PETRUS FONSECA AND MATERIAL IMPLICATION

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Little attention has been paid to the question of whether material implication was recognized in the sixteenth and seventeenth centuries, although it has been argued that John of St. Thomas was aware of the equivalence '$(p \supset q) \equiv (\sim p \vee q)$'.[1] The other usual test-case for a knowledge of material implication is '$(p \supset q) \equiv \sim(p \cdot \sim q)$'; and I intend to show that the sixteenth century Jesuit, Petrus Fonseca, whose *Institutionum Dialecticarum libri octo* was one of the most popular textbooks of the period,[2] was well acquainted with this second equivalence.

Fonseca introduces the subject in his discussion of the appropriateness of the name 'hypothetical' as applied to compound propositions. He claims that there seems to be no good reason for a copulative proposition to be called hypothetical unless one takes into account the fact that a negated copulative proposition can be derived from a conditional.[3] His example makes it plain that he has in mind the schema '$(p \supset q) \supset \sim(p \cdot \sim q)$'.

However, in order to show that Fonseca was acquainted with the material conditional it is necessary to prove his acceptance of '$\sim(p \cdot \sim q) \supset (p \supset q)$'; and unfortunately he explicitly rejects this schema in his chapter entitled *De coniunctarum aequipollentia*. Here he argues that no biconditional can be established between '$p \supset q$' and '$\sim(p \cdot \sim q)$' on the grounds that the consequence "It is not the case that Socrates is both a stone and not an animal, therefore if Socrates is a stone he is an animal" is invalid.[4] He accepts the truth of the antecedent; but the consequent is said to be false, in accordance with his earlier definition of the conditional proposition. He felt that, unlike other compound propositions, the truth of a conditional is determined, not by the truth or falsity of its parts, but by the relationship between them. In his words: ". . . eius veritas in sola consequutione consistit."[5]

Despite the explicit rejection of '$\sim(p \cdot \sim q) \supset (p \supset q)$', Fonseca reintroduces it, under slightly different guise, in his section on the copulative syllogism. Like most other contemporary logicians, he describes the inference from a negated conjunction and the assertion of one of its parts to

the negation of the other;[6] but, unlike his rivals, he gives detailed examples of the eight possibilities, *including* '$\sim(p \cdot \sim q)$, p, $\therefore q$'.[7] Obviously this is equivalent, through conditionalization, to '$\sim(p \cdot \sim q) \supset (p \supset q)$'; and, together with the previously acknowledged '$(p \supset q) \supset \sim(p \cdot \sim q)$' it gives us the desired '$(p \supset q) \equiv \sim(p \cdot \sim q)$'. One must conclude that Fonseca was aware both of strict and of material implication.

NOTES

1. See Ivo Thomas, "Material Implication in John of St. Thomas", *Dominican Studies* 3 (1950), p. 180; and John J. Doyle, "John of St. Thomas and Mathematical Logic", *The New Scholasticism* 27 (1953), pp. 3–38.

2. First published in 1564, it went into at least 44 editions. See Wilhelm Risse, *Die Logik der Neuzeit, Band I. 1500–1640* (Stuttgart-Bad Cannstatt, 1964), p. 362, n. 395.

3. Petrus Fonseca, *Institutionum Dialecticarum libri octo* (Conimbricae, 1590) Vol. I, p. 173. "Caeterùm, cur copulativa dicatur hypothetica, nulla apparet ratio; nisi fortè quia alteri enunciationi simplici iam positae alteram adiungit; . . aut certè quia sunt copulativae, quae inferantur ex conditionalibus; ut si ex hac conditionali, Si Socrates est homo, est animal, colligas hanc copulativam negativam, Non & Socrates est homo, & non est animal." [Bk. III, ch. 14]

4. *Op. cit.*, pp. 201–202. "Quod igitur conditionales non aequipollent copulativas, ex eo patet, quia si qua esset copulativa cui aequipolleret haec conditionalis, Si Socrates est homo, est animal, maximè esset haec, Non & Socrates est homo, & non est animal . . . . At haec non idem valet quod illa. Nam & si ex illa inferatur, ut apertum est, non tamen illa infert. Alioqui haec esset bona consequutio, Non & Socrates est lapis, & non est animal, ergo si Socrates est lapis, est animal: ubi plane vides antecedens verum, & consequens falsum." [Bk. III, ch. 22]

5. *Op. cit.*, p. 176. "Id quod proprium, ac peculiare in hoc enunciationum genere ex eo est, quòd eius veritas in sola consequutione consistit; qui fit ut si consequutio sit bona, & apta, enunciatio ipsa sit vera, quocunque modo, quod ad veritatem & falsitatem attinet, partes se habeant." [Bk. III, ch. 15]

6. *Op. cit.*, Vol. II, p. 103. "In negativis autem una tantùm figura esse videtur, in qua nimirum altera pars propositionis ponitur, ut altera tollatur." [Bk. VI, ch. 32] It might be claimed that all logicians who mentioned this 'syllogism' were implicitly aware of the material conditional; but Fonseca is to the best of my knowledge the only one who discussed the relationship between a negated conjunction and a conditional in any detail, although brief references may be found in the contemporary Ramist, Joannes Freigius, and in the later German logician, Joachim Jungius.

7. *Op. cit.*, p. 104.

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