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# AXIOM SETS EQUIVALENT TO SYLLOGISM AND PEIRCE

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We consider the implicational propositions 1. *CCCRCpqpp*, 2. *CCqrCCpqCpr*, 3. *CCpqCCqrCpr*, 4. *CCCrCpqpp*, 5. *CCCpqpp*, 6. *CpCqp*, 7. *CPCQP*, where capitalized variables stand for arbitrary implications. In [1], pp. 173-174, C. A. Meredith showed the inferential equivalence of the sets (2, 4), (3, 4), (3, 5, 6) and that (3, 5) yields 2 and (Thomas) 7. We show that inferentially equivalent are (1, 2), (1, 3), (3, 5).

**A**. (1, 2) yields 3 and 5. *Proof:* If in Meredith's deduction of (3, 4) from (2, 4) we change the last proof line from **DD**2.18.15 to **DD**.2.18.17 the resulting seventeen proof lines produce 3 from our (1, 2), with 5 turning up after the first five detachments.

**B**. (1, 3) yields 2. *Proof:* (1, 3) yields 5, since **DDD**33311 = 5. (3, 5) yields 2 (Meredith).

**C**. (3, 5) yields 1. *Proof:* (3, 5) yields 7 (Thomas) so by 3 we have *CCCQPrCPr*, whence by substitution *CCCRCpqpCCpqp*, from which 3 and 5 yield 1.

**A**, **B**, **C** prove the theorem. As a basis for this system (1, 2) appears to develop by far the most quickly and simply.

## REFERENCE

[1] Meredith, C. A., and A. N. Prior, "Axiomatics of the propositional calculus," *Notre Dame Journal of Formal Logic*, vol. IV (1963), pp. 171-187.

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