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Buridan's Divided Modal Syllogistic

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Abstract In *Jean Buridan's Logic: The Treatise on Supposition; The Treatise on Consequences*, Peter King raises a problem concerning Buridan's divided modal syllogistic. As King interprets Buridan's theory, there are two pairs of premises to which Buridan is committed to holding one of his theorems applies when, in fact, it does not appear to. I argue, however, that the source of the problem is not Buridan's theory, but King's interpretation of that theory. After drawing attention to certain respects in which King's interpretation seems to me to be mistaken, I present an alternative interpretation on which King's problem simply does not arise.

1 Introduction In his recent and welcome work, *Jean Buridan's Logic: The Treatise on Supposition; The Treatise on Consequences* ([1]), Peter King raises a problem concerning the section of *The Treatise on Consequences* in which Buridan presents his "pure divided modal syllogistic" ([1], p. 82). The problem in question concerns Buridan's Theorem IV-5:

> In the second figure, (a) there is always a valid syllogism from a pair of premisses *de necessario* or from ⟨a pair of premisses⟩ one of which is *de necessario* and the other *de possibili* to a conclusion ⟨which is⟩ *de necessario*; but (b) there is no valid syllogism from two sentences *de possibili*. ([1], p. 299)

In a note ([1], p. 356), King presents a list of second-figure divided modal syllogisms to whose "acceptability"[1] he takes Buridan to be committed by virtue of this theorem. King seems to find the construction of most members of the list straightforward; but there are two cases that he finds puzzling for the reason that, with respect to each, "no conclusion at all seems to be entailed by the premisses" ([1], p. 82). The problematic pair is

(3)(c) All P is possibly M[2]
No S is necessarily M
Therefore??

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and

(6)(b) No P is necessarily M
Some S is possibly M
Therefore??

Theorem IV-5, then, seems, at least on King's interpretation, to be mistaken.

But is King's interpretation correct? In what follows, I want to draw attention to certain features of that interpretation that seem to me to run counter to Buridan's intent. Rectification of these matters in the way I go on to propose seems to me to solve King's worry about (3)(c) and (6)(b) without creating any new problems.[3]

2 King's interpretation of Theorem IV-5 I shall not present the list of second-figure divided modal syllogisms that King thinks Buridan regards as acceptable. I shall, however, sketch the way in which I take that list to be generated.

The first step is to isolate those second-figure assertoric "conjugations"[4] that Buridan regards as "useful"[5]—they are (3) AE, (4) AO, (5) EA, (6) EI, (11) IE, (12) IO, (13) OA and (14) OI (see [1], p. 351). And then, in accordance with Buridan's restriction that his theorems pertaining to "syllogisms with divided modal sentences" do not apply to syllogisms whose conclusions are not "formed in the common idiom for negatives",[6] King also deletes (12) and (14). Next, modal operators are added to the sentences of the remaining conjugations in ways taken to be required by Theorem IV-5. And finally King supplies, for each of the conjugations but the troublesome (3)(c) and (6)(b), a conclusion that seems to him to be both acceptable and in accord with the requirements of the Theorem.

King's procedure seems to me to be, for the most part, on the right track. But Buridan places more restrictions on the generation of his list than King's own list reflects.

In the first place, in his prefatory remarks to Theorem IV-5 et al., Buridan says, "I also only speak here of conclusions which are direct and formed in the common idiom for negatives" ([1], p. 299). King heeds the restriction concerning conclusions "formed in the common idiom for negatives"—as indicated already, I assume that this is his reason for eliminating the conjugations (12) and (14). Oddly, however, he seems to have ignored the point about conclusions having to be "direct".[7] Acknowledgment of this restriction leaves King's list with merely the conjugations (3), (4), (5), and (6) with appropriate direct conclusions—twelve syllogisms in all.

Plainly, however, this last point does not bear on King's worry, for (3)(c) and (6)(b) remain as members of the list ascribed by him to Buridan. But there is yet another feature of King's interpretation that seems to me to be mistaken; and correction of this mistake in the way I ultimately propose puts King's worry to rest.

Theorem IV-5 makes claims about various syllogisms whose premises are (divided) *de necessario* or *de possibili* sentences. Thus, in order to understand Theorem IV-5, one must interpret correctly the way in which Buridan would have us add modal operators to the various assertoric sentences. This is a straightforward matter in the case of affirmative sentences, but negative sentences raise complications. How, for example, is an O-sentence to be modalized? Is the operator to be inserted between the copula and the 'not' as in

Some *S* is necessarily not *M*

or between the 'not' and the predicate term as in

Some *S* is not necessarily *M*.

The issue is a crucial one for the interpretation of Theorem IV-5. Take, for instance, the conjugation

(4) All *P* is *M*
Some *S* is not *M*.

Theorem IV-5 has it that if one of the constituent sentences of this conjugation is modalized (dividedly) with a necessity operator and the other with a possibility operator then there is some *de necessario* conclusion that follows. On the other hand, if both sentences are modalized with possibility operators then "there is no valid syllogism". Now suppose that the first sentence of (4) is modalized as

All *P* is possibly *M*

and the second as

Some *S* is necessarily not *M*.

Is this a conjugation one of whose sentences is *de possibili* and the other *de necessario*, and hence, as Theorem IV-5 has it, one from which some *de necessario* conclusion follows? Or, since the latter sentence is equivalent to

Some *S* is not possibly *M*,

is this a conjugation consisting of two *de possibili* sentences and hence one from which, again as Theorem IV-5 states, no conclusion follows? Parallel questions arise for the other way of modalizing the O-sentence.

It seems to me that Buridan has an answer to these questions. Prior to his presentation of the theorems pertaining to "syllogisms with divided modal sentences", he says:

> Whenever I speak of ⟨divided modals⟩ *de possibili* or *de necessario*, I only mean those which have an affirmed mode, even if they have a negation falling under the dictum. ([1], p. 299)

To modalize an O-sentence by inserting the operator between the 'not' and the predicate term is to create a sentence containing a "negated mode". On the other hand, however, insertion of the operator between the copula and the 'not' yields a sentence in which the mode is, as Buridan requires, "affirmed". King's construction of syllogisms under conjugation (4)—the only relevant conjugation involving O-sentences—is, appropriately, in accord with the latter procedure.

But how are we to modalize E-sentences? King's procedure is as follows. In the case in which *de necessario* modalization of an E-sentence is called for, King simply places the operator, 'necessarily', between the copula and the predicate, thereby obtaining a sentence of the form

No *S* is necessarily *M*.

De possibili modalization of E-sentences proceeds in parallel fashion and thus such sentences are of the form

No *S* is possibly *M*.

Yet, if this procedure is correct, it seems to me that one might argue that King's worry about (3)(c) and (6)(b) has a simple solution. Let me explain.

At TC II-3, Buridan discusses affirmative and negative divided modal sentences. The lines of importance for my purposes are in 2.3.2 where Buridan characterizes the first of two ways in which a divided modal sentence can be negative.

> The first way is when the negation occurs in the mode and so precedes it, as for example in
>
> (222) A man can-not-possibly-be an ass
> (223) No man can-possibly-be an ass. ([1], p. 230)

(222) is a straightforward example of a sentence in which the mode ('possibly') is preceded by a negation ('not'). But how are we to understand Buridan's claim that the mode in (223), likewise, is preceded by a negation? It seems to me reasonable to suppose that what Buridan has in mind is that, although in (223) the mode is not explicitly preceded by a negation, it is nevertheless implicitly preceded by one. The implicit occurrence of 'not' in (223) is made explicit in the equivalent sentence 'Every man (is such that he) can-not-possibly-be an ass.'

To generalize on this last point, I take it to be Buridan's view that the mode in any divided modal E-sentence – i.e., a sentence of the form 'No *S* is necessarily/possibly *M*' – is preceded, albeit implicitly, by a negation. But I also assume that Buridan takes a mode that is preceded, explicitly or implicitly, by a negation to be a "negated mode".[8] Hence, as I see it, Buridan would regard the mode in (223), and in fact in any divided modal E-sentence, as a negated mode. Now consider, once again, King's formulation of the minor premise of his problematic second-figure syllogism (3)(c). Buridan's Theorem IV-5 calls for that premise to be *de necessario*. And, indeed, King's premise – 'No *S* is necessarily *M*' – does contain the operator 'necessarily.' But if, as I have contended, the mode in every divided modal E-sentence is a negated mode, King's premise is one in which the relevant mode – 'necessarily' – is negated. Recall, however, that in presenting his theorems on divided modal syllogisms, Buridan restricts his discussion to sentences "which have an affirmed mode". It follows that the conjugation with which King provides us for (3)(c) is not one to which Theorem IV-5 applies. A similar point can be made with respect to the conjugation in King's puzzling (6)(b). Thus, on King's own way of modalizing E-sentences, his worry about (3)(c) and (6)(b) has, in fact, a simple solution. These conjugations are not recalcitrant members of the list to which Theorem IV-5 applies because they are simply not members of that list to begin with.

This solution, however, is hardly satisfactory. It does indeed eliminate (3)(c) and (6)(b) from the list of conjugations to which Theorem IV-5 applies; it does so, however, only by eliminating, from the list appropriate to any theorem of Buridan's pure divided modal syllogistic, every conjugation that contains a sentence that results from modalization of an E-sentence. In other words, on this view, Buridan's theory ignores all assertoric syllogisms that contain E-sentences. Yet it seems to me highly unlikely that, in constructing his theorems, Buridan would have intended this. For one thing, Buridan says nothing that suggests that he wishes to restrict the application of his theorems in this way. For another, the upshot of such a restriction is that his theory would be much narrower in scope, and hence considerably less interesting and significant.

In summary, then, it seems to me that, contrary to what King himself supposes, his way of modalizing E-sentences does not leave Buridan with the problem that his lists include too much—viz., (3)(c) and (6)(b)—but has, instead, the consequence that too much is excluded from those lists—viz., all conjugations that require modalization of E-sentences. Either way, however, the outcome is not a happy one for Buridan. This leads one to wonder whether King's procedure for modalizing E-sentences is in fact what Buridan intends.

3 A solution to King's problem What one would like, of course, is an interpretation that eliminates (3)(c) and (6)(b) while retaining other "acceptable" syllogisms whose conjugations nevertheless contain sentences that result from the modalization of E-sentences. And I think that there is such an interpretation. It is one that concurs with the foregoing "simple solution" in treating modes in sentences of the form 'No *S* is necessarily/possibly *M*' as negated. But it diverges from that solution in that it involves a way of modalizing E-sentences that differs from King's.

Recall that King's procedure for modalizing E-sentences consists simply in inserting the mode called for by the theorem between the copula and the predicate. But in what other way might one go about modalizing E-sentences? I propose that what Buridan has in mind is that, before E-sentences are modalized, they must themselves undergo transformation to an equivalent form. More specifically, I suggest that it is Buridan's view that, prior to modalization, sentences of the form

No *S* is *M*

should be replaced by sentences of the equivalent form

All *S* is not *M*.

Then one can insert the modal operator between the copula and the 'not *M*', thereby obtaining

All *S* is necessarily/possibly not *M*

—a sentence in which the modality is plainly affirmed.

Whatever else may be said about it, this proposal has a felicitous outcome. When the modalized E-sentences in King's problematic (3)(c) and (6)(b) are replaced by sentences modalized in the way just suggested, it turns out that, for each of the resultant conjugations, an acceptable conclusion in conformity with the requirements of Theorem IV-5 can be supplied. The syllogisms that would replace King's incomplete (3)(c) and (6)(b) are, respectively,

All *P* is possibly *M*
All *S* is necessarily not *M*
Therefore, All *S* is necessarily not *P*

and

All *P* is necessarily not *M*
Some *S* is possibly *M*
Therefore, Some *S* is necessarily not *P*.[9]

4 Other consequences of the proposed interpretation One should ask, however, what other consequences the replacement of King's modalized E-sentences with these affirmed-modality E-sentence equivalents has for Buridan's position. After all, this proposal affects other syllogisms that, on King's method of construction, are acceptable.

It seems to me that my proposal yields lists of syllogisms for Theorems IV-4, IV-5, and IV-6 that are both in accord with those theorems and acceptable.

Consider, to begin with, my interpretation's list of first-figure divided modal syllogisms—the list appropriate to Theorem IV-4:[10]

Figure I:

(1)(a) All *M* is necessarily *P*.
All *S* is necessarily *M*.
Therefore: All *S* is necessarily *P*.

(b) All *M* is possibly *P*.
All *S* is possibly *M*.
Therefore: All *S* is possibly *P*.

(c) All *M* is possibly *P*.
All *S* is necessarily *M*.
Therefore: All *S* is possibly *P*.

(d) All *M* is necessarily *P*.
All *S* is possibly *M*.
Therefore: All *S* is necessarily *P*.

(2)(a) All *M* is necessarily *P*.
Some *S* is necessarily *M*.
Therefore: Some *S* is necessarily *P*.

(b) All *M* is possibly *P*.
Some *S* is possibly *M*.
Therefore: Some *S* is possibly *P*.

(c) All *M* is possibly *P*.
Some *S* is necessarily *M*.
Therefore: Some *S* is possibly *P*.

(d) All M is necessarily P.
Some S is possibly M.
Therefore: Some S is necessarily P.

(5)(a) All M is necessarily not P.
All S is necessarily M.
Therefore: All S is necessarily not P.

(b) All M is possibly not P.
All S is possibly M.
Therefore: All S is possibly not P.

(c) All M is possibly not P.
All S is necessarily M.
Therefore: All S is possibly not P.

(d) All M is necessarily not P.
All S is possibly M.
Therefore: All S is necessarily not P.

(6)(a) All M is necessarily not P.
Some S is necessarily M.
Therefore: Some S is necessarily not P.

(b) All M is possibly not P.
Some S is possibly M.
Therefore: Some S is possibly not P.

(c) All M is possibly not P.
Some S is necessarily M.
Therefore: Some S is possibly not P.

(d) All M is necessarily not P.
Some S is possibly M.
Therefore: Some S is necessarily not P.

Given that Buridan regards the subject terms of divided modal sentences as ampliated to supposit for possibles, it is clear that, with respect to each of these syllogisms, the set of the supposita of the modalized predicate term ('possibly M' or 'necessarily M') of the minor premise constitutes a subset (though not necessarily a "proper subset") of the set of the supposita of the subject term of the major premise. Thus there is a "connection of the extremes [the modalized 'S' and 'P'] through the middle [the modalized 'M']" ([1], p. 73). I assume that this is along the lines of what Buridan has in mind when he says of Theorem IV-4 that it is "clear from the *dictum de omni et nullo*" ([1], p. 289).

That my lists of syllogisms appropriate to Theorems IV-5 and IV-6 contain no difficulties can be seen just as readily.[11] Those lists are as follows:

Figure II

(3)(a) All P is necessarily M.
All S is necessarily not M.
Therefore: All S is necessarily not P.

(b) All *P* is necessarily *M*.
All *S* is possibly not *M*.
Therefore: All *S* is necessarily not *P*.

(c) All *P* is possibly *M*.
All *S* is necessarily not *M*.
Therefore: All *S* is necessarily not *P*.

(4)(a) All *P* is necessarily *M*.
Some *S* is necessarily not *M*.
Therefore: Some *S* is necessarily not *P*.

(b) All *P* is necessarily *M*.
Some *S* is possibly not *M*.
Therefore: Some *S* is necessarily not *P*.

(c) All *P* is possibly *M*.
Some *S* is necessarily not *M*.
Therefore: Some *S* is necessarily not *P*.

(5)(a) All *P* is necessarily not *M*.
All *S* is necessarily *M*.
Therefore: All *S* is necessarily not *P*.

(b) All *P* is necessarily not *M*.
All *S* is possibly *M*.
Therefore: All *S* is necessarily not *P*.

(c) All *P* is possibly not *M*.
All *S* is necessarily *M*.
Therefore: All *S* is necessarily not *P*.

(6)(a) All *P* is necessarily not *M*.
Some *S* is necessarily *M*.
Therefore: Some *S* is necessarily not *P*.

(b) All *P* is necessarily not *M*.
Some *S* is possibly *M*.
Therefore: Some *S* is necessarily not *P*.

(c) All *P* is possibly not *M*.
Some *S* is necessarily *M*.
Therefore: Some *S* is necessarily not *P*.

Figure III

(1)(a) All *M* is necessarily *P*.
All *M* is necessarily *S*.
Therefore: Some *S* is necessarily *P*.

(b) All *M* is possibly *P*.
All *M* is possibly *S*.
Therefore: Some *S* is possibly *P*.

(c) All *M* is necessarily *P*.
All *M* is possibly *S*.
Therefore: Some *S* is necessarily *P*.

(d) All *M* is possibly *P*.
All *M* is necessarily *S*.
Therefore: Some *S* is possibly *P*.

(2)(a) All *M* is necessarily *P*.
Some *M* is necessarily *S*.
Therefore: Some *S* is necessarily *P*.

(b) All *M* is possibly *P*.
Some *M* is possibly *S*.
Therefore: Some *S* is possibly *P*.

(c) All *M* is necessarily *P*.
Some *M* is possibly *S*.
Therefore: Some *S* is necessarily *P*.

(d) All *M* is possibly *P*.
Some *M* is necessarily *S*.
Therefore: Some *S* is possibly *P*.

(5)(a) All *M* is necessarily not *P*.
All *M* is necessarily *S*.
Therefore: Some *S* is necessarily not *P*.

(b) All *M* is possibly not *P*.
All *M* is possibly *S*.
Therefore: Some *S* is possibly not *P*.

(c) All *M* is necessarily not *P*.
All *M* is possibly *S*.
Therefore: Some *S* is necessarily not *P*.

(d) All *M* is possibly not *P*.
All *M* is necessarily *S*.
Therefore: Some *S* is possibly not *P*.

(6)(a) All *M* is necessarily not *P*.
Some *M* is necessarily *S*.
Therefore: Some *S* is necessarily not *P*.

(b) All *M* is possibly not *P*.
Some *M* is possibly *S*.
Therefore: Some *S* is possibly not *P*.

(c) All *M* is necessarily not *P*.
Some *M* is possibly *S*.
Therefore: Some *S* is necessarily not *P*.

(d) All M is possibly not P.
Some M is necessarily S.
Therefore: Some S is possibly not P.

(9)(a) Some M is necessarily P.
All M is necessarily S.
Therefore: Some S is necessarily P.

(b) Some M is possibly P.
All M is possibly S.
Therefore: Some S is possibly P.

(c) Some M is necessarily P.
All M is possibly S.
Therefore: Some S is necessarily P.

(d) Some M is possibly P.
All M is necessarily S.
Therefore: Some S is possibly P.

(13)(a) Some M is necessarily not P.
All M is necessarily S.
Therefore: Some S is necessarily not P.

(b) Some M is possibly not P.
All M is possibly S.
Therefore: Some S is possibly not P.

(c) Some M is necessarily not P.
All M is possibly S.
Therefore: Some S is necessarily not P.

(d) Some M is possibly not P.
All M is necessarily S.
Therefore: Some S is possibly not P.

In defense of Theorems IV-5 and IV-6, Buridan recommends transformation of the relevant second and third figure syllogisms into first figure syllogisms; then, given that the acceptability of certain first figure syllogisms has already been established, if each of the transformed second and third figure syllogisms turn out to be of the form of one or another of those acceptable first figure syllogisms, or an "immediate derivative"[12] of those acceptable first figure syllogisms, the case will have been made for the acceptability of those second and third figure syllogisms – and hence for Theorems IV-5 and IV-6.[13]

Each of the syllogisms in my lists under 'Figure II' and 'Figure III' is indeed such that, if appropriately transformed, it yields a syllogism that is either of the same form as one of the acceptable syllogisms in my 'Figure I' list or an immediate derivative of such. In the case of syllogisms under my 'Figure II', the transformation requires replacing the conclusion with the "opposite of the minor" and the minor with the "opposite of the conclusion". Syllogisms under my 'Figure III' are changed by substituting the "opposite of the major" for the conclusion and the "opposite of the conclusion" for the major. Let me summarize the results:

Figure II	Figure I (by appropriate transformation)
(3)(a)	(2)(d)*[14]
(3)(b)	(2)(d)
(3)(c)	(2)(b)
(4)(a)	(1)(d)*
(4)(b)	(1)(d)
(4)(c)	(1)(b)
(5)(a)	(6)(d)*
(5)(b)	(6)(d)
(5)(c)	(6)(b)
(6)(a)	(5)(d)*
(6)(b)	(5)(d)
(6)(c)	(5)(b)

Figure III	Figure I (by appropriate transformation)
(1)(a)	(5)(c)*
(1)(b)	(5)(d)*
(1)(c)	(5)(b)*
(1)(d)	(5)(a)*
(2)(a)	(6)(c)
(2)(b)	(6)(d)
(2)(c)	(6)(b)
(2)(d)	(6)(a)
(5)(a)	(1)(c)*
(5)(b)	(1)(d)*
(5)(c)	(1)(b)*
(5)(d)	(1)(a)*
(6)(a)	(2)(c)
(6)(b)	(2)(d)
(6)(c)	(2)(b)
(6)(d)	(2)(a)
(9)(a)	(5)(c)
(9)(b)	(5)(d)
(9)(c)	(5)(b)
(9)(d)	(5)(a)
(13)(a)	(1)(c)
(13)(b)	(1)(d)
(13)(c)	(1)(b)
(13)(d)	(1)(a)

*5 **Conclusion*** In conclusion, I have argued that King's problem concerning (3)(c) and (6)(b) results from misinterpretation. The alternative interpretation that I have proposed is one that solves King's problem by eliminating those conjugations from Buridan's list without, as far as I can see, introducing any new difficulties. If, on King's interpretation, Buridan's theory is impressive, it is, on my revised reading, surely even moreso.

NOTES

1. I take "acceptable" bona syllogism to be one that is valid.

2. It should be noted that Buridan treats the subject terms of this and other "divided modal sentences" discussed below as being "ampliated"—i.e., a subject term, 'S', of such a sentence, refers to what is or is possibly S. See [1], p. 169, [Rule Amp-3] and [Rule Amp-4].

3. In this paper, I confine my discussion to what King calls Buridan's "pure divided modal syllogistic". This part of the divided modal syllogistic is found in Theorems IV-4, IV-5, and IV-6 (see [1], pp. 299-301).

4. A "conjugation" can be thought of as "a pair of premisses" ([1], p. 75).

5. 'Useful', according to King ([1], p. 335), is "a predicate of a figured conjugation, indicating that a conclusion can be added to produce a syllogistic consequence . . .".

6. King 299. For an explanation of "the common idiom for negatives", see [1], p.76.

7. A conclusion is "direct" if its subject term is the minor term and its predicate term the major term. A conclusion is "indirect" if its subject term is the major term and its predicate term the minor term.

8. This is presumably a point on which King and I differ. His own interpretation suggests that it is only modes that are explicitly preceded by negations that qualify as negated modes. (Given Buridan's restriction that, in presenting his theorems, he is speaking only of sentences in which the modes are affirmed, the fact that King's lists include various conjugations that contain sentences of the form 'No S is necessarily/possibly M' suggests that King takes the modes in those sentences to be affirmed. It seems to me that a natural explanation of why King might hold such a view is that he accepts the notion of "negated mode" just suggested—that a mode is negated only if it is explicitly preceded by a negation.) Unfortunately, I know of no decisive evidence that would settle this matter. Indeed, at this point, the only support I can claim for my own notion of a "negated mode" rests on the plausibility of the overall line of argument in my paper. It is, however, worth noting that the notion of an "implicit negation" is one which Buridan himself makes use of. See TC 2.5.2 ([1], p. 233) where Buridan speaks of the "negation implicit in 'impossible' ".

9. It should be kept in mind that, as noted earlier, Buridan treats the subject terms of divided modal sentences as ampliated. Hence my version of (3)(c) should be understood as

   All that is or is possibly P is possibly M
   All that is or is possibly S is necessarily not M
   Therefore, All that is or is possibly S is necessarily not P;

   and (6)(b), on my reading, should be understood as

   All that is or is possibly P is necessarily not M
   Something that is or is possibly S is possibly M
   Therefore, Something that is or is possibly S is necessarily not P.

10. Theorem IV-4 is as follows: "In the first figure, there is always a valid syllogism from a pair of premisses *de necessario* or ⟨a pair of premisses⟩ *de possibili* or from ⟨a pair of premisses⟩ one of which is *de necessario* and the other ⟨of which⟩ is *de possibili* to a conclusion with the same mode as there is in the major sentence" ([1], p. 299).

    It should be remembered that, on my interpretation, reconstruction of the lists appropriate to each of theorems IV-4, IV-5, and IV-6 requires that one delete, at the outset, not only those assertoric conjugations that are not "useful" or whose conclusions are not "formed in the common idiom for negatives", but also assertoric conjugations from which only indirect conclusions follow. Hence, over and above those conjugations that King (correctly) omits, I excise conjugations (3) and (11) from the Figure I list, (11) and (13) from the Figure II list and (4) and (11) from the Figure III list.

11. Theorem IV-5 is presented at the outset of this paper. Theorem IV-6 is as follows: "In the third figure, (a) a conclusion *de possibili* always follows from two premisses which are *de possibili*; (b) a conclusion *de necessario* always follows from two premisses which are *de necessario*; (c) from one premiss *de necessario* and the other *de possibili* there always follows a conclusion with the same mode as the mode of the major" ([1], p. 300).

12. I use the expression 'immediate derivative' to refer to a syllogism that results from replacing the conclusion of a given syllogism with a weaker sentence that follows, by what Buridan takes to be an acceptable consequence, from that conclusion. Thus, for example, the syllogism 'All *M* is necessarily *P*; all *S* is necessarily *M*; therefore, some *S* is necessarily *P*' is an immediate derivative of the syllogism 'All *M* is necessarily *P*; all *S* is necessarily *M*; therefore, all *S* is necessarily *P*' by virtue of the consequence 'All *S* is necessarily *P*; therefore, some *S* is necessarily *P*', and 'All *M* is necessarily *P*; some *S* is possibly *M*; therefore, some *S* is possibly *P*' is an immediate derivative of 'All *M* is necessarily *P*; some *S* is possibly *M*; therefore, some *S* is necessarily *P*' by virtue of the consequence 'Some *S* is necessarily *P*; therefore, some *S* is possibly *P*'. Indeed, in the cases under consideration the consequences 'All *S* is necessarily/possibly *P*; therefore, some *S* is necessarily/possibly *P*' and 'All/Some *S* is necessarily *P*; therefore, all/some *S* is possibly *P*' are the only ones involved in the construction of immediate derivatives. Furthermore, I realize, of course, that even talk about "immediate derivatives" in the case of syllogisms that require appeal to the former of these consequences could be eliminated as such by including, in the list of Figure I syllogisms, those that exhaust the divided modal versions of the forms 'All *M* is *P*; all *S* is *M*; therefore, some *S* is *P*' and 'All *M* is not *P*; all *S* is *M*; therefore, some *S* is not *P*'.

13. "Proof that a conclusion *de necessario* follows if one or both of the premisses is *de necessario*: the opposite of the minor always follows from the major and the opposite of the conclusion, and so ⟨Theorem IV-5(a)⟩ is apparent from Theorem IV-4 if the syllogisms are formed" ([1], p. 300).

    "Again the whole of Theorem IV-6 is proved *per impossible*, since from the minor and the opposite of the conclusion the opposite of the major is deduced by the first figure" ([1], p. 301).

14. The symbol '*' indicates an immediate derivative.

REFERENCE

[1] King, P., tr. *Jean Buridan's Logic: The Treatise on Supposition: The Treatise on Consequences*. Reidel, Dordrecht, Holland, 1985.

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