The "last sophism" of Roger Swyneshed. Remarks on a fourteenth-century *insolubilia*-treatise

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1. Introduction

Semantic paradoxes or "insolubles" similar to those occasioned by the use of the self-reflexive Liar sentence "*This sentence is false*" became a widely discussed issue during the late-medieval development of scholastic logic.[i] In 1330's the British logician Roger Swyneshed composed his treatises concerning obligational disputations and insolubles and, despite strong criticism formulated almost immediately by an author as important as William Heytesbury, his approach remained influential for more than two centuries in the British logical tradition[ii] as

i Cf. Spade, P. V. – Read, S., "Insolubles", Zalta E. N. (ed.), *The Stanford Encyclopedia of Philosophy (Winter 2009 Edition)*, 2009;
URL = http://plato.stanford.edu/archives/win2009/entries/insolubles/,
and Dutilh Novaes, C., "A comparative taxonomy of medieval and modern approaches to liar sentences", *History and Philosophy of Logic* 29, 2008, pp. 227–261, for a general overview of scholastic solutions to semantic paradoxes.

ii Cf. De Rijk, L. M., "Logica Cantabrigensis: a Fifteenth Century Cambridge Manual of Logic", *Revue Internationale de Philosophie* 29, 1975, pp. 297–315, Ashworth, E. J., "A Note on Paul of Venice and the Oxford Logica 1483", *Medioevo* 1978, 4, pp. 93–99, and Ashworth, E. J., "The Libelli Sophistarum and the Use of Medieval Logic Texts at Oxford and Cambridge in the Early Sixteenth Century", *Vivarium*, 1979, 17, pp. 134–158, Ashworth, E. J. – Spade, P. V., "Logic in Late Medieval Oxford", in: Catto, J. I.– Evans

well as in John Mair's Parisian circle and subsequently in Spain via Mair's disciple Domingo de Soto.[i] The solution he proposes in his *Insolubilia* is in general terms based upon a contextualist approach to truth and ultimately results in a very serious revision of classical logic. The revision includes denying that correspondence with reality has the status of a sufficient condition for truth and that truth-preservation has the status of a necessary condition of validity. It also involves a reconsideration of the traditional square of opposition, namely in terms of assuming that two contradictory sentences can be false at the same time, i.e., the so-called "di-pseudism".[ii] To prove the viability of his theory (and possibly to support its claim to completeness), Swyneshed formulates various sophisms together with solutions to them. This paper will focus on the "last sophism", i.e., the sophism which usually occurs at the very end of his treatise both in manuscripts and early prints[iii] and compare it to

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R. (eds.), *The history of the University of Oxford: Late Medieval Oxford Vol. II.*, Oxford 1992, pp. 35–64.

i Cf. Ashworth, E. J., "The Treatment of Semantic Paradoxes from 1400 to 1700", *Notre Dame Journal of Formal Logic* 13, 1972, pp. 34–52, and Ashworth, E. J., *Language and Logic in the Post-medieval Period*, Dordrecht 1974.

ii Cf. Spade, P. V., "Roger Swyneshed's *Obligationes*: Edition and Comments", *Archives d'histoire doctrinale et littéraire du moyen âge* 44, 1977, pp. 243–285, Dutilh Novaes, C., "A comparative taxonomy of medieval and modern approaches to liar sentences", op. cit., pp. 227–261, Uckelman, S. L., *Modalities in Medieval Logic*, Dissertation, University of Amsterdam 2009, for analysis of Swyneshed's dominant line of thought.

iii It is important to note that Swyneshed's last sophism does not occur in all versions of Swyneshed's treatise: the fifteenth-century manuscript Cambridge, Corpus Christi College 244 (245), ff. 59r–76v (otherwise regarded as fairly reliable by Spade) ends before introducing it (cf. Swyneshed, R., *Insolubilia*, in: P. V. Spade, "Roger Swyneshed's *Insolubilia:* Edition and Comments," *Archives d'histoire doctrinale et littéraire du moyen age*, 46, 1979, pp. 177–220, p. 179) and so does the Cambridge version of *Libellus sophistarum* (at least in the 1510 edition, cf. Anonymous 1510). The subsequent analysis is based on Spade's working edition of the manuscripts and on two early-prints editions which represent British reception of Swyneshed's semantics., cf. Spade, P. V., "Roger Swyneshed's *Insolubilia:* Edition and Comments," op. cit.,

Swyneshed's "standard solution" to semantic paradoxes ("standard" meaning here and henceforth one which he adheres to in the majority of his treatise). The present research is motivated by the fact that the solution to the last sophism is based upon a course of argument different from the one implemented by Swyneshed in his other sophisms. Without questioning prior interpretations of Swyneshed's approach, this paper should attract attention to one usually overlooked feature of Swyneshed's treatise; from the historical point of view, Swyneshed's last sophism offers interesting data relevant for properly positioning its author on the intellectual map of scholastic logic.

2. Swyneshed's "standard solution"

2.1 General principles

In his analysis of paradoxical sentences, Swyneshed tacitly assumes that they are well-formed and meaningful and have neither implicit meaning nor is their explicit meaning restricted; for instance, Liar sentences say precisely that they are false. His solution to semantic paradoxes is ultimately based upon a revision of the correspondence theory of truth, where correspondence with reality is no longer considered to be a sufficient condition for truth and another contextual truth-condition, the absence of self-falsification, is introduced:

Anonymous (ed.), *Libellus sophistarum ad usum Oxoniensis*, London [?]1499–1500 (STC 15576.6), and Anonymous (ed.), *Logica "[Q]uoniam ex terminis"*, Oxford 1483 (STC 16693). (Working editions of extracts from these early prints will be offered in appendixes to this paper.)

> *A true sentence is a sentence that does not falsify itself and that principally signifies as is the case, either naturally or from the imposition or impositions by which it was last imposed to signify.* […] *A false sentence is an expression that falsifies itself, or else an expression that does not falsify itself and that principally signifies otherwise than is the case, either naturally or from the imposition or impositions by which it was last imposed to signify.*[i]

The concept of self-falsification, which is crucial both with respect to defining truth and to solving semantic paradoxes (since the Liar sentence is the paradigm of a self-falsifying sentence), is given detailed analysis and cautious classification in Swyneshed's treatise. For the purposes of this study, only the simplest case of the so-called "immediate" (i.e., direct) self-falsification needs to be introduced:

> *A sentence falsifying itself immediately is a sentence signifying principally as is the case or otherwise than is the case and is pertinent for inferring that it is false.*[ii]

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i "*Propositio vera est propositio non falsificans se principaliter sicut est significans naturaliter aut ex impositione vel impositionibus qua vel quibus ultimo fuit imposita ad significandum.* […] *Propositio falsa est oratio falsificans se vel oratio non falsificans se principaliter aliter quam est significans naturaliter, ex impositione, vel impositionibus qua vel quibus ultimo fuit imposita ad significandum*." Cf. Swyneshed, R., *Insolubilia*, op. cit., pp. 185–186, the English translation of Swyneshed's treatise is derived from Spade, P. V., "Roger Swyneshed's *Obligationes*: Edition and Comments", op. cit., and Uckelman, S. L., *Modalities in Medieval Logic*, op. cit.

ii "*Propositio falsificans se immediate est propositio significans principaliter sicut est vel aliter quam est pertinens ad inferendum se ipsam fore falsam.*" Cf. Swyneshed, R., *Insolubilia*, op. cit., pp. 182–183 (for the complete Swyneshed's analysis of self-falsification, cf. ibid., 182–184), for the English translation of this definition and its

Furthermore, Swyneshed's standard semantics admits the occurrence of truth-value gaps in case of sentences which deny their own correspondence with reality. Again, contextual truth-conditions are taken into consideration:

> *A sentence that principally neither signifies as is the case nor otherwise than is the case, or which is neither true nor false, is a sentence which signifies that something is the case and it itself by signifying in such a way is pertinent for inferring that it does not signify as is the case, such as the following sentence: 'This does not principally signify as is the case', demonstrating itself, which principally signifies that it does not signify as is the case*.[i]

As a consequence, sentences which deny their own correspondence with reality (or entail this denial) do not satisfy the contextual clause and are gappy. Equally as in the case of self-falsifying paradoxical sentences which are false despite the fact that they correspond with reality (since it is actually the case that they are false, which is precisely what they signify to be the case), the sentences which deny their correspondence with reality come out gappy and hence do not correspond with reality (or "do not signify as is the case", as Swyneshed would say) despite the fact

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interpretation, cf. Spade, P. V., "Roger Swyneshed's *Obligationes*: Edition and Comments", op. cit., pp. 243–285, for its modern reconstruction, cf. Uckelman, S. L., *Modalities in Medieval Logic*, op. cit.

i *"Propositio nec principaliter significans sicut est nec aliter quam est, id est, quae nec est vera nec falsa, est propositio significans aliqualiter esse et illa sic significando est pertinens ad inferendum se ipsam non significare principaliter sicut est, sicut haec propositio 'Haec principaliter non significat sicut est', demonstrata illa eadem, quae principaliter significat quod ipsa non significat sicut est.*" Cf. Swyneshed, R., *Insolubilia*, op. cit., pp. 180–181.

that it is actually the case that they do not correspond with reality and say precisely that.

To sum up, the key element of Swyneshed's semantics of truth and correspondence with reality in its standard version as regards the solution to semantic paradoxes is the addition of contextual clauses which apply to paradoxical sentences, rendering them either false or gappy. The relation between a sentence and its semantic correlate ceases to be a decisive truth-criterion and truth becomes a matter of both what a sentence says and contextual linguistic factors, i.e., its direct or indirect self-reflexivity. As a consequence, three theorems incompatible with traditional logic hold of Swyneshed's logic and are proved by him: (1) there are false sentences which correspond with reality, (2) there are valid inferences which are not truth-preserving and (3) there are contradictory sentences with the same truth-value (in other words, the traditional square of opposition does not hold).[i] The first theorem was already presented in the context of Swyneshed's solution to the Simple Liar. The second theorem is, again, an expansion on the Simple Liar: let us assume that the Simple Liar sentence is a consequent of an inference, the antecedent of which says precisely what the consequent does, i.e., that the Liar sentence is false. In that case, the antecedent would be true, since it does correspond with reality and does not falsify itself, whereas the consequent would be false. Swyneshed does not justify his opinion that such an inference would be valid, but the most probable reason is that its components are synonymous.[ii] Therefore,

i For these theorems, cf. Swyneshed, R., *Insolubilia*, op. cit., pp. 188–190.
ii That, at least, is the argument used by John Mair in similar cases, cf. Mair, J., "Tractatus insolubilium", in: J. Mair, *Inclytarum artium ac sacre pagine doctoris acutissimi Magistri Johannis Maioris Scoti libri quos in artibus in collegio Montis acuti Parisius regentando compilavit…*, Lyon 1508, fols. 44ra–70rb, fol. 64vb.

there can be a valid inference which is not truth-preserving. The third theorem is proved by expanding on the same paradoxical situation: let us assume that alongside the simple Liar sentence, there is a sentence which denies that the Liar sentence is false, saying precisely that "That sentence is not false". In that case, this sentence would be contradictory to the Simple Liar sentence (assuming that negation is a contradiction-forming operator) and it would be false, since it does not correspond with reality which is a necessary condition for truth. Therefore, there can be two contradictory sentences which are simultaneously false.

2.2 Analysis of Liar paradox

The usual presentation of particular paradoxes in Swynehed's treatise uses the general framework of "*obligationes*" or of obligational disputations.[i] Close relation between the obligational framework and Swyneshed's analysis of semantic paradoxes is supported by the fact that his treatises concerning obligations and insolubles follow one another and the reader of the latter might have been assumed to be already acquainted

i *Obligatio*-treatises occurred already in twelfth-century logic and covered the issue of leading disputations based upon counter-factual assumptions. Their exact motivation is a matter of ongoing discussion, cf. Spade, P. V., "Medieval Theories of Obligationes", in: Zalta, E. N. (ed.), *The Stanford Encyclopedia of Philosophy (Fall 2008 Edition)*, 2008, URL = http://plato.stanford.edu/archives/fall2008/entries/obligationes/, and Dutilh Novaes, C., *Formalizing medieval logical theories: suppositio, consequentiae and obligationes*, Dordrecht 2007, pp. 145–214. For the present issue it is historically important that o*bligatio*-treatises became almost instantly an important theoretical context for discussing insolubles, cf. Martin, Ch., "Obligations and Liar", in: M. Yrjönsuuri (ed.), Medieval Formal Logic: Obligations, Insolubles and Consequences, Dordrecht 2001, pp. 63–94.

with the former.[i] Also, Swyneshed's definition of truth uses the concept of "being pertinent to inferring" which is part of the obligational framework.ii The obligational disputation begins by positing a (counter-factual) situation or "*casus*" delimited by both linguistic and extra-linguistic assumptions, which is either admitted or denied depending on its internal consistency. Afterwards, assertions related to the posited *casus* are proposed by one participant of the disputation to be conceded, denied, or doubted by its other participant. The disputation ends as soon as the set of reactions to proposed assertions becomes inconsistent.

To construct the so-called "Simple Liar" *casus*, let us assume that there is only one sentence, "*Something false exists*", which signifies precisely that something false exists.[iii] If we assume the correspondence theory of truth (or at least a theory of truth validating Tarskian biconditionals) and classical logic, it is possible to prove that the Liar sentence is true if and only if it is false. The proof goes as follows: if the Liar sentence is true then it is false and if it is false then it is true.[iv] The first leg of the argument can be proved as follows: Let us assume that the Liar sentence

i See the opening passage of Swyneshed's *Obligationes*, Spade, P. V., "Roger Swyneshed's *Obligationes*: Edition and Comments", op. cit., pp. 249–250.
ii Cf. Spade, P. V., "Roger Swyneshed's *Obligationes*: Edition and Comments", op. cit., 1977, pp. 243–285, and Dutilh Novaes, C., "A comparative taxonomy of medieval and modern approaches to liar sentences", op. cit., pp. 251–253 for historical analyses of Swyneshed's concept of self-falsification and its relation to obligations.
iii "*Sit igitur haec propositio* 'Falsum est' *in scripto et nulla alia praeter illam. Et significet illa principaliter quod falsum est.*" Cf. Swyneshed, R., *Insolubilia*, op. cit., p. 194.
iv Swyneshed presents this paradox in the form of a sophism, i.e., in the form of two arguments for contradictory assertions which appear to be equally legitimate (or in the specific case of semantic paradoxes, equally illegitimate). Therefore, his presentation of the paradox focuses on the two legs separately, without proving the equivalence of the truth and falsity of the Liar sentence, but the latter is the immediate consequence of the former.

is true. But it signifies precisely that something false exists. Therefore, since there is no other sentence but the Liar sentence itself, it signifies otherwise than is the case and is false. The second leg of the argument can be proved as follows: Let us assume that the Liar sentence is false. But it signifies precisely that something false exists. Therefore, it signifies precisely as is the case. Therefore, it is true.[i]

Based on his (re-)definition of truth, Swyneshed proposes the following solution to the Simple Liar:

> *The* casus *should be admitted. And if "Something false exists" is proposed, it should be conceded. And it should be conceded that it is false*.[ii]

After admitting that the Simple Liar *casus* is internally consistent and conceding that the Liar sentence is actually false, it is necessary to prove that its falsity does not entail its truth (in other words, to block the second leg of the above-formulated argument). Swyneshed does that as follows (substantiating by the same token that the Liar sentence in question is false):

> *And we deny the inference "hence, it signifies principally otherwise than is the case". One would have to add to the antecedent that it* [i.e., the sentence under scrutiny] *does not falsify itself. Which is false because "Something false exists;*

i For Swyneshed's original argument formulated in terms of obligations, cf. Swyneshed, R., *Insolubilia*, op. cit., p. 194.

ii "*Admittendus est igitur casus. Et quando proponitur* 'Falsum est*', concedenda est. Et concedendum est quod illa est falsa."* Cf. Swyneshed, R., *Insolubilia*, op. cit., pp. 196–197.

> *and every sentence is identical with 'Something false exists'; therefore, it is false". Hence, it is pertinent for inferring that it is false. Furthermore: therefore, it is false.*[i]

In other words, the fact that the Simple Liar sentence is false does not entail its truth because correspondence with reality is not a sufficient condition for truth. Also, since Liar sentences are self-falsifying, they are false as an immediate consequence of Swyneshed's definition of truth and falsity.[ii]

3. Swyneshed's last sophism

3.1 Presentation of the sophism

How Swyneshed's approach towards his last sophism differs from his standard solution is clear already from the delimitation of the paradoxical *casus* under scrutiny, which is as follows:

> *A similar case occurs if it is posited that only the sentence "Something false exists" exists and that it signifies precisely that something false exists and also that every sentence signifying as is the case is true <and every sentence signifying otherwise than is the case is false>.*[iii]

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i "*Et negatur consequentia 'Igitur, illa principaliter significat aliter quam est'. Sed opportet addere antecedenti quod illa non falsificat se. Et hoc est falsum. Nam sequitur 'Falsum est; et omnis propositio est illa 'Falsum est'; igitur, illa est falsa'. Et sic illa est pertinens ad inferendum se ipsam fore falsam. Et ultra: Igitur, illa est falsa.*" Cf. Spade, P. V., "Roger Swyneshed's *Insolubilia:* Edition and Comments,", op. cit., p. 197.

ii Swyneshed characterises the "second leg" in Aristotelian terms as an instance of the fallacy *secundum quid et simpliciter*, cf. Swyneshed, R., *Insolubilia*, op. cit., pp. 197–198.

iii "*Simile est si ponatur quod tantum illa propositio sit 'Falsum est' et quod illa praecise significet quod falsum est et quod quaelibet propositio quae significat sicut est sit vera <et*

The difference from the standard delimitation of the Simple Liar paradox rests upon the additional assumption that correspondence with reality implies truth and non-correspondence with reality implies falsity, which conjointly entails that truth-values can be assigned simply based upon correspondence with reality. This additional parameter of the paradoxical *casus* stands in direct opposition to Swyneshed's definition of truth, where correspondence with reality is only one factor in truth-making. The additional assumption restricts possible applications of contextual clauses which are part of the definition of truth. The paradoxical reasoning is then formulated as follows:

> *Thereafter, "Something false exists" is proposed. If it is conceded or doubted, one can argue against that as follows: the following inference holds: "Something false exists; and this is the only sentence which there is; therefore, it is false." From whence it follows that "therefore, it signifies otherwise than is the case". And furthermore: "therefore, it is not the case as it signifies; and it only signifies that something false exists; therefore, it is not the case that something false exists." And furthermore: therefore, nothing false exists. And hence on the* casus *assumed it entails its contradiction. If "Something false exists" is negated, one can argue against it as follows: this sentence exists and it is not true and it signifies as is the case or otherwise that is the case; therefore, it is false. Furthermore: therefore, it is false*.[i]

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quaelibet quae significat aliter quam est est falsa>." Swyneshed, R., *Insolubilia*, op. cit., p. 219. The clause in angle brackets is only added in one of "Spade's" manuscripts, namely the fifteenth-century Vatican, Vat. Lat. 2130, ff. 154vb–159va, and is also contained in both printed editions.

i "*Deinde proponitur 'Falsum est'. Si conceditur vel dubitatur, contra: Sequitur 'Falsum est; et omnis propositio est illa; igitur, illa est falsa'. Et sequitur: 'ergo, illa significat*

The use of obligational framework causes a slight deviation from the most straightforward form of the argument, which would only prove that the truth of the Liar sentence entails its falsity and *vice versa*. The context of obligations, on the other hand, requires that one takes also the third option into consideration, i.e., that the sentence under scrutiny can be doubted, instead of being simply conceded or denied. However, this option is only possible in the case of sentences which are "irrelevant", i.e., logically independent of the *casus* (*impertinens*), and part of Swyneshed's argument is that this is not the case, as is emphasised by saying that *on the casus assumed* the Liar sentence entails its own contradiction (*ex illa cum casu sequitur suum contradictorium*).[i] The rest of the argument is fairly typical and should not require further comments.

Swyneshed proposes two solutions to this paradox which differ from each other as regards the admission or rejection of the principle of bivalence. The first solution is based upon assigning truth-value gap to the Liar sentence:

> *Solution: the* casus *should be admitted and "Something false exists" should be denied.*

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aliter quam est'. Et ultra: ergo, non est ita sicut illa significat; et illa solum significat quod falsum est; ergo, non est ita quod falsum est. Et ultra: ergo, nullum falsum est. Et sic ex illa cum casu sequitur suum contradictorium. Si negatur 'Falsum est', contra: Illa propositio est; et non est vera; et significat sicut est vel aliter quam est; ergo, illa est falsa. Et ultra: ergo, falsum est."

i Swyneshed does not pay much attention to doubtful sentences in his *Obligationes* but he proposes the rule that "irrelevant" sentences are not a matter of obligation and hence do not have to be conceded or rejected as a consequence of an obligation (*propositio impertinens est propositio non obligata, et propter obligatum nec est concedenda nec neganda*) and that obviously irrelevant sentences should be considered doubtful (*propositio impertinens scita ab aliquo sibi significare dubie sine obligatione et cetera est dubitanda*), cf. Spade, P. V., "Roger Swyneshed's *Obligationes*: Edition and Comments", op. cit., p. 252 and 256.

> *And one should admit that the sentence in question exists and that it is not true. Then it should be denied that it signifies as is the case or otherwise than is the case because it is pertinent for inferring that it does not signify as is the case. The reason is that the following inference holds: "Something false exists; and there is only one sentence, namely this one: 'Something false exists'; therefore, it is false". Furthermore: hence, it signifies otherwise than is the case. Furthermore: hence, it does not signify as is the case. As a consequence, it does not signify either as is the case or otherwise than is the case on the assumed* casus.[i]

The second solution has the form of a rule for obligational disputation:

> *If the* casus *is posited that the sentence "Something false exists" exists and that there is no other sentence and that it principally signifies that something false exists and also that every sentence signifying as is the case is true <and that every sentence signifying otherwise than is the case is false>and that every sentence signifies as is the case or otherwise than is the case, then the* casus *should not be*

i "*Solutio: Admittendus est casus et negandum est 'Falsum est'. Et concedendum est quod illa propositio est et quod illa non est vera. Et tunc negandum est quod ista significet sicut est vel aliter quam est eo quod illa est pertinens ad inferendum se ipsam non significare sicut est. Nam sequitur: Falsum est; et omnis propositio est illa 'Falsum est'; ergo, illa est falsa. Et ultra: ergo, significat aliter quam est. Et ultra: ergo, illa non significat sicut est. Et per consequens illa non significat sicut est nec aliter quam est illo casu posito.*" Cf. Swyneshed, R., *Insolubilia*, op. cit., pp. 219–220.

admitted because it implies that one and the same sentence is true and false which is impossible.[i]

Swyneshed adds yet another additional characteristic of the *casus* under scrutiny, i.e., the principle of bivalence, and concludes that with this additional assumption the *casus* is rendered inconsistent and thereby to be denied. The same step could be interpreted as an alternative analysis of the original *casus* in terms of bivalent semantics rather than positing an entirely new *casus*: one which emphasises that bivalence must fail in paradoxical contexts where classical semantic values are not defined in terms of contextual valuation-clauses. In other words, the two solutions conjointly claim that the posited *casus* should either be evaluated in terms of non-bivalent semantics or denied as inconsistent.

3.2 Historical analysis

Two major historical issues can be addressed regarding the last sophism: how it differs terminologically from Swyneshed's standard position and the logic of the argument and its scholastic context.

The various versions of Swyneshed's treatise differ in their terminology of signification: the manuscripts use the term "*praecise significare*", whereas the printed editions use "*principaliter significare*" in the

i "*Si tamen ponatur ille casus quod illa propositio sit 'Falsum est' et nulla alia et quod illa principaliter significet quod falsum est et quod omnis propositio significans sicut est sit vera <et quod omnis propositio significans aliter quam est sit falsa> et quod omnis propositio significat sicut est vel aliter quam est, tunc ille casus non est admittendus eo quod includit quod eadem propositio sit vera et falsa, quod non est possibile.*" Cf. Swyneshed, R., *Insolubilia*, op. cit., pp. 219–220. The clause in angle brackets is dismissed by Spade according to whom the omission is required by the sense of the argument (ibid., p. 220). However, the definition of falsity in terms of signifying otherwise than is the case seems to play an important role in the argument.

description of the *casus*. This difference is not interesting as a characteristic of the text-versions, since the former term is one which normally occurs in Spade's edition in other sophisms. The point is that these two notions emphasise different aspects of the *casus* in question: to say that a sentence "principally" signifies *that b* is to point out that a sentence as a whole signifies *that b* or even that it primarily and explicitly signifies *that b* (as opposed to what it might say implicitly or what its syntactic components might signify), whereas to say that a sentence signifies "precisely" *that b* is to emphasise that it says *that b* that it does not have any implicit meaning.[i] More importantly, by the occurrence of "*praecise*" in this context the passage resembles the Heytesburian tradition where it plays a crucial role, as will be shown below. Also, the notion of "*principale significatum*" used in *Libellus sophistarum ad usum oxoniensis* suggests adherence to realist semantics but that would only be the case if the nominal form of "*significare*" were actually intended as a sign of objective entity.[ii]

To focus on the theoretical achievement of the first solution proposed in the last sophism: by taking such an approach to Liar sentences into consideration, Swynehed becomes one of the genuine "*mediantes*" mentioned and criticised in Bradwardine's *Insolubilia*:

i Cf. Spade, P. V., "Roger Swyneshed's *Obligationes*: Edition and Comments", op. cit., p. 106, Nuchelmans, G., *Late-Scholastic and Humanist Theories of the Proposition*, Amsterdam – London 1980, pp. 45–46.

ii For an overview of scholastic sentential semantics and the concept of states of affairs conceived as sentential denotation, cf. Nuchelmans, G., *Theories of the proposition. Ancient and medieval conceptions of the bearers of truth and falsity*, Amsterdam 1973, Nuchelmans, G., *Late-Scholastic and Humanist Theories of the Proposition*, op. cit., and Perler, D., *Der propositionale Wahrheitsbegriff im 14. Jahrhundert*, Berlin – New York 1992.

> *[…] the middle way, whose proponents are so called because they say that an insoluble is neither true nor false, but in the middle indifferent to both. But they are mistaken, for every sentence is true or false, so since an insoluble is a sentence, an insoluble is true or false.*[i]

Swyneshed's standard solution, on the other hand, would not be covered by this passage, since it evaluates Liar sentences as false rather than having a "third" semantic value (possibly: being gappy). However, due to the expected chronology of their works, Swyneshed could not have been the object of this remark, because Bradwardine wrote his *Insolubilia* between 1321 and 1324, whereas Swyneshed's treatise was composed approximately a decade later.[ii] Still, the position described by Bradwardine must have been quite rare given that no other text adhering to this position at least as closely as Swyneshed has been uncovered so far.[iii]

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i "[…] *est mediantium. Qui sic ideo dicuntur quia dicunt quod insolubile nec est verum nec falsum, sed medium indifferens ad utrumque. Sed hii errant, quia quelibet propositio est vera vel falsa, insolubile est propositio, ergo insolubile verum vel falsum.*" Cf. Bradwardine, T., *Insolubilia*, in: Roure, M. L., "La problématique des propositions insolubles au XIIIe siècle et au début du XIVe, suivie de l'édition des traités de W. Shyreswood, W. Burleigh et Th. Bradwardine", Archives d'histoire doctrinale et littéraire du moyen age 37, 1970, pp. 285–326, p. 295 (trans. Dutilh Novaes, C., "A comparative taxonomy of medieval and modern approaches to liar sentences", op. cit., p. 239).

ii Cf. Spade, P. V. – Read, S., "Insolubles", op. cit., for the chronology of Bradwardine's, Swyneshed's and Heytesbury's treatises concerning semantic paradoxes.

iii Cf. Dutilh Novaes, C., "A comparative taxonomy of medieval and modern approaches to liar sentences", *History and Philosophy of Logic* 29, 2008, p. 239. There is a theoretical possibility that "*mediantes*" were only Bradwardine's own construction for the sake of discussing alternative solutions to semantic paradoxes; his contemporary Buridan, for instance, argues against authors who assume that Liar sentences are both true and false at the same time and even introduces this position by saying that this is what "others have

The second approach could be conceived as part of the Heytesburian tradition based upon analysis of paradoxes in terms of obligations which primarily focuses on the admissibility of the paradoxical *casus* rather than on the semantic value of paradoxical sentences. The first step in Heytesbury's evaluation of paradoxical sentences is then rejecting the *casus* which are inconsistent as a consequence of their paradoxicality:

> *Second, notice that if a* casus *of an insoluble is posited, and together with that it is assumed that the insoluble precisely signifies just as its terms commonly pretend, the* casus *may in no way be admitted*.[i]

However, it is not possible to say that Swyneshed's second solution to the last sophism is Heytesburian in its fashion, since the exact opposite of what was stated about the relation between Bradwardine and Swyneshed holds here: Heytesbury's *Regulae solvendi sophismata* released in 1335 was obviously written *after* Swyneshed's treatise began circulating because Swyneshed's theory is one of the alternative solutions to semantic paradoxes presented and rejected at the beginning of Heytesbury's treatise.[ii] From this point of view, the last sophism of Swyneshed's treatise would be the historically first formulation of the

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said" (cf. Buridan, J., *Summulae de practica sophismatum*, Turnhout 2004, p. 153), although no such position is likely to have been held by medieval authors.

i "*Secundo est advertendum quod si ponatur casus de insolubili, et cum hoc supponatur quod illud insolubile praecise significet sicut termini illius communiter praetendunt, casus ille nullatenus admittatur*." Cf. Pironet, F., "William Heytesbury and the treatment of Insolubilia in 14th-century England", in: S. Rahman – T. Tulenheimo – E. Genot (eds.), *Unity, Truth and the Liar*: *The Modern Relevance of Medieval Solutions to the Liar Paradox*, Berlin 2008, pp. 251–327, p. 285, for the translation cf. Spade, P. V., "Roger Swyneshed's *Insolubilia:* Edition and Comments,", op. cit., p. 48.

ii Cf. Heytesbury, W., *On "Insoluble" Sentences: Chapter One of His Rules for Solving Sophisms*, Toronto 1979, pp. 18–37.

Heytesburian approach, which would certainly supplement the currently prevalent interpretation of Swyneshed by emphasising that he proposed the obligational solution to semantic paradoxes in classically Heytesburian form even before Heytesbury, not to mention that Heytesbury would actually have taken his own solution over from an author he criticised.

3.3 Systematic analysis

From the systematic point of view, the two solutions are based on truth-value gappism and what as a result is equivalent to restricting the expressive force of the language used in the *casus* in question.

Swyneshed's delimitation of the *casus* in question does not specify the concept of correspondence with reality used in the respective argument. As a consequence, neither the concept of truth-value gap applied as part of the valuation of Liar sentences is entirely clear. Systematically speaking, there are two options: the "black-hole" concept of gap, endorsed by Saul Kripke, and the "active-value" concept of gap, endorsed by Haim Gaifman.

The Gaifmanian solution[i] to semantic paradoxes is based on a contextualist, token-based approach to semantic valuation, where the semantic value of sentences is defined in terms of valuation rules sensitive to their linguistic context. For the present issue, the distinction between the so-called "gap rules" and "jump rules" is crucial. The gap

i Cf. Gaifman, H., "Pointers to Truth", *The Journal of Philosophy* 89, 1992, pp. 223–261.

rules "determine the cases of failure, where GAP is assigned": they govern the assignment of GAP to paradoxical sentences which cannot be evaluated by means of standard rules expressible in the case of classical semantics by means of Tarskian biconditionals. Jump rules which "determine the assignments of standard values, which are based on previous failures", then, are what distinguishes active-value-gaps from black-hole-gaps: even though paradoxical sentences cannot successfully make (direct ir indirect) assertions about their own semantic values (gaps being equivalent to "recognised failures" of such attempts), their semantic value can be expressed (or even the fact that they are gappy and hence do not make successful assertions about their semantic values) by means of another, non-self-reflexive sentence synonymous with the original paradoxical sentence. Being an "active value" entails that the assignment of gap can became a basis for assigning "standard" values (in the case of bivalent semantics, truth and falsity) to semantic assertions about paradoxical sentences. As an example, Gaifman uses the so-called "two-line puzzle":

line 1 The sentence on line 1 is not true.

line 2 The sentence on line 1 is not true.

The sentence on line 1 could not be evaluated in standard terms, since in that case they would have to be both true and false, which is incompatible with the principle of bivalence; therefore, it is assigned GAP.[i] Based on

i The respective rule has the following form by Gaifman: "*if, in the course of applying the evaluation procedure, a closed unevaluated loop forms and none of its members can be assigned a standard value by any of the rules, then all of its members are assigned GAP in a single evaluation step*" (Gaifman, H., "Pointers to Truth", op. cit., p. 230). In

this assignment, The sentence on line 2 would be assigned the value FALSE, based upon some form of jump rules.[i] The whole approach to semantic valuation of sentences is functionally equivalent to Swyneshed's standard solution. In fact, if the concept of gap used in the last sophism were actually the active-value concept, the result would be a more coherent position than Swyheshed's standard approach, which (without any justification) draws a distinction between two groups of paradoxical sentences, i.e., the false ones and the gappy ones. Swyneshed's approaches towards these two groups in his standard theory are internally coherent and even mutually consistent, but probably mutually incoherent: the difference in approach towards otherwise analogical failures of standard semantic valuation seems *ad hoc*.[ii]

The Kripkean approach[iii] reconstructed in the same terms would consist simply in denying the existence of jump rules.[iv] As a consequence, no paradoxical sentence or semantic assertion about paradoxical sentence

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Swyneshedian semantics, the equivalent to this so-called "closed loop rule" can be formulated in terms of self-falsification.

i The respective rule has the following form by Gaifman: "*Assume that q points either to* Tr(p) *or to* Fa(p), *and that* p, *but not* q, *has already been assigned GAP. Then the jump rules (for* Tr *and for* Fa*) assign* q *the value F.*" (Gaifman, H., "Pointers to Truth", op. cit., p. 231. In Swyneshedian semantics, the equivalent to this jump rules can be formulated simply in terms of the definition of truth and the lack of self-falsification.

ii The reason for this incoherence is probably the desire to remain faithful to Aristotle's treatment of self-referential sentences which Swynshed displays in his treatise, cf. Swyneshed, R., *Insolubilia*, op. cit., pp. 190–194. But such an attempt is hardly a valid theoretical reason for the distinction between the solutions to alethic and correspondence paradoxes.

iii Cf. Kripke, S., "Outline of a Theory of Truth", *The Journal of Philosophy* 72, 1975, pp. 690–716.

iv To be more exact, the Kripkean approach is *effectively equivalent* to the Gaifmanian approach stripped of jump rules. From the conceptual point of view, the definition of truth in Kripke's theory in terms of the so-called "minimal fixed points" uses different framework, but we shall refrain from discussing that here.

can be assigned other value than gap (hence: gaps are "black holes"). The problem with this solution is that making true assertions about paradoxical sentences synonymous with them is not possible, which implies serious restrictions of the expressive force of the language in question.[i] In other words: the Kripkean approach would be able to perform a viable truth-assignment which would escape paradoxes but the outcome of this procedure would not be expressible within the same language; it admits of assigning gap to a sentence but not of successfully saying that the sentence in question is gappy.

The most serious (and most common) objection to gappist solutions to paradoxes are the so-called "revenge arguments". In the most elementary form, where gap is assigned to the Simple Liar sentence, the revenge argument can be formulated as follows: let us assume that there is a sentence "*This sentence is not true*". "*Not being true*" would then be equivalent to "*being false or gappy*". If the sentence in question is true then it is not the case as it says to be the case, and hence it is not true. And if it is not true (for instance, if it is gappy equally as Simple Liar sentences) then it is the case as it says to be the case and hence it is true.[ii] Therefore, if introducing the third semantic value is the only change in

i To be more exact, it is something one might designate as "assertive force" conceived as the ability of a language to *successfully* assert certain facts rather than the expressive force itself which is restricted, since one could still assume that Liar sentences and semantic assertions about them are well-formed or meaningful. Also, one should note that despite its sensitivity to the linguistic context of evaluated expressions, Kripkean semantics is effectively type-based, at least in the sense that sentences of the same type are assigned identical semantic values.

ii One version of the revenge argument occurs already in Bradwardine's treatise, cf. Bradwardine, T., *Insolubilia*, op. cit., pp. 295–296. For a generalisation of this argument, cf. Beal, J. C., "Prolegomenon to Future Revenge", in: Beal, J. C. (ed.), *Revenge of the Liar. New Essays on the Paradox*, Oxford 2007, pp. 1–30.

the language which generated the original Liar paradox, paradoxical reasoning can be reconstructed by means of this so-called "Strengthened Liar". However, no such argument can be formulated against either the Gaifmanian or the Kripkean solution to paradoxes. The self-reflexive sentence "*This sentence is not true*" would, indeed, not be true on these accounts, but this fact would not make it true, since truth is defined in terms of valuation-algorithms including gap rules which ensure that every paradoxical sentence is gappy regardless of the respective state of affairs. The only difference would be that on the Gaifmanian approach one could successfully express this fact, which would not be possible on the Kripkean approach. Even if both approaches were equally effective and hence ascribing either of them to Swyneshed equally charitable, the Gaifmanian analysis would be the more probable choice for Swyneshed, since it is the one more coherent with his standard solution.[i]

Unlike different versions of gappist theories and hence unlike the first approach in Swyneshed's last sophism, Heytesburian solutions to semantic paradoxes, such as the one proposed as the second approach in Swyneshed's last sophism, are based on regarding genuinely paradoxical situation as not acceptable due to their inconsistency. As a consequence, this approach restricts the set of admissible linguistic conditions of possible situations; since a semantic theory cannot force any restrictions on its extra-linguistic conditions, restricting language is the only option available. This step makes Heytesburian solutions to paradoxes equivalent to the early-medieval nullification-solution to semantic

i For instance: two tokens of the same sentence-type can be assigned different semantic values in Swyneshed's semantics if one of them is paradoxical, cf. Swyneshed, R., *Insolubilia*, op. cit., p. 189.

paradoxes which is based upon denying paradoxical sentences the status of truth-bearers,[i] or with restrictionist banishment of self-reference in the case of paradoxical sentences;[ii] either way, the restrictions of the expressive force of language are only applied to paradoxical expressions and their ability to successfully express their own falsity, other situations including self-referential expressions being regarded as legitimate. As opposed to Spade's criticism of Heytesbury's position for its incompatibility with the conventional character of language,[iii] it would be probably more accurate to say that Heytesburian solutions leave certain semantic and grammatical questions unattained, most importantly, what particular aspect of the assertion-act actually fails in the attempt of Liar sentences to assert their own falsity. One could, for instance, ask whether Liar sentences are entirely meaningless, and hence neither true nor false, or whether the range of significance of their predicates is restricted, which could make them either true or false.[iv] Leaving these questions open renders the solution ultimately incomplete from the general-semantic point of view, legitimate as it may be in the relatively narrow context of obligations-theory.

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i Cf. De Rijk, L. M., "Some Notes on the Mediaeval Tract *De insolubilibus*, with the Edition of a Tract Dating from the End of the Twelfth Century", *Vivarium* 4, 1966, pp. 83–115.

ii Cf. Panaccio, C., "Restrictionism: a Medieval Approach Revisited", in: S. Rahman – T. Tulenheimo – E. Genot (eds.), *Unity, Truth and the Liar*: *The Modern Relevance of Medieval Solutions to the Liar Paradox*, Berlin 2008, pp. 229–253.

iii Cf. Heytesbury, W., *On "Insoluble" Sentences: Chapter One of His Rules for Solving Sophisms*, op. cit., p. 93.

iv In scholastic logic, this would be a difference between *cassantes* and *restringentes*, in modern logic between (e.g.) illocutionary-logic solutions and Russellian solution, cf. Vanderveken, D., "Illocutionary Logic and Self-Defeating Speech Acts", in: J. R. Searle – *F. Kiefer – M. Bierwisch* (eds.), *Speech-Act Theory and Pragmatics*, Dordrecht 1980, pp. 247*–272*, and Russell B., "Mathematical Logic as Based on the Theory of Types", *American Journal of Mathematics* 30, 1908, pp. 222–262.

4. Conclusions

Swyneshed's last sophism presents two different solutions to the Simple Liar paradox; one is based on truth-value gappism, the other on denying the (obligational) admissibility of paradoxical situations. Its content raises the question of authenticity for several reasons. First, some editions of Swyneshed's *Insolubilia* do not include it, but there is still a majority of text-versions which do; hence this objection taken separately is not very serious. Second, there are minor terminological variations as compared to the rest of the treatise, but not any fundamental ones; therefore this objection is not very serious either. Third, the first attempt to solve the sophism endorses an alternative approach to truth-assignment; even though it would make the whole treatise more coherent (at least on one interpretation), this step seems hard to explain. Fourth, the second attempt to solve the sophism suggests that genuinely paradoxical situations should be denied, which implies a fundamentally different approach towards semantic paradoxes. Finally, the preceding two arguments conjointly entail another argument against the authenticity of the last sophism: nowhere else in his treatise is Swyneshed so open to theoretical pluralism that he would present two incompatible theoretical alternatives as equally admissible. Even though the last sophism occurs in the majority of manuscripts used for Spade's working edition and of currently known early-print editions of Swyneshed's *Insolubilia*, its occurrence is surprising. On the other hand, accepting it as a genuine Swyneshed's passage results in an even more interesting picture of the author who is even without it an exceptional medieval scholastic logician.

To sum up, if what was called "the last sophism of Roger Swyneshed" is an authentic Swyneshed's work, he can be interpreted as an author who, despite his adherence to one particular version of contextualist approach to truth, also took alternative solutions into serious consideration. Namely, he formulated a consistently gappist approach to semantic paradoxes; as a result, the whole of Swyneshed's propositional semantics could only be using one pair of semantic predicates, as opposed to his standard position which introduces two pairs of semantic predicates which denote truth and correspondence with reality, for which different rules hold. This step would not only secure the coherence of Swyneshed's approach to different paradoxes (and thus conform to "the principle of uniform solution" proposed by Graham Priest: same kind of paradox, same kind of solution)[i] but also simplify the set of contextually sensitive evaluation algorithms and increase practical applicability of the theory in question. Furthermore, to put the point in a bit paradoxical way, not Heytesbury but Swyneshed would be the originator of the Heytesburian tradition. But even if the last sophism is actually inauthentic, it does contain the theories just mentioned, i.e., a consistently gappist treatment of semantic paradoxes and a Heytesburian solution. The only question would then be, who to ascribe this position (and its insertion to the corpus of Swyneshed's texts) to. Assuming that it would be possible to prove that it originated before 1335, the need for rethinking the history of the Heytesburian tradition would last. One way or another, the existence of the last sophism occurring in Swyneshed's *Insolubilia* sheds interesting light on the whole treatise and should stimulate further research.

i Cf. Priest, G., "The Structure of the Paradoxes of Self-Reference", *Mind, New Series* 103, 1994, pp. 25–34, p. 32.

Appendix 1 *Libellus sophistarum ad usum Oxoniensis*

Simile est si ponatur quod tantum ista propositio sit "*Falsum est*" et quod ista principaliter significat quod falsum est. Et quaelibet propositio quae significat sicut est sit vera et quaelibet significans aliter quam est sit falsa. Deinde proponatur "*Falsum est*". Si concedatur vel dubitetur, contra: falsum est; et omnis propositio est ista "*Falsum est*"; ergo ista est falsa. Tunc sic: ista est falsa, ergo significat aliter quam est. Et ultra: ergo, non est ita sicut illa significat principaliter; et solum significat quod falsum est; ergo non est ita quod falsum est. Et ultra: ergo, nullum falsum est. Et sic ex ista cum casu sequitur suum oppositum. Si negetur quod falsum est, contra: ista propositio est; et non est vera et significat sicut est vel aliter quam est; ergo est falsa. Et ultra: ergo, falsum est.

Responsio: admittatur casus et negetur quod falsum est. Et tamen concedatur quod ista propositio est et illa non est vera. Et negetur quod illa significat sicut est vel aliter quam est eo quod est pertinens ad inferendum seipsam non significare sicut est. Nam sequitur: falsum est; et omnis propositio est ista; ergo ista est falsa. Et ultra: ergo, significat aliter quam est. Et ultra: ergo, illa non significat sicut est. Et per consequens ista nec significat sicut est nec aliter quam est. Sed si ponatur ille casus quod illa propositio sit "*Falsum est*" et nulla alia et quod principaliter significat quod falsum est et quod omnis propositio significat sicut est vel aliter quam est et quod omnis propositio significans sicut est sit vera et omnis propositio significans aliter quam est sit falsa, tunc iste casus non est admittendus eo quod includit contradictionem. Et similiter eadem

propositio est vera et falsa propter illud principale significatum, quod non est possibile.[i] Vel melior negatur casus prior, quia partes repugnant, si bene inspiciantur.

Appendix 2 Theodoric Rood's 1483 *Logica*

Sextum sophisma prope simile. Si ponatur quod tantum ista propositio sit "*Falsum est*" (sic principaliter significans) et quod quaelibet propositio quae significat sicut est est vera et quaelibet significans aliter quam est est falsa. Admisso casu proponitur quod falsum est. Si concedatur vel dubitetur, tunc sic: falsum est; et omnis propositio est ista propositio; ergo ista est falsa. Et ultra: sequitur istam significare aliter quam est. Et ultra: ergo, non est ita sicut ista significat; et ista solum significat quod falsum est; ergo non est ita quod falsum non est. Et ultra: ergo, nullum falsum est. Et sic ex isto casu sequitur suum contradictorium. Si negatur quod falsum est, contra: ista propositio est; et non est vera et significat sicut est vel aliter quam est; ergo est falsa. Et ultra: ergo, falsum[ii] est.

Solutio: admittatur casus et negatur quod falsum est. Et tamen conceditur quod ista propositio est, videlicet "*Falsum est*". Et eciam quod ista non est vera. Et negatur quod ista significat sicut est vel aliter quam est (est

i Anonymous, *Libellus sophistarum ad vsum Cantabrigiensis*. London 1510 (STC 15576), has "*impossibile*", which is not compatible with what the argument aims at.
ii Anonymous, *Logica "[Q]uoniam ex terminis"*, op. cit., has "*falsam*", which is a typographical error.

enim pertinens medium ad inferendum seipsam non significare sicut est). Sequitur enim: falsum est; et ista propositio est omnis propositio; ergo ista est falsa. Et ultra: ergo, significat aliter quam est. Et ultra: ergo, non significat sicut est; et per consequens non significat sicut est nec aliter quam est. Si autem ponatur casus sic quod ista propositio "*Falsum est*" sit omnis propositio et quod ista principaliter significat quod falsum est et omnis propositio significans sicut est est vera et omnis propositio significans aliter quam est est falsa et quod omnis propositio significet sicut est vel aliter quam est, tunc non est admittendus. Includit enim eandem propositionem esse veram et falsam, quod est impossibile.