Medieval vs Contemporary Metaphysics and Logic of Intentionality

MSc Thesis *(Afstudeerscriptie)*

written by

Andrzej Bułeczka
(born April 24th, 1989 in Zduńska Wola, Poland)

under the supervision of **Prof. Francesco Berto**, and submitted to the Board of Examiners in partial fulfillment of the requirements for the degree of

MSc in Logic

at the *Universiteit van Amsterdam*.

Date of the public defense:	Members of the Thesis Committee:
June 23, 2017	Prof. Francesco Berto
	Prof. Catarina Dutilh Novaes
	Prof. Benedikt Löwe
	Dr Jaap Maat
	Prof. Robert van Rooij
	Prof. Frank Veltman

INSTITUTE FOR LOGIC, LANGUAGE AND COMPUTATION

Breviary

Lord,

grant me the ability to compose a long sentence, whose
line, customarily from breath to breath, is a line spanned
like a suspension bridge like a rainbow the alpha and
omega of the ocean

Lord, grant me the strength and agility of those who build
sentences long and expansive as a spreading oak tree, like
a great valley; may they contain worlds, shadows of worlds,
and worlds of dreams

may the main clause rule confidently over dependent claus-
es, control their course, a circuitous but expressive *basso
continuo*, endure unmoved above the elements in motion,
draw them to itself like nucleus draws electrons by unseen
laws of gravitation

I pray then for a long sentence, sculptured by the sweat
of my brow, extending so far that in each there might be
reflected the mirror image of a cathedral, a great oratorio,
a triptych,

and also animals mighty and minuscule, train stations, the
heart brimming with sorrow, rocky cliffs, and the furrow
of the fate in the hand

— Zbigniew Herbert

Ad maiorem Dei gloriam.

ABSTRACT

This thesis addresses three challenges posed by intentionality - the ability of our mental states and language to be about something - to a logician: an apparent reference to non-existent objects, intentional indeterminacy and the failure of substitutivity of coextensive terms in an intentional context. Since intentionality plays an important role in our everyday reasoning, a proper formal account of it is highly desirable, yet it requires a departure from classical logic. One can modify classical logic and adapt the formal apparatus to account for the aforementioned problems (Graham Priest's logic for intentionality serves as an example of such an approach in this work) or one can make an even more radical shift and seek for inspiration in a different logical tradition like the terminist logic developed in the Late Middle Ages by figures like William of Ockham or John Buridan. The second path is explored here as a modest attempt to show that once we abandon the bias against the history of logic as irrelevant, we can actually get access to firm logical solutions inaccessible from a classical perspective, while still practicing logic proper.

Among all worldly things there is nothing
which seems worthy to be preferred to friendship.
Friendship unites good men and preserves and promotes virtue.
Friendship is needed by all men in whatsoever occupations they engage.
— Thomas Aquinas

ACKNOWLEDGMENTS

CONTENTS

INTRODUCTION

This thesis is an attempt towards the practice of the philosophical logic in an historically self-conscious way. The main focus is on the three major challenges posed by intentionality to logic: an apparent reference to non-existent objects, the phenomenon of intentional indeterminacy and the failure of substitutivity of coextensive terms in intentional context. Such problems might not worry someone interested just in the classical, pure mathematical logic. However, if a logician attempts to give an account of human reasoning outside of this well defined, safe zone, sooner or later she or he would have to face at least one of the above mentioned problems.

As a matter of fact, these issues where discussed from the very beginnings of logic as a discipline. Already Aristotle discussed the first and the last problem in his logical writings. Each of them received even more attention in the late Middle Ages, among others from logicians such as Ockham and Buridan. Not surprisingly, also contemporary logicians such as Graham Priest, while developing the logic of intentionality, discuss exactly these old problems.

A brief look at the contemporary examples of the logic of intentionality shows that solutions to the challenges posed by intentionality require a rather sophisticated formal tools. Moreover, it seems to be necessary that the classical logic is abandoned, since some crucial assumptions behind it have to be dropped (e.g. an assumption that each name has a referent). At the same time, these very issues where discussed by Medieval logicians without the powerful resources of a (fully) formalised language. One could wonder how they were able to handle it. Things get even more intriguing when one observes that contemporary attempts to formalise Medieval Logic also require very sophisticated formal tools and departure from the classical logic. This thesis is build around this link, connecting the relevant ideas from the history of logic with the advantages of contemporary formalisation.

In the first chapter the basic characterisation of intentionality and related concepts, like intentional operators or the *de re/de dicto* distinction is given. Also the three above mentioned challenges are described in more detail. Finally, an example of a contemporary solution to each of them as given by Graham Priest from a noneist (neo-Meinongian) perspective is presented. In the second chapter we take a step back to the Middle Ages, specifically to the works of two chief nominalists and logicians of the fourteenth century, William Ockham and John Buridan. Their respective views on intentionality are given, followed by an exposition of their logic based on the semantical properties of terms such as signification, supposition, ampiliation and appellation.

Finally, their solutions are presented. In the third chapter, a formalisation of the relevant parts of Ockham's logic is given, so that also Ockham's solution can be expressed formally. In the last, concluding chapter, after a recapitulation of the main points discussed in the thesis, it is discussed whether the study of Medieval logic, taken as a study of problems universal to logic as such, rather than a study in the history of logic, has any relevance for the contemporary discussion of the issues in philosophical logic.

Part I

INFORMAL EXPOSITION

INTENTIONALITY: EASY FOR A KID, HARD FOR A LOGICIAN

'What a curious feeling!' said Alice; 'I must be shutting up like a telescope.'

And so it was indeed: she was now only ten inches high, and her face brightened up at the thought that she was now the right size for going through the little door into that lovely garden. First, however, she waited for a few minutes to see if she was going to shrink any further: she felt a little nervous about this; 'for it might end, you know,' said Alice to herself, 'in my going out altogether. I wonder what I should be like then?' And she tried to fancy what the flame of a candle is like after the candle is blown out, for she could not remember ever having seen such a thing.

— *Alice in Wonderland*, Lewis Carroll

1.1 INTENTIONALITY: A MENTAL BOW

We start our study with the brief characterisation of intentionality as it is usually understood in contemporary philosophy. As Ed Zalta (1988; 10) puts it,

> Intentionality is the fascinating property certain cognitive states and events have in virtue of being *directed*, or *about*, something.

Intentionality

When I think, there is something that I am thinking about. When you believe, there is something you believe. When she hopes, there is something she hopes for. And so on. Thus intentionality is a characteristic property of cognitive states, perhaps the fundamental property, as suggested by Graham Priest (2005, 5)[1].

The very word 'intentionality' originates in medieval scholastic philosophy (e.g. see studies in Perler 2001). It's contemporary presence in the philosophical vocabulary is due to the work of Franz Brentano at the end of the nineteenth century. As noted by Pierre Jacob (2014), it is a philosopher's word. Referring to the etymology of a word can be misleading, but in the case of 'intentionality' as derived from the

---

1 There is of course an ongoing debate in the realm of the philosophy of the mind whether intentionality is 'a mark of the mental' and if so, what does it actually mean that intentionality is a characteristic or fundamental property of the mental. Cf. (Jacob 2014, sections 8-11).

Latin word *intentio,* it can be helpful [2]. *Intentio* in its turn comes from the verb *intendere,* "which means being directed towards some goal or thing"(Jacob 2014). Thus, it points to the following metaphor:'*intendo arcum in ...*', 'I draw a bow at ...'. So we can say that our cognitive states work a bit like a bow - when in use, by their very nature they point towards something. Now, the problem with the *bow* in question (our mental state) is that *prima facie* it can be directed towards non-existent objects (past, future, possible or even impossible ones), vague, indeterminate objects or upon a determinate object, but from such different angles that it is not recognisable that the object in question is the same one. All of these problems are described in more detail in the following sections of this chapter.

However, before we get to them, let us take a closer look at the structure of an intentional act as presented by Tim Crane (2013, 4). First of all, an intentional state has an *object* - "something it is about or directed on". Next, it has a *content* - "the way it represents what it is about or directed on". Finally, intentional states possess an *intentional mode* - "[a] psychological type by means of which the mind is directed upon its object, via a content: whether it is through belief, memory, hope, fear, etc". Thus when I hope to have a child in the future, the intentional object of my intentional state is the child, the content is me being a father of a child in the future, and the intentional mode is hope. As for the intentional object, understood as the object of thought, we need to consider two senses of "the object of thought" (Crane 2013, 7):

> The first is *what we think* — when we think that something is the case. When we believe or judge, what we believe or judge is sometimes called the object of thought; normally these things are called 'propositions' and states of thinking them are now called 'propositional attitudes' (...). But the second sense is what we think *about*: the object of thought is what Prior called 'a more normal sense'. (...) Propositions *can* be intentional objects; but only when we think *about* propositions, not when they are simply what we think.

In what follows the intentional object or the object of thought is taken in the second, broader sense.

So far mental states and their features have been discussed. However, from now on I will take it for granted that the linguistic expressions used to describe those states are faithful in preserving interesting properties of our mental states[3]. Thus what follows will concen-

---

2 The etymology of the word will become very useful in the discussion of the problem of intentional identity, cf. Geach 1981, 147.

3 Thus I follow the approach of semantical theory of cognition - one where the mental states are "consciously approached from the perspective of language" - as developed, for instance, by Kazimierz Ajdukiewicz, cf. Ajdukiewicz 1985, 264-270.

trate on intentional expressions. To be even more precise, I will concentrate on the analysis of intentional predicates - intentional verbs such as 'know', 'seek', 'hope', with noun-phrase complements. Common examples of those are:

- Ponce de Leon sought the fountain of youth.

- The Ancient Greeks worshipped Zeus.

- Some people fear the consequences of Brexit.

In cases where the compliment is not a noun-phrase, but the whole sentence ('She hopes that he love her'), then the whole intentional verb with the compliment sentence is an intentional operator[4].

At this point it is handy to introduce one more pair of notions, namely the distinction between the *de re* and *de dicto* intentional states as expressed in the propositional attitudes ascriptions. The very distinction dates back to Medieval Logic and is designed to handle different readings of a statement of the form[5]:

1. Everything is necessarily *F*.

Which can be expressed as stating either

2. It is a necessary truth that everything is *F*.

or

3. Each thing is such that it has *F* necessarily.

The two readings are called *de dicto* and *de re* reading, respectively. In sentence 2) we ascribe necessity to a sentence (*dictum*) 'everything is *F*'; in sentence 3) we ascribe necessity to a thing (*res*). Thus in the case of the *de dicto* reading, we are saying something about the sentence; in the case of the *de re* reading we are saying something about things, reality. As noted by Crane (2013, 153-154):

> Traditionally, the distinction between the *de re* and the *de dicto* is conceived as a distinction in the relative scope in a sentence of a name or a quantifier and some other operator or predicate in the sentence.

Hence, the distinction is a logical one. Let us see now how it works in the context of intentional states. Consider the sentence 'John thinks that the girl next door is beautiful'. If we take it to be an expression of the *de dicto* intentional state, then it expresses a property of a proposition (or anything else that we consider to be a truth-bearer, e.g. a

---

4 Intentional operators get a detailed treatment by Priest in the first two chapters of his *Towards Non-Being*.
5 Examples taken from (Fitting and Mendelsohn, 1998, 85).

sentence), in this case a proposition that the girl next door is beautiful. On the *de re* reading, it expresses a predication of the object of thinking - the girl next door. It (the *de re* reading) could be expressed more clearly in the following way: John thinks of the girl next door as being beautiful (or The girl next door is such that John thinks her to be beautiful). Let us put it in terms of the difference of the relative scope: in the *de dicto* reading, the intentional verb has a wide scope and is applied to the whole sentence - it is treated as an intentional operator. In the *de re* reading, intentional verb has a narrow scope and is applied to a noun phrase - it is treated as an intentional predicate[6].

The phenomenon of intentionality and various problems connected with it are discussed in philosophy from its very beginnings. For instance Aristotle famously discussed the problem of the failure of the substitutivity of identicals in his *De Sophisticis Elenchis* ($179^a 24$–$179^b 34$). However, the real boom of the work on the problems connected with intentional contexts happened in the Middle Ages and was carried out, among others, by two main heroes of this work, namely Ockham and Buridan - who were key fourteenth century logicians. In fact, following the strategy of Priest, we can introduce the problems generated by intentional predicates by focusing on the relevant sophismata discussed by Buridan.

1.2   NON-EXISTENT OBJECTS

From this brief description we can already arrive at the picture of intentionality as a relation between some mental state and the object towards which the mental state is directed[7]. Once we start to consider this statement, we may begin to wonder what kind of a relation we are talking about here. What is its foundation in reality? Undoubtedly, the mental state in question has to be a real, actual mental state of a cognitive agent. However, is it also necessary that the intentional object be real? This issue smoothly bridges our introduction to the first problem related to intentionality, namely, the problem of non-existent objects. Take for instance a sentence such as 'Little Jack fears a monster hidden in the drawer'. It seems that in this case there is an intentional relation of fearing between a kid, Jack, and an intentional object - a monster hidden in the drawer. However, the trick is that in fact there is no monster hidden in the drawer (no spatio-temporal,
Non-existent objects   concrete monster). This very monster does not exist, at least not in a way in which we are ready to say that Jack exists. Whatever its existential status may be, if any, it is not the ordinary way of existing enjoyed by ordinary objects like living beings or rocks. Still, if one accepts the

---

6 More on the connection between the intentional states and the *de re/de dicto* distinction can be found in (Crane 2013, 153-155) and (Priest 2016, 47-50).

7 In the next chapter we will see that the relational account of intentionality is not the only option

account of intentionality given above, there is an intentional object of Jack's fear. It appears to have a serious lack - a lack of existence, thus being a non-existent object. And this in a way seems to commit us to non-existent objects. But how is it possible that there is any relation if one of the relatum does not exist? Moreover, for lots of people the very idea of there being some non-existent objects is flawed and unacceptable. Let us see now how the problem was stated by Buridan (terminology will be explained later, but the point should be already visible):

SOPHISM: A NON BEING IS UNDERSTOOD

> Posit that the proposition is affirmative with an infinite subject. Then the sophism is proved: for such infinite terms are analysed so that to say 'A non-man runs' is equivalent to saying 'What is not a man runs'. And thus to say 'A non-being is understood' is equivalent to saying 'What is not a being is understood'. But the second is true, for Antichrist, who is not a being, is understood.
>
> The opposite is argued; for the term 'non-being' supposits for nothing, but a proposition is false if its subject supposits for nothing and if it is affirmative; therefore, etc[8].

The meaning of this piece will become clear in the next chapter, but even now we can get that we understand (are able to think and reason about) Antichrist, even if he actually doesn't exist. The claim seems true, but how can it be so?

As noted by Crane (2013, 18), the problem that we have with the truth of such a proposition follows from two sources: "the connection between the truth and reality on the one hand, and the idea of something being true of something on the other". We usually tend to think that truth should be based on reality. Now, simple negative existential claims, such as "Dragons do not exist" fit neatly into the Aristotelian classical notion of truth : "to say of what is that it is, and of what is not that it is not, is true"(*Metaphysics*, 1011$^\text{b}$25)[9]. However, intentional claims about non-existent objects are not of this simple form[10].

---

8 Buridan, *SD* 9.5.7: 923. In what follows I will refer to the main work of Buridan, *Summulae de Dialectica* as *SD*, followed by the number of the section and the page in the English translation (Klima 2001). As for Ockham, similarly, while referring to *Summa Logicae* (*SL*), I will indicate the part and chapter (e.g. *SL*, I, 33) and the source of the translation afterwards

9 I leave aside problems with reference to non-existent objects as a different matter.

10 Some philosophers took it for granted that our intentional states are in a way neutral with respect to the existential status of respective intentional objects. The ability of intentional states to be about non-existent objects was used by Aquinas in his famous argument for the real difference between essence and existence: we can grasp what it is to be a phoenix without the need to check whether it actually exists; *a fortiori* for Aquinas to exist is something different than to have a characterisation (Aquinas 2007, 240):

The problem becomes even more pressing once we think about formalisation. In the semantics of classical first-order logic, by the very basic assumption all singular terms (names or descriptions) of a language get denotation - some object from the domain, thus they are names of objects from the domain. In the classical setting there are simply no empty terms. Hence, from the perspective of the semantics of classical first-order logic the very problem of empty terms is absent, impossible to occur[11]. If one wants to allow terms which lack denotation, as for instance free logicians do, then we still can encounter problems. Not any free logic will do. As argued by Crane (2013, 54-55), negative free logic, which holds that all simple predication containing empty names is false, as such is not a promising candidate. Even if non-denoting terms are allowed, they lack any significance. Luckily, there is also a positive free logic, "according to which some predications of non-existence are true, and some are not"(Crane 2013, 57). In this case terms which lack denotation can be elements of a true simple predication, thus they can have a significance which is required by our natural language. This being said, it seems that we are able to say something true when we observe that a kid is afraid of a monster or when we notice that Sherlock Holmes is more famous than any real detective. Should we allow the domain to include non-existent objects? Or change our views on the falsity of sentences containing empty terms? Whichever way we choose, if we want to preserve our intuitions about sentences expressing intentional states directed towards non-existent objects, we need to rethink our attachment to classical logic.

1.3   INTENTIONAL INDETERMINACY

Since this problem is less commonly known than the previous one, I will devote some more attention to the following exposition. Before we get to the problem of indeterminacy itself, we can benefit from considering a more general problem related to indeterminacy, namely the problem of intentional identity. The *locus classicus* for the problem of intentional identity is Peter Geach's paper titled *nomen omen* "Intentional Identity", and here I rely on his exposition. So, first I will explain what the intentional identity is; later we shall see, what is the problem connected with it.

Whatever is not included in the understanding of an essence or quiddity is coming to it from outside, entering into composition with the essence; for no essence can be understood without its parts. But every essence can be understood without even thinking about its existence, for I can understand what a man or a phoenix is, and not know whether it actually exists in the nature of things. Therefore, it is clear that existence is distinct from essence, unless, perhaps, there is a thing whose quiddity is its own existence.

11   More on this point in (Crane 2013, 21-22).

Geach starts his analysis with a distinction between a real and an intentional identity. Recall the metaphor of a bow used in the beginning. With it in mind we can consider the following example (Geach 1981, 147):

> For a number of archers may all point their arrows at one actual target, a deer or man (real identity);

> but we may also be able to verify that they are all pointing their arrows the same way, regardless of finding out whether there is any shootable object at the point where the lines of fire meet (intentional identity).

Thus Geach (1981, 147) proposes the following definition: *Intentional identity*

> We have intentional identity when a number of people, or one person on different occasions, have attitudes with a common focus, whether or not there actually is something at that focus.

In other words, Geach speaks here about the identity of intentional objects across time and between different agents with intentional states.

Now, let us move to the famous sentence, which will serve as a source for the presentation of the problematic nature of intentional identity from a perspective of a classical logician. Any satisfactory account of intentional identity has to explain how it occurs in order for the following example to make sense (and if Geach is right, to be true):

> Suppose a reporter is describing an outbreak of witch mania, let us say in Gotham village:
>
> 1. Hob thinks a witch has blighted Bob's mare, and Nob wonders whether she (the same witch) killed Cob's sow[12].

---

12 Geach 1981, 147.

At this point it seems to me right to give a motivation for tackling the issue in question. As Geach (1981, 151) puts it:

> This in fact points up the importance of intentional identity as a problem in the philosophy of logic. We very often take ourselves to know, when we hear the discourse of others, that they are meaning to refer to some one person or thing - and that, without ourselves being able to identify this person or thing, without our even being certain that there really is such a person or thing to identify. What we are claiming to know in such cases - let alone, whether the claim is justified - must remain obscure so long as intentional identity is obscure.

This observation is stressed and developed by others. Edelberg (2006, 489) points out that intentional identity statements are indispensable when it comes to the "explanation of human behaviour in terms of belief and desire."

Getting back to our example, we can attempt to read (1) as:

2. As regards some witch, Hob thinks she has blighted Bob's mare, and Nob wonders whether she killed Cob's sow.

3. As regards somebody, Hob thinks that she is a witch and has blighted Bob's mare, and Nob wonders whether she killed Cob's sow[13].

But both attempts seem to be unsatisfactory: (2) expresses real identity of some witch, on top of that committing one to the existence of witches[14] and (3) implies that Hob and Nob are thinking about one person as a suspected witch, but the reporter may say (1) even if Hob and Nob just thought about a witch being around without yet thinking about a specific person being a witch. Notice that (2) expresses the *de re* reading of (1), and as such is of no help in the case if indeterminacy (cf. Crane 2013, 162). Intentional identity is connected with the phenomenon of indeterminacy of reference. In other words, if the referents of intentional attitudes were always fully determined, we could encounter only real identity and there would be no question about the intentional identity as "pointing [in] the same direction without a target".

Intentional Indeterminacy

Geach connects this problem in his paper with a more specific one, namely the problem of intentional indeterminacy, referring to the medieval discussion on the issue. In fact, Geach himself started to work on this issue inspired by his readings of medieval authors such as Ockham and especially Buridan. So now we can once again look at the original sophism discussed by Buridan:

---

13 Geach 1981, 148.

14 Unless one is a noneist; cf. Priest 2016, 65, footnote 12.

SOPHISM: 'I OWE YOU A HORSE', AND LIKEWISE, 'I OWE YOU A PENNY'.

> And I posit the case that in return for some good service that you performed for me, I promised you one good horse, and that I obligated myself before a competent judge to give you one good horse.
>
> Then the sophism manifestly appears [to be true]: for it is commonly said that everything promised is something owed. And since this I owe, as long as I do not deliver what I obliged myself to deliver by means of a legitimate obligation before a judge, you can justly sue me in order that I deliver a horse to you, and this you could not do if I did not owe it to you . . .
>
> But the opposite side is argued for in a way that is difficult to solve, granting the aforementioned cases, thus: nothing is owed by me to you; therefore I owe you neither a horse nor a penny.
>
> The consequent seems to be self-evident. For if you were to acknowledge before a judge that no thing is owed by me to you, the judge would rule that I was free from debt[15].

To put the problem more clearly, when I promise someone a horse, I may not promise any particular horse. So when he points towards some horse telling me 'Look, here you have a horse you could buy and give to me in fulfilment of your promise', I can always respond 'But I haven't promised you this horse'. These words show more clearly that intentionality allow us to have intentional attitudes towards non-determinate objects, something like a-horse-in-general, or a-penny-in-general (a-horse-in-general being a different thing than, e.g. a platonic form of a horse). Sentences from the title of the sophism can be true even if, for certain abnormal reasons, there were no horses or stamps at all. Of course they can be true also in cases when there are horses, stamps, and no non-existent objects whatsoever. Their truth conditions are totally dependent on the subject and his/her intentional states, not on the intentional objects. The existential status of intentional objects is irrelevant for indeterminacy. Thus the problem at hand is independent of the previous one: indeterminacy affects both existing and non-existent intentional objects equally. In contrast, in case of sentences like 'There is some horse I owe you' or 'There is some penny I owe you', there has to be some particular, identifiable horse or penny to make them true.

---

15 Buridan, *SD* 9.4.15: 907-908.

1.4   SUBSTITUTIVITY OF IDENTICALS

As noted before, the problem of substitutivity was discussed already by Aristotle. It seems that in an intentional context we cannot substitute coextensive terms *salva veritate* - with the preservation of truth. For instance, I can admire rabbits in the Amsterdam Science Park. However, unknown to me, these rabbits are of the same kind as the monster rabbit from "Monty Python and the Holy Grail" and have killed already hosts of innocent students and academics. In this case it seems false to say that I admire monster rabbits.

Failure of the substitutivity

Let us give once again the voice to Buridan:

SOPHISM: YOU KNOW THE ONE APPROACHING.

> I posit the case that you see your father approaching from afar, so that you cannot tell whether he is your father or someone else. Then the sophism is proved as follows: you know your father well; and your father is the one approaching; therefore you know the one approaching.
>
> Again, you know the one who is known to you; but the one approaching is known by you; therefore you know the one approaching.
>
> I prove the minor: for your father is known by you, and your father is approaching; therefore, etc.
>
> The opposite is argued: you do not know the person concerned when he is such that, if asked who he is, you would truly say: 'I do not know'; but about the one approaching you will say this; therefore, etc[16].

There are plenty of other examples: I can think of Darth Vader without thinking about the father of Luke Skywalker (I have seen only episode IV of the Star Wars saga, so I don't know who the father of Luke is); Lois Lane loved Superman, but not Clark Kent, which is, unbeknownst to her, the same man; Kate may fear Jack the Ripper without fearing her neighbour, while in fact her neighbour is Jack the Ripper, and so on. Notice, that we are dealing here with intentional predicates, not operators.

This problem is independent of the previous two: the intentional object may exist or not. For instance, in the example given by Buridan, the intentional object actually exists. However, in case of me thinking about Darth Vader, the intentional object in question is non-existent. As for the indeterminacy, it also plays no role in the examples considered above - intentional objects in question (the one approaching, Darth Vader) are the determined ones. Thus the apparent failure of inference from 'I think of Darth Vader' to 'I think of the father of Luke

---

16 Buridan, *SD* 9.4.9: 892-893.

Skywalker', when I do not know that Darth Vader is the father of Luke, has nothing to do with the inability to identify the intentional object, as it happens when we deal with the indeterminacy.

1.5 NONEIST SOLUTIONS INFORMALLY

In the last section of this chapter I present the solutions to the problems mentioned above given by Graham Priest. There are two main reasons to choose Priest's work in the context of the following considerations. First, Priest himself worked at some point on medieval logic and semantics (together with Stephen Read), especially on Ockham (cf. Priest and Read 1977, Priest and Read 1981). Secondly, Priest's so called noneism is a version of meinongianism, which, arguably, is in its principles closer to the principles of medieval semantics than the mainstream view influenced by figures like Russell or Quine[17]. To be more precise, for a noneist like Priest or Routley, only concrete actually existing physical objects exist. Thus all abstract objects like numbers or universals are nonexistent. It differs from Meinong's original view, where abstract objects are considered to entertain the form of being called 'subsistence'[18]. Now, it is high time to provide an initial, informal introduction to the noneist way out of the intentional jungle.

1.5.1 *Non-existent Objects*

With respect to the first problem, the noneist solution is the acceptance of the view that intentionality is a relation where one of the relatum does not have to be existent. As Priest (2016, 57) puts it:

> To suppose otherwise is simply a prejudice in favour of the actual, as Meinong put it. By analogy with 'racism' and 'sexism', etc., we might call this 'actualism'—though that word has other well-known uses in philosophy.

Thus noneists accept the idea that the existential status of the intentional object is not relevant for the occurrence of the intentional state directed on them. The liberalism of noneism goes far enough to accept also impossible non-existent objects as intentional objects. In the end, as pointed out by Lewis Carroll in his famous story of little Alice, one can fancy what it is to be like a flame of a candle that has just burned out. As a result, an "intentional predicate, then, is a relation that may be towards non-being" (Priest 2016, 58).

At the same time, to say that some objects exists and some do not is not taken by a noneist to mean that in some way there are ('are' understood in a metaphysical way) non-existent objects. Contrariwise,

---

17 Defence of this view can be found for instance in (Klima 2005, 177-189).
18 More on this in the Part II of Priest's *Towards Non-Being*.

as argued by Priest at length in the second part of *Towards Non Being*, noneism is a view according to which the only objects that exist are the ordinary beings of our actual words. There is no ontologically committing realm of non-existent (but somehow being) objects. Even more, Priest argues that a noneist can take fictional objects, abstract objects or mathematical objects to be non-existent - thus a noneist can be a full blown nominalist, more radical than Quine and some other contemporary nominalists, who accept for instance abstract beings like sets indispensable for mathematics, and *a fortiori* science. Non existent objects, while not being, still can be characterised or described as having certain properties, of course not the ones which entail existence of the object possessing them (cf, Priest 2016, chapter 4).

One important part of such a picture from a logical perspective is the separation of the issue of existence from particular quantification (Priest 2016, 323-342, see also Berto 2012 and Berto 2015). Just consider the following sentence:

> I thought of something I would like to buy you for Christmas, but I could not get it because it does not exist (e.g., a flying skateboard from "Back to the Future 2")[19].

If we read this sentence through Quinean lenses, where the particular quantification is understood as existentially loaded, we get clear contradiction: 'There exists something such that I thought I would like to buy it for you for Christmas, but I could not get it because it does not exist'. However, we can also read it differently as: 'There is something such that I thought I would like to buy it for you for Christmas, but I could not get it because it does not exist', where the first conjunct is taken to mean 'Something is such that I thought I would like to buy it for you for Christmas'. Arguably, the second reading is more natural (Priest 2016, 324). Accordingly, in his semantics Priest distinguishes between the basic particular quantifier $\mathfrak{S}$, and classical existentially loaded $\exists$, which expresses the existence predicate E (Priest 2016, 13-14). Hence one should read $\mathfrak{S}xA(x)$ not as 'There exists something, x, such that $A(x)$', but rather as 'Something, x, is such that $A(x)$'.

It is crucial not to confuse the noneist view on non-existent objects with a closely related view of early Russell, where in his object theory, as he said: "to mention anything is to show that it is" (Russell 1903, 449). He distinguished between a full form of existence of normal, actual objects, and a diminished form of existence of all the others. Even Meinong himself denied any form of being to impossible objects, while Russell held a liberal view on them too (he granted a kind of being even to impossible objects). As we all know, quite quickly Russell abandoned his view, starting from his famous critique of it in 'On Denoting'. What is important for us here is the fact that Russell's critique of Meinong to a huge extent is rather a critique of

---

19   Example taken from (Priest 2016, 324), with a modification.

early Russell himself (Priest 2016, 106-108). The final confusion was caused by Quine and his extremely famous paper 'On What There Is', where one of the criticised views on existence is the one held by the fictional character, Wyman, which quite commonly is taken to be the view of Meinong and his followers, while in fact it is exactly the view held by Russell before his conversion. As we will see later on, this confusion about (neo)Meinongianism *vel* noneism is present also among the scholars of medieval logic and metaphysics[20].

1.5.2 *Intentional Indeterminacy*

Before we proceed to the noneist proposal concerning the problem of indeterminacy, we need to introduce a small distinction. According to Priest, sentences like

(1) I promise you a horse

are ambiguous, since they can be read in two different ways. First, it can mean that there is a particular horse that I owe, for instance I could promise you the fastest horse in the Netherlands in 2016. It can be expressed formally in the following way:

(2) $\mathfrak{S}x(Qx \wedge aPx)$[21]

(where Qx is 'x is a horse', and yPx is 'y promises you x'.) Secondly, there can be no particular horse, I just promised you *some* horse. The first reading is a determinate one, the second, naturally, an indeterminate. One can distinguish the two quite simply in the following way. As for the determinate reading, it makes sense to ask 'Which one (horse, penny, book, etc)?'. In the second case it makes no sense to ask such a question.

Determinate and indeterminate reading

   Now, as for the determinate reading, the very problem of indeterminacy is simply not present (thought there might be some other problems, e.g. I could have promised you some fictional or in some other way nonexistent horse)(cf. Priest 2016, 64-65). However, as for the indeterminate reading, things are quite different. As Priest observes, "noneism *per se* does not solve the problem of what this is". It can be a bit surprising, since noneism claims to be a theory explaining what the non-existent objects are, while it is commonly observed that such objects are very often indeterminate in one way or another. For instance, it is usually not specified what the colour of the round square is. However, the intentional indeterminacy is of a different sort. Consider, for *reductio*, that when I promise you a penny, or a stamp, or a horse, I actually promise you an indeterminate, non-existent penny or stamp or horse. But then it would make sense to ask 'Which one?',

---

20 A variety of (neo)Meinongian views is presented in (Berto 2012).

21 Priests uses here his particular quantifier $\mathfrak{S}$ understood as existentially neutral version of $\exists$.

and the answer could be 'a certain non-existent object'. Clearly it is not what was promised. Besides, in the indeterminate case, we are not able to ask such questions.

The next thing to notice is that the problem does not arise when a proper name follows the appropriate verb, but only when we have a phrase 'a so and so' (indefinite description). Now, such phrases "often express particular quantification in English" (Priest 2016, 65), so it seems natural that we should analyse it in terms of quantifiers. Yet, as we have seen, reading (1) as (2) gives it the wrong sense. Moreover, what follows the verb is not a sentence, so there is no other place to insert the quantifier.

Still, Priest has a proposal of a way out from the trap. According to him, what actually happens when I say 'I promise you a horse', in ordinary circumstances means that I promise *to give* you a horse. It can be analysed then as:

(3) I promise that $\mathfrak{S}x(x$ is a horse $\wedge$ I give you $x)$

In a similar way, when I say in the bookstore "I am looking for a book,' its indeterminate sense would normally be something like 'I am trying to find a book,' i.e.: I am trying to bring it about that $\mathfrak{S}x(x$ is a book $\wedge$ I find $x)$. Thus, the indeterminate sense of (1) can be expressed as:

$$a\Psi\mathfrak{S}x(Qx \wedge aGx)$$

where Ψ stands for an appropriate intentional operator. It solves the problem of indeterminacy by "construing utterances of such sentences as elliptical for ones with a corresponding intentional operator; the indeterminacy is then handled by appropriately placing a particular quantifier"(Priest 2016, 66). The other question is whether such a switch from an intentional predicate to an intentional operator is always accessible. According to Priest it is not, however, it does not cause a problem. The reason being that when we encounter the case where the switch is not possible, e.g. when Homer worships a Greek god, which cannot "be cashed out as any particular intentional propositional attitude"(Priest 2016, 67), we do not encounter indeterminacy. We can ask 'which god?'; hence the indeterminate reading does not seem to arise. Hence, possibly, we are never in trouble. Priest (2016, 67) concludes:

> It seems natural to conclude, therefore, that indeterminacy arises only when the statement made is, effectively, one with a that-clause. And if this is right, the solution sketched above is quite general.

1.5.3 *Substitutivity of Identicals*

As for the noneist solution to the problem of the failure of the substitutivity of identicals (from 'I believe that Hulk is the most powerful

superhero' and 'Hulk is Bruce Banner' it does not follow that 'I believe that Bruce Banner is the most powerful superhero'), we need to recall the distinction between intentional operators and predicates. Intentional predicates are built out of the intentional verb (e.g. believe) and a noun phrase compliment, e.g. 'I admire Hulk'. Intentional operators differ from predicates by the fact that the compliment is not just a noun phrase, but the whole sentence. Example: 'I know that Hulk is the most powerful superhero'. Now, according to Priest, SI holds for intentional predicates but fails in the scope of intentional operators. Thus, intentional predicates behave like any other predicates with respect to SI. Schematically, if P is an intentional predicate, then the following holds: $b = c$, $aPb \models aPc$ (from 'I admire Hulk' and 'Hulk is Bruce Banner' it does follow that 'I admire Bruce Banner').

Thus, according to noneist, when I admire Hulk, I do admire Bruce Banner, whether I am aware of this or not. I may not know it, doubt it, suppose it to be so, etc. It does not influence the underlying *de re* state which I have towards an object, which happens to be Hulk and Bruce Banner. Thus, since an intentional predicate is an expression of a relation between two objects, it seems that SI must hold. When I fail to be aware that I admire Banner while admiring Hulk, it is exactly a result of me not knowing that Hulk is Banner. 'Being aware that' is an intentional operator, not predicate, and for intentional operators SI can fail (cf. Priest 2016, 62-63).

2

MEDIEVAL LOGIC AND SEMANTICS: OCKHAM AND BURIDAN

Our prejudice about mediaeval philosophy, I think is this: we conceive of the philosophers as merely playing a game which had a great many strict rules. They were not allowed to question the truth of innumerable dogmas: their thought was crushed by authority; and accordingly, they spent their time in dividing hairs and determining the specific gravity of angels - much as men, having to pass an hour in a country railway station without anything to read, might cast up the figures on the timetable. The belief in the triviality and in the restrictions to their liberty of thought, should be dissipated (...).

I shall merely call attention to two positive advantages enjoyed by this philosophy. The philosophers, unlike modern philosophers, held certain beliefs in common; it was therefore possible for them so some extent to understand each other - a feat impossible to our contemporaries. Second, the Church could and did afford them very great liberty. For the Church was one; it was not occupied with polemic or defence against other churches. The systems of the philosophers were hardly of a nature to inflame whole races to heresy. For they were philosophical systems; their inventors were concerned with the discovery of truth, of such truth as was accessible to them; they were men interested in ideas for their own sake. And [in] whatever degree of truth or errors this philosophy issued, I think there is no question that the only hope of finding truth is to seek for it regardless of practical consequences.

— *The Varieties of Metaphysical Poetry*, Thomas S. Eliot

2.1 MEDIEVAL THEORIES OF INTENTIONALITY

In the previous chapter we have seen a standard modern characterisation of intentionality and some problems connected with it. However, as it was already pointed out, the very notion of intentionality received a lot of attention in the Middle Ages. Now, before we move to discuss some necessary aspects of medieval logic, we need to have a look at medieval theories of intentionality, especially those of Ockham and Buridan.

2.1.1   *Brentano on Intentionality*

In order to understand and appreciate the depth of medieval theories, it is worth to set a point of reference by quoting the 'father' of modern discussion about intentionality, Franz Brentano (1973, 88-89.):

> every mental phenomenon is characterised by what the Scholastics of the Middle Ages called the intentional (or mental) inexistence of an object, and what we might call, though not wholly unambiguously, reference to a content, direction toward an object (which is not to be understood here as meaning a thing), or immanent objectivity. Every mental phenomenon includes something as object within itself, although they do not do so in the same way... This intentional inexistence is characteristic exclusively of mental phenomena. No physical phenomenon exhibits anything like it. We can, therefore, define mental phenomena by saying that they are those phenomena which contain an object intentionally within themselves.

From these words, following (Jacob 2014) and (Black 2010), we can extract a list of theses usually assumed in contemporary debates about intentionality:

1 Object directedness: intentional states are directed upon something different from themselves, namely upon the intentional objects.

Brentano's Characterisation of Intentionality

2 Mental existence: those objects upon which intentional states are directed in virtue of intentionality possess a property of 'intentional inexistence' (thus they are different and irreducible to external objects).[1]

3 Mentality: intentionality is 'the mark of the mental', it is a distinctive property of mental phenomena, distinguishing them from physical ones.

This list can be slightly modified or extended (see Black 2010 or Klima 2013), however, its importance for current discussion comes from two observations: Brentano claims that his view is based on medieval theory on intentionality and in a way offers a comprehensive summary of scholastic theory; at the same time each of the items on this list has been refuted by a scholastic thinker; moreover the notions of intention and intentionality had a far broader scope of meanings and uses in philosophical discussion than they tend to have nowadays

---

1 Actually, what Brentano meant by "intentional inexistence" is a controversial matter and subject of an ongoing debate. See for instance Crane 2006 and Crane, forthcoming.

(cf. Zupko 2015). For instance Ockham's mature view on intentionality stands in opposition to the first two theses (Brower-Toland 2007), while Aquinas and Buridan had no problem in ascribing intentionality to the merely physical phenomena, thus refuting the third thesis (Klima 2013). Moreover, as noted by de Rijk (2005, 28), even if medieval thinkers agree with Brentano about the intentional nature of both sensorial and intellective cognition, still they would not examine mental phenomena such as loving or hating in the context of intentionality[2]. In the end, contrary to Brentano's wish to make intentionality a mark of special, psychic reality, for medieval authors intentionality appears to be a very ordinary phenomenon (Zupko 2015, 254). As pointed by King (2010), medieval intentionality is so broad as not to have a straightforward way to account for the difference between cognizers such as humans and complex intentional systems like well programmed robots, "thus leaving it open just what is distinctively psychological about cognition (King 2010, 44)."

2.1.2 *Preliminaries: Intention and Imposition*

Before we get to the details, it is worth giving a general background to the medieval discussions about intentionality and related notions. The three main sources for the development of scholastic theories of intentionality are Aristotle, Augustine, and last, but not least, Avicenna (Amerini 2011, 559-560, de Rijk 2005, 29-39.). Avicenna's contribution has two main ingredients. On one hand he puts stress on relating the term 'ma'nā' (translated into Latin as *intentio*) to conceptual content which can be connected with a thing. In this context he develops the idea of intentional (conceptual) distinction between two concepts connected to the same thing if they express different concepts. On the other hand he introduces distinction between first (*prima intentio mentis*) and second intentions (*secunda intentio mentis*), where first intentions, e.g. *rock* or *donkey*, are concepts of external (concrete) things, while second intentions, e.g. *form* or *species*, are concepts of concepts. The importance of this move is clearly expressed by Amerini (2011, 560), when he describes the two medieval approaches to intentionality as focused either on the first or second intentions.

First and Second Intention

---

2 Further de Rijk ads:

> The Medievals' including of judgement and inference did not go beyond the purely intellectual domain and, accordingly, merely concerned the extension of the intentional scope over the domain of all three intellectual operations, simple apprehension, framing propositions, and inference, which has led to the common distinction between simple or incomplex intentions, and complex ones (acting in assertion) and more complex ones (acting in ratiocination).

Later on he (de Rijk 2005, 29) goes as far as to say that "(t)here is no good reason for us to doctrinally relate our findings about the Medieval notion of intentionality to Brentano or other modern thinkers about 'intentions' or 'objective being'.

In the former case "to account for intentionality amounts to accounting for the formation, the foundation, and the function of natural-kind concepts." In the latter "two other points of speculation are introduced, namely, that of the foundation of second-order concepts and that of the explanation of the mechanisms of intentional predication, which occurs when second intentions are predicated of first intentions." Avicenna choosing to go the latter way changes the standard approach to logic and defines it as a science "dealing with second intentions as applied to first intentions." As Knudsen (1982, 480) observes, this "association of logic with intentions considered as epistemological entities marks the starting point of the development of an 'intentionalistic' logic," developed in the Latin tradition by figures like Albert the Great or Radolphus Brito[3]. The scholastic debate on the subject matter of logic continued these thread, and the notion of 'second intentions' played a central role in it (de Rijk 2005, 19). Even if Ockham and Buridan - authors on which we focus later on - are not intentionalistic logicians, still they use the terminology of intentions and impositions in their semantics (in definitions of types of supposition), thus it is worthwhile to have a closer look on these notions.

First, some attention needs to be given to the concept of intention, which, according to Knudsen, (1982, 479) played "a key role in the discussions of epistemological, logical, and semantic questions in later medieval philosophy", also ones related to intentionality as we understand it today. The very term 'intention' is used by medieval thinkers "in the generic, ambivalent (or rather 'ambivalence-producing') sense of 'concept (or thought)-*including*-what-it-intends-to-signify'" (de Rijk 2005, 24). The reason why this matters for our considerations is due to the following: this ambivalence is fundamental for medieval semantics. As de Rijk (2005, 24) points out:

> To understand the core of the (widely divergent, for that matter) semantic positions held by Medieval philosophers and theologians, it is important to keep in mind the following. The semantic views of the Medieval thinkers, being a vital part of their general philosophical attitude, however different they sometimes were from one thinker to another, were basically determined by a twofold firm conviction, to the effect [a] that there is an extra-mental world around us, which possesses by itself—independently, that is, of the operation of any created intellect—certain ontic features, and [b] that, in principle, our cognitive (sensitive and intellective) faculties provide us with the capability of having an effective access to this extra-mental Reality, and this owing to the fundamental parallelism existing between the various ontic articulations of things in the

---

3 A more detailed characterisation of an intentionalistic logic is given by Margaret Cameron in (Cameron 2016, 200-201, 204-205).

outside world, on the one hand, and the different natural ways in which we understand things, on the other.

Thus some grasp of the term 'intention' is essential for the task of dealing with medieval semantics.

At this point it is useful to mention another important distinction relevant to our further considerations, namely the distinction between first and second imposition, related to the one introduced by Avicenna. Roughly speaking, some "signs have been imposed to signify non-signs, others are signs of signs" (Knudsen 1982, 484). Unlike intentions understood as concepts, thus being natural signs, impositions concern words as conventional (imposed) signs. Therefore, words of first imposition are signs of some extralinguistic things, e.g. the word "dog", while words of second imposition are signs of other words, e.g. the word "noun". How do the orders of intention and imposition relate to each other?

First and Second Imposition

For Ockham spoken names (nouns or adjectives) fall under first or second imposition, while the distinction between first and second intention is a sub-division within it (imposition). Names of second imposition are names of names, "they are conventional signs that signify conventional signs as such" (Knudsen 1982, 492). For example the spoken word "verb" signifies each verb such as 'write' or 'think'. Moreover, Ockham makes a distinction between names of second imposition in the strict sense - ones that do not have corresponding items in mental language (e.g. 'declination'); and names of the second imposition in the broad sense - ones that do have corresponding items (e.g. 'name'). Furthermore, Ockham introduced a distinction between names of first and second intention (as applied to spoken signs) within the class of names of first imposition in the strict sense. Names of second intention in the strict sense are imposed to signify intentions of the soul (mind), which are natural signs, while names of second intention in the broad sense are imposed on the conventional signs in their capacity as signs. Notice that in this "broad sense names of second intention can be names either of first or second imposition" (Knudsen 1982, 493). Finally, names of first intention are imposed in order to signify things or objects as such, which are neither signs nor are derived from any signs. The last interesting thing to notice here is the following (Knudsen 1982, 493): "Names of second imposition belong to the domain of grammar, names of first imposition and second intention belong to the domain of logic, names of first imposition and first intention belong to the domain of the real sciences, and names imposed on the transcendentals belong to the domain of metaphysics." With this brief exposition of the notions of intention and imposition we are almost ready to explore some relevant aspects of the theories of intentionality as held by Ockham and Buridan.

There is one last preliminary point crucial for a proper understanding of Ockham's and Buridan's positions, namely their nominalism[4]. One thing to note here: usually when we talk about nominalism with respect to medieval debates, the term is taken in a narrow sense of reductionist account of universals (and other non-individual entities). In contemporary ontological debates nominalism is usually associated with a broader deflationist view with respect to all kinds of non-individual and non-concrete beings, so not only universals, but also abstract objects are ontologically suspicious. In what follows I stick to the contemporary broader meaning of the term. Thus, in a nutshell both Ockham and Buridan severely purified dominating realistic ontology such as one of Aquinas, Scotus or Burley by refuting the real, objective existence of universals and reduction of acceptable categories from Aristotle's ten to just two or three. They both accepted substance (individual beings) and individual qualities (tropes), while Buridan kept also the category of quantity, however it would not play any role here. What is crucial is the fact that for both of them acts of the mind where just a singular, individual qualities of the thinking mind in a way in which a particular whiteness (white trope) is a quality of the white wall. Hence they both needed an account of intentionality (and, as we will see later on, also logic), which cannot appeal to any abstract entities like intentional objects or propositions in contemporary sense usually given to these terms[5].

2.1.3   *Intentionality in Ockham*

Ockham's theory of intentionality underwent a significant change between his early and late writings. We concentrate here on his mature writings (especially *Quodlibetal Questions*)[6]. It is closely connected to his views on the nature of judgement and apprehension. Importantly for us, Ockham claims that there is no special object upon which the acts of judgement or apprehension are directed upon:

> Speaking of the first [i.e. direct] sort of assent, I claim that such an act does not have a proposition (*complexum*)[7] as its object because such an act is able to exist through the mere formulation of a proposition[8] and without any apprehension of a proposition. For this reason, it cannot be

---

4 A handy introduction to the varieties of the fourteenth century's nominalism is given by Biard in (Biard 2009).

5 Cf. papers by Klima, Panaccio and Spade from (Spade 1999).

6 The detailed account of changes in Ockham position is given e.g. in (Brower-Toland 2007b) or in (Panaccio 2004). Note, that there are actually many controversies connected with the interpretation of Ockham's view on the intentionality and epistemology in general, cf. (Panaccio 2004), (Normore 2010), (Choi 2016).

7 Proposition in its modern sense: abstract entity, as opposed to later medieval notion of proposition as declarative spoken/written/mental sentence. Cf. (Cesalli 2016, 245-246).

8 Here 'proposition' understood as mental sentence, thus quality of the mind.

an act of assenting to a proposition. Furthermore, when
an ordinary person knows that a rock is not a donkey, he
is not thinking about a proposition at all and, as a result,
he is not assenting to a proposition[9].

So, for Ockham, a mental act[10] of judgement, e.g. 'a rock is not a
donkey', does not have a proposition as its object but rather possess
a propositional content. What is known through such an act is not
a proposition 'a rock is not a donkey' but rather it is known *that a
rock is not a donkey*. We need to take one step back here and introduce
another distinction present in Ockham's writings, namely a distinc-
tion between content intentionality and referential intentionality. As
Brower-Toland (2007b, 90) nicely puts it: "a mental state has content
intentionality just in case it has representational content, and it has
referential intentionality just in case there is an object to which it re-
lates in virtue of having the content it does." Now it is possible to
make Ockham's view more precise. When he says that an act such as
believing, knowing or in some other way assenting to some proposi-
tional content should not be analysed in terms of a relation between
an act of judgement and a proposition, he refutes relational analysis
of content intentionality, not referential one. Hence mental acts are
still able in virtue of their content to relate or refer to certain objects.
However, as for the content intentionality, to have a propositional at-
titude towards a proposition (know, belief, doubt, etc.) is to entertain
an act (or occupy a state) of assent or dissent which is by itself *propo-
sitionally contentful* (cf. Brower-Toland 2007b, 90, 98-99). Still, it is not
the case that acts of judgement are not related to extra-mental objects,
since, as stressed in (Panaccio 2004), mental acts apart from being acts
are also signs of mental language, and as such posses (natural) signi-
fication which relates them to signified objects[11]. To clarify Ockham's
view more, let us consider the following passage:

*Content and
Referential
Intentionality*

> Although it is by means of a proposition formulated in the
> intellect that one affirms and knows that things are such
> and such in reality or that things are not such and such
> in reality, one nonetheless does not perceive this [proposi-
> tion]. Instead, the act of assenting has as its object things

---

9 Ockham, *QuodL* III, q. 8. Cit. after (Brower-Toland 2007b, 97).

10 A detailed account of Ockham's understandiong of mental acts can be found in
(Panaccio 2004, c. 2).

11 Mental language in Ockham writings is a big topic. For the current discussion it
suffices to notice that Ockham takes our mental activities to have a nature of a
natural language *sensu stricto* that means they have the nature of signs, but not
conventional ones, like spoken languages, but natural, thus shared by everyone -
they are intentions not impositions. Still, if our mental acts have a linguistic character,
according to Ockham we can apply our rules of logic to them (thus he says that
mental terms - concepts - posses signification, in the context of mental propositions
supposition, etc. A detailed account of Ockham's view is given e.g. in (Panaccio 1999)
and (Panaccio 2004). Mental language is also accepted by Buridan, for a comparison
between Ockham's and Buridan's account see (Pannacio 2017).

> outside the mind, namely, a rock and a donkey. And yet
> it is not the case that a rock is known or that a donkey
> is known; rather, what is known is that a rock is not a
> donkey[12].

So on the one hand an 'act of assenting has as its object things outside the mind' (referential intentionality, there is a relation to a referential object), on the other 'it is not the case that a rock is known or that a donkey is known; rather, what is known is that a rock is not a donkey' (content intentionality, no relation to an object). Thus Ockham explicitly uses here the distinction introduced above and claims that the referential intentionality is to be analysed in terms of a relation, while the content intentionality is non-relational[13].

To sum up, in his mature theory of intentionality Ockham abandons the relational analysis of intentionality ("he assumes that the representational content for a given intentional act is an object external to it and to which it relates", Brower-Toland 2007, 102), which he endorsed at the beginning of his career. Thus his final theory of intentionality does not fit into a post-Brentano schema (at least to its representationalist reading), since he refutes the mental existence of intentional object as an intermediate point between the mental act such as judgement and a thing that this mental act refers to. After all, as an ontological deflationist (nominalist in the contemporary meaning of the word), Ockham cannot accept spooky intentional objects distinct from the reality of extra-mental things and mental acts themselves, which, when entertained, are concrete, particular states of the particular thinking mind. As for the object-directedness of mental acts, he holds that they can be referentially directed without being content-directed (thus, as argued by Panaccio (2004), there is still a sense in which Ockham is a representationalist). In a way similar to Scott Soames, who identifies propositions with our mental acts ("Propositions are repeatable, purely representational, cognitive acts or operations; to entertain one is to perform it." Soames 2013, 480)[14],

---

12 Ockham, *QuodL* III, q. 8. Cit. after (Brower-Toland 2007b, 99).

13 To be even more precise, we should distinguish first and second-order judgements, the former are about things, the latter about the first-order ones. As for the first-order judgements, Ockham thinks that strictly speaking there is nothing (no entity or object) "to which the act of judgement relates as *what is assented to* (Brower-Toland 2015, 224)." Only second-order judgements "can be said to have objects properly speaking; for only these sorts of acts relate to something in such a way that it is appropriate to say of the *relatum* that it is known or believed or assented to (Brower-Toland 2015, 226)."

14 There is a striking resemblance between Ockham's approach and the "new" theory of propositions advocated by Scott Soames. Here is a representative example from one of the newest papers by Soames (2016, 2):

> This traditional idea, on which I want to build, must be distinguished
> from its frequent companion, which takes the intentionality of propo-
> sitions to be explanatory prior to the intentionality of agents. On that
> view, agents who entertain propositions cognitively represent things

Ockham identifies propositions understood as objects of content intentionality, with mental acts. As Ockham itself puts it:

> In favour of [the mental-act theory] there is the principle that *what is done through many is done in vain if it can be done with fewer*. But everything preserved by positing something distinct from an act of thinking can be preserved without positing any such distinct thing.... Therefore, it is not necessary to posit anything beyond an act of thinking[15].

Thus, Ockham has a theory of mental (intentional) acts that rejects an act-object distinction to account for intentional content. One of the clear advantages is ontological economy: it postulates fewer types of entities (just mental acts), and on top of that fewer distinct entities to play the role of content (Panaccio 2004, Panaccio 2006, Brower-Toland 2007b).

2.1.4   *Intentionality in Buridan*

As for Buridan's theory of intentionality, there are certain similarities with Ockham's account[16]. Since both of them are nominalists, *a fortiori* Buridan cannot accept the idea of intentional objects enjoying 'intentional inexistence'. It is worthwhile to check one of the senses of *intentio* in Buridan's work, namely the one in which *intentio* is synonymous with 'concept' and 'reason'. In this context 'intentional' is close to Brentano's ideal of mental or psychological, existing in the mind. Now, what is the nature of such understood intentions according to Buridan? They are "singular mental qualities or 'dispositions' of the intellectual part of the soul" (Zupko 2015, 260), different from physical qualities due to the lack of bodily extension:

> our concepts exist in our intellect as singularly and distinctly from one another and from other things as colours and flavours do in bodies: although such concepts do not have extension or corporeal location in it, they certainly all exist singularly[17].

as bearing certain properties because the propositions they entertain do. Unfortunately, we have no understanding of what such primitively representational entities are, of what cognising them amounts to, or of how or why our cognising them results in our representing things as bearing properties. Faced with these mysteries, I start at the other end, with the obvious fact agents represent things as being various ways when they think of them as being those ways. (...) we can explain the intentionality of things of kind P by deriving it from the intentionality of agents who bear R to them.

15 Ockham, *SL* I.12, cit. after (Brower-Toland 2007b, 105).

16 For an overview of the current discussions on Buridan's account of intetnionality, see articles in (Klima 2017).

17 Buridan, *Quaestiones in libros Aristotelis De anima* III.8, cit. after (Zupko 2015, 260).

Notice how, in the following words, Buridan sticks to an adverbial description of concepts in order to avoid attempts to reify them as some static property or attribute: "the intellect understands universally, even though it exists singularly, as do the things understood, and also the intention [by which it understands].[18]" Interestingly, this kind of adverbial talk is one of the standard nominalist moves also nowadays. For instance in a famous dialogue written by Lewis & Lewis (1970, 207) about holes, nominalistically minded Argle attempts to avoid reference to holes in the cheese by saying that cheese is specifically perforated: "I'll take your word for it without even counting: there are as many holes in mine as in yours. But what I mean by that is that either both pieces are singly-perforated, or both are doubly-perforated, or both are triply-perforated, and so on." Hence one does not speak about holes in the cheese, but rather about cheese being perforated certain way, which requires only the existence of cheese, not of ontologically spooky holes.

It seems that 'mental quality' talk of Buridan about the intentions can be related to Ockham's mental act theory of intentionality (cf. Panaccio 2012, 143). For both of these theories try to explain intentionality of our cognitive acts as an inherent, real quality of them. Ockham speaks about the inherent intentionality of the mental act, Buridan about the inherent intentionality of the quality of the act, but in both cases there is no space for an extra 'intentional object' somehow distinct from the ordinary mental act or quality thereof. Thus, according to Klima (2013, 372), when Buridan speaks about the so-called *esse intentionale* of a form of an object in a cognitive subject, he is not committed to any non-real (inexistent) being. Moreover, Klima proposes to look at Buridan's theory as a functionalist theory of our mental activities, where intention is a real, inherent quality of the mind acquired in virtue of a causal impact of the object, carrying information about the object to the subject through a natural system of encoding (the match between different types of forms transmitted in the act of cognition can be exactly interpreted in terms of encoded information flow).[19]

The story does not end here, since, as pointed by Zupko (2015), Buridan speaks about intentionality also in the context of animal perceptual judgements, and even causal dispositions of inanimate bodies[20]. Thus, in the straightforward words of Zupko (2015, 270), "intentionality for Buridan seems no more than a family-resemblance term;" and as such is applied to such various realms as semantics, non-intelectual dispositions or unrealised potentialities. Hence Buri-

---

18 Buridan, *Quaestiones super octo Physicorum libros Aristotelis* I.7, cit. after (Zupko 2015, 260-261).

19 Cf. Klima 2013, 372-373. Expanded account of the process of such an information flow through intentions is given in (Klima 2009, 97-99).

20 More on the connection between intentionality and causality in Ockham and Buridan can be found in (Pasnau 2001).

danian intentionality is significantly different from Brentano's idea and cannot serve as a distinctive characteristic of the mental. In even broader terms, once the Augustinian background of medieval theories of intentionality is recognised, especially the doctrine that all creation is ultimately a sign of its Creator,

> intentionality is the mark not just of the mental but of the 'true word', i.e., the intelligible structure of a world created by a provident God. On this view, fires and donkeys and men are all suffused with meaning, and what they signify is the rational hand of their creator. Thus, understanding things in the natural order comes down to our ability to grasp, however derivatively in thought and speech, God's intention in creating them[21].

2.2 MEDIEVAL LOGIC.. WHAT?

2.2.1 *Important thus negligible*

With the previous considerations in mind, we can provide an exposition of Ockham and Buridan's views on logical issues important for our purposes. One of the best motivations for looking at medieval logic is given by Sara Uckelman (2008, 1) in these straightforward words:

> There are two reasons why the study of medieval logic is of interest to the modern logician. The first is to see how closely logical theories in different branches (modal logic, temporal logic, quantifier logic, etc.) resemble modern logical theories in these same branches. The second is to see how much they differ.

However, it feels like a good idea to give a short personal testimony. I will start with a description of a scene from an Italian movie, "La grande bellezza (The Great Beauty)" by Sorrentino that won the Oscar for the Best Foreign Language Film in 2014. Apart from being a little diamond inside a big masterpiece it is an excellent illustration for the point I want to make here. Almost at the end of the movie there is a short dialogue between the main character, Jep, and Santa, a saintly old woman, happening on the balcony of Jep's flat:

> Santa: - Why did you never write another book?
> Jep: - I was looking for the great beauty, but I didn't find it.
> Santa: - Do you know why I only eat roots?
> Jep: - No, why?
> Santa: - Because roots are important.

---

21 Zupko 2015, 271-272.

Roots are important.. Is it so?

As far as I remember during my first introductory course to logic, which lasted for the whole academic year, my lecturer never mentioned that there is any significant history of logic. We just started with propositional calculus, moved to First Order Logic, and then looked at bits of model and set theory. As if before Frege nothing had happened. Thus for most of my bachelor and master studies in philosophy I had no idea that I might miss something of value with my ahistorical approach to logic. Probably, if at the end of my master in philosophy I had not encountered papers by Peter Geach and later on by Gyula Klima, I would have never had an opportunity to change this state of affairs. After two years in the ILLC I can say that it really seems that my story is not an exception, but rather a norm. Even at the UvA there is actually no master course on the history of logic (!), which, taking into account the recent existence of a great Dutch School of history of logic with Lambertus Marie de Rijk at its core, is for me surprising, to say the least[22]. Thus even if roots really are important, in the case of the study of logic they are quite often completely neglected and deemed irrelevant. For a purely mathematical logician it might not not a big deal, however for someone interested in philosophical logic, exposure to the 'roots' can actually make a difference. Or so I want to show in this work.

2.2.2   *Medieval Logic: Formal yet not Formalised*

Now, let us get to Medieval logic itself. One of the obvious differences with contemporary logic is the lack of formalisation so natural for anyone practising mathematical logic from the time of Frege, Peirce, Russell and Whitehead. The difference between what logicians do today and did in the Middle Ages is stated in an illuminating way by Peter King (2001, 135-136)[23]. According to him modern logicians, "who spend much of their time either devising logical systems that are mathematically-defined objects or investigating the properties of such systems (metatheory)" are involved in a modern way of doing logic *per se*, and this mathematical treatment of logic is one of the key reasons of their success. Medieval logicians clearly could not be engaged in such an enterprise, though they still deserve a name 'logicians'. Logic is not intrinsically mathematical, however mathematisa-

---

22 Of course there are still people in the Netherlands working in the field of the history of logic, but absence of them in the ILLC is quite symptomatic

23 I distinguish here between something being formal and something being formalised. An easy example: traditional sylogistics would be a formal theory, since its focus is on the forms of inferences in accordance with some well defined set of rules, while it can be on top of that formalised - expressed in an artificial symbolic language. More on the relation between formal and formalised in the context of logic can be found in (Dutilh Novaes 2007, sec. 4.1), (Dutilh Novaes 2011) and (Dutilh Novaes 2012, part I).

tion (formalisation) changes its character. In this perspective medieval and modern logic can be seen as an overlapping yet distinct enterprises. They both try to account for what does it mean for a reasoning to be a good, correct reasoning, and they both do it in systematic and rigorous way - "each is a formal discipline." Both medieval and modern logic "are concerned with studying properties of formal features, e.g. determining which inferences hold in virtue of the logical form of the premises and of the conclusion (truth-preserving formal inferences)." In this respect there is not so much a difference (in principle) between Ockham and Tarski. Notwithstanding, that is not the end of the story, cause there is also an important part of medieval logic which is essentially non-formal. Some inferences and assertions do not hold in virtue of their formal features but rather are based on conceptual (content) connections between terms involved. By dealing with this kind of inferences medieval logic shows itself to be more inclusive than modern logic. Hence King points to the following subjects indicating the scope of medieval logic: semantics, reference, syncategoremata, syllogistic, consequences, topics, sophisms, paradoxes, obligations, and fallacies. All of it connected by the central role of the concept of consequence: "[i]nferences may be formal or material, legitimate or illegitimate, and are found in different dialectical circumstances. The unity of mediaeval logic is grounded in its conception of inference (consequence), the key to non-formal logic."

Thus, Medieval logic is precise and formal, but not formalised (though at some point a kind of artificial, regimented Latin of logic emerged; cf. Parsons 2014)[24]. As a result, Medieval logic is done within natural language - medieval Latin, and the focus of study is language itself. This has important consequences, which will become clear later in this study, but one of which is a great sensitivity towards issues studied extensively within philosophical logic, e.g. paradoxes of self-reference, material implication, relevance, etc. The branch of Medieval logic on which I concentrate here is the so called 'terminist logic' or 'logic of terms', specifically as it was developed by Ockham and Buridan. In what follows we will take a look at the properties of terms: signification, supposition, ampliation, restriction, and appellation. Since medievals focus was on language, they developed a sophisticated theory of properties of terms, basic blocs of propositions understood as sentences (utterances, tokens)[25]. In case of nominalist views on the nature of propositions as advocated by Ockham and

---

24 Even as such it is quite powerful. For instance it has enough resources to express axioms of Peano Arithemtics, see (Parsosn 2014, 269-275). More on the expressive power of Medieval logic and it's relation to modern logic can be found for instance in (Klima 2001), (Parsons 2013) and in (Parsons 2014, especially chapter 9).

25 In what follows propositions are to be understood as linguistic expressions, declarative sentences (mental, written or spoken), not as abstract entities. In this way we remain faithful to late-medieval usage of a term 'propositio' which was shared by Ockham and Buridan. Detail of medieval account can be found in (Cesalli 2016).

Buridan, propositional semantics can be reduced to the semantics of terms (Cesalli 2016, 249), thus they take a sort of compositional approach towards semantics. One very important warning, which will reappear every now and then, is connected with the fact that medieval semantics, of which the theory of properties of terms is a part, does not have a counterpart in contemporary semantic theories. As pointed by Read (2015), "although one can see analogies and similarities, none of the medieval 'properties' matches exactly any modern notion."

Before we get into the properties of terms, we need to take a closer look at some distinctions among terms (and concepts, which for Ockham, and to some extent also Buridan, are just mental terms). Accordingly, written and spoken terms so as concepts in the mind fall into the following, standard classification:

Categorematic and
Syncategorematic
Terms

> Categorematic terms have a definite and fixed signification. For instance, the name 'man' signifies all men, and the name 'animal' signifies all animals, and the name 'whiteness' signifies all whitenesses"[26].

> Syncategorematic terms, such as 'every', 'none', 'some', 'whole', 'besides', 'only', 'insofar' and the like, do not have a definite and fixed signification. Neither do they signify any things distinct from the things signified by categoremata. (...) a syncategorema does not signify anything, properly speaking, but rather when added to another [term] makes it signify something, or makes it supposit in a determined way for some thing or things, or exercises some other function with respect to the categorema[27].

Typical examples of categorematic terms are 'donkey', 'running' (simple terms) or 'the one approaching', 'golden mountain' (complex terms). As for syncategorematic ones, logical connectives like 'no', 'all', 'both' are standard examples. Categorematic terms can occupy a position of subject or predicate in a proposition, while syncategorematic normally cannot cannot (unless taken materially, as in 'No has two letters')[28].

Absolute vs
Connotative Terms

Moreover, among categorematic terms, we can distinguish between absolute and connotative ones:

> Merely absolute names are those that do not signify something principally and [something] else, or even the same [thing], secondarily. Rather, whatever is signified by the name is signified equally primarily [by it][29].

---

26 Ockham, (*SL* I. 4, cit. after (Ockham 1995, 13).
27 Ockham, (*SL* I. 4, cit. after (Ockham 1995, 13).
28 For Ockham's account, see *SL* I. 4, for Buridan's account see *SD* 4.2.3. Buridan adds the category of mixed terms, see (Klima 2009, 37).
29 Ockham, (*SL* I. 10, cit. after (Ockham 1995, 25).

> But a connotative name is one that signifies something
> primarily and something secondarily[30].

A typical examples of absolute terms are 'donkey' or 'man'. Such terms signify just their primary *significata*. However, a connotative term has a additional secondary signification (Klima 2009, 56-57). Such terms on top of their primary signification posses also a secondary signification. For instance a connotative term 'father' primarily signifies fathers, while secondarily it signifies children (in relation to whom fathers are fathers)[31].

2.3 SIGNIFICATION

2.3.1 *General overview*

The most basic property of terms is signification. It differs from other properties of terms by being not relative to an occurrence of a term in a proposition, thus being rather a relation between terms and things. As neatly expressed by Kann (2016, 221), "[t]he theory of signification deals with the capacity of descriptive terms to function as signs, i.e. their pre-propositional and context-independent property of being meaningful prior to their particular occurrences or uses."

Signification

Hence, a term 'donkey' has a signification independently of its (possible) occurrences within a proposition, unlike supposition or ampliation, which are properties of occurrences of terms. "Now signification differs from supposition in that signification is prior to supposition" (Lambert 1988, 105). It should not be surprising then that signification is a ground for other properties of terms; it is a necessary condition for other properties to occur. But what is it then? With all precautions the closest concepts from contemporary semantics could be reference and denotation (Dutilh Novaes 2007, 18-20, 55) [32].

To make it more clear what a signification is, we need to examine two medieval approaches that try to explain how language is related to the world described by it, namely realistic (connected to the so called *via antiqua*) and nominalistic (related to the *via moderna*)[33]. Ac-

---

30 Ockham, (*SL* I. 10, cit. after (Ockham 1995, 26).

31 For Ockham's account, see e.g. *SL* I. 10, for Buridan's account see *SD* 3.1.3, 3.4.1, 8.2.3-4, 8.6.2-3. Actually, a distinction between absolute and connotative terms is one of the most important aspects of Ockham's (and Buridan's) nominalist semantics, crucial for the success of their reductionist program, see for instance (Panaccio 2003, 2004) or (Klima 2004, 2008).

32 Meaning according to e.g (Parsons 2008, 186-187). However, it seems to be a dead end. Here is an exemplary warning from (Spade 2007, 61), who says that while the "Latin verb *significare*, and its corresponding noun *significatio*, are frequently translated by 'to mean' or 'meaning'", at the same time "this should be avoided in almost all technical contexts."

33 Here I follow a clear, simplified exposition given by (Parsons 2008, 186-187), a more detailed and historically informed account can be found in e.g. (Klima 2008), (Read 2015a) or (Spade 2007).

cording to the realistic account, there are mind independent universals, usually called forms, while particular things fall under them. A common term like "donkey" becomes a part of the language once it is conventionally imposed on a common form, in this case the species donkey shared by all donkeys. The imposition can take place either through the will of the speaker (exception) or through convention. When it happens, a word is a sign of - signifies - a specific form *Direct and Indirect* on which it was imposed. Moreover, while a sign directly signifies a *Signification* form, it also, but indirectly signifies all individual things sharing the form. Thus 'donkey' indirectly signifies all individual donkeys:

form

signifies   is shared by

word   individuals

indirectly signifies
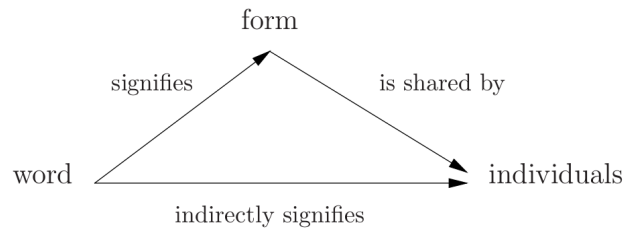
As for nominalists, they rejected the existence of mind-independent universals and spoke about mind-dependent concepts instead, which are natural concepts of individual things. A common term like 'donkey' becomes a part of language once it is conventionally imposed on a concept, in this case the concept of donkeys. Imposition can take place either through the will of the speaker (exception) or through convention. When it happens, a word is a sign of - signifies - a specific concept on which it was imposed. Moreover, while a sign directly signifies a concept, it also, but indirectly, signifies all individual things of the concept. Thus 'donkey' indirectly signifies all individual donkeys:

concept

signifies   is of

word   individuals

indirectly signifies
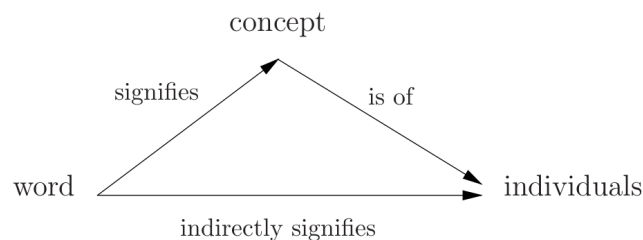
2.3.2   *Signification in Ockham and Buridan*

Now, in this study I concentrate on the views of Ockham and Buridan, so it is necessary to look closer at their respective theories thereof. As nominalists, they endorsed the second account described above. Thus, they both agreed "that words are signs of (or subordinated to) mental concepts, and the words thereby signify the things those concepts are concepts of"(Parsons 2014, 95).

Now, when we look closer at the words of Ockham himself, we get an even more radical, purely extensional[34] view:

> [A]n utterance primarily signifies that for which on account of its institution it primarily supposits. However, names of first intention supposit for things, and names of second intention for concepts, and names of second imposition for nouns or [other] utterances, as is clear by induction. The major premise is obvious, because that is primarily signified by the utterance, for which the person imposing the name uses it. But it is clear that this is what the utterance primarily supposits for. Thus, we use the term 'man' principally for men[35].

Even clearer is the exposition from chapter 33 of *Summa Logicae* on signification:

> From this it is clear that those [people] are in error who say that the utterance 'man' does not signify all men. For, since the universal 'man', according to the above Doctor [Damascene, AB], signifies several [things], and it does not signify several things that are not men, [therefore] it has to signify several men. This is to be granted, because nothing is signified by 'man' except a man, and no one man any more than another[36].

At the same time we encounter strong externalist traits in Ockham's approach to language and logic. As stressed by Panaccio (2015, 168), the crucial idea behind 'full-fledged form of linguistic externalism' in Ockham is the notion of subordination, which plainly says that when a new sign (even a conventional one) is subordinated to another existing sign, it inherits its signification (basic semantic features) from the preceding sign, whatever this signification was[37]. As noted by Klima (2009, 165), "[w]hat a term immediately signifies is the mental act on account of which we recognise the term as a significative utterance or inscription, as opposed to some articulate sound or discernible scribble that makes no sense to us at all." So actual token words: utterances, inscriptions, mental words, which possess signification, are

Subordination

---

34 By an extensional reading of signification I mean here that signification gives us rather a denotation of a term than the description of its content or form. Furthermore, I take a theory to be extensional when it does not postulate intermediate or abstract things in semantics: just pieces of language and things out there.

35 Ockham, *Ordinatio*, Opera Theologica, vol. IV, lb. 1, q. 22, pp. 48.18 - 49.4. Cit. after: (Klima 2008, 407).

36 Ockham, *SL* I. 33, cit. after (Ockham 1995, 45).

37 Actually, there is a whole debate about the extent to which Ockham endorses externalism or internalism, with Panaccio defending the former, and Brower-Toland the latter reading of Ockham's epistemology and semantics. However, there seem to be good arguments that Ockham's view is somewhere in between, thus (Choi 2016) argues for weak externalism. For a clear overview of the debate see (Choi 2016) and (Vaughan 2014, ch. 2).

meaningful because they are "associated with some act of understanding", or in medieval terms "they are subordinated to some concept of the human mind."

As a result, even if spoken or written words are primarily related to mental words through subordination, ultimately only the signification of concepts as natural signs counts, and this very signification relates concepts with the things signified. As a result the previously mentioned difference between direct and indirect signification collapses, moreover we can say in Hilary Putnam's fashion that "the signification of words does not essentially depend on what the speaker happens to have in mind when uttering the words.[38]"

Thus, for Ockham, terms, when they primarily signify, they signify things, not concepts. Which things? It depends. Either actual things falling under the concept (narrow reading), or all present, past, future and possible *significata* (broad or wide reading). Here is Ockham's explicit statement:

> In one sense a sign is said to 'signify' something when it supposits, or is apt to supposit, for it – in such a way, that is, that the name is predicated by means of the verb 'is' of a pronoun pointing to it. Thus, 'white' signifies Socrates. For 'This is white' is true, pointing to Socrates.

> 'To signify' is taken in another sense when the sign can supposit for the [thing] in some proposition about the past or about the future or about the present, or in some true proposition about a mode. In this sense, 'white' not only signifies what is now white, but [also] what can be white. For in the proposition 'A white can run', taking the subject for what can be, the subject supposits for the [things] that can be white[39].

Usually a precedence is given by Ockham to the broader reading, hence a term 'donkey' is taken to signify all donkeys, where 'all' means not only presently existing, but also past, future and possible donkeys.

One of the consequences of Ockham's a view is pointed out by Read (2015), namely, once signification is defined in extensional terms, the difference between signification and supposition shrinks to a matter of priority: "a general term signifies all those things of which it can be truly predicated." This claim fits with the development of Ockham's view on the concepts understood by him in mature works as mental acts. According to this view, when someone conceives a concept, she or he conceives any individual thing represented by the

---

38 Panaccio 2015, 172. A detailed account of the relations of subordination and signification with respect to spoken and written words so as the concepts on one hand and reality on the other can be found in (Spade 2007, 61-86).

39 Ockham, (*SL* I. 33, cit. after (Ockham 1995, 45), with emendations.

concept. As a result, for a term to signify what is conceived by the relevant concept is for it to signify the relevant individuals themselves (no matter whether they are actually existent, past, future or merely possible). Thus we get here a view on signification based on a plural, distributive reference. A link with supposition becomes then very obvious, since these individual things are the personal *supposita* of the term in a propositional context (Klima 2008, 409).

Now, since a common term broadly signifies the individuals represented by the corresponding concept regardless of their existential status (actual, past, future, possible), in a formal reconstruction of Ockham's semantics the signification of the term 'donkey' would not be any function, but rather a subset of the domain of the discourse, comprising both actual and non-actual elements (Dutilh Novaes 2007, 55; Klima 2008, 409).[40] Accordingly, a *significate* of a given term would be an element of the relevant subset of the domain, and a personal *suppositum* of such a term would be any appropriate *significatum*, "provided it is actual relative to the time connoted by the copula of the proposition in which the term is suppositing (Klima 2008, 409)."

There is yet another important type of signification - a secondary signification, which applies to connotative terms such as 'white', 'non-man', 'chimera' or 'blind'. In this type of signification it is not things named that are signified, but rather the content of the nominal definition of the connotative term in question (as Ockham points out, the signification of the connotative terms is equivalent to the signification of their corresponding nominal definitions, cf. *SL*, I, 26). As noted by Fredosso (1998, 4) such terms, when they signify, "bring to mind things of which they are not truly predicable by means of any sort of verb-present-tense, past-tense, future-tense, or modal." For example, a term 'white' primarily signifies white objects(!), but secondarily signifies individual whitenesses, while it is impossible that such an individual whiteness be white. Yet, one who understands the term 'white', at least implicitly knows that a white thing is something possessing whiteness, thus implicitly knows its nominal definition: 'something having whiteness'(Fredosso 1998, 5). On the other hand, a term 'whiteness' is an absolute term, and as such primarily signifies all distinct individual whitenesses of white objects. Now notice the difference between ontological difference between the signification of an absolute term 'whiteness' and a connotative term 'white'. An individual whiteness (an instance) is a whiteness if it is at all. At the same time a term 'white' signifies white objects. If one of them loses it (say, it becomes red), the term 'white' stops to signify it. Now, as pointed by Normore (2012, 81), Ockham claims that "a thing can gain or lose a whiteness without anything being created or destroyed." Now, when we notice that something has changed it's colour from white to a dif-

*Secondary
Signification*

---

40 Notice that the "(sub)set" talk here is just a useful simplification. Ockham the nominalist would definitely refuse any reference to sets as unacceptable abstract entities.

ferent one, we do not know yet whether the "furniture of the world" has changed, it might just rearranged. Yet if a whiteness has come or ceased to be, we have a real change in the world. As a result, we can "read off Ockham's ontology from the signification of absolute terms in a way that we cannot read it off from the signification of connotative terms".

As for Buridan, at the end of the day we get quite a similar picture fitting into Parson's nominalists schema, however there are some important differences. Unlike for Ockham, for Buridan mental expressions are not signs of things, but they are rather naturally similar to things outside the mind. At the same time spoken and written expressions are signs of mental expressions, and through them, derivatively, signs of external things (Read 2015b, 7). Here are Buridan's own statements regarding the matter:

> [W]ritten letters signify utterances, spoken or utterable, but they do not signify other things outside the soul, such as donkeys or stones, except by the mediation of the signification of utterances[41].

> [S]ignificative utterances signify affections, i.e., concepts of the soul, and signify other things only by the mediation of the signification of the concepts[42].

> [B]y every concept something is conceived, though this need not be only one thing but can be several things together[43].

> [A]lthough an utterance immediately signifies a concept, nevertheless, it is by the mediation of the concept that the utterance is imposed to signify things that are conceived by means of the concept. Therefore, the word 'donkey' is imposed to signify by the mediation of the concept of donkey—[for] it signifies donkeys, which are conceived by means of that concept—and the utterance 'risible', imposed to signify by means of the concept of risible, signifies risible things, which are conceived by means of that concept. (...) Furthermore, with respect to supposition we should note that a spoken term, if it is taken significatively and not materially in a proposition, does not supposit for itself, nor for the concept that it immediately signifies, but it supposits for the same things as those for which the concept corresponding to it supposits, namely, for the things conceived by that concept. And in the same way, even a written term, if it does not supposit materially, supposits neither for itself, nor for the utterance that it immediately

---

41 Buridan, *SD*, 9.1, First conclusion, 831.
42 Buridan, *SD*, 9.1, Second conclusion, 832.
43 Buridan, *SD*, 9.1, Third conclusion, 833.

signifies, nor for the concept that it signifies by the mediation of the utterance, but rather for the things for which that concept would supposit in a mental proposition, so that everything in utterance or in writing, if taken not materially but significatively, is to be related to the supposition of the concepts in mental propositions[44].

As can be noticed, Buridan devotes more attention to the mediating role of concepts in the mind, hence his account of signification is not externalist as Ockham's (however it is still a nominalist one). As argued by Panaccio (Panaccio 2017), this is exactly a point where Ockham and Buridan go different ways, and in case of Buridan we should rather talk about internalism. Buridan gives a more significant role in his semantics to the distinction between immediate signification connecting a term with a concept (*apud mentem*) and ultimate signification relating a term to the things conceived by the relevant concept (*ad extra*). The best statement of what an ultimate signification is for Buridan comes from the same chapter in his *Sophismata*:

> [F]irst, 'to signify' is described as 'to establish an understanding of the thing'; therefore, an utterance is said to signify the thing the understanding of which it establishes for us[45].

Therefore, for Buridan a term 'donkey' does not signify just all donkeys, but all donkeys as understood or conceived in the intellect. In the words of (Klima 2009, 165), "a categorematic term, therefore, is said to signify the concept to which it is subordinated immediately, but it is imposed to signify ultimately the object (or objects) conceived by this concept, in the manner that it is (or they are) conceived by means of this concept." In the end, signification is a property of terms related to our cognition, not a property of things themselves. As for the syncategorematic terms, they can possess only immediate signification - they can signify only syncategorematic concepts to which they are subordinated. Their function is not to bring about an understanding of anything, but rather to modify the representative function of other concepts (Klima 2009, 175-176). At the same time it is important to bear in mind that once the immediate signification of a categorematic term is established, then when a signification of a term is mentioned, if not specified otherwise, what is meant by it is the ultimate signification (Klima 2009, 176).

Now, as for complex expressions like 'red book' or the whole propositions like 'A book is red', they have compositional signification. More specifically, their signification is derived from the signification of concepts which are parts of the complex concept to which a given expression is subordinated to (Klima 2009, 175). So immediately they

---

44 Buridan, *SD*, 9.1, Eight conclusion, 836-837.
45 Buridan, *SD*, 9.1.4, 828.

signify "complex compounds of concepts" (Read 2015b, 8). As for the ultimate signification, there is no such complexity among the things - ultimate significates. So, the written proposition 'A book is red' signifies the spoken proposition, which accordingly immediately signifies the concepts 'book' and 'red' with their combination, the mental proposition. What it signifies ultimately are only books and red things. Notice, that one of the consequences of such a view is that 'A book is red' and 'A book is not red' have the same ultimate signification. This observation generalises to any proposition and its contradictory (Read 2015b, 8).

Actually, the distinction between immediate and ultimate significa-tion in connection with the idea of compositionality gives Buridan a very powerful tool. He is able to make many semantical distinctions on a level of immediate signification - mental language, without in-troducing corresponding complexities on the level of ultimated signi-fication - external world. As stressed by Klima (2009, 175), this is the fundamental idea of Buridan's nominalism: thanks to the distinction between immediate and ultimate signification,

> Buridan can work with a two-tiered semantics for conven-tional spoken and written languages, which enables him to provide a sufficiently "fine-grained" semantics for these languages combined with his "coarse-grained" nominalist ontology.

The last thing to be said here is the following: for a categorematic to have a signification (ultimate) is not yet for it to stand for the things which it signifies. This can happen only in a context of propo-sition and is handled by the theory of supposition, to the exposition of which we now proceed.

2.4   SUPPOSITION

Supposition

Supposition, unlike signification, is a context-dependent property of terms (for those with signification) which they possess as parts of propositions. For a term to supposit it needs to stand for something (or some things) in a context of a proposition. The basic idea here is that while a term has its signification fixed in all uses, the range or kinds of things for which it stands for can vary across different propositional contexts (Kann 2016, 224). Hence a goal (one of) of a theory of supposition is to establish what a term actually stands for when it appears in a proposition. As noted by Read (2015a), "sup-position corresponds in some ways to modern notions of reference, denotation and extension. The comparison is far from exact, how-ever. One major difference is that the medievals distinguished many different modes (*modi*) of supposition." Now, the basic part of the the-ory of supposition corresponds to the diagrams of signification from

the previous section, since a term, depending on a proposition, can supposit for any of the three items (word/itself, concept, individuals/ultimate significata) thereof. A term 'donkey' in the proposition 'Donkey is a noun' supposits for itself; in 'Donkey is a species' it supposits for a form or concept; and in 'A donkey is an animal' it supposits for individual donkeys signified by the concept. In the first case medievals usually spoke about material supposition (*suppositio materialis*), in the next one about simple supposition (*suppositio simplex*), and in the last case about personal supposition (*suppositio personalis*). The second part of the theory of supposition concerns various modes of personal supposition and is usually spelled out in terms of inferential relations between a given proposition and a singular proposition(s) (it will become clear soon what this means). To get an initial understanding, we can somewhat inaccurately put it this way: a mode of personal supposition of a given term is connected with the question of how many of its (ultimate) significata it has to refer to in order to make the proposition true[46]: exactly one - discrete supposition (*suppositio discreta*); at least one - determinate supposition (*suppositio determinata*); several together - merely confused supposition (*suppositio confusa tantum*); all present instances - distributive supposition (*suppositio confusa et distributiua*); all past, present, and future instances - natural supposition (*suppositio naturalis*)(King 2015)[47]. The importance of supposition in logical theories of authors like Ockham and Buridan lies in the fact that, together with the structure of a proposition, it determines the truth conditions of a proposition (Parsons 2008, 188; Kann 2016, 224)[48]. Since the details of supposition theory vary from one medieval author to the other, we proceed with the exposition of crucial elements of Ockham's and Buridan's views[49].

Material, Simple, Personal Supposition

2.4.1   Ockham's Theory of Supposition

Ockham devotes the last fifteen (63-77) articles of the first part of his *Summa Logicae* to supposition theory. He states there that:

> Supposition is so called as, so to speak, a "positing for another", in such a way that when a term in a proposition stands for some thing, so that we use the term for something of which (or of a pronoun pointing to it) that term

---

46 Note that properly speaking a signification of a given term is the same in each case, namely to all of the things signified. In case of different modes of personal supposition due to the presence (or lack of) syncategorematic terms, we restrict our focus to some of those things.

47 A more detailed account of the different modes of supposition can be found for instance in (Read 2015a), (Kann 2016), (Spade 2007) or (Parsons 2008).

48 As stressed by Spade, the truth-conditions approach is "by no means a regular part of supposition theory" (Spade 1982, 193 n.37).

49 A more thorough account of supposition theory as such is given for instance by Parsons in (Parsons 2008) and (Parsons 2014, 184-226)

(or the nominative of that term, if it is in an oblique case) is verified, it supposits for that [thing]. At least this is true when the suppositing term is taken significatively (...).

Therefore, there is a general rule that a term never supposits for anything in any proposition, at least when it is taken significatively, except for what it can be truly predicated of[50].

Thus in the case of Ockham we can speak about a supposition-based theory of truth conditions for propositions (Kann 2016, 224) - a term's supposition is directly related to the truth of a proposition in which it occurs. Still, Ockham's supposition theory itself is not a theory of truth conditions but only plays a crucial role in such a theory. In other words, to determine the truth of a proposition one needs to know the supposition of terms within the proposition, while the supposition of terms itself does not depend on a truth value of a proposition (Dutilh Novaes 2007, 45). Besides, supposition theory can be used to determine possible inferential relations in which a given proposition can stand with respect to other propositions or to establish possible meanings of a given proposition.

Moreover, from the above mentioned passages one can get an impression that Ockham's account of supposition is purely extensional in nature (a relation between a word and a thing it stands for), and accordingly that the very theory in question has as a result a limited scope of application. For instance, it does not account for the case of empty terms, nor even for false affirmative propositions like 'Man is a donkey'. However, as argued by Dutilh Novaes (2007, 2008, 2013), Ockham's theory of supposition is an intentional theory of propositional meaning, and within it there is a space for supposition of empty terms and a proper account of false affirmative propositions. As Ockham writes about the first issue:

One might contend that the notions of 'to supposit' and 'to supposit for nothing' are incompatible since the following is a valid inference: a term supposits, therefore it supposits for something. The response is that the inference is not valid. The following inference, however, is valid: the term supposits, therefore it is asserted either to supposit for something or to supposit for nothing[51].

Thus when the term is an empty one, as in "Dodo is a bird", while there are no more dodos around, the relation of supposition still holds, although the proposition in which it occurs is false (recall that signification holds also for past, future and possible objects, thus the actual emptiness of a term is not a problem)[52]. Hence, the supposi-

---

50 Ockham *SL* I, 63. Cit. after (Ockham 1995, 47-48).
51 Ockham, *SL* I, 72. Cit. after (Dutilh Novaes 2013, 368).
52 More on this issue in (Dutilh Novaes 2013, 361-364).

tion of a term is not its reference (assuming that a reference requires that there is something referred to).

What is a theory of supposition for Ockham then? In the words of Dutilh Novaes (2007, 30):

> [S]upposition theory is better seen as a theory of propositional meaning, primarily intended to provide a procedure of analysis for the establishment of what can be asserted by a given proposition, rather than the establishment of the entities that the proposition is about (as would be the case if it was a theory of reference). In other words, supposition theory is a theory of interpretation, of semantic analysis – in sum, a theory of hermeneutics.

What does this say to us? As was already noted, a term, depending on its supposition (simple, material, personal) can stand for different things. The ambiguity connected with it is not suppressed by the theory of supposition, but rather acknowledged and controlled. Thus, when we decide that in 'Donkey is a species', the term donkey has a simple supposition, it does not mean that the material and personal suppositions are gone. They can be present alongside as leading to a different reading of the meaning of the proposition. Only the initial intention of the agent who produced the proposition, in principle, is such that the ambiguity is absent. Still, the whole proposition is true only when 'donkey' supposits for a concept, thus the focus of interpreters is normally given to the supposition which makes the meaning of the whole proposition true. Interestingly, as observed by Panaccio (2013, 373), Ockham allowed for supposition ambiguity even on the level of mental language, since he endorsed the view that the division of supposition holds also within mental language[53]. Moreover, all sentences with past or future tensed verbs or modal verbs are systematically ambiguous - in Ockham's terms they need to be distinguished.

Now, Ockham does not speak so much about meanings as about things when he gives an account of supposition - hence why so often he was taken to hold an extensional theory of supposition. As observed by Dutilh Novaes (2007, 31), both perspectives are actually connected. Thus, she speaks of Ockham's theory as an extensional theory of intensions (meaning). It boils down to the idea that the meaning of a given phrase, especially a proposition, is determined by the extension of its terms. In Ockham's own terminology, what is asserted by a proposition (*denotatur*) is determined by the supposition of its terms. Even more, taking into account the fact that Ockham, as a logician, was not avoiding natural ambiguity but rather embraced

Extensional Theory of Intensions

---

[53] "Now just as such a diversity of [kinds of] supposition can belong to a spoken and a written term, so too can it belong a mental term. For an intention can supposit for what it signifies, for itself, for an utterance and for an inscription." Ockham, *SL* I, 64, cit. after (Ockham 1995, 50).

it and tried to account for it in his theory. Hence, a proposition can have more than one reading, and as a result different assertions can be made with it. When some terms in a proposition are able to supposit in more than just one way, thus for different things, a proposition containing them can have multiple readings.

2.4.1.1 *Types of Supposition*

As already mentioned, Ockham accepts three main types of supposition: material, simple and personal. He defines them in the following way:

> So whenever the subject or predicate of a proposition supposits for its significate in such a way that it is taken significatively, the supposition is always personal.
>
> Simple supposition occurs when a term supposits for an intention of the soul, but is not taken significatively. For example, in saying 'Man is a species', the term 'man' supposits for an intention of the soul, because that intention is a species.
>
> Material supposition occurs when a term does not supposit significatively but supposits for an utterance or for an inscription. This is clear in 'Man is a name'. 'Man' supposits for itself, and yet it does not signify itself[54].

Accordingly, Ockham also suggests some ways to establish a supposition of a term in a given propositional context based on the semantic features of other terms present in a proposition. Moreover, any term can have a personal supposition:

> It is to be noted too that a term always, in whatever proposition it occurs, can have personal supposition (...)[55].

While to have simple or material supposition it needs to be related to the term of second imposition and/or second intention:

> But a term cannot in every proposition have simple supposition or material, but only in a [proposition] where such a term is matched with another extreme that pertains to an intention of the soul or to an utterance or an inscription[56].

These are the basics. However, we still need to consider another part of supposition classification, namely the modes of personal supposition: determinate, merely confused, confused and distributive. The difference between these modes of personal supposition is expressed by Ockham in terms of descent and ascent relations between

Modes of Personal Supposition

---

54 Ockham, *SL* I, 64, cit. after (Ockham 1995, 48-50).
55 Ockham, *SL* I, 65, cit. after (Ockham 1995, 51).
56 Ockham, *SL* I, 65, cit. after (Ockham 1995, 51).

the propositions where the term occurs and singular propositions of
the form 'This *a* is *b*':

> Discrete supposition is [the kind] in which a proper name
> of something supposits, or a demonstrative pronoun taken
> significatively. This kind of supposition makes a proposi-
> tion singular. For example, 'Socrates is a man', 'This man
> is a man', and so on.

Discrete Supposition

> Determinate supposition occurs when one can descend to
> singulars by some disjunctive [proposition]. For example,
> it correctly follows: 'A man runs; therefore, this man runs,
> or that [man runs]', and so on. Therefore, supposition is
> called "determinate" because by such supposition it is de-
> noted that the proposition is true for some determinate
> singular. This determinate singular all by itself, without
> the truth of another singular, is enough to verify the propo-
> sition. For example, for the truth of 'A man runs' it is
> required that some definite singular be true. Any one suf-
> fices, even assuming that every other one would be false.
> Yet often many or even all [of them] are true.

*Determinate
Supposition*

> Merely confused personal supposition occurs when a com-
> mon term supposits personally and one cannot descend to
> singulars by a disjunctive [proposition] without making a
> change on the part of the other extreme, but [one can de-
> scend to singulars] by a proposition with a disjoint pred-
> icate, and one can infer [the original proposition] from
> any singular. For example, in 'Every man is an animal',
> 'animal' supposits merely confusedly, because one cannot
> descend under 'animal' to its contents by a disjunctive
> [proposition]. For it does not follow: 'Every man is an an-
> imal; therefore, every man is this animal, or every man is
> that animal, or every man is [that] other animal', and so
> on. But one is quite able to descend to a proposition with
> a disjoint predicate [made up] of singular [terms]. For it
> correctly follows: 'Every man is an animal; therefore, ev-
> ery man is this animal or that one or that one', and so on.
> And it is plain that this predicate is truly predicated of ev-
> ery man. Therefore, the universal [proposition] is simply
> true. Likewise, the [original proposition] is inferred from
> any content under 'animal'. For it correctly follows: 'Ev-
> ery man is this animal' pointing to any animal whatever
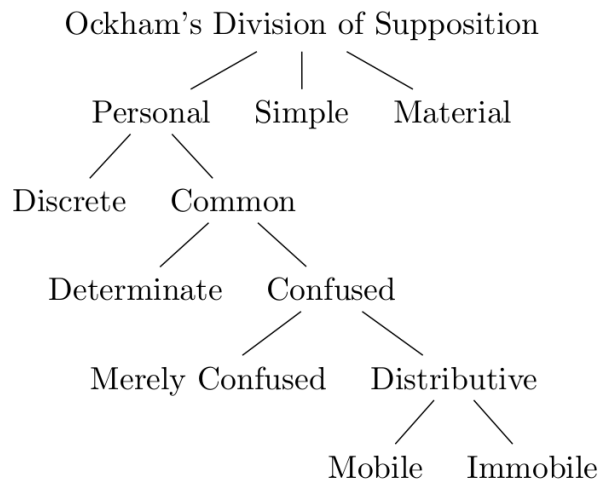> therefore, every man is an animal'.

*Merely Confused
Supposition*

> Confused and distributive supposition occurs when one
> can descend in some way copulatively, if [the term] has
> many contents, and from no one [of them] is [the orig-
> inal proposition] formally inferred. For example, in 'Ev-

*Confused and
Distributive
Supposition*

ery man is an animal', the subject supposits confusedly and distributively. For it follows: 'Every man is an animal; therefore, this man is an animal and that man is an animal', and so on. And it does not formally follow: 'This man is an animal' pointing to any [man] whatever therefore, every man is an animal[57]."

One more distinction used by Ockham with respect to distributive personal supposition is a distinction between mobile and immobile distributive supposition. Parsons (2008, 231) gives a clear account of the mobility in question. Thus, a mobile term is "one that can be instantiated; that is, the proposition containing it entails the result of replacing the term (along with its quantifier sign, if any) with any discrete term that stands for a *suppositum* of the original term." In other words, a term is mobile when a descent to a particular falling under it is possible, e.g. from 'Every donkey is running' and information that Brownie is a donkey we can infer 'Brownie is running', thus the term 'donkey' is a mobile one. Accordingly, when such a descent is impossible, a term is an immobile one. An instance of such a case is the following: in 'Every running thing is a donkey' the term 'donkey' is immobile because even if we know that Brownie is a donkey, we cannot infer (descend to) 'Every running thing is Brownie'.

Ockham's Division of Supposition

Personal   Simple   Material

Discrete   Common

Determinate   Confused

Merely Confused   Distributive

Mobile   Immobile

As for the rules determining the mode of personal supposition, they are more complex than the ones determining whether a term has a personal, simple or material supposition. They are based on such factors as presence or absence of syncategorematic terms like 'some' or 'every', also on the position of each term within a proposition. One thing to note here is the limitation of the non-axiomatic way of doing logic in a natural language like Latin (even regimented Latin used in logical treatises). The rules based just on the above mentioned factors cannot simply cover all of the possible cases (which are

---

57   Ockham, *SL* I, 70, cit. after (Ockham 1995, 58-59).

possibly infinite). On the other hand, the system of rules is open for necessary amendments (Dutilh Novaes 2007, 47-48). Moreover, even if the amount of possible combinations of terms, syncategorematic terms and their relative positions within a proposition are infinite, in a natural language, usually only a limited number of combinations is used. Thus the rules present in Ockham's theory are sufficient to cover the significant majority of cases actually encountered by a medieval logician whose main task was an analysis of natural language, which is normally less complex than mathematical infinite structures dealt with by the contemporary mathematical logician.

Now, Ockham gives the following exposition of the rules determining the mode of personal supposition:

> First it should be noted that when in a categorical proposition no universal sign distributing the whole extreme of a proposition is added to a term, either mediately or immediately (i.e., either on the part of the same extreme or on the part of the preceding extreme), and when no negation or any expression equivalent to a negative or a universal sign is added to a common term, that common term always supposits determinately. (...) The same should be said in the case of 'some man runs'; for whether the sign of particularity is added or not does not alter the personal supposition of the term, such that it is frequent for a term to have personal supposition.

> First, where a common term mediately follows an affirmative sign of universality, it has merely confused supposition. That is, in an affirmative universal proposition the predicate always has merely confused supposition.

> The first rule is that in every universal affirmative and universal negative proposition that is neither exclusive not exceptive, the subject has confused and distributive mobile supposition.

> The second rule is that in every such universal negative proposition the predicate stands confusedly and distributively.

> The third rule is that when a negation determining the principal composition precedes the predicate, the predicate stands confusedly and distributively. Thus the word 'animal' in 'Man is not an animal' stands confusedly and distributively. 'Man' however stands determinately.

> A general rule is that if anything makes a term stand confusedly and distributively, it is either a sign of universality, a negation or an expression equivalent to a negation[58].

---

58 Ockham, *SL* I, 73-74, cit. after (Dutilh Novaes 2007, 48-49).

With rules such as these at one's disposal, one can establish possible *supposita* of terms within a proposition and obtain all possible readings of a given proposition[59].

For instance, we can analyse the sentence 'A book is a concept'. As for the term 'book' it can have a personal supposition (since each term can always have a personal supposition), but also a simple supposition, since the second term is a term of second intention - it signifies an intention of the soul. In the case of personal supposition, since there are no syncategorematic terms in a proposition, the term 'book' has a determinate personal supposition and supposits for a book. If it has a simple supposition, then it supposits for a concept *book*. As for the term 'concept', it again can have a personal supposition, and actually only a personal supposition, since the term 'book' does not signify intentions of the soul or spoken/written terms. Similarly to the case of the term 'book', since there are no other modifying (syncategorematic) terms, 'concept' has a determinate personal supposition, thus it supposits for its *significata* - for all mental terms which are concepts, among them a mental term *book*. Thus we get two possible readings:

READING 1: A book is a concept.

READING 2: The concept *book* is a concept.

Obviously, only reading 2 of a proposition qualifies it as a true one, though reading 1 is still a possible reading. In sum, as pointed by Dutilh Novaes (2007, 51), Ockham's theory of supposition "can be seen as a piece of machinery which, when given propositions as input, outputs their possible readings."

2.4.2 *Buridan's Theory of Supposition*

As for Buridan's theory of supposition, there are two crucial differences between his and Ockham's accounts. Firstly, he famously eliminates simple supposition, treating the term 'man' in 'A man is a species' as suppositing materially. For Buridan (as for Ockham) universals are just words of mental language, thus if a term supposits for an universal, it supposits for a kind of linguistic term, and as such is to be treated as a case of material supposition (Read 2015a, Zupko 2014). Buridan's explanation for this is the following:

> Of the first [section on the divisions of supposition], we
> should realise that some people have posited also a third

---

59 Note that it is not entirely clear whether there is any variance with respect to supposita between different modes of personal supposition to Ockham. For instance Panaccio in (Panaccio 1983) argues that there is no such difference, thus the term 'horse' supposits for the very same things in 'All horses are mammals', 'A horse runs' and 'Bucephalus is a horse' - namely in these cases: for all presently existing horses.

member, which they call 'simple supposition'. For they
[e.g., Peter of Spain] held that universal natures are dis-
tinct from the singulars outside of the soul. And so they
said that a term supposits personally when it supposits for
the singulars themselves, that it supposits simply when it
supposits for that material nature, and materially when it
supposits for itself. But I hold that Aristotle correctly re-
futed that opinion in the seventh book of the Metaphysics
[VII.3.1038b1–1039a23] and so this kind of supposition has
to be eliminated, at least according to this interpretation.
In another manner, others [e.g., Ockham] call supposition
'simple' when an utterance supposits for the concept ac-
cording to which it is imposed and material when it sup-
posits for itself or another similar to itself. And this can be
permitted, but I do not care [about this usage], for I call
both 'material supposition'[60].

As a result, we obtain a slightly different (simplified) scheme of types
of supposition (which can be seen on the next page).

Secondly, Buridan re-introduces the notion of natural supposition
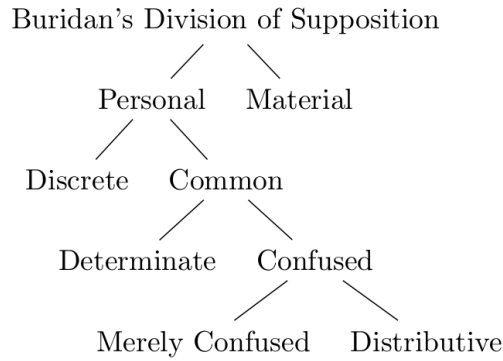as applicable to common terms:

Common supposition is usually divided into natural and
accidental supposition. Supposition is called 'natural' when
a term supposits indifferently for everything for which it
can supposit, present, past and future; this is the sort of
supposition we use in the demonstrative sciences. Suppo-
sition is called 'accidental' when a term supposits only
for present things, or only for present and past, or only
for present and future things, as the verbs and predicates
require, and will be explained later. Again, this is the sup-
position we use in telling stories, and this is also mostly
used by sophists[61].

This kind of supposition is in his opinion needed to account for the
semantics of atemporal sentences like laws of nature, which behave
differently from normal present-tensed declarative sentences.

Recall that for Buridan (as for Ockham), propositions are under-
stood very locally, as spoken, written or thought declarative sentences
rather than what is being expressed by them, and as such they con-
tain some kind of temporal index (Zupko 2003, 67). The proposition
'A book is being read' would be usually taken to be about presently
existing books, since the verb 'to be' is used there in the present tense,
and as such true only if there were presently books and some read-
ers reading them. However, proposition 'A thunder is a sound in the
cloud' is clearly true also when uttered on a sunny day. According to

---

60 Buridan, *SD* 4.3.2: 253.
61 Buridan, *SD* 4.3.4: 259.

Buridan's Division of Supposition

```
                  Buridan's Division of Supposition
                         /          \
                   Personal        Material
                    /     \
               Discrete   Common
                          /      \
                  Determinate    Confused
                                 /       \
                        Merely Confused   Distributive
```

Zupko (2003, 67), natural supposition consist of a development of theory of ampliation which we are about to present subsequently; thus now it is only needed to point out that Buridan's treatment of modes of personal supposition "is in keeping with other fourteenth-century accounts"(Zupko 2003, 70)[62].

2.5   AMPLIATION AND RESTRICTION. APPELLATION

2.5.1   *Ampliation and Restriction*

Finally, we get to the point in our exposition of terminist logic which is directly involved in the issues of intentionality, namely to the characterisation of ampliation and restriction. Recall that by default medievals took propositions to be actual sentence tokens - utterances, inscriptions, occurring thoughts - rather than abstract types. Moreover, the basic type of a declarative proposition would be simple present-tense proposition such as 'Graham Priest is a man' which possess with them a sort of time index. For this sentence to be true, both terms have to have their *supposita* (actual Graham Priest is enough in this case) existing at the moment of the formation of a token. However, as we pointed earlier, supposition depends on signification, and signification itself is not bounded in such a way, any term can signify present, past, future or possible objects. Thus in a certain context also supposition can be accordingly extended (ampliation) or restricted *Restriction* (restriction). Hence, when the adjective 'symphonic' is added to the term 'metal', the supposition of 'metal' in 'A symphonic metal is a genre of music' is restricted to symphonic metal. Another restricting factor was context of use, thus when we say 'A president is giving a speech', we are taken to mean the president of a specific country, thus 'president' is restricted to supposit only for that president (Read 2015a).

---

62 A very detailed exposition of Buridan's theory of supposition together with a comparison of the contemporary quantificational theories can be found in (Klima 2009, 176-187).

In the other direction, presence of tense ('was', 'will be'), modal ('can') and intentional verbs (such as 'know' or 'promise') broadens - ampliates - the range of supposition. A standard example here is the seemingly false proposition 'An old man will be a boy'. It was taken to be true when referring to someone not yet born, who will be an old man at some time, and will be a boy before that (Kann 2016, 233). Notice that broadening was usually taken to mean that a term preserves its default supposition to presently existing *supposita* (if any), and on top of that acquires some additional range.

Ampliation

Ockham is a special case in this context - unlike the vast majority of terminisit logicians he does not speak of ampliation and restriction (Priest and Read 1981, Johnston 2015, Read 2015a, Kann 2016, 234). One of the reasons for this seems to be his disagreement about evaluation of certain propositions. For instance 'A white thing was black', which was taken by other authors to be true when a thing that is white now and was white in the past, was black at some point before now, for Ockham is ambiguous and it "must be distinguished"[63]. On one hand it could mean 'What is white was black', on the other 'What was black was white', and these two can have different truth value. Similarly in case of modal propositions, they are ambiguous:

> 'A white thing is possibly black' is true. For 'This is black', referring to something for which 'white thing' supposits, is possible - and yet 'A white thing is black' is impossible[64].

According to (Read 2015), Ockham's account seems more plausible and is an improvement on ampliative theory[65]. Still, even if Ockham is not as explicit about the ampliation/restriction theory as other authors, he effectively uses it in his semantics together with his systematic ambiguity analysis. In the end, one of the ambiguous readings requires in its analysis ampliation/restriction mechanism.

Buridan does not share Ockham's reservations and explicitly includes the doctrine of ampliation and restriction in his *Treatise on Suppositions* (within *Summulae de Dialectica*), using it later in his Sophismata, where he offers solutions to one of the problems raised in the first chapter (the problem of non-existence). His account of restriction does not expand on what was already stated about restriction, hence

---

63 Cf. Ockham, *SL* I, 72.
64 Ockham, *SL* II, 10, cit. after (Ockham 1998, 114).
65 Read (2015) notes:

> For the ampliative account is disjunctive: it says that the proposition is true if either what was white was black or what is white was black. Then it is true if either disjunct is true; whereas on Ockham's account it has two different senses, and can be false on one while true on the other — true because something now white used to be black but false if nothing which used to be white was ever black.

we can concentrate on ampliation. He gives the following characterisation of the context in which ampliation occurs:

> We should realize that a term is ampliated beyond the status in varous ways. First, if in its categorical proposition it is placed before a verb of the past time, then it is ampliated to stand for past things, whether in suppositing or in appellating, along with the present things. For example, if I say 'A man ran', the term 'man' supposits indifferently for all men who are and who were.Second, in an analogous manner, a term put before a verb of the future time is ampliated to stand for future things. Third, a term put before the verb 'can' or before the copula of a proposition about possibility [*de possibili*] in the divided sense is ampliated to stand for possible things, even if they do not and did not exist. Therefore the proposition 'A golden mountain can be as large as Mont Ventoux' is true. Fourth, the same has to be said about a term put in a proposition about necessity [*de necessario*] in the divided sense, for such a proposition is equivalent to one about possibility. Fifth, a term is ampliated to past, future, and possible things if it is construed with a verb signifying an act of the cognitive soul, whether the term is before or after the verb; and so the proposition 'A man I think of' is true if I think of Aristotle or the Antichrist, and also 'I think of a rose' is true even if no rose exists. Sixth, verbal nouns or participles deriving from such verbs, if they are the predicates of propositions, ampliate the subjects just as the aforementioned verbs; therefore, something is generable or corruptible, or generated or corrupted, or opinable or opined, which does not exist[66].

Later on he notices that in case of future and past tensed verbs we can speak of alienation, by which it is meant that terms supposit for past of future objects only, unless it happens that these objects are presently existing (Buridan 2001, 301).

Now, what is of a special interest for us is the use of ampliation made by Buridan in accounting for modal inferences. For instance when he discusses the inferences where the verb 'know' occurs, he notices that "although I know that every man is an animal, nevartheless, it does not follow that every man is known by me to be an animal; for then it would follow that every man, whether alive or dead or yet to be born, would be known by me to be an animal, which is false (*SD* 5.6.8: 348)." Thus, through ampliation the range of truth-makers for modal inferences is extended. Once a modal or intentional verb occurs, subject of a proposition supposits also for possible things

---

66 Buridan, *SD* 4.6.2: 299.

falling under the term. In this way merely possible objects become relevant to the evaluation of our modal inferences, as in contemporary possible worlds semantics. However, as stressed by Zupko (2014), "it would be a mistake to regard it as a remarkable anticipation of that twentieth-century doctrine." Buridan himself did not see it as a great innovation, his remarks on its theoretical significance are rare. For him it was rather a part of "ongoing effort to make existing schemes for checking inferences more practicable."

In fact this picture of ampliative context given here is a bit simplified, since, as argued by Perini-Santos (2008, 60), for Buridan "the extension of the time intended by a statement is underdetermined by the tense of the verb". Even in the case of propositions with present-tensed verbs, e.g. 'Socrates is thinking', the meaning, and accordingly the truth value, are determined by the intention of the speaker, who can decide which time interval is he or she taking to be present - be it a minute, an hour, a year. One of the surprising consequences of such a view is the following. Suppose that I say 'Socrates is thinking', when in fact he is sleeping and the moment of my utterance. Then you try to contradict me by saying 'Socrates is not thinking', but in the meantime Socrates wakes up and immediately starts to think. Thus, we failed to contradict each other, if all that matters for the evaluation of a proposition is just a form, including the tense of a verb. However, you could have intended your proposition to be not about the instant of present time when you uttered your sentence, but rather about an interval of present in which the time of my statement is included, and then you would actually successfully contradict me. Hence Buridan recognises that to determine the meaning and the truth value of a proposition one has to analyse not only its form, but also account for the intention of the utterer. Consequently, we should specify that for Buridan the bearer of truth value is not just a proposition token taken in itself (written, spoken or mental), but an assertion, in which also the intention of the speaker is taken into account (Perini-Santos 2013, 412).

2.5.2 *Appellation*

The last property of terms of which we will talk about here is appellation. It is a property of predicate which roughly concerns the ability of predicate to be truly predicable about the supposita of the subject - in medieval terms it says that 'the predicate appellates its form'(Read 2015a). As Ockham explains:

Appellation

> [. . .] the predicate appellates its form. This should not be understood to mean that the predicate supposits for itself or for the relevant concept. The point is that where the proposition concerns the past, the assertion is that the proposition in which that very same predicate (under its

proper form) is predicated of that for which the subject supposits (or of the pronoun referring to that thing) was once true. If the proposition concerns the future the assertion is that the relevant proposition will be true. If the proposition concerns the possible the assertion is that the relevant proposition is possible, and similarly in the case of propositions that are necessary, impossible, *per se*, *per accidens* and so on for the other modalities[67].

As noted by Read (2015a), appellation so understood is closely connected with ampliation and restriction, which allow to distinguish it as a property of the predicate, not of the subject. Recall the proposition 'A white thing was black' which was taken to be true only if 'is black' at some point has been truly predicable of the supposita of the subject, namely, of what is or was white. Thus the predicate appellates its form (being black) to the supposita of the subject - white things. On the other hand 'A white thing is black' cannot be true, since it is self contradictory, and as a result the predicate has no appellation. Very important thing here is the universality of the application of the idea by Ockham. He uses the mechanism of the appellation of the form in analysis of past and future tensed proposition and all modal (intentional included) propositions (without a dictum or with it but taken in the divided sense, *cf.* sec.2.6.3.1 in this chapter)[68].

Buridan has two notions of appellation which can cause some terminological confusion. He speaks of a term 'appellating its form' as Ockham, but what he means by it is a contextual property which can be attributed to connotative terms in general, whether they are in a subject or predicate position (Panaccio 2012, 150)[69]. Appellation of

---

67 Ockham, *SL* I, 72, cit. after (Panaccio 2012, 144-145).
68 Cf. Panaccio 2012, 144-148.
69 This type of appellation Buridan describes in the following words:

> But every term connoting something other than what it supposits for is called 'appellative' and appellates that which it connotes as pertaining to [*adiacens*] that which it supposits for, as when 'white' [*album*] appellates whiteness as pertaining to that which the term 'white' [*album*] is apt to supposit for (Buridan, *SD* 4.5.1: 291).

Later on Buridan gives a clarifying example of what does it mean to 'appellate a form':

> For example, the term 'wealthy' supposits for a man, and so the man is called its 'matter', and it appellates houses, lands, and money, and other things he possesses as pertaining to him as to their possessor, and so such things, insofar as [*ea ratione qua*] they are possessed, are called the 'form' of the term 'wealthy'. So this is the ground of my assertion that an appellative term placed in a proposition always appellates its form, i.e., the things it connotes or of which it is appellative, and it appellates them as pertaining, either in the present or in the past or in the future or possibly, to the thing for which this term supposits, or to the thing for which the substantive term in the nominative case with which it is construed would supposit if it were the subject or the predicate of a proposition (Buridan, *SD* 4.5.2: 292).

the form is for Buridan just a contextual side of connotation of connotative terms. As such it is distinct both from Ockham's appellation of form (a property of both absolute and connotative terms in a predicate position) and second 'type' of appellation in Buridan system, namely the *appellatio rationis* (also a property of both absolute and connotative terms as related to intentional/psychological verbs)[70]. This kind of appellation is encountered in the context of intentional or epistemic verbs ('to know', 'to desire', 'to promise') "which, says Buridan (...), cause the terms following them (the predicate, or part of the predicate) to appellate their *rationes*, that is, the concepts by which they signify what they do (Read 2015a)." In other words, the terms occurring after such verbs are induced with a special type of connotation, which causes them to evoke "not only their objectual referents as in normal contexts, but also their own meaning (Panaccio 2012, 141)." Recalling the Buridan's distinction between ultimate and immediate signification, in case of appellation of reason the reference is made to immediate signification of a given term (Klima 2009, 191). Buridan himself gives the following explanation:

> There is a great difference, with respect to appellation, between verbs that signify acts of the cognitive soul, such as 'recognize', 'understand', 'signify', 'supposit', and the like, and other verbs, such as 'cut', 'burn', 'move', and the like. For with respect to verbs that do not signify such acts of the soul terms appellate only things that they signify or connote ultimately, but they do not appellate the concepts by means of which they signify. In relation to verbs that do signify such acts of the soul, however, if they follow these verbs and are construed with them as terminating their action, terms do appellate their own concepts by which they signify whatever they signify; but if these terms precede these verbs, then they do not appellate their concepts in this manner[71].

Why only "verbs that signify acts of the cognitive soul" appellate their reason? As Buridan explains it:

> They appellate these concepts in this way because we think of things by means of those concepts, but it is not in this way, i.e., not by means of a concept, that fire heats water or that a stone hits the ground[72].

This kind of phenomenon is diagnosed by Buridan to apply to a wide range of verbs where the mediation on a concept is required:

---

70 More on the appellation of the form in Buridan can be found in (Klima 2009, 188-191).
71 Buridan, *SD* 4.5.3: 294.
72 Buridan, *SD* 4.3.8.4: 281.

> . . . we have to realize that the verbs 'understand', 'know', and their like, which will be discussed later, and the participles and nouns deriving from them, such as 'understanding', 'knowing', 'thought', 'knowledge', etc., cause in the terms with which they are construed certain special modes of appellation. . . . we should note that we impose names to signify by the mediation of the concepts whereby we understand things. Therefore, even the verb 'signify' produces such appellations, just as 'understand', or 'cognize' does, and so does the verb 'appear', and so do the verbs 'know', 'opine', 'believe', 'hold [the opinion that . . .]', etc. Also, since our wishes arise in us by the mediation of cognition, it follows that the same sort of appellation is produced for us by the verbs 'want', 'wish', and 'desire'. Furthermore, since we make our promises and obligations in terms of certain concepts, it follows that the verbs 'owe', 'promise', 'obligate', etc., and other terms deriving from them also produce such appellation[73].

In all of the cases mentioned by Buridan we get a clear criterion which allows us to distinguish between verbs which causes terms following them to appellate their reason or not. If a verb or its derivative signify a mental act which concerns its object solely through the mediation of a concept, then we have a case of *appellatio rationis* (Klima 2009, 193; Biard 2017, 269-270).

The example of such *appellatio rationis* that Buridan gives is going to play a role in the next section:

> Therefore, now I briefly state that it makes a great deal of difference to say 'I know the one approaching' and to say 'The one approaching I know'. For however much you know your father by many concepts, such as those according to which he is said to be 'man', 'animal', 'father', and 'big', if you do not know him by the concept from which the name 'one approaching' is taken, then, provided he is in fact the one approaching, the proposition 'You know the one approaching' is false, for, because of the appellation of the concept, the sense of this proposition is that you know him by the concept according to which he is said to be the one approaching; but the proposition 'The one approaching you know' is true, for it is not required for its truth that you know him by that concept according to which he is said to be the one approaching, but it is sufficient if you know him by another concept, whatever that may be[74].

---

73 Buridan, *SD* 9.4, 895-896.
74 Buridan, *SD* 4.5.3: 294-295.

All in all, as pointed by Panaccio (2012), there are three main salient features of Ockham's appellation of the form and Buridan's appellation of reason, which render the two approaches more similar than it is usually admitted or even recognised (the exception here is (Biard 1990)).

1. A term appellating its reason (Buridan) or form (Ockham) normally has personal supposition - it supposits for objects falling under the term in question.

2. Appellation is directly responsible for the failure of intersubstitutivity of coextensive terms in epistemic context with respect to predicates (terms in a predicate position), whereas intersubstitutivity is admissible in case of subject terms.

3. What is appellated - form or *ratio* - is a mental act (mental concept).

One thing to notice here with respect to the first point is the difference of such approach from a Fregean view, where connotation is treated rather in intensional than extensional way. Hence, for both Ockham and Buridan, in proposition 'Jessica knows that Cicero is the author of Tusculan Disputations', the phrase 'the author of Tusculan Disputations' stands for Cicero himself despite the indirect context, while for Fregean it should stand not for its normal referent, but rather for its usual sense (Panaccio 2012, 142)[75].

2.6 OCKHAM'S AND BURIDAN'S SOLUTIONS

Finally we can spell out the solutions to the three puzzles introduced in the first chapter as given by Ockham and Buridan in terms of their nominalistic, token-based semantics.

2.6.1 *Non-existence: medieval noneism*

Here we just need to recall a few facts about properties of terms and connect them in a proper way. As we have seen, neither signification, nor supposition or its modifications (ampliation, restriction, appellation) require present (actual) existence of the objects to which terms possessing them relate. Interestingly, as observed by Dutilh Novaes (2007, 38-39), we can "dissociate the semantic notion of supposition from the issue of existence or non-existence of the *suppositum*", since the question about supposition is separable from the question about

---

75 Notice, that nowadays people tend to speak rather of guises (Castañeda), labbels (Forbes 1993), conceptual covers (Aloni 2005) than about Fregean sense. However, see (Zalta 2001) for a defence of Fregean approach in the framework of his Object Theory.

the truth of a proposition[76]. Therefore "supposition is less a theory of a proposition's aboutness than a method to establish the possible readings a proposition may have." Accordingly, *supposita* are either actual, past, future or possible objects falling under the term, yet whatever we are talking about, the ontology is composed of the nominalistically acceptable objects - concrete external individuals, their concrete features (tropes) or equally concrete mental acts, all of them being actually existing things, and nothing more[77]. In other words, as I want to argue, the semantics of Ockham and Buridan endorses noneism, where the question of the actual existence is separated from the question of the presence of objects satisfying certain properties. The domain of the discourse is broader than the domain of our ontology here.

2.6.1.1 *Ockham's account*

Surprisingly, it is not so easy to find an account of Ockham views on non-existent objects from a logical perspective. For instance, Priest (2016, 69-72; 326-328) does not speak about Ockham's view in this respect, while Klima (2008, 413) says that "Ockham is mostly silent on this subject, just as on many further details of his semantic theory, such as the issue of the apparent ontological commitment to non-existents (mere *possibilia*) in his semantics." However, arguably, such omissions or claims seems to be unjustified. Ockham's view on non-existent objects just in his *Summa Logicae* is rich enough to give an interesting description. In fact, there is a significant debate over Ockham views on non-existent objects (mere *possibilia* and impossible objects), however it is motivated mostly by Ockham's controversial views in his epistemology (ability to get a direct intuition of a non-existent object as miraculously brought about by God). On one hand we have (Adams 1990), (Brower-Toland 2007), (Normore 2012), (Choi 2016) or (Freddoso 1998) arguing that Okcham is not committed to such non-existent objects in his ontology, while (Adams 1977), (Karger 1980), (McGrade 1985), (Panaccio 1999) and (Panaccio 2016) argue that Ockham is a possibilist, committed to non-existent objects in his ontology. Let us have a look on some of the arguments proposed by one of the chief figures in the second camp, Panaccio in (2016).

Recall, that Ockham accepts the signification of non-existent objects: past, future and possible ones:

---

76 Again, there is a whole debate around this issue, for a different view see (Vaughan 2014).

77 Actually there is a special case outside of the safe zone, namely Trinity with its problematic relational nature, thus the above claim holds for the realm of created beings. Note that for both Ockham and Buridan angels are concrete, particular immaterial beings - individual substances. In any case, their nature is different from the nature of abstract or universal "beings".

> In another sense we say that a sign signifies something when it is capable of suppositing for that thing in a true past, future or present proposition or in a true modal proposition. Thus 'white' not only signifies what is now white but also what can be white (*quod potest esse album*), for if we take the subject of the proposition 'What is white can run' for what can be (*quod potest esse*), then it supposits for those things that can be white (*supponit pro his quae possunt esse alba*)[78].

Accordingly, Ockham accepts supposition to past, future and possible objects:

> On this point, it must be understood that a term supposits personally when it supposits for its significates, or for [things] that were its significates or will be or can be (possunt esse)[79].

Finally, he also speaks about the connotation with respect to possible objects:

> (...) it should be said that a property (...) is an intention predicable of some species *in quale* and convertible with it. It connotes affirmatively or negatively something extrinsic to the thing which is designated by the subject. It is not, however, necessary that the extrinsic thing be some entity outside the mind and actually existing in the nature of things, but it may be enough that it is something possible in the nature of things (*sufficit quod sit aliquid possibile in rerum natura*), or it can be a proposition existing or capable of existing in the mind[80].

These three quotes show that Ockham has no trouble with accepting semantic properties of terms lacking actually existing referent. Naturally, we can start to wonder, whether there are any metaphysical consequences following from such statements. Ockham endorses in his semantics the capability of our language to be about things that do not actually exist.

As for the ontological commitment following such a capability, it seems that it depends on the accepted meta-ontology, which is overlooked by some of the interpreters. Panaccio (2016), who seems to endorse a kind of Quinean meta-ontology, proposes the following implicit criterion of ontological commitment for Ockham (which, if correct, applies also to Buridan):

---

78 Ockham, (*SL* I, 33, cit. after (Ockham 1974, 113).

79 Ockham, (*SL* I, 72, cit. after (Ockham 1995, 61-62). See also *SL* III-1, 23 and *SL* III-3, 2.

80 Ockham, (*SL* I, 24, cit. after (Ockham 1974, 102) with some revisions.

> The acceptance of a certain sentence S as true commits one to accepting the existence of entities of a certain sort if and only if such entities must be primarily signified, or supposited for, or connoted by the terms of S if S is to be true.

We already have seen examples of such sentences. Just consider standard example used by Ockham: 'A white thing is/was/will be/can be black', which is made true by present, past, future or possible white things. With such a semantic criterion at hand there is no doubt that Ockham is committed to the existence of non-existent objects: past, future ones and *possibilia*. Hence, from a perspective of Quinean metaontology (Quine 1948, Van Inwagen 2009), Ockham in one way of another admits possible entities in his ontology by admitting reference to them and quantification over them in his semantics[81].

Sed contra, Ockham himself was not a Quinean and was quite specific about these matters (cf. Normore 2012, 91-95). First, we should consider Ockham's view on the role of a logician as different from a role of a metaphysician:

> [T]he logician, since he does not treat of man insofar as he does not treat of things that are not signs, does not have to define man. Rather he has to teach how the other sciences that do treat of man should define him[82].

The task of a logician is to establish the proper way of the use of language (signs), not to give a view on metaphysics. Logical analysis should be rather a tool than a method of metaphysical research.

Moreover, there are many reasons to think that Ockham would not agree from a perspective of his metaphysical or theological considerations with the admittance of pure *possibilia* in his ontology. From a metaphysical point of view, we have e.g. the following claim:

> Being is divided into being in potency and being in actuality. This should not be understood to mean that something which does not actually exist but possibly exists is truly a being, and that something else than that which actually exists is also a being[83].

This is a clear statement of noneism: there are possible objects (things that are not, but could be), yet they are not beings of any relevant ontological kind. Only actual beings are real beings. Full stop. It is

---

81 I leave here aside all of the problems connected with the knowledge of non-existent objects considered by Ockham on many occasions and concentrate just on semantics and logic. (Choi 2016) presents an interpretation of Ockham's epistemology which endorses both externalistic spirit of Ockham's philosophy with the view that there is no necessary commitment to non-existent objects in Ockham's ontology.

82 Ockham, (*SL* I, 26, cit. after (Ockham 1995, 37).

83 Ockham, *SL* I, 38, cit. after (Choi 2016, 1085). Interestingly, Karger in (Karger 1980, 246-250) argues that these words establish Ockham's commitment to pure *possibilia*.

instructive to compare Ockham's words with the following statement by another prominent logician from the beginning of the fourteenth century, Walter Burley, who in his *De puritate artis logicae* writes:

> ... 'being' can be taken in three ways. (a) In one way, as most transcendental and common to every intelligible. In this sense, it is the adequate object of the intellect. And in this sense, it does not follow: 'This is a being; therefore, this exists'. (b) In the second way, it is taken for a being for which it is not prohibited for it to be. In this sense, every possible being is a being. In this sense too it does not follow: 'This is a being; therefore, this exists'. (c) In the third way, it is taken for an actually existing being. In this sense, it is a participle derived from the verb 'is'. And in this third way, it does correctly follow: 'This is a being; therefore, this exists'. 'Being' said in the first way is called 'being in the understanding', because it is the object of the understanding. And in that sense, being is in the understanding 'objectively'. 'Being' said in the second way is called 'being in its causes', or the 'being that is in its cause'. But 'being' said in the third way is called 'being in itself'[84].

It is worth noting that Burley endorsed realism with respect to universals, thus already in this respect he had a more reach ontology than Ockham (or Buridan).

The presence of pure *possibilia* would also create a very serious theological problem for the doctrine of *creatio ex nihilo*. One of the motivation for Ockham to refuse any independent existence of universals is exactly of this sort:

> Again, if the view in question were true [that universals are individual, independent substances/beings, AB], no individual would be able to be created. Something of the individual would pre-exist it, for the whole individual would not take its existence from nothing if the universal which is in it were already in something else[85].

The same argument would apply for the possible being considered as the true being (or a semi-being, somehow possessing a shadow of existence). Ockham's Razor was sharp enough to cut off vast amount of abstract, universal or fictional objects from his ontology. A man with such a sober view on reality would definitely use his Razor against any other kind of non-existent beings: past, future or possible ones[86].

---

84 Burley, *De puritate artis logicae*, §246, cit. after (Vaughan 2014, 77).
85 Ockham, *SL* I, 15, cit. after (Ockham 1974, 80)
86 There is yet a derivative sense of 'being' corresponding to a derivative sense of 'nothing' accepted by Ockham, namely, in the wider sense we can say that 'This is

Thus, I agree with Choi (2016) that, from a perspective of Ockham's logical, metaphysical and theological considerations, the admittance of pure *possibilia* as beings is questionable. Here I would risk the following hypothesis. The accusation of Ockham with respect to the acceptance of *possibilia* as parts of his ontology, like the one made by Panaccio or Karger, is based on reading Ockham through the lenses of Quinean meta-ontology. With a different meta-ontology at hand, for instance noneism (aka meinongianism), the verdict would be different. As for the Quinean meta-ontology, we just need to realise that Ockham would not have accepted it (Normore 2012, 91). The other issue, which I cannot discuss here for the lack of space (cf. Priest 2016, especially chapters 5, 6 and 18), is that it (Quinean meta-ontology) could be aptly described by the following quote from the classic: "It really is a nice theory. The only defect I think it has is probably common to all philosophical theories. It's wrong" (Kripke 1980, 64).

Now one could ask: is there any way to specify ones metaphysical views within Ockham's framework? When, according to Ockham, we are committed to the existence of objects to which terms present in the sentences which we take to be true refer? In general the presupposition of existence occurs in the context of affirmative singular present tensed, non-modal categorical propositions. Actually, as argued for instance by Fredosso (1980), the truth of all other kinds of propositions is for Ockham dependent on the truth of some singular, present-tensed, non-modal sentence, so a proper account of such singular proposition is crucial for the understanding of Ockham's whole semantics.

Still, before we move further, we need to recall a distinction between the primary signification in the narrow sense, in which we say that a term T signifies an object just in case a sentence 'This is T' ('this' pointing or referring to an object) is true[87]. And, as argued by Normore (2012, 92), such sentences are true when whatever 'this' or a relevant pronoun picks out exists.

Hence we can reformulate the criterion proposed by Panaccio in the following manner:

> The acceptance of a certain affirmative, assertoric singular
> present-tensed, non-modal sentence *S* as true commits one
> to accepting the existence of entities of a certain sort if and
> only if such entities must be primarily signified (in the
> narrow sense) by the terms of *S* if *S* is to be true.

Now, what about the truth of propositions where we encounter terms signifying, suppositing or connoting past, future or possible

---

a being' is equivalent to 'This is not repugnant to existence', which accordingly is equivalent to 'This can exist' (Normore 2012, 93). Still, arguably, such a distinction is not a straightforward way of committing oneself to *possibilia* as we will see shortly.

87   See the first description of signification in *SL* I, c. 33.

objects (all of which are not actually existing beings)? One could argue (Fredosso 1980) that for Ockham the truth of such propositions where we encounter a reference to non-existent objects (many intentional propositions are just like that) does not depend on a special metaphysical foundation, but rather on the occurrence of appropriate logical relations as being asserted (*denotatur*) to obtain. For the one thing, when Ockham explains the truth conditions of singular, present-tensed non-modal propositions (not equivalent with any hypothetical proposition), he speaks exactly about the obtaining of a certain logical relation:

> [F]or the truth of such a singular proposition which is not equivalent to several propositions it is not required that the subject and predicate be really identical, or that the predicate be in reality in the subject or that it really inhere in the subject, or that the predicate be united to the subject itself outside the mind. Thus, for the truth of 'This is an angel' it is not required that the common term 'angel' be really identical with what is posited as the subject, or that it be really in that subject, or anything of this sort. Rather, it is sufficient and necessary that the subject and predicate supposit for the same thing. And, therefore, if in 'This is an angel' the subject and predicate supposit for the same thing, the proposition will be true[88].

Moreover, when I say 'Socrates was/will be/can be a philosopher', according to Ockham I can validly infer that 'Socrates was/will be/-can be', but not that 'Socrates is' (Normore 2012, 92). Things are not always so easy though. For instance in a case of sentences like 'Elvis is dead' or 'The Antichrist is a future being', the modal or tense operator are not explicit. In case of the former sentence, 'is dead' functions in a way as would a complex phrase 'was alive and is not now alive', thus an inferences from 'Elvis is dead' to 'Elvis is' is invalid, as desired. Thus Ockham would claim that 'Elvis is dead' is a true sentence without any commitment to the existence of Elvis.

Let us have a look at the case of a sentence with a connotative term. According to Ockham categorical sentences with a connotative term are equivalent to some hypothetical sentence (a sentence with a more complex logical structure) (cf. *SL*, II, 11). As Ockham puts it:

> Hence, it should be noted that whenever there occurs in a proposition a concrete term corresponding to an abstract term that introduces a thing that informs another thing, then it is always the case that two propositions are required for the truth of such a proposition . These two propositions can be called its exponents[89].

---

88 Ockham, *SL* II, 2, cit. after (Ockham 1998, 86).
89 Ockham, *SL* II, 11, cit. after (Ockham 1998, 117).

For instance the sentence 'Socrates is white', because of the presence of a connotative term 'white', requires for its truth that two other sentences be true, namely 'Socrates exists' and 'Whiteness is in Socrates'. Clearly, the first one (as a relevant singular affirmative sentence) carries the straightforward existential claim. Accordingly, the truth of various types of propositions, including universal, tensed, modal propositions depends on the truth of some appropriate singular propositions (cf. *SL* II, 3, 4, 7, 10, 11), the crucial place where we need to seek for the ontological commitment is the affirmative singular proposition and its truth conditions, just as we stated above.

Recall how Ockham himself deals with the issue of supposition for non-existent terms in affirmative propositions with empty names:

> To the second doubt, it must be said that, according to the proper meaning of the expression, it must be conceded that if no man is white and no man sings the mass and if God does not create, then in the aforementioned propositions, the subject does not supposit for anything. And yet it is taken significatively, since 'taken significatively' or 'supposit personally' can be understood in two ways: either that the term supposits for one of its *significata*, or that it is asserted [*denotatur*] to supposit for something, or that it is asserted to supposit for nothing. For in such affirmative propositions, it is always asserted that the term supposits for something, and therefore if it supposits for nothing, the proposition is false. In negative propositions, however, it is asserted that the term does not supposit for anything, or that it supposits for something of which the predicate is not true, and therefore such negative [propositions] have two causes of truth. [. . .] In '*homo albus est homo*', if no man is white, the subject is taken significatively and personally, not because the subject supposits for something, but because it is asserted to supposit for something; and since it supposits for nothing, and yet it is asserted to supposit for something, the proposition is simply false[90].

Here I agree with Dutilh Novaes (2013) that this explanation of Ockham is clear and satisfactory. It shows at the same time that Ockham was aware of the problem of reference to non existent objects. And he had ways to avoid it built in in his intensional semantics of the theory of supposition based on the notion of *denotatur*. In other words, Ockham is a noneist: he accepts that a talk about nonexistent objects is meaningful, yet at the same the only beings there are in the strict sense, are actual entities. Nothing more.

---

90 Ockham, *SL* I, 72. Cit. after (Dutilh Novaes 2013, 362-363).

In what follows I want to make it explicit what does it mean than Ockham is a noneist (or a pre-meinongian), and specify his views on impossible objects from a perspective of a logician. Ockham seems to be more restrictive in his considerations of things which do not exist than some medieval or contemporary noneists like Marslius of Inghen, Paul of Venice or Graham Priest (cf. Priest 2016, 326-328). Thus, for instance, he argues that terms referring to fictional or impossible objects do not signify any objects in a way that terms referring to actual, past, future or possible objects do:

> In the same way, by means of figment terms (*terminos fictos*) such as 'chimera', 'tregelaphus', 'vacuum', 'infinite', etc., nothing is signified except what is signified by other terms, as is clear from the nominal definitions of these terms. Still, things are not signified in the same way by these terms and by the others. Rather, they are signified by the other terms in such a way that those other terms can supposit for the things, whereas these figment terms cannot supposit for them, just as their nominal definitions cannot supposit for them. Hence, it should not be imagined that just as there are certain beings signified by terms such as 'man', 'animal', 'white ', 'hot', 'long', 'short', and so on, so too there are certain non-beings and *impossibilia*, totally distinct from beings, which are signified by terms like 'chimera', 'goat-stag', etc. -as if there were a world of *impossibilia* in the same way that there is a world of beings. Rather, anything imaginable signified by the name 'chimera' is signified by some term of which 'being' is predicated in a non-modal proposition or in a *de possibili* proposition. Nevertheless, the name 'chimera' cannot supposit for that thing. For this reason, any affirmative proposition in which the name 'chimera' or one just like it, taken significatively, is either the subject or the predicate is, strictly speaking, false, since it has some false exponent. For 'A chimera is a non-being' - and any proposition just like it - is literally false, since each such proposition has the exponents 'A chimera is something' and 'That thing is a non-being', the first of which is false[91].

So not only there are no actual, real, existing chimeras, but also no non-existent chimeras. *A fortiori*, no non-existent round-squares, etc. One could say that we then fall into the problem with the law of excluded middle: either 'A is B' or 'A is not B'[92]. Ockham has a reply to that problem too:

---

91 Ockham, *SL* II, 14, cit. after (Ockham 1998, 122-123).
92 When we consider supposedly material objects like a man or a chimera, to say that a chimera is not a being seems *prima facie* equivalent to saying that a chimera is a non-being.

> Someone might claim that (...) one of two contradictories is said of anything. Therefore, if a chimera is not a non-man, then a chimera is a man.
>
> It should be replied, in keeping with Aristotle's meaning, that it is not the case that one of two contradictory terms is said of any term taken significatively. For example, neither 'man' nor 'non-man' is said of the name 'chimera' taken significatively. Nevertheless, one of two contradictory terms is said of any term-suppositing significatively and not including in itself any syncategorematic element or other determination-of which 'being' or 'something' is truly predicated. Thus, if 'A chimera is something' were true, then either 'A chimera is a man' or 'A chimera is a non-man' would be true. And so it should be conceded that it is not the case that one of two contradictory terms is said of just any term taken significatively, but that, despite this fact, it is the case that any term is either truly affirmed or truly denied of such a term. This latter point is what Aristotle means when he says: "Of anything either the affirmation or the negation," and not both. So although neither 'man' nor 'non-man' is said of 'chimera', still 'man' is either truly affirmed (*vere affirmatur*) or truly denied of 'chimera'. Hence, one of these two propositions is true: 'A chimera is a man', 'A chimera is not a man'. Similarly, one of these two propositions is true: 'A chimera is a non-man', 'A chimera is not a non-man'. The same thing holds for these two: 'A white man is a man', 'A white man is not a man'; and for these two: 'A white man is a non-man', 'A white man is not a non-man'[93].

In other words, since chimera is a connotative term with only nominal definiton, there is no object signified properly by the term, thus there is no proper way to apply the law of excluded middle in a normal way. Moreover, also the identity statements fall with respect to terms signifying impossible objects:

> Now, someone might ask: isn't 'A chimera is a chimera' true? It seems that it is true, since the same thing is predicated of itself.
>
> It should be replied that if the terms supposit significatively, then 'A chimera is a chimera' is, strictly speaking, false, since it implies a falsehood[94].

Actually, the statement of self identity of any non-existent object, also a past, future or possible one, is for Ockham false, cause he takes it to

---

93 Ockham, *SL* II, 12, cit. after (Ockham 1998, 120).
94 Ockham, *SL* II, 14, cit. after (Ockham 1998, 123).

imply the existence of the *suppositum*, as long as it is expressed in a present tense proposition. Thus 'Socrates is Socrates' is false for Ockham, while 'Socrates was Socrates' is true. We can say that Ockham's restrictions on signification and supposition fulfil here the function similar to the restrictions on the Characterisation Principle. We can allow names of actually non-existent, impossible objects, but their logical properties are restricted just to those which do not entail the existence of the referent.

Still, when terms referring to impossible objects are not taken significatively (in a sense of primary signification), they can be parts of true affirmative propositions:

> A nominal definition, on the other hand, is an expression that reveals explicitly what is conveyed by a word. For example, someone who wants to teach [someone] else what the name 'white' signifies says that it signifies the same as [does] the expression 'something having a whiteness'. There can be this [kind of] definition not only for names of which 'to be' can be truly verified in reality, but also [for names] of [things] of which such predication is impossible. Thus 'vacuum', 'non-being', 'impossible', 'infinite', [and] 'goat-stag' have definitions. That is, there correspond to these names certain expressions that signify the same [things] that these words [do].

> It follows from this that, taking 'definition' in this sense, sometimes it is impossible to predicate the definition of the defined by means of the verb 'is', when both [the definition and the defined] are taken significatively. Thus, 'A chimera is an animal composed of a goat and an ox' (let that be its definition) is impossible. This [is so] because of an impossible implication, namely, [the one] by which it is implied [by this proposition] that something is composed of a goat and an ox. Nevertheless, the proposition '"Chimera" and "animal composed of a goat and an ox" signify the same [things]', in which the terms supposit materially, is true[95].

So the terms referring to impossible objects posses some logical properties in an appropriate context, namely, where the terms in question are not taken significatively, i.e. they do not stand for their referents. The notion of a nominal definition (related to connotative terms) is actually very powerful in this context: it allows us to endow our words with meanings, even if there is nothing in the external reality corresponding to them[96]. As pointed by Keele (Keele 2010, 58-59),

---

95 Ockham, (*SL* I, 26, cit. after (Ockham 1995, 39-40).
96 More on the role of nominal definitions in Ockham semantics, which again is a matter of controversy, can be found e.g. in (Panaccio 2003) and (Panaccio 2004).

in Ockham's semantics "where connotative terms and nominal definitions are at stake, no metaphysics is at stake, and there can be no profound ontological disputes". To give another example of the similarity of Ockham's view with contemporary ideas, the way nominal definitions corresponding to the terms naming impossible objects work seems similar to the way encoding works in Zalta's Object Theory (cf. Zalta 1983). In Zalta's framework, to describe an abstract object (which is for him necessarily non-existent) as possessing certain properties is to give its characterisation - describe properties encoded by it, not to give its representation. Thus, arguably, since the representational part is missing, we have a way to speak about all sorts of non-existent abstract objects without any ontological commitment. In an analogous way Ockham allows that impossible objects can be defined - characterised, yet not represented.

2.6.1.2 *Buridan's account*

In Buridan's semantics too, aboutness or directedness of mental acts can be coherently divorced from the commitment to not (fully) existent objects taken as somehow real. The key idea here is the use of the doctrine of ampliation. Perhaps a look at Buridan's own words will clarify the matter:

> We should note that we can think of things without any difference of time and think of past or future things as well as present ones. And for this reason we can also impose words to signify without any difference of time. For this is the way names signify. Therefore, by the specific concept of 'man' I conceive indifferently all men, present, past and future. And by the name 'man' all [men] are signified indifferently, present, past and future [ones alike]. So we truly say that every man who was was an animal, and every man who will be will be an animal. And for this reason it follows that the [verbs] 'think/understand' [*intelligere*], 'know', 'mean/signify' [*significare*] and the like, and the participles deriving from them, ampliate the terms with which they are construed to refer indifferently to present, past and future and possible [things] which perhaps neither are, nor will be, nor ever were. Therefore, even if no rose exists, I think of a rose, not one that is, but one which was, or will be, or can be. And then, when it is said: the name 'rose' signifies something, I concede this. And when you say: that [thing] is not, I concede that; but it was. If, then, you conclude: therefore, something is nothing, I deny the consequence, for in the major premise the term

> 'something' was ampliated to past and future [things], and
> in the conclusion it is restricted to present ones[97].

Buridan argues here that we can speak truly about presently non-existing objects (past, future or possible) due to the ampliation. Klima (2013, 366) concludes, that then at the level of object language we are not committed to the existence of not fully real or actual beings. All we need is our concrete acts of thinking endowed with capability to signify, supposit and connote present, past, future or possible objects. Again, we can ask about the ontological commitment of semantics where such moves are allowed.

As argued by Klima on many occasions, Buridan would deny charges concerning the acceptance of possible (or any toher type of non-existent) beings in his ontology. For instance, as Buridan argues, from the truth of the sentence 'A man is possibly a logician', it does not follow that either a man, or that a possible man exists. What follows is that, through ampliation, we can infer that 'What is or can be a man can be a logician', which does not require actual existence of men or logicians, only an overlap of possible *significata*. Quinean objection works from a level of metalanguage, from which we observe that Buridan's analysis of propositions with ampliated terms requires the variables to range over mere *possibilia*. Yet, Buridan would reject such an objection by denying the object/metalanguage distinction, since for him there is only one language, thus he endorses semantical closure. Henceforth he would say that he is committed only to the things which he has to say that they exist (Klima 2008, 418). And those are just actual, real beings of his nominalistic ontology - again, a case of noneism.

Granted we can think of, signify, supposit to not presently existing objects, are we not then thinking of, signifying or suppositing for non-existents? Buridan would say that we are not. Let us look at the explanation of the sophism "A non being is understood" which we already pointed in the first chapter:

> I respond that the sophism is false, for the term supposits
> for nothing. And this is clear in the following manner:
> for the verb 'to understand' or 'to be understood' ampli-
> ates supposition to past, and future, and even all possi-
> ble things. Therefore, if I say, 'A being is understood', the
> term 'being' supposits indifferently for every present or
> past or future or possible thing. But the rule is that an
> infinitizing negation added to a term removes its suppo-
> sition for everything for which it supposited and makes
> it supposit for everything for which it did not supposit,
> if there are any such things. Therefore, in the proposition
> 'A non-being is understood', the term 'non-being' does not

---

97 Buridan 1983, 12-14. Cit. after Klima 2013, 365-366.

supposit for some present, nor for some past, nor for some
future, nor for some possible being; therefore, it supposits
for nothing, and so the proposition is false. And I say that
'A non-being is understood' and 'What is not a being is
understood' are not equivalent, for by the verb 'is' you re-
strict the infinity [*infinitatem*] to present things. Therefore,
the supposition for past and future [and possible] things
remains, and thus this has to be conceded: 'What is not
[a being] is understood'. If, therefore, we are to give an
equivalent analysis of 'A non-being is understood', then it
will be the following: 'What neither is, nor was, nor will
be, nor can be is understood', and this is false, just as the
sophism was[98].

It is as clear a statement of noneism as one can get, at least among
medieval authors. It seems that Ockham would in principle agree
with Buridan on this point.

There is something we can add here about Klima's interpretation of
Buridan's view. On few occasions Klima juxtaposes Buridan's seman-
tics with Meinongian and Quinean framework. However, when he
is speaking about the 'Meinongian Jungle' (cf. Klima 2009, 157-159),
where it is assumed by him that Meinongians claim that "for quantifi-
cation and reference things somehow already have to be there, they
must be somehow given in order to be referred to or to be quantified
over", what he has in mind is not a Meinongian view as proposed by
Meinong himself or a neo-Meinongian like Priest, but rather some-
thing like early Russell object theory. It is even more clear when he
writes about the issue of ontological commitment, contrasting the
view of Buridan with Quine and Wyman (Klima 2009, 163-165), an
arch-villain of proper metaphysics. He takes Wyman to be a propo-
nent of Meinongian view. However, as quite clearly shown by Priest
(2016, ch. 5), if there is anyone with whom Wyman can be identified,
it is early Russell, not Meinong, even less neo-Meinongians like Priest.
On the other hand, Klima's interpretation of Buridan fits perfectly in
noneist framework. Thus we can take another risk and claim that both
Buridan and Klima's reading of him are implicitly noneist.

2.6.2   *Intentional Indeterminacy*

2.6.2.1   *Ockham's account*

First, let us have a look at Ockham's own words:

[I]t has to be said that such propositions [as] 'A horse is
promised to you' [and] 'Twenty pounds are owed to you'
are literally false, because each [of their] singulars is false,

---

98 Buridan, *SD* 9.5.7: 923-924.

as is clear by induction. Yet if such terms occur on the part of the predicate, [the propositions] can be granted after a fashion. In that case, one must say that terms following such verbs have, by virtue of those verbs, merely confused supposition. Therefore, one cannot descend disjunctively to singulars, but only by a disjunctive predicate, counting not only present [things] but also future [ones]. Thus, it does not follow: "I promise you a horse; therefore, I promise you this horse or I promise you that horse," and so on for present singulars. But it does correctly follow: "I promise you a horse; therefore, I promise you this horse or that one or that one", and so on, counting all [horses], both present ones and future ones. This is because such verbs equivalently include verbs about the future. Thus 'I promise you a horse' amounts to 'You will have a horse by my gift'[99].

Unpacking what is said here, let us consider the sentence:

(1) I promise you a horse.

According to Ockham the term 'horse' has a merely confused supposition. Therefore one cannot descent to a wide scope disjunction:

(2) I promise you *this* horse or I promise you *this* horse, and so on.

but rather to the following narrow scope disjunction:

(3) I promise you *this* horse or *that* horse, and so on.

Moreover, because of the special character of the verb 'promise', 'horse' supposits for present and future horses. Now, if the term 'horse' had a determinate supposition, one could descent to (2). Contraposing it, one could ascend from 'I do not promise you this horse and I do not promise you that horse ...' to 'It is not the case that I promise you a horse', and (1) would be false. But since 'horse' has a merely confused supposition, inference is blocked and (1) can be true. Notice that for Ockham (1) is not ambiguous but rather indeterminate i.e. it is not the case that (1) has more than one reading, but rather it has one, unambiguous reading where it is just indeterminate. At a face value this is a simpler explanation than the one offered by Priest, since we do not require any propositional analysis of the indeterminate sense of (1). All what is needed is the recognition of the feature of a verb like 'promise' which causes terms following it to have a merely confused supposition (of course it also causes supposition's ampliation). Still, not all verbs recognised by Priest to call for propositional analysis seem to fall under Ockham's analysis, e.g. 'worship', and there is no clear (and not *ad hoc*) criterion of distinguishing such verbs (Priest

---

99 Ockham, *SL* I, 72, cit. after (Ockham 1995, 65).

2016, 74-75). In this respect we could say that for Ockham the issue here is with terms, not with verbs; only terms which can be ampliated to future or past objects can also be caused to have a merely confused supposition. As for possible objects, he could admit only naturally possible objects what would fall under contemporary notion of physical possibility. Hence "I promise you a chimera' would be false, since chimera is naturally [physically] impossible object.

2.6.2.2 *Buridan's account*

In Buridan's account not only the mode of personal supposition, but also appellation plays a role[100]. We need to note that the appellation of intentional verbs serves to restrict supposition of a predicate term. Consider for instance the sentence 'You are one who knows Coriscus.' The predicate 'one who knows Coriscus' has here a determinate supposition, since we can descend to 'You are a person a, or you are a person b, ...', which constitutes a list of these people who know Coriscus. However, since the verb 'know' is an intentional one, the supposition of the predicate is restricted to the people who know Coriscus under this specific appellation.

Let us have a glimpse on the Buridan's formulation of the response to the sophism connected with (1) (note that Buridan speaks about someone owing a horse, not about someone promising penny):

> This sophism appears to be difficult. First, however, I lay it down that in the case posited I would owe you a horse, but then the question arises whether I owe you Blackie. And we should reply that this is not so, and also that by promising you a horse I did not promise you Blackie; for, as was said earlier, the verbs 'promise' and 'owe', just like the verbs 'know' and 'think', make the terms following them appellate their concepts. Therefore, a consequence is not valid in which the concept or predicate is changed after [the verb]; indeed, it does not appear to be a valid consequence either if we descend from the species to the individual without distribution. It should be added, however, that it makes a great difference whether we place 'horse' before or after [the verb], for the aforementioned verbs, because of the appellation of the concept, somehow confuse the [supposition of the] terms that follow them, so that it is not possible to descend to the singulars by means of a disjunctive proposition. For example, this is not valid: 'I owe you a horse; therefore, I owe you Tawny, or I owe you Blackie', and so forth; for each [member of this disjunction] is false. But before [the verb] the term is not thus confused; therefore, it is possible to descend by means of

---

100 For the very detailed analysis of Buridan's account see (Klima 1993) and (Biard 2017).

a disjunctive [proposition]. Therefore, if 'A horse is owed
by me to you' is true, then it follows that either Tawny is
owed by me to you or Blackie is owed by me to you, and
so forth[101].

What Buridan is saying here is that the reason why we cannot infer
'I owe you this horse or I owe you that horse, ...' from 'I owe you a
horse' has to do with the difference in appellation. In each disjunct the
appellated concept is a singular concept of this or that horse, while in
the premise we have an universal concept of horse. Thus it is possible
that the premise is true while each of the disjuncts is false. At the
same time from 'I owe you a horse' it does follow that 'This horse I
owe you or that horse I owe you, ...', since 'horse' is placed before the
verb in each of the disjuncts, and in such case we do not encounter a
determined *appellatio rationis* (Klima 2009, 196-197).

   Now, getting back to the analysis of (1), its canonical form for Buri-
dan would be 'I am one/someone who promised you a penny.' As ex-
plained by Klima (2009, 194), the question of truth-conditions of sen-
tences like (1) boils down to the question whether the term 'the one
who promised you a penny' supposits for me in the canonical form
of (1). In presence of intentional participle 'promise', the oblique term
following it appellates its own *ratio* (immediate signification, concept),
and as a result a complex term can supposit for me only if its par-
ticiple supposits for me in relation to this ratio together with other
connotata required by their signification. Accordingly, the predicate
'one who promised you a penny' has a determinate supposition and
stands for all those who have promised you a penny, however, under
that appellation (immediate signification of this complex term). With
this kind of appellation at hand we can show why (1) is true. So, let
p_1, p_2, ..., be a list of pennies. Notice that it is true that I do not owe
you p_1 and I do not owe you p_2, etc. However, we cannot ascend from
it to 'I do not owe you a penny (p_1, p_2, ...), because the appellations
of 'one who owes you a penny' and 'one who owes you p_1', etc, are
different.

   According to Priest (2016, 77-78), what it shows is that the suppo-
sition of 'a penny' does not play a role (at least not a direct one) in
establishing of the truth value of (1), only supposition of the complex
term 'one owing you a penny', hence the problem of indeterminacy of
'a penny' vanishes. At the same time one can ask what is the precise
contribution (if any) of the supposition of 'a penny' to the complex
term 'the one who promised a penny'.

---

101 Buridan, *SD* 9.4.15: 909.

2.6.3   *Substitutivity of Identicals*

2.6.3.1   *Ockham's account*

As for the failure of substitutivity of identicals, Ockham's account is similar to the one given in the first chapter. Thus substitutivity holds in non-propositional intentional context:

(4)   You know Coriscus.
       Coriscus is the hooded man.

       You know the hooded man.

The reson for this is that according to Ockham there is no case of appellation of the form here. Neither 'Coriscus' in the first premise, nor 'the hooded one' in the conclusion are taken by him to be predicates of modal epistemic sentence. To be treated as such so they would have to stand for 'F' (a logical predicate) in the following construction:

- A is known (or believed, etc.) to be F

And clearly it is not the case here (cf. Panaccio 2012, 158). Actually, Ockham would probably not recognise a sentence like 'you know Coriscus' as a modal sentence *sensu stricto*. When he describes a division of propositions between modal and non-modal ones, he says:

> On this point it should be noted that a proposition is called modal because of the addition of a mode to the proposition. But not any mode is sufficient to make a proposition modal. Rather, it is necessary that the mode be predicable of a whole proposition. Therefore, properly speaking, the mode of a proposition is, as it were, truly predicable of the proposition itself. And it is in virtue of such a mode or the adverbial form of such a predicable - if it has an adverbial form - or its verbal form that a proposition is said to be modal. But there are more such modes than the four mentioned above. For just as one proposition is necessary, another impossible, another possible, another contingent, so too one proposition is true, an other false, another known, another not known, another spoken, another written, another thought, another believed, another opined, another doubted, etc. Therefore, just as a proposition is called modal in which the mode 'possible' or 'necessary' or 'contingent' or 'impossible' or the adverbial form of any of them occurs, so too a proposition in which one of the above mentioned modes occurs can just as reasonably be called modal. Thus, just as 'That every man is an animal is necessary ' and 'Every man is necessarily an animal, are modal propositions , so too are 'That every man

is an animal is known ' and 'Every man is known to be an animal' and propositions such as 'That every man is an animal is true' - and so on for the others[102].

For the sake of better understanding Ockham's position here, we need to introduce two distinctions. First, a distinction between a modal sentence with or without a dictum:

Modal Sentence with and without a Dictum

> And it should first be noted that some times a proposition is called modal because the dictum of the proposition is taken with such a mode. This is clear in the following cases: 'That every man is an animal is necessary', 'That every man is running is contingent', 'That every man is an animal is *per se* in the first mode', 'That everything necessary is true is known', 'That Socrates is running is unknown', and so on for the others. However, some propositions are called modal in which the mode occurs without such a dictum of a proposition[103].

What it amounts to is basically a distinction between a modal sentence with a that-clause in English or a one without (and not equivalent to a sentence with a that clause, cf. (Panaccio 2012, 146)). However, on top of this, Ockham claims that all modal sentences with a dictum are ambiguous between a divided and composite reading:

Composite and Divided Reading of Modal Propositions

> A modal proposition of the first type must always be distinguished with respect to composition and division. In the sense of composition it is always asserted that such a mode is truly predicated of the proposition corresponding to the dictum in question. For example , by means of 'That every man is an animal is necessary' it is asserted that the mode 'necessary ' is truly predicated of the proposition 'Every man is an animal', the dictum of which is 'That every man is an animal'. For something is called the dictum of a proposition when the terms of the proposition are taken in the accusative case and the verb in the infinitive mood. However, the sense of division of such a proposition is always equipollent to a proposition taken with a mode and without such a dictum. For example, 'That every man is an animal is necessary' in the sense of division is equipollent to 'Every man is of necessity (or necessarily) an animal'. Similarly, 'That Socrates is an animal is known' in the sense of division is equipollent to 'Socrates is known to be an animal '- and so on for the others[104].

---

102 Ockham, *SL* II, 1, cit. after (Ockham 1998, 80-81).
103 Ockham, *SL* II, 9, cit. after (Ockham 1998, 108-109).
104 Ockham, *SL* II, 9, cit. after (Ockham 1998, 109).

Both distinctions are reminiscent of the de re/de dicto distinction mentioned in the first chapter of this work, however one should bare in mind that none of them fits in with it, at least not fully (cf. Bos 1993, 52; Panaccio 2012, 146; Johnston 2015, 237-238). Be that as it may, what is crucial here is the bearing on the truth conditions of a sentence depending on the reading in which we take it. So, if we take a modal sentence with a dictum 'it is known that man is an animal' and one without: 'a man is known to be an animal', the first one taken in its divided sense has the same truth conditions as a corresponding sentence without a dictum. At the same time, a composite reading of the former is not equivalent to the latter (Panacio 2012, 146). The importance of these observations lies in the implicit use of the appellation of the form by Ockham to account for the truth conditions of a sentence without a dictum, and, *a fortiori*, a sentence with a dictum taken in a divided sense:

> [I]t should be noted that for the truth of such propositions it is required that the predicate under its proper form belong to that for which the subject supposits, or to a pronoun referring to that for which the subject supposits. Thus, it is required that the mode expressed in such a proposition be truly predicated of a non-modal proposition in which the very same predicate is predicated of a pronoun referring to that for which the subject-supposits - just as it was explained in the case of past tense and future-tense propositions. For example, for the truth of 'Every truth is necessarily true' it is required that each proposition be necessary in which the predicate 'true' is predicated of anything for which the subject 'truth' supposits. That is, it is required that each proposition like the following be necessary: 'This is true', 'That is true', referring to something for which the subject supposits. And since it is not the case that each such proposition is necessary, 'Every truth is necessarily true' is simply false[105].

Now, getting back to the analysis of (4), as pointed out by Willing (1985, 47), Ockham accepts the following argument form:

A1:   s knows a

      a is b

∴   s knows b

Ockham explains the reasons for his approval in the following words:

> For it follows: 'You know Coriscus; therefore Coriscus is known by you'; now it follows 'Coriscus is know by you;

---

105 Ockham, *SL* II, 10, cit. after (Ockham 1998, 112).

Coriscus is the one approaching; therefore the one approaching is know by you,' and further, 'therefore you know the one approaching'; therefore from the first to the last: you know Coriscus, Coriscus is the one approaching, therefore you know the one approaching[106].

So the acceptance of the form A1 depends on the acceptance of the following three argument forms by Ockham:

A2: s knows a

∴ a is known by s

A3: a is known by s

a is b

∴ b is known by s

A4: a is known by s

∴ s knows a

The admittance of inferences like A2 and A4 is not exactly obvious, ass we will see from the discussion of Buridan's account. Notwithstanding, the following inference is clearly valid:

Coriscus is a man.

(5) Coriscus is the hooded one.

The hooded one is a man.

However, the result of prefixing in (5) one of the premises and the conclusion with a verb like 'know' or 'possible' is not allowed:

You know that Coriscus is a man.

(6) Coriscus is the hooded one.

You know that the hooded one is a man.

Thus, the following argument form is fallacious:

A5: s knows that a is F

a is b

∴ s knows that b is F

As was already noticed, the cause of the failure of substitutivity is the difference in appellation of the form. As explained by Pannacio

---

106 Ockham, *Expos. Elench*, lib. II, c. 9, cit. after (Willing 1985, 48).

(2012, 151-152), the rule of appellation of the form in case of epistemic modal sentences requires that for you to know that Coriscus is a man is for you to know a singular sentence in which 'is a man' is a predicate applied to Coriscus, thus you know the sentence 'Coriscus (or 'this', pointing at Coriscus) is a man'. On the other hand, for you to know that the hooded one is a man is for you to know the sentence 'the hooded one (or 'this' pointing to him) is a man'. The general explanation for such a position is given by Ockham in the following words:

> Now what has been said should also be understood to apply to other modal propositions, e .g. 'Every man is known by you to be an animal'. For in order for this proposition to be true, it is required that each proposition like the following be true: 'This is known by you: "This is an animal, and that is an animal"', and so on for each one. Therefore, 'Every man is known by you to be an animal' is false, strictly speaking, as is 'Every man is not known by you to be an animal'[107].

Interestingly, as pointed out by Ivan Boh (1993, 53-54), we can also approach the problem in terms of the supposition theory. He observes that in a sentence like 'you know that the hooded one is a man', the term 'the hooded one' has an immobile supposition since it falls under the scope of the intentional verb, in this case 'to know'. Recall, that in case of immobile supposition one can not descend to (infer) a singular sentence.

2.6.3.2 *Buridan's account*

Buridan gives the following reply to the sophism 'I know the one approaching':

> To the sophism that was the ninth of this chapter I reply that in the case posited the sophism is true, namely, 'You know the one approaching'. For you know him in terms of the concept according to which he is said to be the one approaching, for you see him approaching.
>
> And when it is argued against this that if you were asked who he is you would reply: 'I do not know', then I reply that I indeed would be able to tell that he is something, that he is a substance, or perhaps even that he is an animal, and a man. But I cannot tell whether he is Socrates or Plato, for I do not know him in terms of the proposition 'This is Socrates' or 'This is my father'. But I do know [enough] to say that this is the one approaching, for I know him in terms of the proposition 'This is the one

---

107 Ockham, *SL* II, 10, cit. after (Ockham 1998, 115).

approaching'. But then let the case be posited that he is approaching and you do not see him, nor you do in any way think about his approaching; and then it is asked whether you know the one approaching.

I reply negatively, even though the one approaching I do indeed know. Nor is the following argument valid: 'You know your father, etc.', for there is a change of appellation after [the verb][108].

Buridan differs here from Ockham since he would take (4) to be invalid too. For him a term after an intentional epistemic verb always appellates it's reason - concept - and since 'Coriscus' and 'the hooded man' clearly stand for distinct concepts, they cannot be substituted in (4) even if they signify the same object. Recall that the truth of 'I know the hooded one' depends on the supposition, more specifically, whether I am one of the *supposita* of these terms. At the same time, as noted by Klima (2009, 195), *supposita* are "functionally dependent on the *rationes appellatae* of the names following these verbs [intentional verbs, AB]." Accordingly, a change of a name may mean a change of the *ratio appellata* (apart from a case of synonymy), which may in its turn change the *supposita* of the term in question, and this may change the truth of the proposition we are dealing with. In different words, when we analyse a proposition with intentional verb followed by some term, the *supposita* of the latter are determined in context of the ultimate signification, but also immediate signification, which is much more fine-grained, plays a crucial role. Interestingly, Buridan takes synonyms to be different words signifying the same concept, hence they appellate the same concept. These explains why only synonyms can be substituted in such a context (Klima 2009, 195).

Biard (2017, 263-264) points to another component which connects the semantical analysis with a more general, epistemological aspect of intentionality, relevant to this particular paradox. Note that when we say 'You do not know that the one approaching is your father', we express not just an intentional attitude, but more precisely "an attitude combining sensation and intellection: the singular concept applied to the visual object is more or less determined." Here we have a claim concerning vagueness: objects in the external world can be fully determined, while our cognition of them (and thus our mental acts/concepts concerning them) need not to be so. In the case at hand the very individual at hand who is approaching can be very well determined, while it does not have to be apprehended in such a way. As Buridan argues elsewhere (*in the Questions on the Soul*, III, q.8), a determinate singular is first apprehended by means of universal concepts: we judge that something is a body before we judge that it is an animal, then we note that it is an animal before we note it is a

---

108 Buridan, *SD* 9.4.9: 902-903.

human, and eventually we apprehend that the individual in front of us is Socrates. Thus Buridan allows that our intentional acts can have various levels of determination with respect to the object upon which they are directed, which gives space for the the intentional paradoxes like the one with the hooded man[109].

Concentrating our attention on the argument forms A1-A5 introduced above, we can notice that Buridan would definitely refute A1, A4 and A5 (cf. Willing 1985, 52-54) while being fine with A2 and A3. As for A3, Buridan in a similar way to Ockham was at calms with substitution of coextensive terms in subject position. Now, as for the Buridan's account of the inferences of the form A2 and A4, after Klima (2009, 196), we can observe the following. In Latin, in the proposition which has a shape 's knows a', the term 'a' is in accusative case, e.g. *venientem* in *Cognosco venientem*. Now, it can be put in front of the verb still in the accusative case, which is rendered in English by 'a is known by s', while in Latin it is simply *Venientem cognosco*. Now, for Buridan, such accusative preceding the intentional verb is still appellating its concept, but in disjunction with other concepts. In context of the assumption that a disjunction is implied by any of its members, Buridan holds that when a term supposits for something "under the appellation of a determinate concept", it supposits too for "the same thing under a disjunctive appellation" (Klima 2009, 196). As a result, when "a complex term containing an intentional verb supposits for something under the the determinate appellation of the concept of the accusative following it, then it will also supposit for the same thing with the disjunctive appellation of other *rationes*." Hence for Buridan an argument form A2 is valid, while A4 not, since the sentences in which the accusative follows the verb will always entail the sentences in which they precede the verb, but not conversely. This can be the case not only with intentional verbs, since we would intuitively agree that when I see Socrates it follows that I see someone, but if I see someone it does not follow that I see Socrates. Now, since the validity of the argument form A4 fails for Buridan, A1 has to fail too.

Accordingly, also validity of (6) fails for Buridan, and it is clearly caused by the difference in appellation of 'Socrates' and 'the hooded one'. Now, as noted by Panaccio (2012, 158):

> At bottom, the disagreement between Ockham and Buri-
> dan over the Coriscus case comes from the fact that Buri-
> dan associates the appellation of reason not only with a
> certain grammatical function of the relevant term (being
> the complement of an epistemic verb) but also with a de-
> terminate word-order: in order to determinately appellate

---

109 Biard presents in an illuminating way also other paradoxes related to this discrepancy between our concepts, intentional attitudes and the worlds discussed by Buridan in his *Sophismata*, see (Biard 2017, 264-265).

its reason the term in question must come after the epistemic verb in the surface structure; while, for Ockham, only the logical function of the term (its being the predicate of the proposition) determines that it appellates its form.

Recall however, that the appellation of reason occurs only in case of a predicate, thus substitution in a subject position is recognised by both Ockham and Buridan to be valid. That is why they both are fine with the inference (5).

Part II

FORMALISATION

The following question would be more correct: is contemporary modern formal logic a sufficient tool for an exact methodical rebuilding of all scholastic philosophy? I answer that I do not know. (..) Perhaps, for philosophical aims, logic must be developed much more.

Anyway, scholastic philosophy, if it does not want to break off with its many century traditions, has to assimilate definitive results reached in the field of mathematical logic. Scientific catholic thought, as it was previously shown, always used the most exact methods.

— *Comparisons between scholastic logical tools and modern formal logic*, Fr. Jan Salamucha

OCKHAM'S SEMANTICS FORMALISED

> 'You may call it "nonsense" if you like,' she said, 'but I've heard nonsense, compared with which that would be as sensible as dictionary!'
>
> — *Through the Looking-Glass*, Lewis Carroll

3.1 FEW REMARKS ABOUT THE IDEA OF FORMALISATION

Before we get into the business of formalisation (symbolism), we need to address briefly few issues connected with the very idea. At a first glance it might seem that using contemporary logical tools to express ideas pertaining to logic, also medieval, is the best way to obtain clarity and comprehensibility. However, as pointed out by for instance by Paul Thom (2011, 195-196), reservations of the historians of logic like Bocheński or Moody in using contemporary formalisms shows that "these two authors at least seem to realize that beauty is not necessarily enhanced by being dressed up in the latest fashions." In a less metaphorical words, by using contemporary ways of expressing non-contemporary ideas one risks that he or she will misrepresent the later. Taking into account the fact that the authors of medieval texts on logic as dead can not defend against misunderstandings of this kind themselves, we need to proceed here with precautions in order to give justice to their works. At the same time, as again stressed by Thom (2011, 196), the very use of contemporary logical symbolisms in interpreting the logics of the past "is not itself pernicious", moreover it can even "contribute to an interpretation's success."

As for the philosophy of formalisation, (Thom 2011), the last chapter of (Dutilh Novaes 2007) devoted to this very problem together with the subsequent monograph *Formal Languages in Logic* (Dutilh Novaes 2012) offer a detailed analysis of the challenges and perspectives connected with the use of formal tools in both logic and history of logic. What follows attempts to keep with the spirit of these works.

I hope that by now it is already visible that medieval semantics is a very challenging and at the same time tempting field for a contemporary (philosophical) logician.

3.2 FORMALISATION OF OCKHAM'S SUPPOSITION THEORY

Since the seminal work of Jan Salamucha, who worked out the first known contemporary formalisation of Ockham's logic in 1935, there were many attempts to formalise Ockham's ideas, e.g. (Priest & Read

1977), (Karger 1976) or (Cochiarella 2001). Still, arguably, the work of Dutilh Novaes (2007) is the best thing on the market right now, hence it will be extensively used in this part, devoted to the formal reconstruction of Ockham's logic for intentionality based on his theory of supposition.

3.2.1 *Preliminaries*

First, quite basic consideration is needed. The division between object-language and meta-language seems to be missing in medieval logic. This point is stressed for instance by Klima (Klima 2009, 172-173). On the contrary, Moody (1953, 26-29) argues that the presence of such distinctions as categorematic/syncategorematic terms, terms of first or second intention, terms of first or second imposition, personal versus simple and material supposition, at the end of the day gives us a theory where parts of language used to speak about objects can be systematically separated from the parts of language used to speak about language itself. Here, together with (Dutilh Novaes 2007, 54), we follow Moody's intuition on the matter.

OBJECT-LANGUAGE.   Our object-language is composed of categorical propositions of the form subject-copula-predicate, where the copula is present-tensed, non-modal, while subject and predicate are typically categorematic terms. The addition of quantifying syncategorematic terms like 'every' and 'some' is possible. We accept the following notation:

- terms: $a, b \dots$

- copula: $\circ$

Using it we can represent our basic categorical proposition (like 'a book is white') as $a \circ b$. Notice, that we allow indefinite descriptions like 'a book' to be terms.

META-LANGUAGE.   Just as expected, our meta-language consists of object-language together with the additional expressions for the concepts used in analysis. Notice that we have here two types of schematic letters, the ones standing for terms, but also the ones standing for things (objects in our ontology). Mind that terms (understood by medievals as tokens) are elements of our ontology themselves.

schematic letters for terms:	$a, b \dots$
schematic letters for things:	**t, s** $\dots$
abbreviations for propositions:	**P, Q** for proposition-types;
	$\mathbf{P_1, P_2}\dots$, for individual occurrences.

RELATIONAL PREDICATES   As for the core of Ockham's semantics, the notions of signification and supposition are expressed by a two-place relational predicates, associating a term to an object:

SIG$(a, \mathbf{t})$ <=> The term a signifies object $\mathbf{t}$.

SUP$(a, \mathbf{t})_{P_1}$ <=> The term a supposits for object $\mathbf{t}$ in proposition $\mathbf{P_1}$

Recall that a common term usually signifies or supposits (when in a proposition) for many different objects at once, hence neither signification nor supposition can be represented by functions, uniquely associating a term to one *significatum* or one *suppositum*, they are relations between terms and (typically) numerous entities (Dutilh Novaes 2007, 55).

TYPING DEVICES - OBJECTS   The Nominalistic ontology of Ockham can be organised or divided into three levels: linguistic entities, mental entities and physical entities. At the same time it is important to bear in mind that this division applies not only to actually existing entities, but also to the past, future and possible ones.

$\mathbf{t}/\varkappa$ <=> entity $\mathbf{t}$ belongs to the physical realm (denoted $\varkappa$)

$\mathbf{t}/\lambda$ <=> entity $\mathbf{t}$ belongs to the linguistic realm (denoted λ)

$\mathbf{t}/\mu$ <=> entity $\mathbf{t}$ belongs to the mental realm (denoted μ)

TYPING DEVICES - TERMS   Accordingly, terms can also be classified with respect to the kind of entities they signify. Thus, terms signifying entities from a physical realm are said to be of first intention and imposition; terms signifying entities from the linguistic realm are said to be of second imposition, and terms signifying entities from mental realm are said to be of second intention. Now, it is important to once again point out that the relation of signification is not ontologically committing (it does not carry the presupposition of existence), so for instance a term like 'dinosaur' can be of first intention and imposition without there being any actual dinosaurs. Still, if there were dinosaurs, they would belong to the realm of physical entities (Dutilh Novaes 2007, 55)[1].

$a: \varkappa$ <=> $\exists \mathbf{t}(\text{SIG}(a, \mathbf{t}) \text{ and } \mathbf{t}/\varkappa)$

$a: \lambda$ <=> $\exists \mathbf{t}(\text{SIG}(a, \mathbf{t}) \text{ and } \mathbf{t}/\lambda)$

$a: \mu$ <=> $\exists \mathbf{t}(\text{SIG}(a, \mathbf{t}) \text{ and } \mathbf{t}/\mu)$

---

1 Dutilh Novaes speaks here about 'chimera' as a term capable of being a term of first intention, however, that is possible only if we allow (complex) connotative terms to be present in mental language, which is a controversial matter, cf. (Panaccio 2004).

TERMS TAKEN SIGNIFICATIVELY AND NON-SIGNIFICATIVELY   It is necessary to give an account of another technical distinction. Depending on the intention of the interpreter, terms in a proposition can be taken either significatively or non-significatively.

$In<^{*}a>_{P_1}$ <=>   the term a is taken significatively in $\mathbf{P_1}$ under interpretation *In* (where *n* is a natural number indexing the given interpretation) – that is, it supposits for an object **t** such that $\mathrm{SIG}(a, \mathbf{t})$, insofar as **t** is a *significatum* of *a*

$In<\#a>_{P_1}$ <=>   the term a is taken non-significatively in $\mathbf{P_1}$ under interpretation *In* (where *n* is a natural number indexing the given interpretation) – that is, it supposits for an object **t** such that $\sim \mathrm{SIG}(a, \mathbf{t})$, or for an object **t** such that $\mathrm{SIG}(a, \mathbf{t})$, but not insofar as **t** is a *significatum* of *a*

denotatur - SIGN OF ASSERTION   At this point we need to introduce a representation of one more concept, extremely important for Ockham's semantics, namely *denotatur*, which can be loosely translated as 'it is asserted that'.

denotatur : ⊢

The symbol ⊢ is typically used for the notion of provability, but here it is rather to be understood in the way in which Frege used it, namely as a sign of assertive force. Recall that a relation of supposition can obtain regardless of the actual existence of *suppositum*. Hence we need a sign of assertive force to separate the presupposition of the existence of *supposita* from the truth of the proposition in question. In other words, when a term supposits for a non existent object, it is not the relation of supposition which fails to obtain, but rather a presupposition of the existence of *supposita* fails, hence the proposition, if affirmative, is false, and if negative, is true (Dutilh Novaes 2007, 56). For instance, in a proposition 'Pegasus is flying', the subject 'Pegasus' supposits for a non-existent object, Pegasus, while the predicate 'is flying' supposits for flying objects. Based on this we can evaluate what is asserted by means of this proposition, in this case whether Pegasus is among actually flying objects. As a non-existent object, it cannot be one of the *supposita* of the predicate, thus the proposition in question is false. And it is false not because of the failure of supposition to obtain.

Exactly this difference between *denotatur* and supposition leads to the characterisation of supposition as intensional relation. Actually, it

resembles intentional relation, since both supposition and intentionality do not depend on the existence of *supposita* or intentional objects, both relations hold even if the latter do not exist.

3.2.2 *Personal, Simple and Material Supposition*

Now we are prepared to give a formalised definitions of the three basic kinds of supposition, namely personal, simple and material supposition:

PERSONAL SUPPOSITION   For some $\mathbf{t}$,

$$\text{PSUP}(a, \mathbf{t})_{P_1} <=> In<^*a>_{P_1} \text{ and } \text{SIG}(a, \mathbf{t})$$

Therefore, for some type Ω, if $a: \Omega$ and $\text{PSUP}(a, \mathbf{t})_{P_1}$, then $\mathbf{t}/\Omega$.

SIMPLE SUPPOSITION   For some $\mathbf{t}$,

$$\text{SSUP}(a, \mathbf{t})_P <=> In<\#a>_{P_1} \text{ and } \mathbf{t}/\mu.$$

MATERIAL SUPPOSITION   For some $\mathbf{t}$,

$$\text{MSUP}(a, \mathbf{t})_P <=> In<\#a>_{P_1} \text{ and } \mathbf{t}/\lambda.$$

Since the distinction between simple, material and personal supposition is not playing a significant role in the analysis of the problems of intentionality which were introduced earlier, we will not go into more details, which can be find in (Dutilh Novaes 2007, 57-60). There are just two points to make here.

First, one should bare in mind the difference between actual and potential supposition. For Ockham (as for Buridan and many other medieval logicians for that matter), actual supposition is relative not only to the proposition token, $\mathbf{P_1}$, but also to the intention of the agent who forms the proposition in question, hence it is relative to a specific interpretation *In*. We, as interpreters, usually do not posses an access to the original intention of the speaker, hence what we are left with is the range of possible suppositions of terms in the proposition analysed, relative only to the form of the proposition, e.g. presence or absence of syncategorematic terms or the type of other extreme. Since many proposition tokens can share the same form, one of the consequences of this state is that in our analysis we move our attention from tokens to the proposition types (note that it is just a more convenient manner of speaking, we are not introducing a new, universal type of being). So, possible supposition is relative to a proposition-type $\mathbf{P}$(Dutilh Novaes 2007, 57-58). This considerations justify the claim made in the previous chapter that Ockham's theory of supposition boils down to algorithmic hermeneutics. I will just give an example of this difference with respect to personal supposition:

For some $\mathbf{t}$,

Actual and Potential Supposition

> @*In*<PSUP$(a, \mathbf{t})_{P_n}$> <=> *a* actually has personal supposition in token *Pn*, under interpretation *In*, and no other kind of supposition.

> +<PSUP$(a, \mathbf{t})_P$> <=> *a* possibly has personal supposition in **P**, and possibly other kind(s) of supposition as well.

Second, we should finally say something about the truth of a proposition. So, for Ockham a proposition is true if there is a coincidence of *supposita*, namely, "it is sufficient and necessary that the subject and predicate supposit for the same thing"[2]. For instance, when we consider the proposition 'Pope Francis is Argentinian', it is true iff the object to which 'Pope Francis' supposits is also the object to which 'Argentinian' supposits, which as a matter of fact is the case. So the proposition is true. Still, we can observe that a necessary condition for the truth of a proposition is that *supposita* of subject and predicate are of the same type (physical, mental or linguistic). Hence a proposition 'a table is a colour' is necessarily false, since the objects for which subject and predicate supposit for belong to different realms. Still, it can be an object of interpretation.

3.2.3   *Modes of Personal Supposition*

3.2.3.1   *Preliminaries*

Here we enter into a far more complex situation. In case of presonal, simple and material supposition we had a limited amount of possible propositional forms to account for (precisely nine, cf. Novaes 2007, 59). However, as for the modes of personal supposition, such an exhaustive enumeration of possible propositional forms (i.e. the presence or absence of syncategoremata, word order, etc.) is not possible. Just note, for instance, that as in the General Quantification Theory, also here we have unlimited number of possible syncategoremata (quantifiers), hence not only 'all', 'every' and 'some', but also 'most', 'at least three', 'exactly five', etc. Medieval Logic, recall, is a logic with an ambition to account for the reasoning done in the natural language, which is (the language) unbound in this respect. So in a way our semantics is not going to be complete. Nonetheless, since we tend to use a finite set of propositional forms in our linguistic activities, especially as a logicians, a proper theory grasping them can account for a significant amount of cases. Moreover, the theory of supposition is ever open for adjustments which could allow to cover new cases (Dutilh Novaes 2007, 60, 75).

As for the definitions of the modes of personal supposition, we encounter a controversy over the relations of ascent and descent. There is an ongoing debate about their role in medieval semantics. Here it is assumed that "the ascents and descents are Ockham's manner of

---

2 Ockham, *SL* II, 2, cit. after (Ockham 1998, 86).

defining what it means, in terms of its *supposita*, for a term to have such-and-such personal supposition."(Dutilh Novaes 2007, 61). From this perspective the form is primary with respect to the content, hence we can have a formal theory of semantic analysis.

Finally, a word needs to be given to the issue of the absence of modes of material and simple supposition. In principle nothing forbids there being also modes of the latter, the very idea is compatible with Ockham's doctrine (Novaes 2007, 61-62). In fact it was worked out by some later authors, like Marsilius of Inghen, who just a few decades after Ockham attributed different modes to the material supposition.

3.2.3.2 *The Semantic Rules for the Modes of Personal Supposition*

Before we got to the definitions, we need to clarify some issues. First, the definitions of the modes of personal supposition made in terms of inferential relations of descent and ascent are not sufficient because sometimes we do not have a logical equivalence between the original proposition and the chains of disjunction and conjunction. Moreover, some modes are defined by the lack of descent or ascent. Still, even if we do not get a proper definitions of logical equivalences or of truth conditions, through the inferential relations of descent and ascent we gain an information about what is asserted (*denotatur*) by means of a proposition (Novaes 2007, 63). This is so because these relations illustrate what is asserted to be the case by means of a given proposition. Hence, "what can be determined by the relations of ascent and descent are the models underlying the different interpretational schemata defined in terms of the personal supposition of the terms in a proposition" (Dutilh Novaes 2007, 64). And as such, we can grasp them by some basic model theoretic tools.

Now, we proceed in the following way. First, we will present characterisations of each mode of personal supposition. From there we move to the "handling the different interpretational schemata (i.e., considering the supposition of subject and of predicate at once) and their underlying models" (Dutilh Novaes 2007, 64).

Following Ockham, we concentrate here on the categorical propositions of the form '(S) *a* is (S) *b*' (where 'S' stands for syncategorema and is a placeholder for syncategorematic terms such as 'omnis', 'aliquid' or 'nullus', which may or may not be filled) and their inferential relations with propositions of the form 'This *a* is (S) *b*' or '(S) *a* is this *b*'.

Last, but not least, in the proposed formulations and later on in the different interpretational schemata, the implication holds only in one direction: from the kind of supposition to the semantic interpretation of the proposition. The reason for it is derived from the assumption that "it is not the semantic properties of a proposition that determine

the supposition of its terms, but rather the supposition of its terms that determines its semantic properties" (Dutilh Novaes 2007, 64).

Let us now move to the formulations of the modes of the personal suppositions and their interpretational schemata.

DISCRETE SUPPOSITION   A term *a* has discrete supposition in P_1 => A term *a* is a proper name or a demonstrative pronoun taken significatively[3].

DETERMINATE SUPPOSITION   A term *a* has determinate supposition in P_1 => A disjunction of propositions of the form 'This *a* is (S) *b*' can be inferred from P_1 but a conjunction of propositions of the form 'This *a* is (S) *b*' cannot be inferred from P_1 => With P_1, it is asserted that (at least) one proposition of the form 'This *a* is (S) *b*' is true.

CONFUSED AND DISTRIBUTIVE SUPPOSITION   A term *a* has confused and distributive supposition in P_1 => A conjunction of propositions of the form 'This *a* is (S) *b*' can be inferred from P_1 => With P_1, it is asserted that every proposition of the form 'This *a* is (S) *b*' is true.

MERELY CONFUSED SUPPOSITION   A term *b* has merely confused supposition in P_1 (where *a* has confused and distributive supposition) => A proposition with a disjunctive predicate of the form 'this *b*, or that *b* etc.' can be inferred from P_1 but neither a disjunction nor a conjunction of propositions of the form '(S) *a* is this *b*' can be inferred from P_1 => With P_1, it is asserted that a proposition of the form '(S) *a* is this *b*, or that *b* etc.' is true.

INTERPRETATIONAL SCHEMATA   Taking into account that there are only three modes of common personal supposition and we are dealing only with basic, categorical forms of propositions (with two terms), it would seem that we should have nine options of interpretational schemata. However, things are easier, since at the very outset we can drop three of such schemata as impossible (or senseless). Thus, it cannot occur that: the subject has determinate supposition and the predicate has merely confused supposition; the subject has merely confused supposition and the predicate has determinate supposition; finally, both terms have merely confused supposition (Dutilh Novaes 2007, 65).

As a result, we get the following list:

(1) $\text{PcdSUP}(a, t_1)_P$ and $\text{PcdSUP}(b, t_2)_P$

(2) $\text{PcdSUP}(a, t_1)_P$ and $\text{PdSUP}(b, t_2)_P$

---

3 We can treat this mode as a special case of determinate supposition. Notice that in what follows, we will concentrate on the three modes of common personal supposition

(2') $\text{PdSUP}(a, \mathbf{t_1})_P$ and $\text{PcdSUP}(b, \mathbf{t_2})_P$

(3) $\text{PcdSUP}(a, \mathbf{t_1})_P$ and $\text{PmcSUP}(b, \mathbf{t_2})_P$

(3') $\text{PmcSUP}(a, \mathbf{t_1})_P$ and $\text{PcdSUP}(b, \mathbf{t_2})_P$

(4) $\text{PdSUP}(a, \mathbf{t_1})_P$ and $\text{PdSUP}(b, \mathbf{t_2})_P$

Now, since (2) and (2') so as (3) and (3') are symmetric, actually we just need to deal with four schemata.

SCHEMA (1) In the first case we consider a situation where both terms (*a* and *b*) in a proposition have confused and distributive supposition. In this situation what is asserted by means of a proposition **P** is that all *significata* of *a* (or not, if the proposition is negative) are related by the relation **R** expressed by the copula or verb to all *significata* of *b*.

$\text{PcdSUP}(a, \mathbf{t_1})_P$ and $\text{PcdSUP}(b, \mathbf{t_2})_P \Rightarrow \vdash$ For all $\mathbf{t_1}$ and $\mathbf{t_2}$ such that $\text{SIG}(a, \mathbf{t_1})$ and $\text{SIG}(b, \mathbf{t_2})$, $\mathbf{t_1 R t_2}$.

Example *Nullo homo est asinus.*

In this example it is asserted that no man is in a relation of being identical with all donkeys (taken distributively) or in other words it is asserted that every man is such that he is not identical to each donkey. This corresponds to the following diagram:
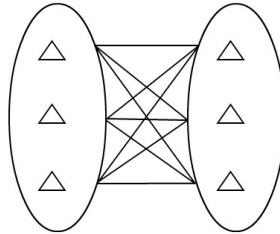

Figure 1: Schema 1

SCHEMA (2) In the second case term *a* has confused and distributive supposition while term *b* has determinate supposition in a proposition **P**. In such a situation it is asserted that all *significata* of *a* (or not, if the proposition is negative) are related by the relation **R** expressed by the copula or verb to one and the same *significatum* of *b*.

$\text{PcdSUP}(a, \mathbf{t_1})_P$ and $\text{PdSUP}(b, \mathbf{t_2})_P \Rightarrow \vdash$ There is a $\mathbf{t_2}$ such that $\text{SIG}(b, \mathbf{t_2})$, and for all $\mathbf{t_1}$ such that $\text{SIG}(a, \mathbf{t_1})$, $\mathbf{t_1 R t_2}$.

Example *Asinum omnis homo videt.*

In case of the regimented use of Latin in medieval logic (which gives no place for the contemporary scope amibiguity), to which Ockham was also faithful, in our example it is asserted that every man (each one of them) sees one and the same donkey or is in a relation of seeing with one and the same donkey. This situation corresponds to the diagram from Figure 2.
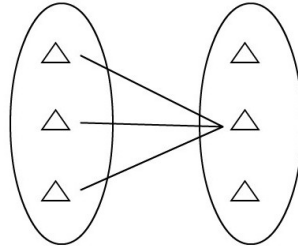

Figure 2: Schema 2

SCHEMA (3)   Here we have a bit more complex case. Term *a* has confused and distributive supposition while term *b* has merely confused supposition in a proposition **P**. In this situation it is asserted that all *significata* of *a* are (or not, if the proposition is negative) related by the relation **R** expressed by the copula or verb to some *significatum* of *b*. In this way ordered pairs are formed, because merely confused supposition "'assigns' a *significatum* of the term in question to each *significatum* of the other term" (Dutilh Novaes 2007, 67-68). Importantly, all *significata* of *a* are related to a *significatum* of *b*, but not to a particular one.

$\mathrm{PcdSUP}(a, \mathbf{t_1})_{\mathrm{P}}$ and $\mathrm{PmcSUP}(b, \mathbf{t_2})_{\mathrm{P}} => \vdash$ For each $\mathbf{t_1}$ such that $\mathrm{SIG}(a, \mathbf{t_1})$, there is a $\mathbf{t_2}$ such that $\mathrm{SIG}(b, \mathbf{t_2})$ and $\mathbf{t_1 R t_2}$.

We can consider here the three types of mapping: non-surjection-nor-injection (1), injection (2) and bijection (3) (cf. Figure 3).
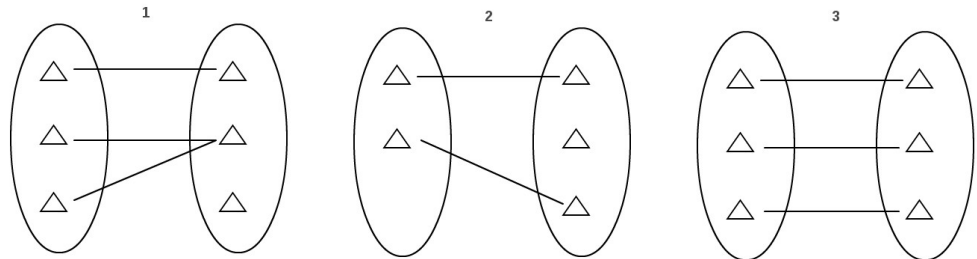

Figure 3: Schema 3

1 – Non-Surjection-Nor-Injection   All *significata* of *a* are mapped into some *significatum* of *b*, but some *significatum* of *b* is related to more than one *significatum* of *a*.

Example   *Omnis homo videt asinum.*

For the truth of this proposition it is not necessary that all significata of *homo* see one particular significatum of *assinus* (but it is sufficient for that). One donkey can be seen by more than one man, however, it is also possible that some donkey is not seen by any man.

2 – Injection   All *significata* of *a* are mapped into a *significatum* of *b*, and a *significatum* of *b* is related to at most one *significatum* of *a*, but there are more *significata* of *b* than *significata* of *a*, so some *significata* of *b* are not related to any *significatum* of *a*.

Example   *Omnis homo est animal.*

Here we just want to say that all men are animals, yet not all animals are men.

3 – Bijection   All *significata* of *a* are mapped into a *significatum* of *b*, and all *significata* of *b* are related to exactly one *significatum* of *a*.

Example   *Omnis homo est animal rationale.*

Here we have a one-to-one mapping between all significata of *homo* and all significata of *animal rationale*.

Now, when a proposition P belongs to this interpretational schema, we are not able to determine from its form alone to which of the three above mentioned cases it applies. In other words, "as far as its form goes, any of these three situations would verify it" (Dutilh Novaes 2007, 68). We need to analyse the content of a proposition in order to find out what exactly is being asserted, which of the three possible mappings apply. One way to do such analysis it to look at the inferential relations between the proposition in question and similar ones. Notice that 'Every man is rational animal' is logically equivalent to its converse, 'Every rational animal is a man'. Yet, in case of 'Every man is an animal' we do not have entailment to the converse 'Every animal is a man'.

SCHEMA (4)   In the last case both terms (*a* and *b*) have determinate supposition in a proposition **P**. In such a situation it is asserted that one *significatum* of *a* is related by relation **R** expressed by the copula or verb to one *significatum* of *b*. So, simply, one *significatum* of *a* is related to one *significatum* of *b*.

$\mathrm{PdSUP}(a, \mathbf{t_1})_P$ and $\mathrm{PdSUP}(b, \mathbf{t_2})_P \Rightarrow \vdash$ There is a $\mathbf{t_1}$ such that $\mathrm{SIG}(a, \mathbf{t_1})$ and a $\mathbf{t_2}$ such that $\mathrm{SIG}(b, \mathbf{t_2})$, such that $\mathbf{t_1 R t_2}$.

Example   *Homo est albus.*

In this example it is asserted that one of the significata of *homo* is in a relation of identity with one of the significata of *albus*. Schematically it is depicted by the diagram of Figure 4.
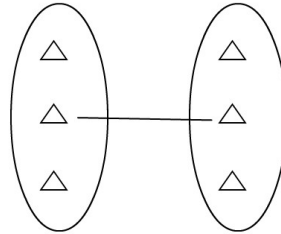
Figure 4: Schema 4

POLARITY   Few words should be devoted now to the case of negative propositions (propositions with negated verbs or copulas). Within the semantic description carried out so far, while in an affirmative proposition it is asserted that a certain relation expressed by the copula or the verb obtains or exists, in a negative proposition it is asserted that such relation fails to obtain. Moreover, negative propositions are true also in a situation when the presupposition of the existence of *supposita* fails. When there are no entities to ground the relation expressed by the copula or the verb, the very relation obviously fails to obtain.

3.2.4   *Quasi-Syntactical Rules for the Modes of Personal Supposition*

There are a few things to mention before we move on to the quasi-syntactic rules for the modes of personal supposition. We concentrate on the logical form of propositions. However, as already mentioned, an exhaustive enumeration of all logical forms (well-formed propositions) cannot occur. Our language is not a previously defined, closed language like most of the languages of logic we work with nowadays. Hence the theory of supposition is ever open for an expansion of its rules and definitions. Notwithstanding, one could draw a certain comparison between this aspect of supposition theory and contemporary generalised quantifying theory developed exactly for the purpose of dealing with an open natural language, which is also in a state of expansion (Dutilh Novaes 2007, 71).

Getting back to the issue of a logical form, in a subsequent section we will be dealing with proposition types, not with tokens. Now, we get back to the logical forms and corresponding modes of personal supposition handled by Ockham.

THE SCOPE OF A SYNCATEGOREMA   From the perspective of the logical form of categorical propositions (subject-copula-predicate), a syncategorematic term can occur:

   - before the subject

   - before the copula

   - before the predicate

In defining the scope the crucial point is the principle of maximal scope with respect to left-hand association. Accordingly, a syncategorema placed in front of the predicate or copula has a scope only over predicate, while the one placed before the subject has a scope over both subject and predicate.

Now, let (S) be any syncategorema, while '**P**' is a name of the proposition where the relation of scope obtains:

Definition: Scope of Syncategorema

P: $(S)a \circ b \Rightarrow <(S); a,b>_P$

P: $a(S) \circ b \Rightarrow <(S); b>_P$

P: $a \circ (S)b \Rightarrow <(S); b>_P$

As for the categorema, if it follows the syncategorema directly, we shall say that is it immediately under the scope of the latter. If there is another term or the copula between the categorema and syncategorema, we have a case of categorema being mediately under the scope of a syncategorema.

P: $(S)a \circ b \Rightarrow \mathbf{I}<(S); a>_P$ and $\mathbf{M}<(S); b>_P$

P: $a(S) \circ b \Rightarrow \mathbf{M}<(S); b>_P$

P: $a \circ (S)b \Rightarrow \mathbf{I}<(S); b>_P$

We need to add one more abbreviation:

O$<(S); a>_P$

which stands for 'a is **only** under the scope of (S)'. We need this to account for the effect of 'weak' syncategorema, especially ∃ (Dutilh Novaes 2007, 72).

Now, we can start to give rules. We begin with universality (represented by ∀) and particularity (represented by ∃), negation will be treated in a moment. The absence of any syncategorema is represented by {}.

Let a be an incomplex common term (a term where only categorematic terms occur). Then we can define the following rules for determining the mode of personal supposition:

RULE 1 $\mathbf{O}<\{\}; a>_P$ => $\mathrm{PdSUP}(a, \mathbf{t})_P$

RULE 2 $\mathbf{IO}<\exists; a>_P$ => $\mathrm{PdSUP}(a, \mathbf{t})_P$

RULE 3 $\mathbf{IO}<\forall; a>_P$ => $\mathrm{PcdSUP}(a, \mathbf{t})_P$

RULE 4 $\mathbf{MO}<\forall; a>_P$ => $\mathrm{PmcSUP}(a, \mathbf{t})_P$

NEGATION   As for the negation, things are more complex here. We start with the effects of negation on a term that, without negation, would have determinate or merely confused supposition. Ockham is not explicit about it, but there is a rule offered by Buridan consistent with Ockham's theory:

> A negating negation distributes every common term following it that without it would not be distributed and does not distribute anything that precedes it[4].

Let A be any term (complex or incomplex, but without negation) and '~' stand for any negation sign. Next, given a proposition **P**, let **P*** be the proposition resulting of the introduction of one negation sign in any position of **P**, such that A is in its scope. Then we get:

RULE 5 $\mathrm{PdSUP}(A, \mathbf{t})_P$ & $<\sim; A>_{P*}$ => $\mathrm{PcdSUP}(A, \mathbf{t})_{P*}$

RULE 6 $\mathrm{PmcSUP}(A, \mathbf{t})_P$ & $<\sim; A>_{P*}$ => $\mathrm{PcdSUP}(A, \mathbf{t})_{P*}$

As for the rule concerning a term that, without negation, would have confused and distributive supposition, we need to introduce some more notation and depart a bit from Ockham (we use the solution of John of St. Thomas), remaining faithful to the principles and goals of his semantics[5]. Let $\sqsupset$ be a distributive sign (i.e.,a negation or a universal sign). Also, given a proposition **P**, let **P#** be the proposition resulting of the introduction of one distributive sign at the beginning of **P**, so that A be under its scope. Then:

RULE 7.1 $\mathrm{PcdSUP}(A, \mathbf{t_1})_P$ & $\mathrm{PmcSUP}(B, \mathbf{t_2}$ & $<\sqsupset; A>_{P\#}$ => $\mathrm{PdSUP}(A, \mathbf{t_1})_{P\#}$

RULE 7.2 $\mathrm{PcdSUP}(A, \mathbf{t_1})_P$ & $\mathrm{PdSUP}(B, \mathbf{t_2}$ & $<\sqsupset; A>_{P\#}$ => $\mathrm{PmcSUP}(A, \mathbf{t_1})_{P\#}$

With this rules at hand, we have a way to analyse basic propositions formally.

---

4 Buridan, *SD* 4.3.7.2: 269.

5 The reason for this given in details in (Dutilh Novaes 2007, 73-75).

3.3 OCKHAM'S SOLUTIONS FORMALLY

3.3.1 *Non-existent Objects*

As stated many times, Ockham allows that not only present, but also past, future and possible objects can be in a relation of signification, supposition or appellation. Hence in all our definitions, $\mathbf{t}$ is not necessarily a presently existing object. The range of supposition is always determined by the copula or the verb (its tense and mode). Hence, speaking loosely, our domain (possible referents of $\mathbf{t}$) consist of present, past, future and possible objects. Notice, that impossible objects are not included. However, in some parts of intentional, hypothetical propositions, there is even space for terms that cannot be exemplified, since they would have to refer to impossible objects.

Let us consider for instance a proposition 'Dragons do not exist'. There are few ways to analyse it. The easiest and most straightforward one is just to recall the rule that a negative proposition with an empty term (subject or predicate) is always true (*SL* II, 2). In a similar way a proposition 'Dinosaurs do not exist' is true now, since there are no dinosaurs around. Even more, 'Dinosaurs are not dinosaurs' is true for Ockham exactly for the same reason.

We may also rephrase it in a shape of an affirmative proposition such as 'Dinosaurs are non-existent'. Here it is again true, since both subject and the predicate term supposit for the same, namely for nothing. We can even phrase it formally. First we observe, that since it lacks any syncategorematic terms, it is just a basic categorical proposition $a \circ b$. Since the subject and predicate are of a type $\varkappa$, they can have only personal supposition. As for the modes of personal supposition, according to the rule 1 ($\mathbf{O}<\{\}$; $a>_P => \mathrm{PdSUP}(a, \mathbf{t})_P$) both subject and predicate have determinate supposition. Hence our proposition falls under Schema 4 ($\mathrm{PdSUP}(a, \mathbf{t_1})_P$ and $\mathrm{PdSUP}(b, \mathbf{t_2})_P => \vdash$ There is a $\mathbf{t_1}$ such that $\mathrm{SIG}(a, \mathbf{t_1})$ and a $\mathbf{t_2}$ such that $\mathrm{SIG}(b, \mathbf{t_2})$, such that $\mathbf{t_1}\mathbf{R}\mathbf{t_2}$). Thus, by means of this proposition it is asserted that some dinosaur is in a relation of being identical with some non-existent being. Now, each *significatum* of 'dinosaur' is in a relation of being identical with each *significatum* of 'non-existing being', hence our proposition is true. This shows that within the framework of the theory of supposition we can account for the truth of propositions with terms 'referring' to non-existent objects.

In case of a proposition containing an intentional verb, a few things needs to be said. From the point of view of semantics we can easily create a rule which allows to use the signification of possible beings when we analyse the supposition of terms standing for intentional objects. In this way we avoid the presupposition of existence of *supposita* of our terms, which is present with respect to non-modal, thus non-intentional propositions. Hence, when we want account for the

truth of e.g. 'Ponce de Leon sought the fountain of youth', we have resources to claim that by means of this proposition (with subject having discrete and predicate determinate supposition) it is asserted that an individual (Ponce de Leon) was at some point of time in a relation of seeking to one *significatum* of the term 'the fountain of youth', where *significatum* could be not only actually existing being (at some point in the past), but also a possible one (in virtue of a special intentional character of the verb 'to seek'). In such case this proposition would be true.

Finally, as for the the term that cannot be exemplified, like chimera or goat-stag, they can be subjects of the true hypothetical propositions. For instance in a proposition "'Chimera' and 'animal composed of a goat and an ox' signify the same thing'[6], where the terms are taken to supposit materially, the proposition is true. Recall, that in case of material supposition, a term is taken non-significatively, hence the question of the existence of *suppositum* or primary *significatum* is not present. However, the proposition 'A chimera is an animal composed of a goat and an ox' strictly speaking is false, since, as a categorical non-modal proposition, where the term 'chimera' supposits personally and as such is taken significatively, it carries the presupposition of the existence of chimera.

3.3.2   *Intentional Indeterminacy*

As for the case of intentional indeterminacy, we need to express formally the following rule:

> [I]t can be said that 'horse' supposits merely confusedly. This is because it follows such a verb. And so, in general, a common term that follows such a verb so that it is merely a part of the extreme always supposits merely confusedly and not determinately[7].

The verbs in question here are not any intentional verbs, but these of them which require that something will or ought to be true, e.g. 'promise', 'owe', 'be indebted', 'search', 'want'. Here again Ockham on the matter:

> Thus, you have to know that whenever in any such proposition about the present or about the past or about the future there occurs a verb by virtue of which it is denoted that some [other] proposition will be true, or ought to be true, in which a common term appears on the part of the predicate, and it is not denoted for any proposition in which a singular [term] contained under that common

---

6 Ockham, *SL* I, 26, cit. after (Ockham 1995, 40).

7 Ockham, *SL* I, 72, cit. after (Ockham 1995, 66).

[term] occurs on the part of the predicate that it will be true, then (taking 'supposit' in the sense in which a part of an extreme can supposit) the common term does not supposit determinately[8].

Note, that the term 'horse' in 'I promise you a horse' is not a predicate, but just a part of a predicate, the whole predicate being 'promising you a horse' (since 'I promise you a horse' is equivalent to "I am promising you a horse'). If it were a predicate, according to the rule 1 it would have a determinate supposition. Yet, since it is just a part of a predicate, the rule does not apply to it - as Ockham explains, it does not have a supposition in the strict sense. Nevertheless, "extending the name, it can be said that 'horse' supposits merely confusedly". It shows that to account for the case of intentional identity the theory of supposition needs to be extended and made more fine-grained, in order to capture also some relevant semantic properties of the parts of complex predicates. Even more. In the case of Ockham's analysis of intentional identity we are no more in a situation where it is just the supposition of a term that determines the semantic properties of a proposition. Rather the semantic properties of a verb determine the supposition of a term, which in its turn determines the semantic properties of a proposition as a whole.

Recall, that for Ockham by means of the proposition 'I promise you a horse', in virtue of a special force of the verb 'promise' it is asserted (*denotatur*) that the sentence 'I give you a horse' or any equivalent one will or ought to be true at some point in the future. At the same time, in terms of inferential relations, from 'I promise you a horse' we can descend to a disjunctive predicate 'I promise you this horse or that one or that one and so on', where all present and all future horses with which I could fulfil the promise (hence not the future horses born after your death) are enumerated.

Let *Pr* be a predicate made of a complex term (without negation) and ⊏ be a sign of 'being a part of a predicate'. Moreover, let † be a sign of a verb referring to something which will or ought to be true at some point in the future.

Using this and previous tools we can describe the following interpretational schema:

SCHEMA 5   Term *a* has discrete supposition while term *b*, as a part of predicate following special verb, has merely confused supposition in a proposition **P**. In this situation it is asserted that one and only one *significatum* of *a* is related by relation **R**† expressed by the special verb to some present or future *significatum* of *b* indifferently (see Figure 5).

---

8 Ockham, *SL* I, 72, cit. after (Ockham 1995, 66).

$\mathsf{PdisSUP}(a, \mathbf{t_1})_{P_1}$ and $\mathsf{PmcSUP}(b, \mathbf{t_2})_{P_1} \Rightarrow \vdash$ For the specific $\mathbf{t_1}$ such that $\mathsf{SIG}(a, \mathbf{t_1})$ there is some present or future $\mathbf{t_2}$, where $\mathsf{SIG}(b, \mathbf{t_2})$, such that $\mathbf{t_1 R t_2}$.
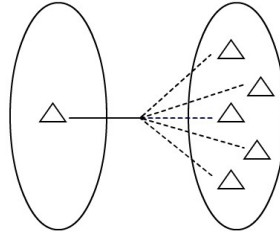

Figure 5: Schema 5

On top of that we can introduce the following quasi-syntactic rule.

RULE 8 $a \circ \dagger \mathsf{Pr} \ \& \ <b \sqsubseteq \mathsf{Pr}> \Rightarrow \mathsf{PmcSUP}(b, \mathbf{t})_P$

Notice that the verb not only enforces the merely confused supposition of the term b, but it also causes ampliation of the supposition of the term b to the future and possible *significata* of b. This is Ockham's way to diagnose the issue of intentional indeterminacy. We do not encounter indeterminacy with respect to intentional attitudes directed towards the past or just the present (understood as the current point in time, not as a not fully determined interval). Only the extended present, future (and possibility) is undetermined enough to admit the problem of intentional indeterminacy. When I promise you a book, I oblige myself to make it true that there is some book and you get it from me. When Katie wants a cookie now, she wants it to be true that there is some cookie and she has it (even when she wants it now), but now is treated rather as an interval than a point. Only when we are able to look forward, we can encounter the problem of indeterminacy according to Ockham. Note that when I say 'Yesterday I desired an ice-cream', even though the case of indeterminacy from current perspective is about the past, from the perspective of the moment of a desire it is directed towards the future or extended present. We need to distinguish here between the time of evaluation and the time indicated by the intention of the speaker (cf. Perini Santos 2013). Hence the charge of Priest (2016, 75) that Ockham's diagnosis and his solution to the problem are *ad hoc* seems to me in the end to be unjustified.

3.3.3 *Substitutivity of Identicals*

As already pointed out, to explain the failure of substitutivity of identicals in intentional context, we need to appeal to the appellation of

the form. Ockham argues that it occurs rather in the case of intentional (modal) operators, not in the case of intentional predicates. In Ockham's own terminology, only the former ones are predicates of modal sentences. Hence the proposition 'Frege knows Venus' is not a modal (epistemic) one for Ockham, but the proposition 'Frege knows that Venus is Hesperus' is (it is a modal proposition with a dictum). And appellation of the form occurs only in the latter (as taken in the divided sense). Notice, that in this way it is assured that the appellation of the form occurs only within a predicate, never within a subject.

Appellation of the form is a kind of "oblique reference to something in a proposition which is not supposited for in that proposition" (Klima 1993, 340). It is a good idea to bring here an example we discussed before, but this time to give a detailed analysis.

Consider a proposition:

(1) A white thing was Socrates.

According to Ockham, for its truth it is not required that a proposition

(2) A white thing is Socrates.

was true at any point in the past. Rather, it is obligatory that a proposition

(3) This is Socrates.

was true, "referring to that for which the subject supposits in" (1). In other words it is needed that the predicate of (1) - 'Socrates', under this specific form, applied in some point in the past to some of the *supposita* of the subject of (1). That is why a singular proposition (3) must have been true at some point in the past about one of the *supposita* of the subject of (1) - and in this way predicate appellates its form (Panaccio 2012, 145). This has a very interesting consequences as pointed out by Ockham:

> Hence, if Socrates is now white for the first time, then 'A white thing was Socrates' is true, as long as the subject is taken for that which is white - and yet 'A white thing is Socrates' was never true. Rather, 'This is Socrates', referring to Socrates, was true. And since 'white thing' in 'A white thing was Socrates ' supposits for Socrates, this latter proposition is true[9].

In the light of this we can now approach the semantical specification of the rule of the appellation of the form.

---

9 Ockham, *SL* II, 7, cit. after (Ockham 1998, 106).

SCHEMA 6: APPELLATION OF THE FORM   A predicate b appellates its form in $\mathbf{P_1}$ => It is asserted that a singular proposition (or more singular propositions depending on the mode of personal supposition of the subject) with b as its predicate (under the very same form) is predicated of one of the *supposita* of the subject of $\mathbf{P_1}$ or of a pronoun pointing precisely to that for which the subject of $\mathbf{P_1}$ supposits, and this very proposition was true if the proposition $\mathbf{P_1}$ is about the past, or it will be true if the proposition $\mathbf{P_1}$ is about the future, or it is possible if the proposition $\mathbf{P_1}$ is about the possible, or it is necessary if the proposition $\mathbf{P_1}$ is about the necessary, and so on for other kinds of modal propositions (without a dictum or with a dictum taken in the divided sense)[10].

Now we can propose the following formal definition for the case when the subject of $\mathbf{P_1}$ has determinate supposition. Let $\mathcal{AP}$ be a tensed proposition or appropriate modal proposition (without a dictum or with a dictum taken in the divided sense). Then we have:

$\mathbf{P_1}$ is $\mathcal{AP}$ and b is a predicate of $\mathbf{P_1}$ => ⊢ There is exactly one $\mathbf{t_1}$ such that $\mathrm{SIG}(a, \mathbf{t_1})$ and:

- if the copula of $\mathbf{P_1}$ is past tensed, then there was $\mathbf{t_2}$ such that $\mathrm{SIG}(b, \mathbf{t_2})$, such that $\mathbf{t_1 R t_2}$ was true at some point in the past.

- if the copula of $\mathbf{P_1}$ is future tensed, then there will be $\mathbf{t_2}$ such that $\mathrm{SIG}(b, \mathbf{t_2})$, such that $\mathbf{t_1 R t_2}$ will be true at some point in the future.

- if the copula of $\mathbf{P_1}$ is a modal one, then there is $\mathbf{t_2}$ such that $\mathrm{SIG}(b, \mathbf{t_2})$, such that $\mathbf{t_1 R t_2}$ and the mode of the copula is true of a singular proposition satisfying these conditions.

Accordingly, in our proposition 'Frege knows that Venus is Hesperus', the verb 'knows' causes the predicate to appellate its form if this proposition is taken in the divided sense. As such it can be read as 'Frege knows Venus to be Hesperus'. Recall that for Ockham a modal sentence with a dictum taken in the divided sense is equivalent to a sentence without a dictum (they both have the same truth conditions). Hence our proposition is equivalent to 'Venus is known by Frege to be Hesperus'. According to the rule of appellation of the form, in order for this proposition to be true, a singular proposition 'Venus (or 'this' pointing to Venus) is Hesperus' has to be known by Frege. Now, if we check the proposition 'Frege knows that Venus is Phosphorus' in the same way, we will easily observe the failure of the substitutivity of identicals as a result of a difference in the truth conditions for these two propositions. Hence, the intersubstitutivity of coextensive terms fails in case of terms in a position of a logical predicate of modal epistemic sentences. Still, it holds for the terms in a position of the subject, since they cannot appellate their form there.

---

10 *Cf.* Ockham, *SL* I, 72 (Ockham 1995, 62-63).

At the very end there is one last point worth of notice. Appellation of the form does not cancel the normal supposition of the term. Thus, in 'Frege knows that Venus is Hesperus', the predicate term 'Hesperus' has personal supposition, thus Hesperus stands for its normal referent, planet Venus, not for a Fregean sense (as if it had simple supposition), despite the indirect context of 'that-' clause.

CONCLUSIONS

'The situation is serious but by no means hopeless,' Behemoth responded. 'What's more, I'm quite certain of final victory. Once I've analysed the situation properly.'

He set about this analysing in a rather strange manner - namely, by winking and making all sorts of faces at his king.

(...) The white king finally understood what was wanted of him. He suddenly pulled off his mantle, dropped it on the square, and ran off the board. The bishop covered himself with the abandoned royal garb and took the king's place.

(...) 'Your king is in check.'

'I must have heard wrong, my master,' replied the cat. 'My king is not and cannot be in check.'

'I repeat, your king is in check!'

'Messire,' the cat responded in a falsely alarmed voice, 'you are overtired. My king is not in check.'

'The king is on square G-2,' said Woland, without looking at the board.

'Messire, I'm horrified!' howled the cat, showing horror on his mug. 'There is no king on that square!'

'What's that?' Woland asked in perplexity and began looking at the board, where the bishop standing on the king's square kept turning away and hiding behind his hand.

'Ah, you scoundrel,' Woland said pensively.

'Messire! Again I appeal to logic!' the cat began, pressing his paws to his chest. 'If a player announces that the king is in check, and meanwhile there's no trace of the king on the board, the check must be recognised as invalid!'

'Do you give up or not?' Woland cried in a terrible voice.

'Let me think it over,' the cat replied humbly, resting his elbows on the table, putting his paws over his ears, and beginning to think. He thought for a long time and finally said: 'I give up.'

'The obstinate beast should be killed,' whispered Azazello.

'Yes, I give up,' said the cat, 'but I do so only because I am unable to play in an atmosphere of persecution on the part of the envious!' He stood up and the chessmen climbed into their box.

— *The Master and Margarita*, Mikhail Bulgakov

We have gone quite a roller-coaster through the various theories of intentionality, logician's problems with various phenomena related to the intentionality, bits of Medieval and contemporary discussions related to those problems. In the spirit of Hans Georg Gadamer's philosophical hermeneutics and the method of hermeneutical circle (Gadamer 2006), we have gone few times - in each chapter from a slightly different perspective - through the three challenges posed by intentionality to logic: apparent reference to non-existent objects, intentional indeterminacy and the failure of substitutivity of coextensive terms in intentional context. By now all of the arguments have been already stated and, better or worse, defended. So here I just want to wrap up some of the main points, in case a patient reader, who survived this intellectual travel so far, feels lost about the main claims around which this thesis was build.

4.1 MEDIEVALS AND NONEISTS: HOW FAR FROM EACH OTHER?

First, the answer to one of the main questions which constituted an initial motivation to write this thesis: whether there is actually any similarity between medieval nominalist semantics and logic of figures like Ockham and Buridan and contemporary noneist *vel* neo-Meinongian nominalist semantics and logic of figures like Priest. How far are they from each other? I hope that by now it is clear that the answer is: not too far, indeed contrariwise, they are very close. In both cases we have a kind of free logic, where the issue of existence is separated from the issue of particular quantification. For both parties the domain of the discourse can be broader than the domain of ontology. In both groups it is recognised that there are some objects which exists - ordinary particular beings, while some other objects do not exist - for instance past, present or possible, but actually non existent objects of our intentional states. Yet, luckily, not everything is the same. Main differences are: a presence of formalisation or lack of it (tough one should not forget about the somewhat regimented Latin used by Ockham and Buridan), a stance about impossible objects, and of course a different mechanism underlying semantics and logic: possible worlds semantics vs properties of terms and inferential relations between propositions closely connected to the properties of terms. Impossible objects have a different status in Ockham's and Buridan's semantics, since the terms naming them do not posses a primary signification, the one enjoyed by terms naming actual, past, future or possible objects. Priest, on the other hand, treats all kinds of non-existent objects, also impossible ones, in a more uniform way. Yet, he also distinguishes in his framework between possible and impossible worlds, thus there is a way to say that impossible objects are of a different kind.

As for metaphysics, Ockham, Buridan and Priest present a sober, naturalist and nominalist view, with no abstract/shady/fictional suspicious beings. In this respect they are in a way better Quineans than Quine himself. In a semantics where the issue of truth and meaning can be separated from the issue of existence of the referents of our terms, we are able to express a metaphysical view more sober than the one of Quine. With a noneist semantics the issue of ontological commitment flowing from sentences we take to be true is no more a tool of ontological slavery. For instance, we are no more forced to accept the arguments for the existence of such weird, abstract objects like universals, mathematical objects, fictional objects or *possibilia* based on the indispensability arguments[1]. Hence, ironically, it is rather Ockham and Buridan shaving Quine's beard e.g. of indispensable mathematical objects, than the other way round.

In a way we could say, that noneists represent an attitude towards semantics and logic quite similar to the one presented by Woland to the rules of chess in the fragment of Bulgakov's masterpiece *Master and Margarita* quoted in the beginning of this chapter. Rules of semantics and logic are binding not only when they describe the actual world. Our terms/words may sometimes fail to have a referent in reality, yet still be endowed with semantical and logical properties. Existential status of the referent of a term or a word is not always as fundamental as it is sometimes admitted. At the same time there are some logicians and philosophers who behave just like Behemot, the demon-cat, who abuses both rules of chess and logic by sticking in a fundamentalist manner to the prejudice about the necessary existential connection between a term and its referent.

4.2 PHILOSOPHIA ET LOGICA PERENNIS

The very last words I would like to devout to the issue of something I would like to call the *Logica Perennis* - the *Eternal Logic*. People with a more historical outlook on the philosophy often speak about the *Philosophia Perennis*. It is a name for these philosophical doctrines, issues, arguments, which we take to be universally valid or important, irrespective of the time when they appeared. For instance many questions asked by Socrates and Plato are usually taken to be of such a kind, which was famously described by Whitehead (1979, 39) in a phrase "The safest general characterisation of the European philosophical tradition is that it consists of a series of footnotes to Plato." Thus, as the advocates of the *Philosophia Perennis* claim, it makes sense

---

1 We have seen Ockham's and Buridan's arguments against universals and *possibilia*, Priest presents his rebuttal of the actual existence of *possibilia*, abstract, fictional and mathematical objects in the second part of his *Towards Non Being* (chapters 5 to 8). I believe that our medieval friends would node their heads in approval for his arguments. Definitely their semantics and logic is compatible with Priest noneism in this respect.

for a contemporary philosopher to read and get inspired by any great philosopher, dead or alive. Philosophy engaged in the discussion of the current philosophical issues can be done in a fruitful way also when it is informed by the history of philosophy. Thus, a work done in the history of philosophy can still count as a work done in philosophy proper. However, among the tribe of contemporary philosophers it is a controversial matter whether there is any value of looking back into the history. Even more so among logicians. History of logic is usually not recognised as a part of logic, in a way as history of physics is usually not seen as a part of physics.

Hence I would risk a claim that the belief in the *Logica Perennis* is not too widespread among logicians. It might be justified with respect to many branches of mathematical logic, which, as a matter of fact, are rather new, thus there is no point in looking at their history, since there in no history to look at. However, with respect to the philosophical logic such blindness towards the history is not always the most optimal way to go. There are many silent assumptions underlying our contemporary practice of logic which are not visible as long as we remain in a safe circle of logic as it is done after Frege. Even if philosophical logicians disagree, they most often disagree within the same conceptual framework, roughly based on the classical First Order Logic and variations of it. A look into a different logical framework can be extremely beneficial, especially for a philosophically minded logician. A work in the realm of the logic of intentionality is quite illustrative in this respect. Reasoning based on the phenomena of intentionality is handled quite well even by a school kid, while it poses a serious challenge for a logician trapped in the framework of classical logic. People like Ockham or Buridan can still teach as a lesson even by the very simple fact of offering to our consideration a logic based on a different set of assumptions. At the same time we can learn that some of the questions asked by logicians (and some replies to them) are not so new. Thus at least in the realm of question we can easily find the *Logica Perennis*.

The other issue, though closely connected, is the question about the value of the reconstructions of the logic of the past with modern logical tools. During the work in this thesis I realised how challenging a task it is. There is a plenty of freedom and equally vast space of dangers. Though there is one certain thing: the closer we want to get to the logic of the past with our tools, the more we need to push our framework to the limits. Get out of the "classical" box and be creative, innovative. In other words, we need to develop (often change) our logic and tools to be able to make their (past logicians) logic expressible in our terms. This seems like doing logic proper.

In any case, one can combine in his logical practice both approaches. Work of people like Peter Geach, Arthur Prior or Graham Priest is an example of the fruitfulness of engaging in current debates in philo-

sophical logic with modern tools, but with the sensitivity towards the elements of the *Logica Perennis*.

BIBLIOGRAPHY

PRIMARY LITERATURE

[1] Aquinas, Thomas. 2007. "On Being and Essence," translated by Gyula Klima. In: *Medieval Philosophy: Essential Readings with Commentary*, edited by G. Klima with F. Allhoff and A. J. Vaidya, 227-249. Oxford: Blackwell Publishing Ltd.

[2] Buridan, John. 1983. *Questiones Longe super Librum Perihermeneias*, edited by Ria van der Lecq, Utrecht: Ingenium Publishers.

[3] Buridan, John. 2001. *Summulae de Dialectica*, translated by G. Klima. New Haven: Yale University Press.

[4] Lambert of Auxerre (Lagny). 1988. "Properties of terms." In: *Cambridge Translations of Medieval Philosophical Texts*, translated by N. Kretzmann and E. Stump, 102-162. Cambridge: Cambridge University Press.

[5] Ockham, William. 1974. *Ockham's Theory of Terms: Part I of the Summa Logicae*, translated by M. J. Loux. Notre Dame: University of Notre Dame Press.

[6] Ockham, William. 1991. *Quodlibetal Questions*. Translated by A. J. Freddoso and F. E. Kelly. New Haven: Yale University Press.

[7] Ockham, William. 1995. *Summa Logicae*, translated by P. V. Spade. Accessed June 20, 2016. URL = `http://pvspade.com/Logic/docs/ockham.pdf`.

[8] Ockham, William. 1998. *Ockham's Theory of Propositions: Part II of the Summa Logicae*, translated by A. J. Freddoso and H. Schuurman. South Bend: St. Augustine's Press.

SECONDARY LITERATURE

[9] Adams, Marilyn McCord. 1977. "Ockham's Nominalism and Unreal Entities." *The Philosophical Review* 86(2):144–176.

[10] Adams, Marilyn McCord. 1987. *William Ockham*. 2 vols., Notre Dame: University of Notre Dame Press. (2nd rev. ed., 1989.)

[11] Adams, Marilyn McCord. 1990. "Ockham's Individualisms." In: *Die Gegenwart Ockhams*, edited by W. Vossenkuhl and R. Schönberger, 3–24. Weinheim: VCH-Verlagsgesellschaft.

[12] Ajdukiewicz, Kazimierz. 1985. "Problemat transcendentalnego idealizmu w sformułowaniu semantycznym." In: *Język i Poznanie*, 264-277. Warszawa: Państwowe Wydawnictwo Naukowe.

[13] Amerini, Fabrizio. 2011. "Intentionality." In: *Encyclopedia of Medieval Philosophy. Philosophy Between 500 and 1500*, edited by H. Lagerlund, 558-564. Heidelberg: Springer.

[14] Berto, Francesco. 2012. *Existence as a Real Property: The Ontology of Meinongianism*. Dordrecht: Springer.

[15] Berto, Francesco. 2015. "There Is an 'Is' in 'There Is'": Meinongian Quantification and Existence." In: *Quantifiers, Quantifiers, and Quantifiers: Themes in Logic, Metaphysics, and Language*, edited by A. Torza, 233-256. Dordrecht: Springer.

[16] Biard, Joël. 1990. "Verbes cognitifs et appellation de la forme selon Albert de Saxe." In: *Knowledge and the Sciences in Medieval Philosophy*, edited by. S. Knuuttila, R. Työrinoja, and S. Ebbesen, 427-435. Helsinki.

[17] Biard, Joël. 2009. "Nominalism in the later Middle Ages". In: *The Cambridge History of Medieval Philosophy*, edited by R. Pasnau, 661-673. Cambridge: Cambridge University Press.

[18] Biard, Joël. 2017. "Buridan, Intentionality and Its Paradoxes." In: *Questions on the Soul by John Buridan and Others*, edited by G. Klima, 261-277. Dordrecht: Springer.

[19] Black, Deborah L. 2010. "Intentionality in Medieval Arabic Philosophy." *Quaestio* 10(1):65-81.

[20] Boh, Ivan. 1993. *Epistemic Logic in the Later Middle Ages*. London: Routledge.

[21] Brentano, Franz. 1973. *Psychology from an empirical standpoint*, translated by A. C. Rancurello et al. London: Routledge.

[22] Brower-Toland, Susan. 2007a. "Intuition, Externalism, and Direct Reference in Ockham." *History of Philosophy Quarterly* 24(4):317–335.

[23] Brower-Toland, Susan. 2007b. "Ockham on Judgment, Concepts, and the Problem of Intentionality." *Canadian Journal of Philosophy*, 37(1):67-109.

[24] Brower-Toland, Susan. 2015. "How Chatton Changed Ockham's Mind. William Ockham and Walter Chatton on Objects and Acts of Judgement." In: *Intentionality, Cognition, and Mental Representation in Medieval Philosophy*, edited by G. Klima, 204-234. Fordham: Fordham University Press.

[25] Cameron, Margaret. 2016. "Logica Vetus." In: *The Cambridge Companion to Medieval Logic*, edited by C. Dutilh Novaes and S. Read, 195-219. Cambridge: Cambridge University Press.

[26] Cesalli, Laurent. 2016. "Propositions: Their Meaning and Truth." In: *The Cambridge Companion to Medieval Logic*, edited by C. Dutilh Novaes and S. Read, 245-264. Cambridge: Cambridge University Press.

[27] Choi, Philip. 2016. "Ockham's weak externalism." *British Journal for the History of Philosophy*, 24(6):1075-1096.

[28] Cocchiarella, Nino B. 2001. "A Logical Reconstruction of Medieval Terminist Logic in Conceptual Realism." *Logical Analysis and History of Philosophy*, 4:35–72.

[29] Crane, Tim. 2006. "Brentano's Concept of Intentional Inexistence." In: *The Austrian Contribution to Philosophy* edited by M. Textor, 20-35. London: Routledge.

[30] Crane, Tim. 2013. *The Objects of Thought*. Oxford: Oxford University Press.

[31] Crane, Tim. Forthcoming. "Brentano on Intentionality." In: *The Routledge Handbook to Brentano*, edited by U. Kriegel.

[32] de Rijk, Lambertus M. 2005. "A study on the medieval intentionality debate up to ca. 1350." In: *Giraldus Odonis OFM (ed) Opera philosophica, vol II: De intentionibus*, 19–357. Leiden/Boston: Brill.

[33] Dutilh Novaes, Catarina. 2007. *Formalizing Medieval Logical Theories*. Dordrecht: Springer.

[34] Dutilh Novaes, Catarina. 2008. "An Intensional Interpretation of Ockham's Theory of Supposition." *Journal of the History of Philosophy* 46(3):365-393.

[35] Dutilh Novaes, Catarina. 2011. "The Different Ways in which Logic is (Said to Be) Formal." *History and Philosophy of Logic*, 32:303–332.

[36] Dutilh Novaes, Catarina. 2012. *Formal Languages in Logic: A Philosophical and Cognitive Analysis*. Cambridge: Cambridge University Press.

[37] Dutilh Novaes, Catarina. 2013. "The Role of 'Denotatur' in Ockham's Theory of Supposition." In: *Medieval Supposition Theory Revisited*, edited by E. P. Bos, 352-370. Leiden/Boston: Brill.

[38] Edelberg, Walter. 2006. "Intrasubjective Intentional Identity." *Journal of Philosophy*, 103:481-502.

[39] Fitting, Melvin and Mendelsohn, Richard L. 1998. *First-Order Modal Logic*. Dordrecht: Synthèse Library, Springer.

[40] Freddoso, Alfred. 1998. "Ockham's Theory of Truth Conditions." In: *Ockham's Theory of Propositions*, edited by A. Freddoso and H. Shuurman, 1–76. South Bend: St. Augustine's Press.

[41] Gadamer, Hans Georg. 2006. *Truth and Method*, translation revised by J. Weinsheimer and D. G. Marshall. London: Continuum

[42] Geach, Peter T. 1981. "Intentional Identity." In: *Logic Matters*, 146-153. Oxford: Basil Blackwell.

[43] Jacob, Pierre. 2014. "Intentionality", *The Stanford Encyclopedia of Philosophy*, edited by E. N. Zalta, Accesed June 28, 2016. URL = `http://plato.stanford.edu/archives/win2014/entries/intentionality/`.

[44] Johnston, Spencer. 2015. "Ockham and Buridan on the Ampliation of Modal Propositions." *British Journal for the History of Philosophy*, 23(2):234-255

[45] Karger, Elizabeth. 1976. *A Study of William of Ockham's Modal Logic*, Ph.D. dissertation: University of California.

[46] Karger, Elizabeth. 1980. "Would Ockham Have Shaved Wyman's Beard?" *Franciscan Studies* 40:244–264.

[47] Keele, Rondo. 2010. *Ockham Explained. From Razor to Rebellion*. Chicago: Open Court.

[48] King, Peter. 2001. "Consequence as Inference: Mediaeval Proof Theory 1300-1350." In: *Medieval Formal Logic: Obligations, Insolubles and Consequences*, edited by M. Yrjönsuuri, 117-146. Dordrecht: Kluwer Academic Publishers.

[49] King, Peter. 2010. "Mediaeval Intentionality and Pseudo-Intentionality." *Quaestio* 10(1):25-44.

[50] King, Peter. 2015. *A Brief Guide to Supposition Theory*. Accesed November 25, 2016. URL = `http://colorado.edu/neh2015/sites/default/files/attached-files/king.supposition_theory.pdf`.

[51] Klima, Gyula. 1993. "Debeo tibi equum: A Reconstruction of the Theoretical Framework of Buridan's Treatment of the Sophisma." In: *Sophisms in Medieval Logic and Grammar*, edited by S. Read, 333-347. Dordrecht: Kluwer Academic Publishers.

[52] Klima, Gyula. 2001. "Existence and Reference in Medieval Logic." In: *New Essays in Free Logic*, edited by A. Hieke and E. Morscher, 197-226. Dordrecht: Kluwer.

[53] Klima, Gyula. 2004. "John Buridan on the Acquisition of Simple Substantial Concepts." In: *John Buridan and Beyond. Topics in the Language Sciences 1300-1700,* edited by R. L. Friedman and S. Ebbesen, 17-32. Copenhagen: The Royal Danish Academy of Sciences and Letters.

[54] Klima, Gyula. 2008. "The Nominalist Semantics of Ockham and Buridan." In: *Handbook of the History of Logic, Vol. 2, Mediaeval and Renaissance Logic*, edited by D. M. Gabbay and J. Woods, 389-431. Amsterdam: Elsevier.

[55] Klima, Gyula. 2009. *John Buridan. Great Medieval Thinkers*. Oxford-New York: Oxford University Press.

[56] Klima, Gyula. 2013. "Three Myths of Intentionality Versus Some Medieval Philosophers." *International Journal of Philosophical Studies*, 21(3):359-376.

[57] Klima, Gyula (Ed.). 2017. *Questions on the Soul by John Buridan and Others*. Dordrecht: Springer.

[58] Kundsen, Christian. 1982. "Intentions and impositions." In: *The Cambridge History of Later Medieval Philosophy*, edited by N. Kretzmann, A. Kenny and J. Pinborg, 479-495. Cambridge: Cambridge University Press.

[59] Kripke, Saul. 1980. *Naming and Necessity*. Cambridge, Massachusetts: Harvard University Press.

[60] Lewis, David & Lewis, Stephanie. "Holes." *Australasian Journal of Philosophy*, 48(2):206-212.

[61] McGrade, Arthur S. 1985. "Plenty of Nothing: Ockham's Commitment to Real Possibles." *Franciscan Studies* 45(1):145–156.

[62] Normore, Calvin. 2010. "Primitive Intentionality and Reduced Intentionality: Ockham's Legacy" *Quaestio* 10 (1):255-266.

[63] Normore, Calvin. 2012. "Ockham on Being." In: *Categories of Being. Essays on Metaphysics and Logic*, edited by L. Haaparanta and H. Koskinen, 78-98. Oxford: Oxford University Press.

[64] Panaccio, Claude. 1983. "Guillaume d'Occam: signification et supposition." In: *Archéologie du signe*, edited by L. Brind'Amour et E. Vance, 265-286. Toronto: Institut Pontifical d'Études Médiévales.

[65] Panaccio, Claude. 1999. "Semantics and Mental Language." In: *The Cambridge Companion to Ockham*, edited by P. V. Spade, 53–75. Cambridge: Cambridge University Press.

[66] Panaccio, Claude. 2003. "Connotative Concepts and Their Definition in Ockham's Nominalism." In: *La tradition médiévale des catégories, XIIe - XVe siècles*, edited by j. Biard and I. Rosier-Catach, 141-156. Leuven: Peeters.

[67] Panaccio, Claude. 2004. *Ockham on Concepts*. Aldershot: Ashgate.

[68] Panaccio, Claude. 2006. "Conceptual Acts." In: *Intellect et imagination dans la Philosophie Médiévale*, Vol. 1, edited by M. C. Pacheco and J. F. Meirinhos, 37–51. Turnhout: Brepols.

[69] Panaccio, Claude. 2012. "Ockham and Buridan on Epistemic Sentences: Appellation of the Form and Appellation of Reason." *Vivarium*, 50:139-160.

[70] Panaccio, Claude. 2013. "Ockham and Buridan on Simple Supposition." In: *Medieval Supposition Theory Revisited*, edited by E. P. Bos, 371-384. Leiden/Boston: Brill.

[71] Panaccio, Claude. 2015. "Ockham's Externalism." In: *Intentionality, Cognition, and Mental Representation in Medieval Philosophy*, edited by G. Klima, 166-185. Fordham: Fordham University Press.

[72] Panaccio, Claude. 2016. "Ockham's Commitment to Merely Possible Beings. Handout." *Ontological Commitment in Medieval Logic - Conference*, Geneva, 16.12.2016.

[73] Panaccio, Claude. 2017. "Linguistic Externalism and Mental Language in Ockham and Buridan." In: *Questions on the Soul by John Buridan and Others*, edited by G. Klima, 225-237. Dordrecht: Springer.

[74] Parsons, Terence. 2008. "The Development of Supposition Theory in the Later 12th through 14th Centuries." In: *Handbook of the History of Logic, Vol. 2, Mediaeval and Renaissance Logic*, edited by D. M. Gabbay and J. Woods, 157-280. Amsterdam: Elsevier.

[75] Parsons, Terence. 2013. "The Expressive Power of Medieval Logic." *Vivarium*, 51(1-4):511-521.

[76] Parsons, Terence. 2014. *Articulating Medieval Logic*. Oxford: Oxfrod University Press.

[77] Pasnau, Robert. 2001. "Intentionality and Final Causes." In: *Ancient and Medieval Theories of Intentionality*, edited by D. Perler, 301-323. Leiden: Brill

[78] Perini-Santos, Ernesto. 2008. "John Buridan on the Bearer of Logical Relations." *Logica Universalis* 2:59-70.

[79] Perini-Santos, Ernesto. 2013. "When the Inference 'p is true, therefore p' Fails: John Buridan on the Evaluation of Propositions." *Vivarium*, 51:411-424.

[80] Perler, Dominik (Ed). 2001. *Ancient and Medieval Theories of Intentionality*. Leiden: Brill

[81] Priest, Graham. 2016. *Towards Non-Being. The Logic and Metaphysics of Intentionality*. Oxford: Clarendon Press.

[82] Priest, Graham and Read, Stephen. 1977. "The Formalization of Ockham's Theory of Supposition." *Mind, New Series*, 86(341):109-113

[83] Priest, Graham and Read, Stephen. 1981. "Ockham's Rejection of Ampliation." *Mind* 90(358):274–279.

[84] Quine, Willard van Orman. 1948. "On What There Is." *Review of Metaphysics* 48:21–38; repr. as ch.1 of *From a Logical Point of View*, Cambridge, MA: Harvard University Press.

[85] Read, Stephen. 2015a. "Medieval Theories: Properties of Terms." *The Stanford Encyclopedia of Philosophy*. Edited by E. N. Zalta. Accessed June 28, 2016. URL = `http://plato.stanford.edu/entries/medieval-terms/`.

[86] Read, Stephen. 2015b. "Introduction." In: John Buridan, *Treatise on Consequences*, translated by S. Read, 1-52. Fordham: Fordham University Press, 2015

[87] Salamucha, Jan. 1935. "Logika zdań u Wilhelma Ockhama." *Przegląd Filozoficzny*, 38: 208–239.

[88] Soames, Scott. 2013. "Cognitive Propositions," *Philosophical Perspectives: Philosophy of Language*, 27:479-501.

[89] Soames, Scott. 2016. "Propositions as Cognitive Acts," *Synthese*, 1-15.

[90] Spade, Paul Vincent. 1982. "The Semantics of Terms." In: *The Cambridge History of Later Medieval Philosophy*, edited by N. Kretzmann, A. Kenny and J. Pinborg, 188-196. Cambridge: Cambridge University Press.

[91] Spade, Paul Vincent (Ed.). 1999. *The Cambridge Companion to Ockham*. Cambridge: Cambridge University Press.

[92] Spade, Paul Vincent. 2007. *Thoughts, Words and Things: An Introduction to Late Mediaeval Logic and Semantic Theory*. URL = `http://pvspade.com/Logic/docs/Thoughts,%20Words%20and%20Things1_2.pdf`.

[93] Uckelman, Sara L. 2008. "Three 13th-Century Views of Quantified Modal Logic." *Advances in Modal Logic*.

[94] Uckelman, Sara L. 2013. "A quantified temporal logic for ampliation and restriction." *Vivarium*, 51(1-4):485-510.

[95] Van Inwagen, Peter. 1998. "Meta-Ontology." *Erkenntnis* 48:233–250.

[96] Vaughan, Nicolas. 2014. "Ockham's Conception of Logic as a Rational Science: An Inferentialist Interpretation." PhD Thesis. Oxford: University of Oxford. URL = `http://goo.gl/6oSDp2`.

[97] Willing, Anthony. 1985. "Buridan and Ockham: The Logic of Knowing." *Franciscan Studies*, 45:47-56.

[98] Whitehead, Alfred, N. 1979. *Process and Reality*. New York: The Free Press.

[99] Zalta, Edward N. 1983. *Abstract Objects: An Introduction to Axiomatic Metaphysics*. Dordrecht: D. Reidel Publishing Company.

[100] Zalta, Edward N. 1988. *Intensional Logic and The Metaphysics of Intentionality*. Cambridge: The MIT Press.

[101] Zalta, Edward N. 2001. "Fregean Senses, Modes of Presentation and Concepts." *Philosophical Perspectives (Noûs Supplement*, 15:335-359.

[102] Zupko, Jack. 2003. *John Buridan. Portrait of a Fourteenth-Century Arts Master*. Notre Dame: University of Notre Dame Press.

[103] Zupko, Jack. 2014. "John Buridan." *The Stanford Encyclopedia of Philosophy*. Edited by E. N. Zalta. Accessed November 26, 2016. URL = `http://plato.stanford.edu/archives/spr2014/entries/buridan/`.

[104] Zupko, Jack. 2015. "On the Several Senses of *"Intentio"* in Buridan." In: *Intentionality, Cognition, and Mental Representation in Medieval Philosophy*, edited by G. Klima, 251-272. Fordham: Fordham University Press.