ON AN ENDURING *NON SEQUITUR* OF QUINE'S

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Among Quine's numerous and varied attacks on the viability of modal logic is to be found one which we may call "the ontological criticism of quantified modal logic". This is the claim that a substitution interpretation of the quantifiers "leads us to hold that there are no concrete objects (men, planets, etc.), but rather that there are only, corresponding to each supposed concrete object, a multitude of distinguishable entities (perhaps "individual concepts," in Church's phrase)." ([1], p. 271) The argument for this criticism is to be found in "The Problem of Intrepreting Modal Logic," and it embodies a very basic mistake which renders Quine's conclusion a *non sequitur*. Subsequent to Quine's statement of the ontological criticism attempts were made to show how this (and his other attacks) did not really constitute insurmountable problems in the interpretation of modal logic. Examples of such counterattacks are Church's appeal to an ontology of individual concepts and Marcus' discussion of alternative identity (or at least *equivalence*) relations among the entities to be found in the ontology of modal logic. And while each of these attempts has its advantages, so far as I am able to discover no one has faced the ontological criticism with a specific counterattack. Thus although modal logic seems to have been unaffected by the ontological criticism, the criticism itself has remained unscathed for the past thirty years. In fact, it is often repeated as a standing criticism of quantified modal logic (see, for example, pp. 36-37 of [2]) and seems to be universally accepted as something with which modal logicians must learn to live. After thirty years, then, it is time that we see how Quine's argument does not support his conclusion of the ontological criticism.

Quine begins by adopting a version of the substitution interpretation of the quantifiers:

> (ii) An existential quantification holds if there is a constant whose substitution for the variable of quantification would render the matrix true. ([1], p. 271).

He then argues that modal logic repudiates material objects as follows:

To see this, let us use 'C' (for 'congruence') to express the relation which Venus, the Evening Star, and the Morning Star, e.g., bear to themselves and, according to empirical evidence, to one another. (It is the relation of *identity* according to materialistic astronomy, but let us not prejudge this.)

Then

Morning Star **C** Evening Star. □ (Morning Star **C** Morning Star).

Therefore, according to (ii),

(1) $(\exists x)$ $(x$ **C** Evening Star. □ $(x$ **C** Morning Star)).

But also

Evening Star **C** Evening Star. $\sim$ □ (Evening Star **C** Morning Star),

so that, by (ii),

(2) $(\exists x)$ $(x$ **C** Evening Star. $\sim$ □ $(x$ **C** Morning Star)). ([1], p. 272)

Presumably 'Evening Star' and 'Morning Star' are being used as constants, and thus far Quine's argument is perfectly correct. But it is in the next step that he errs. Quine goes on to say,

(*)   Since the matrix quantified in (1) and the matrix quantified in (2) are mutual contraries, the x whose existence is affirmed in (1) and the x whose existence is affirmed in (2) are two objects;

(**)   so there must be at least two objects x such that x **C** Evening Star. ([1], p. 272)

And he concludes with the ontological criticism:

Thus it is that the contemplated version of quantified modal logic is committed to an ontology which repudiates material objects (such as the Evening Star properly so-called) and leaves only multiplicities of distinct objects (perhaps the Evening-Star-Concept, the Morning-Star-Concept, etc.) in their place. For, the ontology of a logic is nothing other than the range of admissible values of the variables of quantification. ([1], p. 272)

Now this conclusion is a blatant *non sequitur*, and close attention to (ii), (*), and (**) will suffice to show this. The problem begins with (*) where Quine talks about the x whose existence is affirmed in (1) and the x whose existence is affirmed in (2). This is at best a sloppy way of speaking, and it is the sort of sloppy speech which naturally leads from (*) to (**). For while (*) can be regarded as true, (**) must be regarded as nonsense. An appeal to (ii) will suffice to show that the x whose existence is affirmed in (1) is nothing more than the *name* 'Morning Star'; and similarly, the x whose existence is affirmed in (2) is the *name* 'Evening Star'. And of course these *names* are distinct. We may refer to the names as "objects" so long as we are careful not to confuse this use of 'object' with its (more customary?) use according to which an object is something which is *designated* by a name, for in the substitution interpretation expressed by (ii) there is no appeal made to designation or to objects in this latter sense.

We may now see that (**) is, strictly speaking, unintelligible—involving, as it does, a mistake between use and mention! What Quine is *entitled* to infer in the light of (ii) and (*) is

(***)   so there must be at least two objects (*names*) x such that the sentence $\ulcorner x$ **C** Evening Star$\urcorner$ is true.

The matrix $\ulcorner x$ **C** Evening Star$\urcorner$ is a formula of the objectlanguage which Quine is examining in order to assess its ontological commitment. Thus $\ulcorner x$ **C** Evening Star$\urcorner$ should be *mentioned* in (**) as it is in (***). Instead, Quine *uses* this matrix in (**) and thereby renders (**) unintelligible.

In a sense, of course, Quine is right that the substitution interpretation "leaves only multiplicities of distinct objects" in the place of the Evening Star and the Morning Star. But these objects are just the *names* 'Evening Star', 'Morning Star', 'Venus', etc. Material objects have not been repudiated. They may bear a certain direct relation (designation) to names, but they bear only an indirect relation to the quantifiers. It is ironic that Quine, who had become so sensitive to the use/mention distinction, should commit such an error and conclude that the substitution interpretation committed the modal logician to a bloated ontology, but there is no doubt that the move from (*) to (**) involves just such a confusion of use and mention. In the end, then, the modal logician who embraces the substitution interpretation seems to be committed only to the names of his language (in addition, perhaps, to the entities to which these names refer), and surely it is not so horrible to be committed to the very linguistic expressions which one uses.

REFERENCES

[1] Copi, I., and J. Gould, eds., *Contemporary Readings in Logical Theory*, New York (1967).

[2] Föllesdal, D., *Referential Opacity and Modal Logic*, Universitetsforlaget (1966).

[3] Quine, W. V., "The problem of interpreting modal logic," *The Journal of Symbolic Logic*, vol. 12 (1947), pp. 42-48. Reprinted in [1].

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