Chapter Five:
Names, Predicates, and Quantifiers

5.1. Introduction: More Logical Form

We now propose to expand the formal language of Chapter Four – the language of "not," "and," "or," and "if". Our motives here are just those underlying the expansion at the beginning of Chapter Four: certain intuitively valid arguments are judged invalid by the formal tests of the previous chapter(s).

For instance, the following simple argument is intuitively invalid.

1. All men are mortal.
2. Socrates is a man.

∴ Socrates is mortal.

But since all of these sentences lack negation, conjunction, disjunction, and conditional phrases, each will be translated by a sentence letter – yielding a familiar ***invalid*** form.

VALID	**INVALID**
1. All men are mortal.	**P**
2. Socrates is a man.	**Q**
∴ Socrates is mortal.	∴ **R**

Here again we resolve the discrepancy by proposing that existing translation methods are overlooking some logical form in English.

In isolating these new bits of form we are helped by the following clue: while the formal translation suggests no overlap among the three sentences, in English they share many common ingredients. For example, the **proper name** "Socrates" appears in both the second premise and conclusion. And note that if this overlap is removed – using the name of the angel Raphael in the conclusion – the argument looks invalid.

INVALID

1. All men are mortal.
2. ***Socrates*** is a man.

∴ ***Raphael*** is mortal.

The **predicate phrase** "is/are mortal" likewise appears in both the first premise and conclusion. And once again the argument seems invalid if the two sentences feature *different* predicate phrases.

INVALID

1. All men ***are mortal***.
2. Socrates is a man.

∴ Socrates ***is Chinese***.

Finally, the English **quantifier** phrase "all" in the first premise is essential to the validity of the argument, since replacing it with the quantifier "some" yields an invalid argument.

INVALID

1. ***Some*** men are mortal.
2. Socrates is a man.

∴ Socrates is mortal.

(A situation where only half the men are mortal, and Socrates ranks among the luckier, immortal men, would be a validity counterexample for this argument.)

Since we assume throughout that the only factor affecting validity is logical form, we conclude that proper names, predicate phrases, and quantifiers are three new examples of logical form in English. To enable the formal test of validity to take note of these three new bits of logical form, we expand the formal language to include each of these three new examples.