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Ockham's Rejection of Ampliation

GRAHAM PRIEST AND STEPHEN READ

1. *Introduction*

In mediaeval supposition theory a term supposits for, or, as we should now say, refers to a class of entities.[1] In normal contexts the class for which a term supposits is the class of things it signifies, that is, of which it can be truly predicated. However, most mediaevals held that in some contexts the class of objects for which a term supposits might be different. In particular, in modal or tensed contexts a term ϕ could supposit for the class of things that will be ϕ, were ϕ, could be ϕ and so on. This change of reference class is called *ampliation* and is necessary in order to ensure that modal and tensed sentences get the right truth conditions.[2] For example, in

Some man is white (1)

'man' supposits for all presently existing men and (1) is true if and only if a_1 is white or a_2 is white or ..., where 'a_1,a_2,...' is an enumeration of this class.[3] However, in

Some man was white (2)

the tense of the copula was thought to ampliate the subject in such a way that 'man' supposits for all present and past men. (2) is true if b_1 was white or b_2 was white or ..., where 'b_1,b_2,...' is an enumeration of the class of present and past men. Similarly, in 'Some man will be black', the supposition of 'man' is ampliated to all present and future men and in 'Some man can be black', 'man' supposits for all things that can be men.

This was, we have said, the standard mediaeval account. Yet ampliation is not to be found in William of Ockham's logical writings, even though he must have been aware of other logicians' use of the notion. Our question is 'Why?' We intend to answer the question by explaining Ockman's account of modal and tensed sentences and then arguing that Ockham's is preferable to the ampliative account.

2. *Modal contexts*

Ockham gives quite distinct accounts of the truth conditions of modal and tensed sentences. Let us start with his account of modal sentences.[4]

1 For the connection between supposition and reference see G. Priest and S. Read, 'Merely Confused Supposition', *Franciscan Studies*, XXXIX (1979).
2 For the standard account, see E. Moody, *Truth and Consequence in Medieval Logic* (Amsterdam, 1953), section 12.
3 For a more precise account, see Priest and Read, *ibid.*
4 Ockham's account can be found in his *Summa Logicae*, ed. Boehner, Gál and Brown (St. Bonaventure, 1974), II chs. 9, 10 (hereafter, *STL*).

Ockham claims that a modal sentence is ambiguous. It can have a composite or a divisive sense. For example, consider

Some man must be mortal (3)

This can mean either

'Some man is mortal' is a necessarily true proposition,

which is the composite sense, or

Some man is, of necessity, mortal,

which is the divisive sense.

In general, in a composite interpretation, necessity (necessary truth) is predicated of a sentence, whereas in a divisive interpretation, necessity is attached to a predicate and the compound predicate is asserted of the subject. The distinction is close to that between *de dicto* and *de re* modalities. However, one should note that a composite interpretation is not quite what is currently called a *de dicto* modality.[1] For in the composite case, the modal operator is a predicate of sentence names whereas in the (modern) *de dicto* case the modal operator is a unary sentence connective.

All this is most clearly seen by symbolising (3) as an example. Suppose that 'L' is the necessity operator of a standard modal language. Then the divisive sense of (3) has the form:

$$\exists x(Ax \,\&\, LBx) \qquad (4)$$

The modality here is Quine's third grade of modal involvement.[2] But if we take 'L' to be a monadic predicate acting on sentence names, and corners $\ulcorner, \urcorner$ to be the name forming functor, then the composite sense of (3) is of the form:[3]

$$L\ulcorner\exists x(Ax \,\&\, Bx)\urcorner \qquad (5)$$

This corresponds to Quine's first grade of modal involvement.[4]

Having got the form of the composite and divisive senses straight it is now straightforward to give the modes of supposition for the various terms and the truth conditions of such sentences. In 'Merely Confused Supposition', we showed precisely how this was to be done for an extensional language. The variations required to deal with the two modal languages at hand are trivial and so we will just state the results for our particular

1 See, for example, G. Hughes and M. Cresswell, *An Introduction to Modal Logic* (London, 1972), p. 183.

2 See W. V. Quine, 'Three Grades of Modal Involvement', in his *Ways of Paradox* (New York, 1966), pp. 156–174.

3 For a formal theory of modality in which modal operators are predicates of sentence names, see G. Priest, 'A Reformulation of Modal Logic', *Notre Dame Journal of Formal Logic*, xviii (1977), pp. 340–354. In that paper corners are not used. In effect, material supposition is. See convention C, p. 341.

4 Quine, ibid. What is now called *de dicto* modality is Quine's second grade of involvement.

example.[1] (5) is of simple subject-predicate form. The predicate 'L' supposits determinately for the class of sentences which are necessarily true. The subject ⌜∃x(Ax & Bx)⌝ has material supposition, that is, it supposits for itself. In (4), the subject 'A' supposits determinately for the class of men and the predicate 'LB' also supposits determinately for its extension, viz. the class of objects which are necessarily mortal. Note that we take the predicate to be 'LB', not 'B'. Here we have to take seriously Ockham's claim that only the whole extreme can properly be said to have supposition (*STL* I, 72). In this way the predicate supposits for its extension. If we took the predicate to be 'B' and if we wanted to get the descended form right, no such simple definition of the supposition class (if any) would be satisfactory.

One final point on modality. We have symbolised the divisive sense of (3) as (4). But Moody (ibid.) claims that it should be written as

$$\exists x(MAx \,\&\, LBx) \tag{6}$$

where 'M' represents possibility. (Actually he claims that it should be written

$$\exists x((MAx \vee Ax) \,\&\, LBx),$$

but since $p \rightarrow Mp$ the former is equivalent but simpler.) Although Moody's analysis appears to agree with his source, Albert of Saxony, (6) makes (3) means something very strange, and it is certainly not correct for Ockham. For example, Ockham says (*STL* I, 74) that the divisive (sense of the) proposition 'A creator of necessity is God' converts to (that is, is equivalent to), 'Something which of necessity is God is a creator'. This confirms our view. For if Moody were right, it would have to convert to 'Something which of necessity is God is possibly a creator'.

3. *Temporal contexts*

Turning to tensed sentences, we find that Ockham also distinguishes two interpretations of a tensed sentence.[2] For example, a sentence such as

Some man was white (7)

can be understood in two ways: it can mean that something which is now a man was white, or that something which was a man was white. This comes out particularly clearly again, in Ockham's discussion of conversion. On one interpretation, (7) is equivalent to

Something which was white is a man,

and on the other to

Something which was white was a man.

(7) is equivalent to the simple

Something white was a man (8)

1 The only point worth remarking on is the fact that it can no longer be claimed that a term must have merely confused supposition if it has no other. For of course, substitutivity of material equivalents does not hold in modal contexts.

2 Ockham's account is found in *STL* II, 7.

if and only if the subjects in both (7) and (8) supposit for what was. In general, the predicate of a tensed sentence has unambiguous supposition. However, the subject of a tensed sentence may have one of two suppositions, its present extension and either its past or its future extension depending on whether the tense is past or future respectively.

Once again, we can clarify this distinction using logical notation. In particular, let 'P' and 'F' be Prior's tense operators 'It was the case that' and 'It will be the case that', respectively. Then, for example, one of the interpretations of (7) is of the form:

$$\exists x(PAx \ \& \ PBx) \qquad (9)$$

whilst the other has the form:

$$\exists x \ (Ax \ \& \ PBx) \qquad (10)$$

However, it is important that the quantifiers in these sentences be considered as ranging over all objects, past, present and future. Otherwise, for example, 'Some French general lost the battle of Waterloo' comes out false.[1]

It is perhaps worth noting that some have found the interpretation of (7) as (9) curious for it allows the object to be B *after* it was A (though still before now). However, the mediaevals claimed just this. Ockham wrote (*STL* III–4, 4) that one interpretation of '*Puer fuit senex*' is 'Someone who was a boy was an old man', and the Venice edition adds: "and this is true". Buridan and Albert of Saxony took the same view.[2] Perhaps a more natural example would be 'Few infant prodigies were famous old men' and symmetrically for the future 'One of the greatest philosophers of the twenty-first century will be born next year'.

Again, it is easy to define the modes of supposition and give the descended forms. It can all be done precisely in a tense language of the Prior type. The details are analogous to the case of the standard modal language which we have already discussed. Hence we will just state that the predicate of (9) and (10), 'PB', the subject of (9), 'PA', and the subject of (10), 'A', all have determinate supposition, though of course the subjects of (9) and (10) supposit for different classes of objects.

4. *The distinctions compared*

Because of the strong similarity of modal logics and their semantics on the one hand and tense logics and theirs on the other, it is tempting to think that the semantics of simple modalised or tensed categorical forms of English must be similar. Ockham's account of the truth conditions of such sentences argues strongly that they are not. In his book, Moody indeed gives parallel treatment to tensed and modal sentences, with the claim that this is generally how the two were handled. Ockham shows that

1 That this is the best way to interpret quantifiers in tense logics has been argued by N. Rescher in 'On the Logic of Chronological Propositions', *Mind*, lxxv (1966), pp. 75–96.

2 Buridan, *Sophismata* ed. and tr. T. K. Scott (New York, 1966) sophisma 4 of chapter 4 on Connotation; Albert of Saxony, *Perutilis Logica* (Venice 1522), II, 10.

however general this treatment was, it was not universal. For the distinction between the two interpetations of tensed sentences is not at all the same as that between composite and divisive modals. The divisive modal is similar to the tensed sentence in which the subject term supposits for present entities. ((4) is structurally similar to (10).) Yet (5) is in no way similar to (9). Ockham is in effect denying that there is a composite interpretation of tensed sentences and that there is an interpretation of modal sentences in which the subject, 'A', supposits for all possible As. This is of course not to say that such things cannot be said or thought. One could easily express them in suitable formal languages by assertions of the form, '$P^{\ulcorner}\exists x(Ax \,\&\, Bx)^{\urcorner}$', '$\exists x(MAx \,\&\, MBx)$', and so on. (Note that the first of these does not have the same truth conditions as (9), '$\exists x(PAx \,\&\, PBx)$'. (9) may be true even though nothing was simultaneously A and B, whilst the former cannot.)

Nor is it to say that such things cannot be said in English: they certainly can if we choose our words carefully. The point is that the simple modalised or tensed categorical forms (A,E,I,O) cannot be thus interpreted.

So 'Some white thing was black' can mean that something which was white was, at some other time, black. But 'Some white thing can be black' cannot mean that something that can be white can also (under some other circumstances) be black. It can only mean (divisively) that something which is, as a matter of fact, white could in other circumstances be black, or (compositely) that it is possible for something to be black and white but under the same conditions (which, leaving zebras, penguins and newspapers aside, is necessarily false).

To repeat: what Ockham is claiming by his distinctions is that structurally similar modal and tensed sentences of Latin (or English) have different logical structure.

5. *Ampliation rejected*

We have so far been content to explain Ockham's account of supposition in modal and tensed contexts. We have now to show that Ockham's account is preferable to the standard ampliative account we sketched in section 1. This account differs significantly from Ockham's on at least two points.

The first is that it attributes to a modal sentence of the form, 'Some A is possibly B', a logical structure '$\exists x(MAx \,\&\, MBx)$', whereas Ockham's does not. We argued in the last section that it cannot have this form, and have therefore already sided with Ockham on this point.

The second point is that the ampliative account does not recognise a tensed sentence as having two interpretations. It gives the sentence, 'Some A was B', for example, the logical structure

$$\exists x(\,(Ax \vee PAx) \,\&\, PBx) \qquad (11)$$

which is of course equivalent to

$$\exists x(Ax \,\&\, PBx) \vee \exists x(PAx \,\&\, PBx),$$

that is, the disjunction of (9) and (10). Thus the ampliative account gives

a single disjunctive truth condition rather than two distinct truth conditions. Which account is right?

Here the parallel with the modal division *is* suggestive. Consider 'Every black thing could be white'. This can mean, 'It is possible that every black thing be white', or, 'Of every black thing it is true that it could be white'. No one would claim that it means, 'Either it is possible that every black thing be white or of every black thing it is possible that it be white'. If the sentence really did have this disjunctive truth condition then there would be no sense in which it was false. But there is: nothing can be both black and white. The case is similar with the division in the tensed case. If 'Every white man was black' had the disjunctive truth condition expressed by (11), then it could not be false in the following situation, which it can be. Suppose on the one hand that every man who has been white at some time before now was also black at some time before that, but that, on the other, there are some who are now white who have never been black. Clearly there is a sense in which 'Every white man was black' is false in this situation. Yet it if had a disjunctive truth condition it could not be.

This situation is even closer to that concerning the sentence

Francis Bacon lived before the eighteenth century. (12)

This sentence is not ambiguous, but it has two distinct sets of truth conditions. Under one set it is true if a certain seventeenth century philosopher lived before the eighteenth century; under another it is true if a certain twentieth century painter did so. Clearly under the one interpretation, (12) is true and under the other it is false. No one, we take it, would claim that the sentence has a disjunctive truth condition, viz. that it is true if either a seventeenth century philosopher or a twentieth century painter lived before the eighteenth century. If such were really the case, then, 'Napoleon was never in France' would be true since one of us has a cat called 'Napoleon' who has never been to France. The parallel between this and the temporal case is, in fact, exact. For in both cases the difference is that of the reference (supposition) of the subject term, and is not a matter of meaning (signification).

Hence, 'Some man was white' can be interpreted as saying either that something which was a man was white, or that something which is a man was white. It cannot be interpreted as saying that something which either is or was a man was white. Ockham's account of the truth conditions of tensed and modal sentences is therefore preferable to the ampliative account on both counts.

UNIVERSITY OF WESTERN AUSTRALIA
UNIVERSITY OF ST. ANDREWS