**Roger Swyneshed's *Obligationes*: a logical game of inference recognition?**

## 0. Introduction

In (Dutilh Novaes forthcoming), I proposed a reconstruction of Walter Burley's theory of *obligationes*, based on the idea that, according to Burley's theory, *obligationes* were logical games of consistency maintenance. As a natural continuation of the analysis presented in that paper, I now intend to test the game hypothesis on another important theory of *obligationes*, namely Roger Swyneshed's theory. Burley wrote his *obligationes* treatise roughly at the beginning of the 14th century, and enjoyed unanimous popularity for a certain time. Roger Swyneshed's treatise on *obligationes* seems to have been written some 30 years later, and is clearly a reaction to Burley's theory, proposing many revisions and changes to the rules governing obligational disputations. These two theories, Burley's and Swyneshed's, were described by Robert Fland respectively as *antiqua responsio* and *nova responsio*.[i] Therefore, any serious attempt to understand the obligational genre should approach at least these two theories.

A historical and conceptual introduction to the *obligationes* would be superfluous at this point, since I have already done it in the previous text. However, in that text, I have not confronted directly the 'strongest concurrent' to my hypothesis (in terms of modern interpretational hypotheses of medieval *obligationes*), namely P.V. Spade's counterfactual hypothesis. I deem it important to fill up this gap, so part 1 of the present text will be an attempt to disprove the counterfactual hypothesis. Part 2 will present the symbolic reconstruction of Swyneshed's theory; part 3 will explore some of its properties, in particular by drawing comparisons with Burley's theory, and part 4 and 5 will offer conclusive remarks.

The present reconstruction will show that Swyneshed's *obligationes* are by no means games of **consistency maintenance**, since the application of the rules simply does not safeguard consistency. Swyneshed's *obligationes* can at most be considered to be games of **inference recognition**, but even this claim must be specified: Swyneshed's goal seemed to be to exclude all dynamic features of Burley's theory, but thereby he ended up excluding its most interesting game-theoretical aspects as well. If Swyneshed's *obligationes* are games at all, they are not exactly of the interesting kind.

## 1. Arguments against the counterfactual hypothesis

The first attempt of a (modern) philosophical interpretation of the medieval theories of *obligationes* was put forward by P.V. Spade in his 1982 article 'Three theories of *obligationes*: Burley, Kilvington and Swyneshed on counterfactual reasoning'. As the title indicates, Spade proposed that *obligationes* be viewed as some sort of logic of counterfactuals. Since then, this interpretation has been challenged by a number of scholars, but their arguments did not seem to provoke a general agreement that the counterfactual hypothesis should be discarded. In what follows I will try once more to present arguments against the counterfactual hypothesis.

Spade says himself that the hypothesis works better for Walter Burley's version of *obligationes* than for Swyneshed's version, so I will turn to Burley's theory first. My starting point is that Burley's version of *obligationes* is best described as a logical game of consistency maintenance; I will argue that most of the aspects of *obligationes* that Spade claims can be accounted for by the counterfactual hypothesis are better accounted for by the consistency game hypothesis.

Perhaps the best argument against the counterfactual hypothesis is one put forward by Christopher Martin (Martin 1993): if counterfactuals at all, what Burley's theory of *obligationes* defines are not **would**-counterfactuals, but rather **might**-counterfactuals. When Respondent has to accept or deny a proposition with respect to the previously accepted or denied propositions, if the proposition is relevant – that is, if the proposition itself or its contradictory follows from the previously accepted or denied propositions – then we do have some sort of would-counterfactual: if all the hypotheses were true, then the proposition proposed or its contradictory would have to be true as well, since it follows logically from the premises. But when the proposition is irrelevant – that is, if it is not relevant -, then both the proposition itself and its contradictory **might** be true in a counterfactual situation where all premises are true. Well, counterfactual reasoning in general is not meant to explore a situation in which both a proposition and its contradictory could be the case, since the aim of a theory of counterfactuals in general is to exclude one of the two possibilities. This indeterminancy of Burley's theory with respect to irrelevant proposition does not fit well with the counterfactual hypothesis, indicating that either Burley's theory is a problematic theory of counterfactuals (which Spade is willing to grant), or that it is not a theory of counterfactuals at all.[ii]

One of Spade's arguments in favor of the counterfactual hypothesis is that the procedure defined by Burley's theory of *obligationes* progressively constructs the possible world that is as similar as possible to the actual world, except for the (false) *positum* and its consequences. But, in fact, a false *positum* does not always define **one** class of possible worlds or models that is subsequently narrowed by the responses to irrelevant propositions; sometimes, branching - mutually exclusive - classes of models are defined by a false *positum*. Which one of these classes contains the possible world that is most similar to the actual world? The *obligationes* theory falls short in providing decisive procedures for this issue. Moreover, the choice of the possible world as close as possible to the actual world seems to involve metaphysical discussions which are out of the scope of obligational disputations properly speaking. (Both points will be clarified by the example that follows.)

Take the following example, from Ralph Strode's treatise on *obligationes* (Cf. Ashworth 1993, Ashworth 1996, 349): the *positum* is 'Every man is running'. It is accepted as a *positum*, since it is possible. Before the game proceeds, two branching classes of possible worlds correspond to the *positum* being accepted, with respect to Respondent (who is a man and is not running): the class of possible worlds in which he is a man and is running, and the class of possible worlds in which he is not running and thus is not a man. Which one of these classes is closer to the actual world? One may argue that the possible worlds in which Respondent is a man are closer to the actual world than the ones in which he is not a man; but this argument does not follow from the rules of *obligationes*, rather it seems to rely on some sort of essentialist contention that the property of being a man is more essential to Respondent than the property of running at time *t*. But the rules of *obligationes* themselves are no support for this argument.

In practice, what happens is that the choice of the class of possible worlds (or models) with which the disputation will go on is made on the basis of purely contingent facts, namely the order in which Opponent will propose propositions. If he first proposes 'You are running', since Respondent has not granted that he is a man, 'You are running' is an irrelevant, false proposition, which is thus denied. In this case, it is the class of models in which Respondent is not running and is not a man that is 'chosen'. Hence, if Opponent then proposes 'You are a man', Respondent will have to deny it, since its contradictory follows from the previously accepted propositions. However, if Opponent, as a matter of pure contingency (i.e., not prompted by the rules of *obligationes*), proposes 'You are a man' first, then Respondent will accept it as a true, irrelevant proposition, and thus the disputation will go on with the other class of models, in which Respondent is a man and is running.

In sum, the rules of *obligationes* do not provide elements for the determination of **the** possible world that is most similar to the actual world (given the false *positum*), and not even of the **class** of possible worlds that are as similar as possible to the actual world. Given that Opponent can choose in which order he proposes propositions, the classes of models defined by the disputation are entirely depended on this order, reflecting thus the great importance of the dynamic character of *obligationes* under Burley's version.

However, if *obligationes* are viewed as games of consistency maintenance, the ‘branching phenomenon’ just described is entirely unproblematic; if the aim is to keep consistency, then either class of models will do. By means of the order in which Opponent proposes propositions, he forces Respondent to adopt this or that class of models; if Opponent wants to win, it is likely that he will force Respondent to adopt the least straightforward, most counterintuitive class of models, and these models will be most likely as remote from the actual world as possible, given the rules of the game. So, in terms of the example above, it seems more likely that Opponent will propose ‘You are running’ first, to force Respondent to admit that he is not a man. The acceptance of this proposition will probably provoke more ‘revisions’ in the model corresponding to the actual world than just accepting that he, the Respondent, is not running.

I now turn to the arguments put forward by Spade to support his counterfactual hypothesis. Under the light of what has been said so far, it seems that they are not as strong as Spade would like them to be.

Argument 1: Spade claims that the rules of *obligationes* clearly provide a procedure to determine what would ‘happen’ if the *positum* were true. Again, as argued, the rules of *obligationes* only define what **might** happen if the *positum* were true, so what is at stake here is primarily the notion of consistency, or ‘cotenability’ (in C. Martin’s terms).

Argument 2: the counterfactual hypothesis ‘provides an explanation for the otherwise apparently pointless treatment of ‘irrelevant’ sentences’ (p.12). Spade contends that the role of the rules for irrelevant propositions is to generate a possible world as similar as possible to the actual world. As we have seen, the rules for irrelevant propositions are not enough to determine **the** possible world most similar to the actual world, given the order-dependence and the so-called 'branching phenomenon'. Moreover, according to the game hypothesis, the role of irrelevant propositions is to make the game 'harder', as I have argued elsewhere, and to exclude 'lazy' strategies. So I claim that the game hypothesis gives a better account of the role of irrelevant propositions than the counterfactual hypothesis.

Argument 3: the choice of false or 'impossible' propositions as *posita* is meant to mirror counterfactual reasoning, which consists of defining what reality would be like if some punctual element of reality were different. Again, the game hypothesis also 'provides a rationale' to this aspect of *obligationes*: if the *positum* were a true proposition, then, to keep consistency, it would be enough to simply respond to propositions in terms of how things actually are, since the actual world would simply be the (consistent) underlying model. In this case the whole activity would be pointless, on the account of being too easy. Thus, the counterfactual hypothesis is not the only way to account for the choice for false or impossible *posita*, even though it is not implausible.

Argument 4: 'obligational disputations have many of the characteristic properties of counterfactuals.' (p. 12). Spade sees the relation between a *positum* and any conceded proposition (or the contradictory of any denied proposition) in a given disputation as some sort of 'inference', and he argues that such 'inferences' follow patterns similar to counterfactual inferences, in particular with respect to the failure of strengthening, transitivity and contraposition. But, to see those similarities, one must adopt as a starting point that there is such a thing as 'obligational inferences'; now, I have already argued that the only restriction for granting a proposition B is that it must be **compossible** (consistent) with a *positum* A. If the relation between a *positum* and the conceded/denied propositions is some kind of inference, then Spade must accept that, in the case of irrelevant propositions, both A□→ B and A□→ ~B are valid, which seems very awkward. But most importantly, by assuming that these are inferential relations, Spade is already somehow assuming the point he wants to prove.

Argument 5: 'the counterfactual interpretation of *obligationes* [...] yields a plausible account of the transition from Burley's theory to Klivington's, and from Klivington's to Swyneshed's.' (p. 13). Spade argues that Burley's theory is a theory of counterfactuals **with problems**, and these are most of all related to the fact that, in different disputations, one might assert that B counterfactually follows from a *positum* A and, in a different disputation, that ~B counterfactually follows from the same *positum* A. This is no surprise, since we saw that, in the case of irrelevant propositions, it is possible to accept both B and, in a different disputation, ~B from the same *positum* A (*obligationes* being thus at most a case of might-counterfactuals). Hence, the so-called problems of Burley's theory seem to stem rather from Spade's interpretation.

Spade goes on to say that, since Burley's theory had problems, it was to be expected that it had to be revised, and Klivington's and Swyneshed's theories would be such a revision.

I will not approach Klivington's 'theory', since it is disputable whether it was a full-fledged theory of *obligationes* at all (he made only scarce remarks on *obligationes* in his 47th *sophisma*), and it raises a series of interpretational problems. But turning to Swyneshed's theory, it seems clear that his main objection to Burley's theory (even though he never says it explicitly) is the extreme sensitivity to the order of proposed propositions for the response they should receive, and the fact that, in two disputations with the same *positum*, it could very well happen that a given proposition would receive different responses, since the responses depend on the responses to previous propositions as well. These aspects will be discussed in more detail in what follows, but for now what matters is that Swyneshed's main goal is most likely to abolish the dynamic character of Burley's *obligationes*. So Spade's claim that the revision proposed by Swyneshed was motivated by the fact that Burley's theory was a problematic theory of counterfactuals seems far-fetched. It is clear that Swyneshed thought that Burley's theory was problematic, but nothing seems to indicate that he found it problematic **insofar as** it was a bad theory of counterfactuals. Swyneshed himself does not motivate the changes he introduces to the theory of *obligationes*, and commentators usually turn to Klivington's *sophisma* 47 to retrieve what his motivations could have been. It seems that the two main problems of Burley's theory according to Klivington are: any falsehood compossible with the *positum* can be 'proved' in Burley's theory, and, according to the rules defined by Burley, the same proposition could receive different answers in two different disputations with the same *positum* or in the same disputation, if proposed at different moments (Spade 1982).

If these were indeed Swyneshed's motivations to revise the *antiqua responsio*, then his revision of the notion of pertinent/impertinent propositions hit the right spot of Burley's theory, but none of this seems to have any relation to *obligationes* being a logic of counterfactuals.

Spade's hypothesis becomes even more endangered when one analyzes the outcome of the revision proposed by Swyneshed; if Swyneshed meant his theory to be a better theory of counterfactuals than Burley's, then he failed miserably, since his theory is an even **worse** theory of counterfactuals than Burley's. By excluding the dynamic elements of Burley's theory, Swyneshed ended up with a theory which is committed to an even stronger form of inconsistency: in Swyneshed's theory, the set formed by the propositions accepted during the disputation and the contradictories of those denied during the same disputation is very likely to be **inconsistent**. Spade is aware of this fact, which leads him to conclude: 'Swyneshed's theory is by no means an attractive account of counterfactuals.' (p.30). So it seems that the counterfactual hypothesis does not yield a plausible account of the transitions from one *obligationes* theory to the other, as Spade claims, since each proposed revision of *obligationes* is worse a theory of counterfactuals than its predecessor.

Nevertheless, in all fairness, it must be said that the game hypothesis does not provide a good account of the transitions between the theories either. From a game-theoretical point of view, Burley's theory is by far the most interesting. Attempting to suppress the dynamic character of Burley's *obligationes*, Klivington and Swyneshed seem to have produced a much less interesting theory of *obligationes* with respect to whichever goals these disputations were supposed to accomplish, and this would explain why Burley's theory remained dominant even after the alternative theories had been proposed.

## 2. Reconstruction

The reconstruction of Swyneshed's theory proposed here follows roughly the same lines of the reconstruction of Burley's theory in (Dutilh Novaes forthcoming), to facilitate the comparison. Moreover, as much as for Burley, I will focus on Swyneshed's treatment of *positio*, disregarding thus *impositio* and *depositio* (the other kinds of obligational disputation treated by Swyneshed).

In Swyneshed's version, an obligation is the quadruple

$$\boldsymbol{Ob} = \langle \boldsymbol{\Sigma_n}, \boldsymbol{\Phi}, \mathbf{I_n}, \mathbf{R}(\varphi_n) \rangle$$

**Σ** is an ordered set of states of knowledge $S_n$. This is the first significant difference with respect to Burley's theory. In the latter, all irrelevant[iii] propositions were supposed to be answered to according to the static state of common knowledge $K_C$.[iv] Changes in things were not supposed to affect the response to (irrelevant) propositions, all the more since, once proposed and accepted or denied, these were included in the 'informational base' of the disputation. So, in Burley's theory, if, at a certain point, it is proposed to Respondent 'You are seated', and Respondent is indeed seated, then he should accept the proposition. Subsequently, if Respondent stands up, and Opponent proposes 'You are not seated', Respondent should deny it, since it contradicts the set of previously accepted/denied propositions, and this logical relation has priority over reality.

In Swyneshed's theory, since irrelevant accepted or denied propositions are not included in the informational base of the disputation, as we shall see, it is not required that the state of knowledge be static. So the response to irrelevant propositions, according to Swyneshed's theory, should take into account the changes in reality during the time of the disputation; therefore, what we have is a series of states of knowledge $S_n$, ordered according to their index *n*, which denotes a natural number and corresponds to the stage of the disputation in which the state of common knowledge must come into play.[v]

**Φ** is an ordered set of propositions $\varphi_n$. These are the propositions proposed during the disputation; their index *n* denotes a natural number and corresponds to the place they occupy in the order in which the propositions are proposed. (No difference with respect to Burley's theory.)

$\mathbf{I_n}$ is an ordered set of responses $\iota_n = [\varphi_n; \gamma]$. Responses are ordered pairs of propositions and one of the replies 1, 0 or ?, corresponding to Respondent's response to proposition $\varphi_n$. Note that the index of the response needs not be the same as the index of the proposition, in the case that the same proposition is proposed twice, in different moments of the disputation.

In my reconstruction of Burley's theory, responses were not primitive constituents of the game, and were introduced only to account for the 'point system' of the second, non-deterministic interpretation of Burley's theory. But to express some of the interesting properties of Swyneshed's theory, the notion of responses is required.

**R($\varphi_n$)** is a function from propositions to the values 1, 0, and ?. This function corresponds to the rules that Respondent must apply to respond to each proposition $\varphi_n$. 1 corresponds to his accepting $\varphi_n$, 0 to his denying $\varphi_n$ and ? to his doubting $\varphi_n$. This definition is identical to the definition of **R($\varphi_n$)** in the reconstruction of Burley's theory, but the **function** corresponding to the rules of Swyneshed's theory is **different** from the function of Burley's theory, since the rules are different.

The **procedural rules** of the game are quite simple, and identical to the procedural rules in Burley's theory. Opponent first puts forward a proposition. If Respondent accepts it (according to **R($\varphi_0$)** defined below), then the game begins.[vi] Then Opponent puts forward a further proposition, Respondent responds to it according to **R($\varphi_n$)**, and this procedure is repeated until the end of the game.[vii]

**Logical Rules**

***Positum***. Swyneshed's analysis of the requirements for a proposition to be accepted as *positum* is less extensive than Burley's. Burley clearly says that the *positum* mustn't be inconsistent, since an inconsistent *positum* gives no chance of success for Respondent.

Swyneshed does not follow the same line of argumentation; rather, he requires that a proposition be contingent to be a *positum*, which he phrases in the following way:

> It must be known that every proposition which, out of the time of the obligation, must receive different answers because of changes in things, and for no other reason, is thus to be obliged [accepted as *positum*].[viii]

That is, Swyneshed requires of a proposition that it be sometimes known to be true, sometimes know to be false, and sometimes not known to be true and not known to be false, for it to be accepted as a *positum*, a situation which would prompt a variation in the answers it would receive were it to be proposed out of the time of an obligation. This excludes impossible propositions – always false - and necessary propositions – always true -, and that is a necessary move in view of the *ex impossible sequitur quodlibet* rule: since Swyneshed's rules of *obligationes* are meant to test Respondent's abilities to recognize inferential relations, an impossible *positum* would make the game trivial (any proposition would follow).[ix]

So the rule for accepting the *positum* could be formulated as:[x]

**$R(\varphi_0) = 0$** iff, for all moments *n* and *m*, and for one reply $\gamma$, $\iota_n = [\varphi_0; \gamma]$ and $\iota_m = [\varphi_0; \gamma]$.

**$R(\varphi_0) = 1$** iff, for some moments *n* and *m*, for two replies $\gamma$ and $\kappa$, $\gamma \neq \kappa$, $\iota_n = [\varphi_0; \gamma]$ and $\iota_m = [\varphi_0; \kappa]$

Moreover, Swyneshed also gives instructions as to how to respond to the *positum* if it is **posited again** during the disputation (§§ 62-64). A *positum* which is re-proposed must be accepted, except in the cases of a *positum* which is inconsistent with the very act of positing, admitting and responding in an obligational context. The paradigmatic example is 'Nothing is posited to you': it should be accepted as a *positum*, according to the rules above, but if it is again proposed during the same disputation, it should be responded to as if it were an irrelevant proposition. In this case, it would be denied, even though it had been accepted as *positum*.

In effect, from the start, the set of all propositions (not only those put forward during the disputation, which constitute **Φ**) is divided in two sub-sets, namely the set of propositions that are **pertinent** with respect to the *positum* $\varphi_0$[xi] – denoted $\Delta_{\varphi 0}$ - and the set of those that are **impertinent** with respect to the *positum* $\varphi_0$[xii] – denoted $\Pi_{\varphi 0}$. The sets are defined as follows:

$$\Delta_{\varphi 0} = \{ \varphi_n \varepsilon \Delta_{\varphi 0} : \varphi_0 \vdash \varphi_n \text{ or } \varphi_0 \vdash \neg\varphi_n \}$$

$$\Pi_{\varphi 0} = \{ \varphi_n \varepsilon \Pi_{\varphi 0} : \varphi_0 \nvdash \varphi_n \text{ and } \varphi_0 \nvdash \neg\varphi_n \}$$

Assuming that any proposition implies itself, the *positum* $\varphi_0$ belongs to $\Delta_{\varphi 0}$.[xiii] E. Stump (Stump 1981, 167) mentions the possibility of allowing for a second *positum* at any given moment of the disputation. In this case, obviously the two sets defined above must be revised, and the set of pertinent propositions is defined by the conjunction of the two (or more) *posita*.

***Proposita***. The rules for responding to the proposed propositions other than the *positum* are better formulated in two steps, first for the pertinent, then for the impertinent propositions, since this division is in fact the decisive aspect of the game in Swyneshed's version.

**Pertinent propositions ($\varphi_n$ ε $\Delta_{\varphi 0}$)**[xiv]

$$\mathbf{R(\varphi_n) = 1} \text{ if } \varphi_0 \text{[xv]} \vdash \varphi_n$$

$$\mathbf{R(\varphi_n) = 0} \text{ if } \varphi_0 \vdash \neg\varphi_n$$

**Impertinent propositions ($\varphi_n$ ε $\Pi_{\varphi 0}$)**[xvi]

$$\mathbf{R(\varphi_n) = 1} \text{ if } S_n \Vdash \varphi_n$$

$$\mathbf{R(\varphi_n) = 0} \text{ if } S_n \Vdash \neg\varphi_n$$

$$\mathbf{R(\varphi_n) = ?} \text{ iff } S_n \nVdash \varphi_n \text{ and } S_n \nVdash \neg\varphi_n$$

The definition of pertinent/impertinent propositions is the aspect of most fundamental disagreement between Burley's and Swyneshed's theories.[xvii] For Burley, a pertinent proposition is one that follows from (or whose contradictory follows from) all previously granted propositions and from the contrary of all previously denied propositions. (I have already explored the dynamic impact of this definition). If the intuition that Swyneshed wanted to suppress all dynamic aspects of Burley's *obligationes* is correct, then he certainly hit bull's eye by modifying the definition of pertinent/relevant propositions. The change in $\mathbf{R(\varphi_n)}$ simply follows from this modification.

**Outcome**. The game ends when Opponent says 'Cedat tempus obligationis'. From Swyneshed's text, it seems that Opponent can say it at any time; he will say it when Respondent has made a bad move, and thus lost the game,[xviii] but he may say it when he is satisfied with the performance of Respondent, who until then has not made any bad move, and therefore has 'won' the game. However, Swyneshed does not say much about it (more on a criterion of loss below).

## 3. Characteristics of Swyneshed's game

On the basis of this reconstruction, some of the most relevant aspects of Swyneshed's version of the obligational game can be explored.

### 3.1 The game is fully determined.

Only one answer to each proposition is correct at a given point. In this aspect, Swyneshed's *obligationes* resemble Burley's *obligationes* under the first interpretation (in Dutilh Novaes forthcoming), that is, the interpretation according to which Respondent has no space for maneuver and must answer according to $\mathbf{R}(\varphi_n)$. That this is the case is seen from the fact that $\mathbf{R}(\varphi_n)$ really is a function, assigning exactly one value to each argument of its domain (the class of propositions). Swyneshed's rules divide the class of propositions in two sets and in five sub-sets: pertinent propositions – 1. repugnant to or 2. following from the *positum* – and impertinent propositions – 3. which are known to be true; 4. which are known to be false; 5. which are not known to be true and are not known to be false. These five subsets exhaust the class of propositions, and for each of them there is a defined correct answer. The same occurs in Burley's theory under the first interpretation, with the difference that these five subsets are relative to each moment of the disputation.

However, Burley's theory seems to give rise to an alternative interpretation, in which Respondent has some choice. If maintaining consistency is the ultimate goal of Burley's game, then irrelevant propositions can be either accepted or denied, and there is always the possibility of using the option *dubio*. I have expressed this flexibility in terms of a 'point system' in the previous paper. In contrast, in Swyneshed's treatise there is no mention at all of flexibility of moves. At each stage of the disputation, Respondent's moves are totally determined by the rules of the game.

### 3.2 The game is not dynamic

The response to a proposition is entirely independent of the order in which it occurs during the disputation. As said above, this was one of the main goals of Swyneshed's revision of Burley's theory, which he accomplished by modifying the notion of pertinent/impertinent proposition. That is, for any proposition $\varphi_n$, at any round *n* of the disputation, the reply to $\varphi_n$ is always the same $\gamma$, where $\gamma$ is either 1, 0 or ?:

$$\iota_n = [\varphi_n; \gamma]$$

In particular, given two rounds *n* and *m* of the game, we must have

$$\iota_n = [\varphi_n; \gamma] \text{ and } \iota_m = [\varphi_n; \gamma]$$

Indeed, the great difference with respect to Burley's theory is that, in Swyneshed's version, the game is totally determined once the *positum* has been posited, from the start, and not only at each move. All Respondent has to do is to correctly determine the two sets of pertinent and impertinent propositions from the outset. Opponent can do nothing to interfere in Respondent's winning strategy, since it simply consists of assessing correctly the presence or absence of relations of inference between the *positum* and the proposed propositions. In this sense, Swyneshed's *obligationes* are much less of a game than Burley's; in Burley's version of the game, the moves of each participant were decisive for the choice of subsequent moves by the other participant. This does not occur in Swyneshed's version. In a way, it is as if it was a game with **one** participant (Respondent), similar to a game in which, once the *positum* has been established, Respondent simply draws cards with arbitrary propositions on them, and he must answer to these propositions according to the rules of the game (something like solitaire or similar card games).

In the previous paper, I have proved that a version of Burley's game in which impertinent propositions are all doubted, or receive no answer, is equivalent to a game in which only the *positum* determines pertinence (the aim was to show that the dynamic aspect of Burley's game was due to the role of impertinent propositions), by applications of the cut-rule. In this sense, it can be said that Swyneshed's revision of the theory letting pertinence depend only on the *positum* is a sign of awareness of the equivalence just mentioned.

Once more, the fact that the game is totally determined from the moment the *positum* is posited means that the order of presentation of the pro*posita* does not matter, and that Opponent cannot do much to make the game harder for Respondent. Moreover, it also means that, during a disputation, only one response is the right one for a given proposition, independent of when it is proposed. In Burley's game, it can happen that a proposition is first doubted (as impertinent and unknown) and then accepted or denied (it has become pertinent in the meantime, given the expansion of the informational base), that is, it is possible that, for two rounds *n* and *m*, for two replies $\gamma$ and $\kappa$,

$$\iota_n = [\varphi_n; \gamma] \text{ and } \iota_m = [\varphi_n; \kappa]$$

where $\gamma \neq \kappa$. As just said, this cannot occur in Swyneshed's game.

There is one exception to this rule: impertinent propositions whose truth-value changes during the course of the disputation. Swyneshed says that these propositions should be answered according to the state of knowledge of that moment, and therefore the response depends on the moment in which they are proposed – but not on the moment **within the disputation** in which they are proposed (their relative position with respect to other propositions). Similarly, if such propositions are proposed twice during the same disputation, they may receive different answers, as a consequence of a change in things.

Thus, let $\varphi_n$ be an impertinent proposition with respect to a *positum* $\varphi_0$ ($\varphi_n \in \Pi_{\varphi 0}$). Let $\varphi_n$ be proposed at round *n* of the disputation. Suppose that $S_n \Vdash \varphi_n$. According to $R(\varphi_n)$, the response to $\varphi_n$ at round *n* should be $\iota_n = [\varphi_n; 1]$. Then suppose that $\varphi_n$ is again proposed at round *m* of the disputation, and that $S_m \Vdash \neg\varphi_n$. According to $R(\varphi_n)$, the response to $\varphi_n$ at round *m* should be $\iota_m = [\varphi_n; 0]$. But Swyneshed does not see this as a problem to his theory, since such changes are caused by changes in things, and he seems to think that they should be included in the rules of *obligationes*.

Interestingly, this is in a way a more daring position than Burley's with respect to different responses to the same proposition. In Burley's theory, a proposition can be doubted and then subsequently denied or accepted, but it can never be so that, for two rounds *n* and *m*,

$$\iota_n = [\varphi_n; 1] \text{ and } \iota_m = [\varphi_n; 0] \text{ or}$$

$$\iota_n = [\varphi_n; 0] \text{ and } \iota_m = [\varphi_n; 1]$$

The difference is of course that, for Burley, any proposition can potentially receive different responses at different rounds of a disputation, whereas for Swyneshed this can only occur with propositions that are impertinent with respect to the *positum* and whose truth-value according to reality changes during the time of the disputation.

Thus, one criterion of loss for Respondent is if he gives two different answers to the same proposition (which is not an impertinent proposition whose truth-value changes during the disputation); since the game is determined and not dynamic, each proposition only has one correct response at **any** time during the disputation, so if a proposition receives two different responses at different times, one of these responses is necessarily incorrect, and therefore Respondent has responded badly in at least one of the two moves. In Burley's game, on the other hand, this is not a criterion of loss, even though Respondent cannot deny and then grant the same proposition (or vice-versa); but he can first correctly doubt and then deny or accept the same proposition.

3.3 Two disputations with the same *positum* will prompt the same answers, except for variations in things.

As mentioned above, the crucial element of a winning strategy for Swyneshed's game is the accurate definition of the two sets of propositions relative to a *positum*, the set of pertinent propositions and the set of impertinent ones. This can be done once the *positum* has been posed, and thus before any other proposition is proposed. Once the two sets are formed, the application of the rules of the game should follow in a straightforward way.

So, if the game is defined once the *positum* is posited, then any two disputations with the same *positum* have **the same winning strategy**, that is, the correct establishment of the same two sets of pertinent and impertinent propositions.

Two disputations with the same *positum* will not necessarily be identical, since the propositions proposed by Opponent may vary. But any given proposition proposed in both disputations will belong to the same set of propositions – either pertinent or impertinent – in both cases. Moreover, if a proposition is pertinent and is proposed in two different disputations with the same *positum*, it should obviously receive the same response in both cases, since the logical relation of following from or being repugnant to the *positum* is independent from other contextual elements of the disputation (for example, other propositions being proposed).

In the case of impertinent propositions, as to be expected, some of them may receive different responses in two disputations that do no take place simultaneously and which have the same *positum*, but that is caused by a change occurred in things. This situation is analogous to a proposition being proposed twice during the same disputation and receiving different responses because of a change in things during the time of the disputation.

Again, the disparity with Burley's theory is significant. In Burley's version of the game, the *positum* was merely one of the propositions constituting the set according to which a proposed proposition was to be evaluated as pertinent or impertinent (the others being the previously accepted/denied propositions). So in two disputations having in common only the *positum*, a given proposition proposed in each of them was most likely bound to receive different responses.

### 3.4 Responses do not follow the usual properties of the connectives.

One of the most discussed properties of the *nova responsio*, not only among medieval authors but also among modern commentator,s was the non-observance of the usual behavior of some sentential connectives, in particular the conjunction and disjunction. This was a corollary of the basic rules of the game according to the *nova responsio,* as the theorems below show, and it was thought to be one of its distinctive traits (Cf. Stump 1981, 139).

**Theorem**: "One need not grant a conjunction in virtue of having granted all its conjuncts" (Stump 1981, 138)

**Proof**: there is at least one situation in which two propositions must be granted, but not their conjunction.[xix]

Suppose that $\varphi_0$ satisfies the condition to qualify as a *positum* (i.e., it is contingent). Then pose $\varphi_0$ as *positum*. The correct response is:

$$\iota_0 = [\varphi_0; 1]$$

Suppose then that $\varphi_n$ ε $\Pi_{\varphi 0}$ and that $S_n \Vdash \varphi_n$; $\varphi_n$ is proposed; the correct response is:

$$\iota_n = [\varphi_n; 1]$$

Then propose $\varphi_{m:}$ $\varphi_0$ & $\varphi_n$. Clearly, $\varphi_m$ ε $\Pi_{\varphi 0}$, since one of the conjuncts does not follow from the *positum*. Moreover, we have that $S_m \Vdash \varphi_n$ but $S_m \Vdash \neg\varphi_0$ (no change has occurred in things with respect to $\varphi_0$ and $\varphi_n$). So $S_m \Vdash \neg (\varphi_0 \,\&\, \varphi_n)$, that is, $S_m \Vdash \neg \varphi_m$. Therefore, the correct response to $\varphi_m$ is:

$$\iota_m = [\varphi_m; 0]$$

Hence, two propositions have been accepted, but their conjunction has been denied. ■

**Theorem**: "One need not grant any disjunct of a disjunction in virtue of having granted that disjunction." (Stump 1981, 138)

**Proof**: there is at least one situation in which a disjunction must be granted, but none of the disjuncts must be granted.[xx]

Suppose that $\varphi_{0:}$ $\varphi_0$'v $\varphi_0$''satisfies the condition to qualify as a *positum* (i.e., it is contingent). Then pose $\varphi_0$ as *positum*. The correct response is:

$$\iota_0 = [\varphi_0; 1]$$

Suppose then that $S_n \Vdash \neg\varphi_0$'. Let $\varphi_0$' be proposed at *n*. Clearly, $\varphi_0$' ε $\Pi_{\varphi 0}$, so the correct response is:

$$\iota_n = [\varphi_0'; 0]$$

Moreover, suppose that $S_m \Vdash \neg\varphi_0''$. Let $\varphi_0''$ be proposed at ***n***. Clearly, $\varphi_0'' \varepsilon \Pi_{\varphi 0}$, so the correct response is:

$$\iota_m = [\varphi_0''; 0]$$

Hence, the disjunction of two propositions has been accepted, but both disjuncts have been denied. ■

Apparently, these two corollaries have struck some of Swyneshed's contemporaries as very odd, and were for them reason enough to reject the *nova responsio* as a whole. However, in a careful inspection, it is only in appearance that two of the most fundamental laws of logic – the truth-conditions of conjunction and disjunction – are being challenged. As M. Yrjönsuuri suggested (Yrjönsuuri 1993, 317), it is as if the bookkeeping of a Swyneshed-style obligational disputation featured two columns of responses, one for pertinent propositions and one for impertinent propositions. **Within each column**, the laws for conjunction and disjunction are in effect observed. So, if in one of the columns two propositions have been correctly granted, then their conjunction will also be granted; similarly, if in one of the columns a disjunction has been correctly granted, then at least one of the disjuncts will have to be granted too.[xxi] This fact only emphasizes the idea that the crucial aspect of playing a Swyneshed-style game of *obligationes* is the correct division between pertinent and impertinent propositions.

3.5 The set of accepted/denied propositions can be 'inconsistent'.

Perhaps the most suprising feature of Swyneshed’s *obligationes* is the little importance attributed to consistency maintenance. That is, if one takes the set of all propositions granted and the contradictories of all propositions denied during a disputation, this set is very likely to be **inconsistent**. There are two main sources of inconsistency in Swyneshed’s game, the most obvious one being the case of impertinent propositions which receive two different responses in different times of the disputation (in particular if they are first denied and the accepted or vice-versa), in virtue of changes occurred in things during the time of the disputation. The second source of inconsistency for this set is the behavior of conjunctions and disjunctions explained above.[xxii]

But again, the bookkeeping metaphor indicates that this corollary is not as awkward as it seems. The column for pertinent propositions will always be consistent, since the set of propositions that follow from a proposition is always consistent – for each contradictory pair of propositions (A, ¬A), a given proposition B implies either one of them (B →A), or the other (B→¬A), or none, but never both contradictory propositions. Therefore, it will never be the case that a *positum* forces the granting of a proposition A and of its contradictory ¬A.

In the case of *posita* that are pragmatically paradoxical, and therefore can be denied if they are re-proposed, they are to be treated as impertinent propositions when re-proposed, and therefore would be written down in the impertinent column. Hence, such cases do not introduce inconsistency in the pertinent column. In contrast, the column for impertinent propositions can very well be inconsistent, in the case of impertinent propositions whose truth-value changes during the disputation and they are in fact proposed twice and receive different responses.

These considerations indicate thus that Swyneshed has no interest whatsoever in the set formed by all granted and denied propositions during a disputation, and that he is perfectly willing to accept its inconsistency. For Burley, on the contrary, the ultimate goal of the *obligationes* game is to keep this very set consistent. So the differences between the two versions of the game do not only regard the rules governing them, but seemingly the very motivations for playing the game.

**4. What is Respondent’s task then?**

Clearly, in Swyneshed’s version of *obligationes*, Respondent’s main task is **not** that of consistency maintenance, since the set of propositions formed by the performance of a disputation is most likely **not** consistent if the game is played as it should be (by correct applications of the rules). Moreover, the hypothesis that *obligationes* are a logic of counterfactuals is, as argued, even less felicitous in the case of Swyneshed’s *obligationes* than in the case of Burley’s.

An analysis of Swyneshed’s rules for *obligationes* shows that the most crucial aspect of a winning strategy for Respondent is the correct definition of the two sets of relevant and irrelevant propositions with respect to the *positum*; if this is done correctly, and in particular if Respondent identifies accurately which propositions follow from and which are repugnant to the *positum*, then the rest of the game poses no further challenge, since Respondent is simply expected to answer to irrelevant propositions as he would if he were not playing the obligational game at that moment.

Thus, Swyneshed's version of *obligationes* seems to be primarily a test for the **recognition of inferential relations** between propositions – namely, the *positum* and each proposed proposition. In Burley's version, inference recognition also plays a role, since the failure of spotting a relation of inference can yield inconsistency. But in Burley's game, especially under the second, non-deterministic interpretation, there seems to be other strategic elements involved in consistency management, for example the possible denial of a proposition with notorious 'tricky' consequences. In Swyneshed's game, no strategy seems to be necessary as long as Respondent possesses the skills of inference recognition; he cannot play the game 'better' or 'worse' in virtue of the presence or absence of strategic decisions.

In sum, inference recognition is somehow related to consistency maintenance, but consistency maintenance is apparently more complex a task than inference recognition.[xxiii]

J. Ashworth suggests that the difference between the *antiqua responsio* and the *nova responsio* lies on two different conceptions of inference: the *antiqua responsio* adopted a 'semantic' notion of inference, based on the idea of consistency, while the *nova responsio* adopted a 'syntactical' notion of inference, based on logical relations between propositions (Cf. Ashworth 1996, 359). She gives compelling textual evidence to substantiate her claim. If this is indeed the case, then it is even more evident that the two games, Burley's and Swyneshed's, involve the performance of quite different cognitive tasks.

In any case, Burley's game seems harder to play than Swyneshed's. In Burley's game, what is tested is the ability to recognize inferential relations between propositions and **sets** of propositions, and that would be done **on the spot** (during the process). The role of irrelevant propositions is to make it a process game, whereas Swyneshed's game is in this sense 'static'.

## 5. Conclusion

With the changes he introduced to the obligational rules, Swyneshed created a game that is not necessarily more problematic that Burley's (the so-called 'inconsistencies' are irrelevant and thus not real inconsistencies), but simply one that is perhaps more tedious and less effective in terms of testing Respondent's abilities. His motivations for introducing the changes seemed to be unrelated to the game aspect of *obligationes*; rather, they regarded some odd properties of Burley's game, especially the fact that any false proposition could be 'proved' from a false *positum*, and that two disputations with the same *positum* did not necessarily force Respondent to give the same replies to the same *proposita*.

However, if *obligationes* did serve the purpose of testing and training logical abilities, as is very likely they did, it is no wonder that Burley's version remained dominant, since it is more effective for these purposes. Of course, *obligationes* had also become a logical genre in itself, whose framework gave rise to all kinds of profound logical investigations that went far beyond the scope of schoolboy's exercise. In this sense, Swyneshed's *nova responsio* certainly offered new material for further investigation. In particular, authors who, after him, wrote *obligationes* treatises basically subscribing to Burley's *antiqua responsio* have a more fine-grained perception of the properties of the game than Burley did, since the challenge posed by the *nova responsio* prompted further reflection.

Remains to be considered the relation between *obligationes* and *sophismata*. In the previous paper I have argued that one of the reasons why the *obligationes* game is hard to play, even though there is always a winning strategy for Respondent, is that Opponent makes use of the intricacies of the language to set up 'traps' for Respondent, involving for example self-reference, reflexivity, ambiguity, equivocation etc; that is, typically the phenomena of language that give rise to sophisms and fallacies. Indeed, there is a vast range of studies dedicated to the relation between *sophismata* and *obligationes*. However, there is no unanimous agreement as to the very nature of this relation. Stump has argued that the *obligationes* framework was primarily meant for the analysis of *sophismata*, given the overwhelming presence of *sophismata* in *obligationes* treatises. I have argued in the previous paper that it seems perhaps more reasonable to suppose that *obligationes* were not meant to solve *sophismata*, but rather that *sophismata* were the best way to test whether a given obligational system of rules was sound. One wonders whether the actual performance of obligational disputations (assuming that they did take place, in spite of no positive evidence) also involved *sophismata* to such a large extend, or whether this was the case only in the treatises, given their theoretical character. *Sophismata* would then have a kind of meta-role with respect to *obligationes*.

In any case, the framework adopted here is not adequate to treat *sophismata* within obligational contexts, since these *sophismata* were essentially semantic puzzles which are in general resistant to symbolic formalization. It seems that the different *sophismata* can only be treated one by one, whereas the present analysis aims at giving a general account of the rules of *obligationes*. One interesting research theme, though, would be to compare Burley's and Swyneshed's systems of *obligationes* with respect to their capacity to solve *sophismata*, but this falls out of the scope of the present study.

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[i] Cf. Spade 1982, p. 3.

[ii] Similar arguments have been advanced by E. Stump in Stump 1981.

[iii] Throughout the text, I will use the terms 'relevant' and 'pertinent' as synonymous, as much as 'irrelevant' and 'impertinent'. The terms in Latin are 'pertinens' and 'impertinens', but they are often translated as 'relevant' and 'irrelevant', for example in the translation of Burley's treatise.

[iv] Cf. Ashworth 1996, 352.

[v] But why use states of knowledge, and not simply states of affairs? Because, both in Burley's and Swyneshed's theories, proposed propositions whose truth-value is unknown to the participants of the disputation – for example, 'The Pope is sitting now' – should be accordingly doubted (imperfect state of information).

[vi] Positis regulis videndum est quibus signis et per quas propositiones et qualiter in hac specie obligationis contingit obligare et quando et per quantum tempus respondens erit obligatus. Pro primo est sciendum quod mediantibus istis signis 'pono' vel 'ponitur', 'suppono' vel 'supponitur' contingit hic obligare. In Spade 1978, (§72). All quotations from Swyneshed's treatise will refer to this edition, and the reference (§xx) is to the paragraph in which they appear.

[vii] Pro quarto et quinto conjunctim est sciendum quod dicto aliquo illorum signorum cum obligato, si respondens assentiat statim obligatur, et aliquo tempore quousque dicatur illa oratio 'Cedat tempus obligationis' continue erit respondens obligatus. Et dicta illa oratione 'Cedat tempus obligationis' non est respondens obligatus amplius. (§75)

[viii] ... est sciendum quod omnis propositio ad quam extra tempus obligationis per mutationem ex parte rei est varianda responsio et nulla alia est hic obliganda. (§ 73). I am indebted to Prof. J. Ashworth for having spotted this passage for me.

[ix] Notice that Swyneshed's reason for excluding impossible propositions is different from Burley's - trivialization of the game *versus* absence of a winning strategy for Respondent. Notice also that Swyneshed applies the obligational framework to non-obligational situations to define a contingent proposition.

[x] Like Swyneshed, I am making use of the obligational conceptual structure to describe a situation **out** of the time of a disputation.

[xi] Propositionum alia est pertinens obligato, alia est impertinens obligato. Et pertinentium obligato alia est sequens ex obligato, alia repugnans obligato. (§4)

Propositio pertinens est propositio non obligata quae, qualitercumque significet, propter obligatum est concedenda vel neganda. (§7)

[xii] Propositio impertinens est proposition non obligata, et propter obligatum nec est concedenda nec neganda. (§8)

[xiii] Except for the *posita* which are (pragmatically) repugnant to the act of positing (Cf. §64); according to Swyneshed, those should be answered as if they were impertinent, thus belonging to $\Pi_{\varphi 0}$.

[xiv] Ad propositionem pertinentem et non ad impertinentem propter obligatum est responsio varianda. Hoc patet. Nam propter obligatum non est varianda responsio nisi ad sequens vel ad repugnans. (§24)

Secunda regula: Omne sequens ex posito sine obligatione ad hoc pertinente non repugnans positioni in tempore obligationis est concedendum. (§67)

Tertia regula: Omne repugnans posito sine obligatione ad hoc pertinente non repugnans positioni in tempore positionis est negandum. (§68)

[xv] Clearly, if the introduction of extra *posita* occurs, then this definition holds for the set of *posita*, instead of the first *positum* only.

[xvi] Ergo, si obligatio non sit pertinens ad allud, sequitur quod ad tale impertinens non est responsio varianda propter obligatum nec propter obligatum nec propter obligationem. Ergo, ad tale impertinens sic est respondendum infra sicut extra. Sed extra quaelibet talis foret concedenda a quocumque sciente principaliter sibi significare sicut est. Igitur, et infra. (§ 26)

Quarta regula: Ad impertinens sine obligatione ad hoc pertinente velut per illud quod principaliter concipitur respondendum est. (§69)

[xvii] This fact has been acknowledged by virtually all studies on medieval *obligationes*, including Stump 1981, Ashworth 1981, Ashworth 1993, Spade 1982 etc..., so I claim no novelty here.

[xviii] Si conceditur, cedat tempus obligationis. Idem concessisti et negasti infra tempus obligationis. Igitur, male respondisti eo quod non est mutatio facta ex parte rei. Si negatur, cedat tempus obligationis. Illa sequitur ex posito. Igitur, concedenda. (§98)

[xix] Propter concessionem partium copulativae non est copulativa concedenda nec propter concessionem disjunctivae est aliqua pars ejus concedenda. Prima pars conclusionis probatur sic: Sit *a* una copulativa facta ex obligato falso et impertinente significante principaliter sicut est. Sit *b* illud obligatum. Tunc concessis istis partibus tota copulativa est impertinentes obligato scita principaliter significare aliter quam est. Igitur, neganda. (§32)

[xx] Secunda pars conclusionis probatur sic: Sit *c* op*positum* talis copulativae, *b* existente obligato sicut prius. Et arguitur sic: *c* disjunctiva est oppositum copulativae negatae. Igitur, illa est concedenda. Et quod utraque pars sit neganda patet. Nam una pars est op*posita b* obligato. Igitur, illa est neganda. Et alia est impertinentes significans principaliter aliter quam est. Igitur, est neganda. (§32)

[xxi] For simplicity, I am disregarding impertinent propositions whose truth-value may change during the disputation.

[xxii] Solutio: concedenda est conclusio quod tria repugnantia sunt concedenda et quattuor et sic deinceps. Et duo contradictoria similiter sunt concedenda propter mutationem rei ut si illa ‘Tu es Romae’ poneretur, et postea proponatur ‘Tu sedes’ illa est concedenda. Si postea durante tempore obligationis tu stares, et tibi proponeretur illa ‘Tu non sedes’, illa foret concedenda. Et sic contradictoria infra tempus obligationis forent concedenda. Et hoc est verum dum tamen nullum contradictorium repugnans posito concedatur infra tempus obligationis. (§101)

[xxiii] Recent research in neurosciences seems to indicate that, in effect, these two tasks correspond to different brain activities, in particular that different areas of the brain are activated when each of the tasks is performed. Cf. Parsons and Oserson, ‘New Evidence for Distinct Right and Left Brain Systems for Deductive versus Probabilistic Reasoning’ (*Cerebral Cortex* 2001). Probabilistic reasoning is not exactly what is at stake in Burley’s *obligationes*, so the parallel should not be taken too far, but it does seem to add an interesting element to the argumentation. I owe this reference to Prof. Wilfrid Hodges.