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A BIBLIOGRAPHY: JOHN CORCORAN'S PUBLICATIONS ON ARISTOTLE 1972–2015

Indeed, one of the great strides forward in the modern study of Aristotle's syllogistic was the realization that it is a system of natural deduction.

—Kevin Flannery, SJ [2001, 219].

Corcoran [...] has convincingly shown that the best formalization of Aristotle's reductio ad impossibile is by means of a natural deduction system.

—Mario Mignucci [1991, 12].

The most radical opponent of Lukasiewicz is J. Corcoran.
—Tadeusz Kwiatkowski [1980, 188].

Contents

Abstract

I. Articles

II. Abstracts

III. Books

IV. Reviews

V. Discussions

Acknowledgements

Abstract

This presentation includes a complete bibliography of John Corcoran's publications devoted at least in part to Aristotle's logic. Sections I–IV list 20 articles, 43 abstracts, 3 books, and 10 reviews. It starts with two watershed articles published in 1972: the *Philosophy & Phenomenological Research* article that antedates Corcoran's Aristotle's studies and the *Journal of Symbolic Logic* article first reporting his original results; it ends with works published in 2015. A few of the items are annotated with endnotes connecting them with other work. In addition, Section V "Discussions" is a nearly complete secondary bibliography of works describing, interpreting, extending, improving, supporting, and criticizing Corcoran's work: 8 items published in the 1970s, 22 in the 1980s, 39 in the 1990s, 56 in the 2000s, and 65 in the current decade. The secondary bibliography is annotated with endnotes: some simply quoting from the cited item, but several answering criticisms and identifying errors. As is evident from the Acknowledgements sections, all of Corcoran's publications benefited from correspondence with other scholars, most notably Timothy Smiley, Michael Scanlan, and Kevin Tracy. All of Corcoran's Greek translations were done in consultation with two or more classicists. Corcoran never published a sentence without discussing it with his colleagues and students.

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Not all publications citing my work on Aristotle show any understanding of it or even contribute to discussion of it. Among those that do show understanding or contribute to its discussion are the following: Abraham Edel, Edgar Andrade, Darcy Cutler, Michael Degnan, George Englebretsen, Kevin Flannery, James Gasser, Pierre Joray, David Keyt, Marcel Guillaume, Mathieu Marion, John Martin, John Mulhern, Mary Mulhern, Sriram Nambiar, Richard Patterson, Paul Thom, Michael Scanlan, Timothy Smiley, Robin Smith, Kevin Tracy, Risto Vilkko, and John Woods.

It is gratifying to be able to report that after forty years of scrutiny by demanding scholars, to my knowledge, few serious objections to my research have come to light—other than those I found myself, some of which I have published. Perhaps the most embarrassing was my early conflation of reduction [of an incomplete two-premiss syllogism to a perfect one] and deduction [of the conclusion of an incomplete two-premiss syllogism from its premises using perfect syllogisms]. I remember feeling a twinge of misgivings when first writing this absurd claim. John Woods justly took me to task on this but only after my mea culpa, which he did not know of, had appeared in print.

I have something to say to the small minority who are offended by my approach to history of logic: an approach that combines features of the Baltimore "history of ideas" movement led by Arthur Lovejoy and the Warsaw "mathematical archeology" movement led by

Jan Lukasiewicz. This paradigm will be corrected, refined, and ultimately replaced, but by one that incorporates its main features—not by one that repudiates them.

Several publications merely cite my work without even noting that my work—like Smiley's—emphasizes two facts: that geometry was taught axiomatically in the Academy when Aristotle studied there and that the first sentence of *Prior Analytics* connects the *Analytics* to geometry. Lukasiewicz and others never mention that sentence.

The paragraph on page 38 of this paper about Aristotle shows that I had fully accepted the then-common interpretation of *Prior Analytics* that was completely oblivious to Aristotle's natural deduction system. Moreover, other aspects of this paper also show roughness since smoothed out. Specifically, I then divided premise-conclusion arguments into valid and invalid but instead of dividing argumentations into cogent and fallacious, I tried to get the word 'sound' to play a role its history rendered it unsuitable for: a role for which 'cogent' is perfectly suited.

b Smiley 1973, p.154: (Added in proof) Since this article was written I have learnt of concurrent work by Prof. J. Corcoran (to appear in *Journal of Symbolic Logic*, *Archiv für Geschichte der Philosophie*, and *Mind*). Corcoran's approach to the syllogistic is very similar to that advocated here, but his treatment is independent and distinctive and provides further strong support for the new approach.

COMMENT: The review never mentions the fact that Corcoran was arguing against the then-well-established view that the syllogistic was an axiomatic theory. Lukasiewicz, the father of modern study of Aristotle's logic, is not mentioned in the review; the word 'axiom' does not occur. Moreover, the review disputes some details of the Corcoran interpretation, but it fails to pronounce on the larger issue of whether the natural-deduction approach is basically correct. And sadly, it does not mention Smiley's meticulous exposition of Aristotle's Greek text. JC ^e Bosley 1979, p. 285: "In describing his system Mr. Corcoran proposes to 'restate ... perfect syllogisms as rules of inference' (p. 109). If one means to give a correct interpretation of Aristotle's discussion of assertoric syllogisms, it is a mistake to hold that a syllogism is a rule. It is also a mistake to assert that '... each application of a rule of inference is (literally) a first figure syllogism' (p. 92). A syllogism is a piece of reasoning: in particular, the act or the achievement of reaching a conclusion. One does not aid the cause of interpretation by suggesting that in executing the act in the first figure one applies a rule. In any case nothing is both a rule and an application of a rule." COMMENT: Corcoran repeatedly emphasizes, contrary to Lukasiewicz, that every premise and every conclusion of a syllogism is something having a truth-value: not a schema, not a propositional function, not a form, and not a formula with free variable occurrences. The Barbara rule is a kind of universal having each Barbara syllogism as an instance. But Bosley's construal of Corcoran, which might well be fair—Corcoran should not be expected to write in such a way as to block every conceivable misconstrual—raises the issue of whether Aristotle's word sullogismos is always used for a mental process or act taking place in a single person's mind during a single time interval, whether it is always used for the particular result or product of that act, whether is always used for something more abstract that is involved in every such act or result regardless of who performs it, or whether is always used in some other way, or whether it is used in various ways throughout Prior Analytics. One reason for presenting a mathematical

^a As its title might suggest, this article supplies some of the basic conceptual structure used in my subsequent work and, in particular, framing my approach to history and philosophy of logic. It was written in the 1960's in Philadelphia before I came to Buffalo. In fact, I presented this paper at Buffalo when being interviewed for a position. My original discoveries about Aristotle's logic were all made in Buffalo over a year later. The basic ideas were completed in the summer of 1971 and they were presented in the Linguistics Institute NSF Seminar jointly taught by Edward Keenan and me.

^c Bosley 1979, p. 284: "The book under review is a collection of papers either read at a symposium in 1972 or written in connection with the symposium. There is too little unity and evenness to address a general judgment to the reader; I can make a general remark: the collection has the interest of an issue of a journal of second standing." COMMENT: No authors or editors should ever be surprised or disappointed to learn that their works do not have universal appeal to informed scholars. In fact, there are informed scholars whose disapproval should be welcomed. Nevertheless, I am disappointed with Bosley's elliptical, pompous, subjective, and uninformative remark. Despite Bosley's one disrespectful sentence his review raises some important issues: it is worth careful study. JC ^d Bosley 1979, p. 285: "In 'Aristotle's Natural Deduction System' John Corcoran argues that Aristotle developed a natural deduction system."

model instead of a full interpretation was to avoid the obligation to answer this and other questions that are difficult or unanswerable. See Corcoran's "Aristotle's demonstrative logic" for further discussion along these lines. JC

^f Bosley 1979, p. 285: Mr. Corcoran's interpretation rests in part upon a misunderstanding of the notions of perfect and of imperfect syllogisms. He means to account for a perfect syllogism when he writes, 'If the reasoning in a deduction actually shows that the conclusion follows from the premisses, the deduction is said to be sound' (p. 92). But a perfect and an imperfect syllogism do not differ in point of having their conclusiveness shown. They differ in the means for reaching the conclusion.

COMMENTS: (1) Corcoran regrets trying to force the word 'sound' to carry a meaning its history renders unsuitable if not impossible: 'cogent' is the word suggested by John Kearns and adopted in later articles. (2) Bosley missed Corcoran's point: the issue is not "having their conclusiveness shown" but "showing their conclusiveness". The imperfect syllogism does not produce knowledge that its conclusion follows from its premises but the perfect and the perfected do. JC

- ^g Kwiatkowski 1980: "The most radical opponent of Lukasiewicz is J. Corcoran."
- h Novak's "Conclusion" makes several points that are now widely accepted.
- ⁱ Smith 1989, p. xvii: One principal virtue of Corcoran's approach, which is especially important in the context of a translation of the *Prior Analytics*, is that it permits a formal model which stays very close to Aristotle's actual text, since it allows us to read formally precise natural deductions straight out of it.
- ^j Mignucci, 1991, 11: Nowadays two interpretations seem to have a following among scholars. One is the Łukasiewicz interpretation [...]. The other [...] I believe is the true one [...].
- ^k Mignucci, 1991, 12: J. Corcoran, 'Aristotle's natural deduction system' [...] 1974, has convincingly shown that the best formalization of Aristotle's *reductio ad impossibile* is by means of a natural deduction system.
- ¹ Scanlan 1991: In the early 1970s, working independently, J. Corcoran and T. Smiley each gave treatments of Aristotle's logic as a natural deduction system that did not involve propositional logic [Corcoran, Arch. Gesch. Philos. 55 (1973), no. 2, 191–219; MR0444423 (56 #2776); Smiley, J. Philos. Logic 2 (1973), no. 1, 136–154]. Aristotle's syllogisms were viewed as direct and indirect deductions in a language in which all sentences belong to one of the four categorical types. Aristotle's claimed "reduction" of all syllogisms to the two universal syllogistic forms of the first figure, traditionally called Barbara and Celerant, was seen as the proof-theoretic assertion that every deduction can be transformed into one using only these two rules. This approach accounts much more closely for the fine details of terminology and reasoning in specific passages of the *Prior analytics* than previous interpretations of Aristotle's logic.
- ^m Degnan 1994, p.82: Timothy Smiley and [sc. John] Corcoran, working independently, showed that Aristotle's theory of deduction contains a self-sufficient natural deduction system that presupposes no other logic.
- ⁿ Reyes et al. 1994, p. 61: The work of Łukasiewicz on syllogistic has been criticized by Corcoran [5]. In particular, Corcoran disputes the view of Łukasiewicz that the Aristotelian syllogistic constitutes an axiomatic theory. The main thrust of Corcoran's work is to show that it is rather "[...] an underlying logic which includes a natural deductive system and that it is not an axiomatic theory as had previously been thought".
- ^o Englebretsen 1996, p. 49: I have offered a slightly different survey of Aristotle's logic [...]. Corcoran and Scanlan 1982 is an ideal place to start. Also see the essays in Corcoran 1974.
- ^p Striker 1996, p. 203: Ever since Lukasiewicz reinstated Aristotle as the founder of formal logic, there has been a wealth of studies of Aristotle's syllogistic as a formal system. Against Lukasiewicz's claim that syllogistic is a system in which certain theses function as axioms, others as theorems derived from these, it has been argued—convincingly, to my mind—that it would be historically more accurate to represent syllogistic as a system of natural deduction [...].
- ^q Striker 1996, p. 203n: The currently favored translation "deduction", though perhaps less misleading than .stnemugra eb ot smsigollys sekat eltotsirA taht tniop eht tuo gnirb ton seod , "msigollys" COMMENT: Given the absence of a definition of 'argument', the reader is at a loss to determine what Striker thinks 'deduction' doesn't bring out. JC
- ^r Striker 1996, p. 207: John Corcoran has argued that the distinction between a perfect and an imperfect syllogism is that between a full deduction and a valid inference which needs filling out.[...] Corcoran concludes that the long deduction will then count as a perfect syllogism. But this no longer agrees with Aristotle's own explanation of the term teleios.

COMMENT: Striker's magisterial pronouncement does not include any clues as to what she takes "Aristotle's own explanation of the term teleios" to be or where it disagrees with what I wrote on this point. What I wrote was discovered and published independently by Scholtz, Smiley, and probably others. JC

- ^s Thom 1996, p.4: In proof theory, I follow the definitive work of Smiley and Corcoran in using a natural deduction analysis of the syllogistic.
- ^t Martin 1997, p.1: My goal in this paper is to reconsider John Corcoran's now classical work on the syllogistic. Corcoran's purpose was to argue against two key theses of the interpretation of Lukasiewicz (1957) and others: that syllogisms should be construed as conditionals [...] and that Aristotle's reduction [sic][...] should be viewed as an axiomatic theory.
- ^u Lamarque 1997, pp. 251f: "A more accurate interpretation of Aristotle's strategy [sc. than the Lukasiewicz interpretation] was offered by Corcoran (1974). In this work Aristotle's method is cast in the form of a natural deduction system. Corcoran convincingly shows that Aristotle's proofs [sc. deductions] can be read as objects generated by an underlying logical calculus which does not presuppose propositional logic."
- COMMENT: Aristotle's completed syllogisms were intended not just as deductions—showing that their respective conclusions follow from their premise sets—but also as exemplifications of his theory of deduction. Of course, they are "proofs" in that they prove that their respective conclusions follow from their premise sets. But it is misleading to call them proofs without explaining that they do not prove their conclusions to be true. Normally, when something is called a proof it is implied that the proof's conclusion is true and that the proof proves it. Lamarque is not the only person who bungles this point.
- ^v Striker's opening paragraph states as her own view a summary of the results of Corcoran 1974, as she generously and candidly reports in her footnote (1998, p.209).
- W Degnan 2000, p.215: In the mid-seventies John Corcoran and Timothy Smiley published ground-breaking articles on Aristotle's assertoric syllogism which rescued Aristotle's reputation as a logician from W. V. O. Quine's and Bertrand Russell's criticisms.
- ^x Flannery 2001, p.219: Indeed, one of the great strides forward in the modern study of Aristotle's syllogistic was the realization that it is a system of natural deduction.
- ^y Flannery 2001, p.202: The approach I take here is somewhat different from John Corcoran's, although it owes much to it. According to Corcoran, "an imperfect syllogism is 'potentially perfect and is made perfect by adding more propositions which express a chain of reasoning from premises to the conclusion" [Corcoran 1973, p. 195; see also p. 205; see also Smiley 1973, p.137]. I agree that, according to Aristotle, a syllogism is perfected by performing additional operations; but the perfected syllogism does not seem to be this augmented chain of reasoning. As the above texts [sc. 28a3-7, 29a31-36] show, the perfected syllogism, for Aristotle, becomes a perfect (i. e., first figure) syllogism in the process of being perfected.
- ^z Striker 1998 states: "I take it to be generally agreed by now that formal syllogistic is best represented as a system of natural deduction, rather than an axiomatized theory" (p. 212).
- ^{aa} Woods 2001, Ch I: Aristotle's own [sc. completeness proof] attempt, which doesn't quite succeed, is to be found at *Prior Analytics* I 23. However, Corcoran has shown how to repair Aristotle's proof. See John Corcoran, "Completeness of an Ancient Logic", *Journal of Symbolic Logic* 37 (1972), 696-702.
- bb Woods 2001, Ch II: Here is Corcoran on the point: "My opinion is this: *if* the Łukasiewicz view [that Aristotle's logic is an axiom system] is correct *then* Aristotle cannot be regarded as the founder of logic. Aristotle would merit the title no more than Euclid, Peano, or Zermelo insofar as these men are regarded as founders, respectively, of axiomatic geometry, axiomatic arithmetic, and axiomatic set theory. (Aristotle would merely have been the founder of 'the axiomatic theory of universals')" ("Aristotle's Natural Deduction System", 98). I note, in this connection, that Gentzen's structural rules are not by any means exclusive to the Gentzen calculi. They hold in Frege's system and in virtually every other logic published subsequently. Why do I invoke the name of Gentzen? Why isn't the core theory of validity a Frege-logic or Whitehead & Russell logic? My answer is that Gentzen was the first (along with Jaskowski, independently) to break with the axiomatic tradition in modern logic and to show that natural deduction systems have all the power of axiomatic set-ups. Because I hold, with Corcoran, that Aristotle conceived of logic in natural deduction terms, it is seemly to use the honorific "Gentzen" in reconstructing Aristotle's conception of validity.
- ^{cc} Woods 2001, Ch 4: Corcoran makes the interesting proposal, in which I concur, that Aristotle's "distinction between perfect and imperfect syllogisms suggests a clear understanding of the difference between deducibility

[...] and implication [...]—a distinction which modern logicians believes to be their own (cf. Alonzo Church, *Introduction to Mathematical Logic*, Princeton: Princeton University Press, 1956, p. 323, fn. 529)". This is an insightful remark.

Patterson 2002, pp. 178f: Some of my reservations about this sort of analysis are implicit in what has gone before. First, at a very general level, my own aim has been to analyze Aristotle's modal proofs in a way that allows us to think them through as he did. This is not so unusual. As Robin Smith remarks, John Corcoran's formal model (and Smith's own, which essentially follows Corcoran's) of the assertoric syllogistic "stays very close to Aristotle's actual text, since it allows us to read formally precise natural deductions straight out of it." By contrast, Lukasiewicz's model incorporates the whole of the propositional calculus, and his proofs of the moods recognized by Aristotle are carried out using its resources, typically in ways that can hardly be read directly out of the text step-by-step. Comment: Notice Patterson comes close to implying that Aristotle's syllogisms are natural deductions.

Patterson 2002, pp. 241f: The reader should consult especially John Corcoran, "Aristotle's Natural Deduction System," in *Ancient Logic and Its Modern Interpretations*, ed. John Corcoran, pp. 85-131, for a defense of "deduction" as a translation of *syllogismos* and a view of "syllogisms" as deductive structures. [See also Timothy Smiley, "What Is a Syllogism?" *Journal of Philosophical Logic* 2(1973): 136-54; Robin Smith, *Aristotle, Prior Analytics*, translated, with introduction, notes, and commentary (Indianapolis: Hackett, 1989) (hereafter cited as *Notes*), p. 106 (on 24a12) and esp. pp. 109f. (on 24b 18-22); and Jonathan Barnes, "Proof and the Syllogism," in *Aristotle on Science: The Posterior Analytics*, ed. E. Berti (Padova: Antenore, 1981), pp. 17-59.] For defense of a narrower construal, see Michael Frede, "Stoic vs. Aristotelian Syllogistic," *Archiv für Geschichte der Philosophie* 56 (1974): 1-32. This issue is related to the view of "incomplete" syllogisms - as opposed to "complete" (*teleios*) ones - as deductive structures requiring certain steps (conversions of premises or conclusion, use of *reductio ad impossibile*) to make them into valid deductions. (For discussion, see the works by Corcoran, Smiley, and Smith just cited.)

COMMENT: Patterson's last sentence needs work. The worst mistake might be the implication that incomplete syllogisms are invalid; all syllogisms are valid in the sense that their conclusions follow from their respective premises. Does Patterson make this point in his book? Does he define valid? Another, but related, mistake is that, although there is no way to make an incomplete syllogism valid since it already is such, there is a way to make it cogent: to make it evident that its conclusion follows from its premises. For Patterson's 'make them into valid deductions' put 'make them into cogent deductions'. Validity is semantic and ontic; cogency is pragmatic and epistemic. A third mistake is in Patterson's enumeration of the steps used to complete an incomplete syllogism: use of the four perfect first-figure syllogisms is incorrectly omitted and conversion of conclusions is incorrectly included.

ff Patterson 2002, pp. 280: Again, I use "complete" and "perfect" indifferently as translations of *teleios*. John Corcoran and Timothy Smiley strongly prefer "complete" on grounds that it indicates something important about the "completion" (*epiteleisthai, teleiousthai, perainesthai*) of a syllogism, namely, that this consists in supplying additional steps so as to make a valid premise-conclusion argument (i.e., a set of premises and a conclusion that they imply) into a deduction (i.e., an extended discourse that makes it evident that a certain conclusion is implied by certain premises). See especially Corcoran, "Aristotle's Natural Deduction System," and T. Smiley. "What Is a Syllogism?" Cf. Robin Smith. *Notes*, p. 110.

In fact, one could use the terms "perfect" and "perfecting" in this way, too, because "perfect" (as a translation of *teleios*) often means "not missing any parts." Thus, although I find the view of Corcoran, Smiley, and Smith attractive and plausible, I shall use both terms.

COMMENT: The only "reason" I know of for using 'perfect' is that it is the Anglicization of the Latin word *perfectus* used to translate *teleios*. The word *perfectus* meant *finished*, *done*, *completed*, and the like: connoting the end result of a process. But, as often happens, Anglicization added meanings such as *excellent* or *wonderful*, and the added meanings render 'perfect' an inappropriate translation. We could not praise students by saying their papers were complete. Of course, there are qualifications to be made: we need a discussion rather than a quarrel. When will commonsense come to Aristotle scholarship?

^{gg} Smith 2007, §3: . On this basis, I am persuaded that the theory contained in the *Prior Analytics* was developed largely to serve the needs of Aristotle's theory of demonstration, especially this argument: here, as in much of the early history of modern symbolic logic, logical theory arose to meet the needs of the philosophy of mathematics.

^{hh} Guillaume 2004: In fact, many of Corcoran's remarks throughout this very rich paper [...] will be of interest to the reader, including his discussion of recent studies concerning the Aristotelian system and the conclusions that he makes [...]. The author states, "The gulf between modern logic and Boole is much greater than that between modern logic and Aristotle". In fact, starting on the very first page he argues, "where Aristotle had a method of deduction that satisfies the highest modern standards of soundness and completeness, Boole has a semi-formal method of

derivation that is neither sound nor complete". He adds in his conclusion that "the method of countermodels for independence proofs (that demonstrate the absence of logical consequence) is prominent in *Prior analytics*, but sadly absent from *Laws of thought*". He also asserts that Aristotle "proves mathematically that two of his four two-premise rules were eliminable. There is nothing in Boole's writings remotely comparable to this." And these are only three of the many examples cited by Corcoran of Aristotle's superiority over Boole.

Woods and Irvine 2004, p.53: Here is Corcoran on the point: "My opinion is this: if the Lukasiewicz view [that Aristotle's logic is an axiom system] is correct then Aristotle cannot be regarded as the founder of logic. Aristotle would merit the title no more than Euclid, Peano or Zermelo insofar as these men are regarded as founders, respectively, of axiomatic geometry, axiomatic arithmetic and axiomatic set theory. (Aristotle would merely have been the founder of "the axiomatic theory of universals')" [Corcoran, 1974b, p. 98].

^{jj} Woods and Irvine 2004, p.55: Corcoran's opinion is that Aristotle did not require of syllogisms as such that they have just two premisses. That he did not impose this restriction is suggested

"by the form of his definition of syllogism [...], by his statement that every demonstration is a syllogism [...], by the context of chapter 23 of Prior Analytics, and by several other circumstances .[...] Unmistakable evidence that Aristotle applied the term in cases of more than two premises is found in Prior Analytics I, 23 (especially 41a17) and in Prior Analytics II, 17, 18 and 19 (esp. 65b17; 66a18 and 66b2)." [Corcoran, 1974b, p. 90].

Still, it is clear that Aristotle often does reserve the term "syllogism" for two-premiss arguments. We follow Corcoran in supposing that such a restriction is explicable by the fact that Aristotle thought if all two-premiss syllogisms are deducible in the logic of the Prior Analytics, then all direct syllogisms whatever are also deducible. COMMENT: The expression of the view shared by Woods, Irvine, and me needs work. For "Aristotle thought if all two-premiss syllogisms are deducible in the logic of the Prior Analytics, then all direct syllogisms whatever are also deducible" put "Aristotle thought if all incomplete two-premiss syllogisms are deducible, then all incomplete syllogisms—whatever the number of premisses—are also deducible". The qualification "direct" is at the very least unnecessary. It also misleading in a strange way. What we are talking about is incomplete syllogisms not completions of them. However, 'direct' and 'indirect' do not apply to incomplete syllogisms at all: it would be a category mistake to say of a given incomplete syllogism, devoid of intermediate steps, that it is direct or indirect. The attributes of being direct and of being indirect refer to the manner of completion. Whether this mistake vitiates other passages in this generally accurate work, I did not notice. Whether this mistake is a result of other mistakes in this work, I could not say without further investigation. JC

kk Tracy 2006, p. 2: Aristotle was not the first to conceive of axiomatic procedures. Euclid's axiomatic geometry is surely descended from axiomatic approaches to geometry contemporary with or earlier than Aristotle (Corcoran, "Aristotle, Boole, and Tarski"). But he is the first, as far as we know, to have conceived of studying deduction itself; he is the first to have developed a formal logic.

¹¹ Tracy 2006: Both Corcoran ("Aristotle's Natural Deduction System") and Smiley ("What is a syllogism?") reconstruct Aristotle's logic as a natural deduction system in this way.

mm Tracy 2006, p. 174: As Corcoran observes, "[Aristotle's] theory of propositional form is very seriously inadequate. It is remarkable that he did not come to discover this for himself, especially since he mentions specific proofs from arithmetic and geometry. If he had tried to reduce these to his system, he may have seen the problem".

nn Tuominen 2007, p. 43: It has often been pointed out that this definition [of sullogismos] does not restrict inferences to syllogisms [sic] in the three figures, i.e. the two-premise three-term inferences discussed in the Prior Analytics. Because of this some scholars have started to translate 'sullogismos' as 'deduction'. However, others have pointed out that this translation is not quite appropriate because Aristotle's definition of syllogism excludes some deductions, for instance ones whose premise or premises [sic] are identical with the conclusion and those that have redundant premises. I have here left 'sullogismos' untranslated as 'syllogism'; the dialectical syllogism is not syllogism in the more narrow sense of the syllogistic figures of the Analytics. Nonetheless, we should also note that the very same definition is presented in the Prior Analytics.

COMMENT: The claim that 'deduction' is not appropriate because according to Aristotle's definition excludes certain items that would be called deductions by some people--e.g. there is no "sullogismos" whose conclusion is among its premises and there is none with redundant premises—is amazing. It is at once a non-sequitur and a

petition. It is a non-sequitur because the word 'deduction' in English is not so sharply defined as to necessarily include the items mentioned. It is a petitio because the premise that such items were excluded by Aristotle has not been established.

^{oo} Bar-Am 2008, p. 145: J. Lukasiewicz [1951] started the modern fashion of anachronistic formal studies of Aristotle's logic. [...] The following texts are the best known, formal studies of Aristotle Logic: G. Patzig 1968, T. J. Smiley 1973, J. Corcoran (ed.) 1974, J. Lear, 1980, P. Thom 1981.

Ph Aristotle could not make a clear-cut distinction between the search for the purely formal (logic) and the search for informative truth (science). Some modern admirers of Aristotle take it for granted that he had made this distinction clearly and endorsed it. Others invent new terms so as to avoid the issue. Notable among these is J. Corcoran (2003 p. 286). By contrast, the terrific M. Grene writes (1963 p. 69): "We may, therefore, legitimately consider Aristotelian logic not as the first adumbration of a formal system but as a discipline enabling the student to acquire scientific knowledge". Later on (ibid., p. 71) she adds: "Aristotle's logic is not a pure logic, a system valid for 'all possible worlds', like the formal systems envisaged by Leibniz."

qq Louis Groarke 2009, p. 100: We discuss these passages in detail below. For the moment, simply note that authorities now translate Aristotle's *sullogismos* as "deduction" (including Robin Smith, John Corcoran, Terence Irwin, Gail Fine, Timothy Smiley, A. J. Jenkinson, and so on, to name a few). This is accurate [...].

Malink 2009: Both Corcoran, 'Completeness', and Smith, 'Ecthetic Completeness', intend to prove that a certain deductive system for Aristotle's syllogistic is complete with respect to (i.e. strong enough to prove everything valid in) a certain semantics. The proposition 'BaB' is valid in their semantics, but not provable in their deductive systems. So the proof of completeness fails when propositions such as 'BaB' are admitted.

COMMENT: This remark needs work. To begin with Corcoran and Smith are not discussing "a certain deductive system", i.e.one system: Corcoran discusses one, Smith another. Second, neither of Corcoran or Smith is discussing provability: both are discussing deducibility of conclusions from premises. Third, 'intend' implies doubts about whether Corcoran and Smith achieves their stated goals: thirty years of acceptance such doubts are unwarranted and unsubstantiated. To disagree with Corcoran, Smith, and many others on the debatable role of one-termed propositions such as "Every good is a good" in Aristotle's syllogistic it is not necessary or even relevant to discuss completeness proofs. In fact, bringing up the subject of completeness proofs is a non-sequitur that suggests a lapse of focus or worse. Moreover, unless arguments adduced by the opponents are presented the reader deserves to be suspicious. There are further difficulties with Malink's remark.

Raymond 2010, p. 194: This section outlines the basis for the interpretation, drawing out how Aristotle historical intuitions concerning polarity (things that never combine) and inseparability (things that never separate). As we will see, these two intuitions are germane to logic, understood as natural deduction (e.g. Smiley 1973, Corcoran 1974, and Smith 1989).

^{tt} Castelnérac, Benoit, and Mathieu Marion, 2013, p.24: This is not the place for a critique of this approach, already severely undermined since pioneering work by Timothy Smiley and John Corcoran in the 1970s. We would like simply to say a word about Aristotle's context. Much of the work in the history of logic in this tradition has shown a remarkable lack of sensitivity to it. With Łukasiewicz, history of logic looked more like an attempt at fitting Aristotle's text onto the Procrustean bed of one's own axiomatic conception of logic, and, although work by Smiley and Corcoran certainly fitted the text much better, it was also ahistorical.

^{uu} Castelnérac, Benoit, and Mathieu Marion, 2013, p.28: The key papers here are Smiley (1973) and Corcoran (1974a). See also Lear (1980) and Smith (1989), which incorporates the Smiley-Corcoran approach in the translation and commentary.

^{vv} Keyt 2013: Can it be proven that the conclusion of every valid categorical argument is deducible from its premises by means of Aristotle's inference rules without first proving that every such argument is a chain argument? The answer is that it can be. Using the sophisticated methods of modern metatheory, John Corcoran has done it (Corcoran, 1972).

www Marion 2013, p. 18: There is certainly no need to see axiomatic systems everywhere when one looks at the history of logic, given that the introduction of that approach only dates from Frege. Moreover, that these are less suited for modelling Aristotle's syllogistic has been independently shown by John Corcoran and Timothy Smiley in the early 1970s, when they interpreted Aristotle's syllogistic not as an axiomatic system requiring an underlying logic, but as an underlying logic itself, which is best modelled (in the ordinary sense of the word 'model') as a

Gentzen-style system. They also gave completeness proofs for their respective systems and thus restored Aristotle's stature as a logician.

xx Simons 2014: Łukasiewicz's trenchant and controversial views sparked a controversy over how to interpret the syllogistic. While the principles did win an early adherent in Patzig (1968), subsequent criticisms by Corcoran (1972, 1974) and, independently, Smiley (1974) established clearly that syllogisms are not propositions but inferences, and that Aristotle had no need of a prior logic of propositions. That view is now universal among scholars of Aristotle's logic. In retrospect, it appears that Łukasiewicz was keen to wish onto Aristotle his own (Fregean) view of logic as a system of theorems based on a propositional logic.

^{yy} Tennant 2014, Abstract: I use the Corcoran–Smiley interpretation of Aristotle's syllogistic as my starting point for an examination of the syllogistic from the vantage point of modern proof theory.