and good."(3) The logic of this same era is called by I.M. Bochenski, "classical logic" and is characterized by him as "something held the field in hundreds of books for nearly four hundred years"(4) but while he sees it as new, he certainly does not see it as good. This is his assessment: "Poor in content, devoid of all deep problems, permeated with a whole lot of non-logical philosophical ideas, psychologist in the worst sense-that is how we have to sum up the "classical" logics.(5)

While I don't think that this attitude is wholly wrong, I would contend that the logic of ideas *was* revolutionary. More specifically, it was the completion of a revolution that took two hundred years to accomplish, from the sixteenth to the eighteenth century. This was the era of the religious reformation, and it would be as appropriate to speak of a philosophical and scientific reformation in this era as well. It was a period of intense intellectual ferment and upheaval, in which the medieval world view was abandoned and replaced by the modern world view. It began with an attack on medieval logic. This at first sight seems odd inasmuch as if there is one area of medieval philosophy which those involved with the history of philosophy do not think was in need of reformation, it is logic. That is no doubt at least part of the reason why the reformed logics are viewed today with so little enthusiasm

The reform of logic occurred in two phases. The first phase was largely reactive. Medieval logic was discredited by the humanists and largely abandoned. The humanists hoped to convert logic from the formal and theoretical discipline of the medieval period into a practical study, which they hoped would be an improved instrument for argumentation and disputation, and so for the discovery of truth. There was however no consensus about how this was to be accomplished. The second phase in the reformation of logic began in the early seventeenth century, with the abandonment of the view that the way to truth is via argumentation and disputation. Disputation does not lead to truth, it was held, rather the road to truth is by the way of ideas.

The logic of this era is, as Bochenski says, something new. It is an important development in the history of logic. But is it also something good? Were the humanists responsible for an advance in logic? Was the epistemological turn which the logic of ideas brought about, the right turn for logic? For the most part, I would have to answer no. These developments were on the whole not good for logic; certainly they were not good for formal logic. In the four hundred years from the end of the medieval era to the beginning of the era of contemporary logic, while there was some development in informal logic, formal logic was largely neglected. It was a reform of logic, a revolutionary change. But revolutions aren't always good and this one was not good for formal logic. Contemporary logicians and historians of logic have reason to be dismayed by its results.

On the other hand, the situation could hardly have been more favourable for the development of epistemology, and of the theory of ideas in particular. Logic was typically the first subject in a course of university studies, and in the logic of ideas, the theory of ideas was the subject matter to which the student was first exposed. The chief focus in the logic of ideas was not on form but on content, principally on epistemological content. Yet it really was a form of logic, as I hope to make clear and the conception of logic it embodies is legitimate.

My principal purpose in this paper is to examine the logic of ideas as it is found in Gassendi's *Institutio Logica* and in the *Port Royal Logic,* to compare these two works and to explain how this form of logic came about. But I do not think that this form of logic can be understood except in its broad intellectual context. Accordingly, it is with this that I begin." pp. 1-3

(1) Howard Jones, *Pierre Gassendi's Institutio Logica (1658)* (Assen, The Netherlands: Van Gorcum, 1981) p. LXVII. This work will henceforward be referred to as "Jones," followed by page number(s).
(2) Wilhelm Risse, *Die Logik der Neuzeit* (Stuttgart-Bad Carstatt: Friedrich Frommann Verlag, 1964) vol II, p. 79.
(3) William and Martha Kneale, *The Development of Logic* (Oxford, 1962) p. 298.
(4) I. M. Bochenski, *A History of Formal Logic,* translation by Ivo Thomas (Notre Dame, Indiana: Notre Dame University Press, 1961) p. 254.
(5) I. M. Bochenski, *A History of Formal Logic,* translation by Ivo Thomas (Notre Dame, Indiana: Notre Dame University Press, 1961) p. 258.

52.     Mugnai, Massimo. 1983. "Alle Origini Dell'algebra Della Logica." In *Atti Del Convegno Internazionale Di Storia Della Logica*, edited by Abrusci, Michele, Casari, Ettore and Mugnai, Massimo, 117-132. Bologna: CLUEB.

53.     ———. 2002. "Denken Und Rechnen: Über Die Beziehung Zwischen Logik Und Mathematik in Der Frühen Neuzeit." In *Neuzeitliches Denken. Festschrift Für Hans Poser Zum 65. Geburtstag*, edited by

Abel, Günter, Engfer, Hans-Jürgen and Hubig, Christoph, 85-100. Berlin: de Gruyter.

54.        ———. 2005. "Logic and Mathematics in the 18th Century: Before and after Christian Wolff." In *Wolffiana 1: Macht Und Bescheidenheit Der Vernunft: Beiträge Zur Philosophie Christian Wolffs; Gedenkband Für Hans Werner Arndt*, edited by Cataldi Madonna, Luigi, 97-109. Hildesheim: Georg Olms.

55.        ———. 2010. "Logic and Mathematics in the Seventeenth Century." *History and Philosophy of Logic* no. 31:297-314.

"According to the received view (Bocheński, Kneale), from the end of the fourteenth to the second half of nineteenth century, logic enters a period of decadence. If one looks at this period, the richness of the topics and the complexity of the discussions that characterized medieval logic seem to belong to a completely different world: a simplified theory of the syllogism is the only surviving relic of a glorious past. Even though this negative appraisal is grounded on good reasons, it overlooks, however, a remarkable innovation that imposes itself at the beginning of the sixteenth century: the attempt to connect the two previously separated disciplines of logic and mathematics. This happens along two opposite directions: the one aiming to base mathematical proofs on traditional (Aristotelian) logic; the other attempting to reduce logic to a mathematical (algebraical) calculus. This second trend was reinforced by the claim, mainly propagated by Hobbes, that the activity of thinking was the same as that of performing an arithmetical calculus. Thus, in the period of what Bocheński characterizes as 'classical logic', one may find the seeds of a process which was completed by Boole and Frege and opened the door to the contemporary, mathematical form of logic."

56.        Muñoz Delgado, Vicente. 1964. *La Lógica Nominalista En La Universidad De Salamanca, 1510-1530. Ambiente, Literatura, Doctrinas*. Madrid: Revista Estudios.

57.        ———. 1972. "Logica Hispano-Portuguesa Hasta 1600 (Notas Bibliográfico-Doctrinales)." *Repertorio de Historia de las Ciencias Eclesiásticas en España* no. 4:9-122.

58.        ———. 1973. "España En La Historia De La Lógica Prerrenacentista (1350-1550)." *La Ciudad de Dios* no. 186:372-394.

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"Although we now dismiss Kant's suggestion that logic was already essentially a completed science, we ourselves embrace its ghost, the idea that the conception of logical inference with which we are most familiar is just the common conception of our illustrious philosophical ancestors. This ghost works mischief. It causes us to think whiggishly of the history of logic and so lends respectability to the thought that only since 1879 has there been great logic. More concretely, I shall argue here, the idea that were is and always has been a single dominant conception of valid inference (ours) blinds us to part of Descartes's project. By setting that project against its medieval background I hope to revive our sense of both its strangeness and its possibilities."

63.        Nuchelmans, Gabriel. 1994. "Can a Mental Proposition Change Its Truth-Value? Some 17th-Century Views." *History and Philosophy of Logic* no. 15:69-84.

" In the first half of the seventeenth century the Aristotelian view that the same statement or belief may be true at one time and false at another and, on the other hand, the conception of a mental proposition as a fully explicit thought that lends a definite meaning to a declarative sentence originated a lively debate concerning the question whether a mental proposition can change its truth- value. In this article it is shown that the defenders of a negative answer and the advocates of a positive answer argued on the basis of different notions of what a mental proposition is: one side taking it as more or less equivalent to a specific utterance- meaning and the other side as more or less equivalent to a generic sentence-meaning."

64.        ———. 1998. "Logic in the Seventeenth Century: Preliminary Remarks and the Constituents of the Proposition." In *The Cambridge History of Seventeenth-Century Philosophy*, edited by Garber, Daniel and Ayers, Michael, 103-117. Cambridge: Cambridge University Press.
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67.    Peckhaus, Volker. 1999. "19th Century Logic between Philosophy and Mathematics." *Bulletin of Symbolic Logic* no. 5:433-450.
"The history of modern logic is usually written as the history of mathematical or, more general, symbolic logic. As such it was created by mathematicians. Not regarding its anticipations in scholastic logic and in the rationalistic era, its continuous development began with George Boole's *The Mathematical Analysis of Logic* of 1847, and it became a mathematical subdiscipline in the early 20th century. This style of presentation cuts off one eminent line of development, the philosophical development of logic, although logic is evidently one of the basic disciplines of philosophy. One needs only to recall some of the standard 19th century definitions of logic as, e.g., the art and science of reasoning (Whateley) or as giving the normative rules of correct reasoning (Herbart).
In the paper the relationship between the philosophical and themathematical development of logic will be discussed. Answers to the following questions will be provided:
1. What were the reasons for the philosophers' lack of interest in formal logic?
2. What were the reasons for the mathematicians' interest in logic?
3. What did "logic reform" mean in the 19th century? Were the systems of mathematical logic initially regarded as contributions to a reform of logic?
4. Was mathematical logic regarded as art, as science or as both?"

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"The aim of the paper is to reassess the role of British Aristotelianism within the history of early modern logic between the sixteenth and seventeenth centuries, as a crucial moment of cultural transition from the model of humanistic rhetoric and dialectic to that of facultative logic, that is, a logic which concerns the study of the cognitive powers of the mind. The paper shows that there is a special connection between Paduan Aristotelianism and British empiricism, through the mediation of British Aristotelianism. British Aristotelians took the ideas of the Paduan Aristotelian tradition and carried them to an extreme, gradually removing them from the original Aristotelian context in which they were grounded and developing what would later become the fundamental ideas of British empiricism."

76.    ———. 2013. *The Aristotelian Tradition and the Rise of British Empiricism. Logic and the Rise of British Empiricism. Logic and Epistemology in the British Isles (1570-1689)*. New York: Springer.

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