ON THE ONTOLOGY OF BRANCHING QUANTIFIERS

I. INTRODUCTION

Branching quantifiers have intrigued logicians since entering the scene almost three decades ago. Enthusiasm for them has been the rule. Two of the three authors I will discuss here, Jaakko Hintikka and Jon Barwise, promote them as allowing a breakthrough in linguistics, in particular. My third author, W. V. Quine, views them with a more jaundiced eye. Still, he and at least Hintikka join a general consensus on their ontology: whatever their pros and cons, or their proper role in our theories, branching quantifiers range over ordinary objects. (These will be simply objects henceforth, for brevity.)

Quine sees this as complicating the workings of his famous criterion for the existential commitment of a theory. But I hope to spare him this complication by removing its basis. I will oppose the popular view that branching quantifiers range over objects. This is not to say that they range instead over entities of some other kind. For in one or another way, the notion of an ontological range could simply get no grip. I will propose a way.

Still, solid formal work has been done on these items, whatever their ontology. In resisting them, Quine traces global implications, citing metalogical desiderata which a move to the new quantifiers would lose. My own argument rests more on conceptual fundamentals. While his resistance may not be too little, I think it does come misleadingly late. If I am right, branching quantifiers, at least as complicating ontology, can be nipped more nearly in the bud. (Through a methodological irony, my nipping them there proves more deniable than I would like. But I can hope that resistance will appear heroic which relies solely on this.)

Unsurprisingly, a semantics for them will be moot. Still, a striking feature of the scene makes semantic facts available: a noncontroversial truth-preserving correspondence between these branching sentences
and ones from a logic allowing for open talk about functions. My favored road to ontological limbo for branching quantifiers indeed flows from a thesis on the status of this correspondence. But in my next section, I will rather exploit it, through a semantic device similar to one Hintikka employs. We can begin by reviewing some of Quine’s claims about displays in his lucid “Existence and Quantification” treatment.

II. BRANCHING AND FUNCTIONAL PREFIXES, A SEMANTICS AND A GAME

Quine (EQ109) discusses all but the fourth of these sentences:

(1) Each thing bears \( P \) to something \( y \) and each thing bears \( Q \) to something \( w \) such that \( Rw_{yw} \).

(2) \((x)(\exists y)[Pxy \cdot (z)(\exists w)(Qzw \cdot Rw)]\)

(3) \((z)(\exists w)[Qzw \cdot (x)(\exists y)(Pxy \cdot Rw)]\)

(4) \((x)(z)(\exists y)(\exists w)(Pxy \cdot Qzw \cdot Rw)\)

(5) \(((\exists x)(\exists g)(x)(z)(PxFx \cdot Qxg) \cdot Rxfxgx)\)

(6) \((Pxy \cdot Qzw \cdot Rw)\)

(7) \((z)(\exists w)\)

About (2) and (3), Quine says: “These are not equivalent. (2) represents the choice of \( y \) as independent of \( z \); (3) does not. (3) represents the choice of \( w \) as independent of \( x \); (2) does not.” (EQ109) Completing the picture, we could add that (4) represents both of these choices as dependent on both \( x \) and \( z \), and by permuting the quantifiers in its prefix we could represent various other combinations of dependence and independence for these choices. But does this picture not still show a gap? Calling standard logic \( QL \), none of these \( QL \) sentences represents the choice of \( y \) as dependent just on \( x \) and the choice of \( w \) as dependent just on \( z \). But without this, it is held, certain English sentences will defy symbolization. (Quine offers (1) as a possible