INTRODUCTION TO LOGIC

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16. All pirates are nonmerchants.
17. Some merchants are not nonpirates.
18. Some nonpirates are nonmerchants.
19. Some merchants are nonpirates.
★ 20. Some nonpirates are merchants.
21. Some nonmerchants are not pirates.
22. Some nonmerchants are not nonpirates.
23. All nonmerchants are nonpirates.
24. Some nonmerchants are pirates.
★ 25. Some pirates are nonmerchants.
26. No merchants are nonpirates.
27. Some nonpirates are not merchants.
28. All merchants are pirates.
29. No pirates are merchants.
30. Some nonmerchants are nonpirates.
31. All pirates are merchants.

5.5 *Existential Import*

A proposition is said to have "existential import" if it is typically uttered to assert the existence of objects of some specified kind. For example, the proposition "There are books on my desk" has existential import, whereas the proposition "There are no unicorns" does not. It seems clear, especially in the light of our discussion of the word "some" in the first section of this chapter, that particular propositions have existential import. The ***I*** proposition "Some soldiers are heroes" says that there exists at least one soldier who is a hero. And the ***O*** proposition "Some soldiers are not heroes" says that there exists at least one soldier who is not a hero. Both particular propositions say that the classes designated by their subject terms are not empty; that is, they do have members.

Apparent exceptions to this view are such statements as "Some ghosts appear in Shakespeare's plays" and "Some Greek gods are described in the *Iliad*." These statements are true despite the fact that there are neither ghosts nor Greek gods. But a little thought will reveal that these apparent exceptions are formulated in a misleading fashion. These statements do not really affirm the existence of ghosts or of Greek gods; they say only that there are certain *other* propositions that are affirmed or implied in Shakespeare's plays and in the *Iliad*. The propositions of Shakespeare and Homer may not be true, but it is certainly true that their writings contain or imply them. And that is all that is affirmed by the apparent exceptions. Outside these fairly uncommon literary or mythological contexts, ***I*** and ***O*** propositions do have existential import as explained in the preceding paragraph.

If we grant that *I* and *O* propositions have existential import, then the traditional Square of Opposition would require that *A* and *E* propositions have existential import also. For if *I* follows validly from the corresponding *A* by subalternation, and if *I* asserts existence, then *A* must assert existence also. Similarly, *E* must have existential import if *O* does. (The existential import of *A* and *E* also follows from that of *I* and *O* if we grant the validity of conversion by limitation of *A* and of contraposition by limitation of *E*.)

A difficulty arises at this point. If corresponding *A* and *O* propositions have existential import, then both could be false. If "All inhabitants of Mars are blond" and "Some inhabitants of Mars are not blond" both assert that there exist inhabitants of Mars, then they are both false if Mars is uninhabited. And if corresponding *A* and *O* propositions can both be false, then they are not contradictories. It would seem, then, that there is something wrong with the traditional Square of Opposition. If it is correct in what it says about superalterns *A* and *E* implying subalterns *I* and *O*, then it is clearly mistaken in holding corresponding *A* and *O* propositions to be contradictories. It must also be mistaken in holding *I* and *O* to be subcontraries.

One can defend or rehabilitate the traditional Square of Opposition, as well as conversion by limitation and contraposition by limitation, through introducing the notion of a *presupposition*. We have already encountered this notion in discussing complex questions in Section 3.2. Some (complex) questions are properly answered "yes" or "no" only if it is presupposed that a definite answer has already been given to a prior question. Thus an answer "yes" or "no" can reasonably be given to the question "Did you spend the money you stole?" only if one grants the presupposition that you did steal some money. Similarly, the four standard-form categorical propositions may be said to presuppose that the classes to which they refer do have members. That is, questions of their truth or falsehood, and of the logical relations holding among them, are admissible only if it is presupposed that the existential question has already been answered in the affirmative. If we make the blanket presupposition that all classes designated by our terms (and their complements) do have members, then conversion and contraposition by limitation are valid, and all of the relationships set forth in the traditional Square of Opposition do hold: *A* and *E* are contraries, *I* and *O* are subcontraries, subalterns follow validly from their superalterns, and *A* and *O* are contradictories, as are *E* and *I*.

The existential presupposition necessary and sufficient for the correctness of the traditional Aristotelian logic is in close accord with ordinary English usage in many cases. Suppose, for example, someone were to assert that "All the apples in the barrel are Jonathans," and we look in the barrel and find it empty. Ordinarily we should not take that to make the proposition true, nor to make it false. We would be more inclined to point out that there are no apples in the barrel, indicating that in this particular case the existential presupposition was mistaken.

There are, however, several objections to making this blanket existential presupposition. In the first place, although it preserves the traditional relations among categorical propositions, it does so at the cost of cutting down on their power to formulate assertions. The existential presupposition makes it impossible for any standard-form categorical proposition to deny the existence of members of the classes designated by its terms. In the second place, the existential presupposition is not in *complete* accord with ordinary usage. For example, the proposition "All trespassers will be prosecuted," far from presupposing that the class of trespassers has members, is ordinarily intended to ensure that the class remain empty. And in the third place, we often wish to reason without making any presuppositions about existence. In physics, for instance, Newton's First Law of Motion asserts that every body not acted upon by external forces perseveres in its state of rest or of uniform motion in a straight line. Yet no physicist would want to presuppose that there actually are any bodies not acted upon by external forces.

On the basis of such objections as these, modern logicians decline to make this blanket existential presupposition, even though their decision forces them to give up some of the traditional Aristotelian logic. In contrast to the traditional or Aristotelian interpretation, the modern treatment of standard-form categorical propositions is called Boolean,[5] after the English mathematician and logician George Boole (1815–1864), one of the founders of modern symbolic logic.

On the Boolean interpretation, ***I*** and ***O*** propositions have existential import, so where the class *S* is empty the propositions "Some *S* is *P*" and "Some *S* is not *P*" are both false. The universal propositions ***A*** and ***E*** are still taken to be the contradictories of the ***O*** and ***I*** propositions, respectively. Where *S* is an empty class, both particular propositions are false, and their contradictories "All *S* is *P*" and "No *S* is *P*" are both true. On the Boolean interpretation, universal propositions are understood as having no existential import. However, a universal proposition formulated in ordinary English that is intended to assert existence can be represented in Boolean terms. This is accomplished by using two propositions, the Boolean nonexistential universal and the corresponding existential particular.

We shall adopt the Boolean interpretation in all that follows. This means that ***A*** and ***E*** propositions can both be true, and are therefore not contraries, and that ***I*** and ***O*** propositions can both be false, and are therefore not subcontraries. Moreover, since ***A*** and ***E*** can be true while ***I*** and ***O*** are false, inferences based on subalternation are not in general valid. The diagonal (contradictory) relations are all that remain of the traditional Square of Opposition. Obversion remains valid when applied to any proposition, but conversion (and contraposition) by limitation is rejected as not generally valid. Conversion remains valid for ***E*** and ***I*** propositions, and contraposition remains valid for ***A*** and ***O*** propositions.

[5]Bertrand Russell refers to it as "Peano's interpretation," in "The Existential Import of Propositions," *Mind*, n.s., Vol. 14, July 1905, pp. 398–401, reprinted in Douglas Lackey, ed., *Essays in Analysis* (New York: George Braziller, Inc., 1973), pp. 98–102.

If it is not asserted explicitly that a class has members, it is a mistake to assume that it has. Any argument that turns on this mistake will be said to commit the Fallacy of Existential Assumption or, more briefly, the Existential Fallacy.

EXERCISES

In the light of the preceding discussion of existential import, explain at which step (or steps) the following arguments commit the Existential Fallacy.

★ I. (1) No mathematician is one who has squared the circle;
therefore, (2) No one who has squared the circle is a mathematician;
therefore, (3) All who have squared the circle are nonmathematicians;
therefore, (4) Some nonmathematician is one who has squared the circle.

II. (1) No citizen is one who has succeeded in accomplishing the impossible;
therefore, (2) No one who has succeeded in accomplishing the impossible is a citizen;
therefore, (3) All who have succeeded in accomplishing the impossible are noncitizens;
therefore, (4) Some who have succeeded in accomplishing the impossible are noncitizens;
therefore, (5) Some noncitizen is one who has succeeded in accomplishing the impossible.

III. (1) No acrobat is one who can lift himself by his own bootstraps;
therefore, (2) No one who can lift himself by his own bootstraps is an acrobat;
therefore, (3) Some one who can lift himself by his own bootstraps is not an acrobat. (From which it follows that there is at least one being who can lift himself by his own bootstraps.)

IV. (1) It is true that: *No unicorns are animals found in the Bronx Zoo;*
therefore, (2) It is false that: *All unicorns are animals found in the Bronx Zoo;*
therefore, (3) It is true that: *Some unicorns are not animals found in the Bronx Zoo.* (From which it follows that there exists at least one unicorn.)

V. (1) It is false that: *Some mermaids are members of college sororities;*
therefore, (2) It is true that: *Some mermaids are not members of college sororities.* (From which it follows that there exists at least one mermaid.)

5.6 Symbolism and Diagrams for Categorical Propositions

Since the Boolean interpretation of categorical propositions depends heavily upon the notion of an empty class, it is convenient to have a special symbol to represent it. The zero symbol, 0, is used for this purpose. To say that the class designated by the term S has no members, we write an equals sign between S and 0. Thus the equation $S = 0$ says that there are no S's, or that S has no members.

To say that the class designated by S does have members is to deny that S is empty. To assert that there are S's is to deny the proposition symbolized by $S = 0$. We symbolize that denial by drawing a slanting line through the equality sign. Thus the inequality $S \neq 0$ says that there are S's, by denying that S is empty.

Standard-form categorical propositions refer to two classes; so the equations that represent them are somewhat more complicated. Where each of two classes is already designated by a symbol, the class of all things that belong to both of them can be represented by juxtaposing the symbols for the two original classes. For example, if the letter S designates the class of all satires and the letter P designates the class of all poems, then the class of all things that are both satires and poems is represented by the symbol SP, which thus designates the class of all satiric poems (or poetic satires). The common part or common membership of two classes is called the product or intersection of the two classes. The *product* of two classes is the class of all things that belong to both of them. The product of the class of all Americans and the class of all composers is the class of all American composers. (One must be on guard against certain oddities of the English language here. For example, the product of the class of all Spaniards and the class of all dancers is not the class of all Spanish dancers, for a Spanish dancer is not a dancer who is Spanish, but any person who performs Spanish dances. Similarly, with abstract painters, English majors, antique dealers, and so on.)

This new notation permits us to symbolize ***E*** and ***I*** propositions as equations and inequalities. The ***E*** proposition "No S is P" says that no members of the class S are members of the class P; that is, there are no things that belong to both classes. This can be rephrased by saying that the product of the two classes is empty, which is symbolized by the equation $SP = 0$. The ***I*** proposition "Some S is P" says that at least one member of S is also a member of P. This means that the product of the classes S and P is not empty and is symbolized by the inequality $SP \neq 0$.

To symbolize ***A*** and ***O*** propositions, it is convenient to introduce a new method of representing class complements. The complement of the class of all soldiers is the class of all things that are not soldiers, the class of all nonsoldiers. Where the letter S symbolizes the class of all soldiers, we symbolize the class of all nonsoldiers by $\bar{S}$ (*read* "S bar"), the symbol for the original class with a bar above it. The ***A*** proposition "All S is P" says that all members of the class S are also members of the class P, that is, that there are no members of the class S which are not members of P or (by obversion) that "No S is non-P." This, like any other ***E*** proposition, says that the product of the classes designated by its subject and predicate terms is empty. It is symbolized by the equation $S\bar{P} = 0$. The ***O*** proposition "Some S is not P" obverts to the logically equivalent ***I*** proposition "Some S is non-P," which is symbolized by the inequality $S\bar{P} \neq 0$.

In their symbolic formulations, the interrelations among the four standard-form categorical propositions appear very clearly. It is obvious that the A and O propositions are contradictories when they are symbolized as $S\bar{P} = 0$ and $S\bar{P} \neq 0$, and it is equally obvious that the E and I propositions, $SP = 0$ and $SP \neq 0$ are contradictories. The Boolean Square of Opposition may be represented as shown in Figure 2.

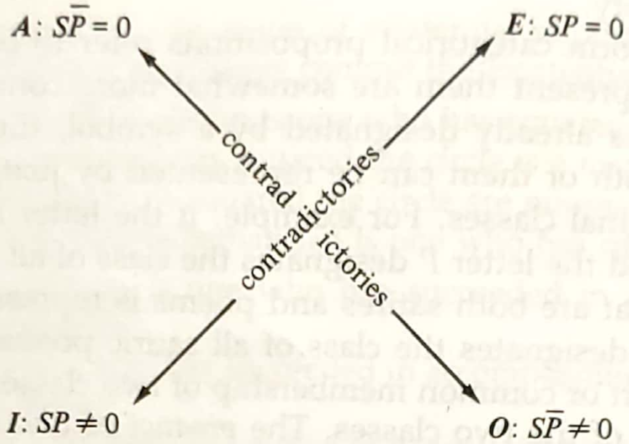


FIGURE 2

Propositions can be expressed diagrammatically by diagramming the classes to which they refer. We represent a class by a circle labeled with the term that designates the class. Thus the class *S* is diagrammed as in Figure 3.

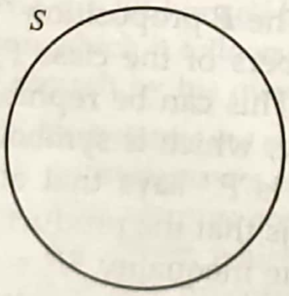


FIGURE 3

This diagram is of a class, not a proposition. It represents the class *S*, but says nothing about it. To diagram the proposition that *S* has no members, or that there are no *S*'s, we shade all of the interior of the circle representing *S*—indicating in this way that it contains nothing, but is empty. To diagram the proposition that there are *S*'s, which we interpret as saying that there is at least one member of *S*, we place an *x* anywhere in the interior of the circle representing *S*—indicating in this way that there is something inside it, that it is not empty. Thus the two propositions "There are no *S*'s" and "There are *S*'s" are represented by the two diagrams in Figure 4.

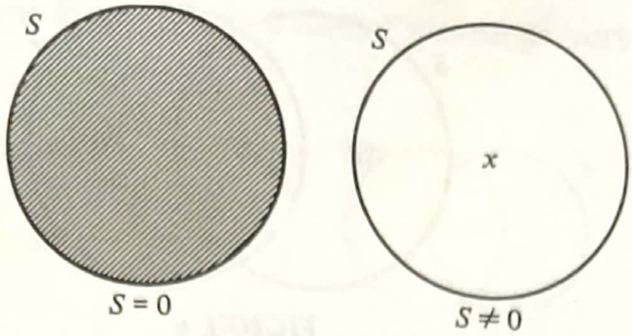


FIGURE 4

It should be noted in passing that the circle that diagrams the class S will also, in effect, diagram the class $\bar{S}$, for just as the interior of the circle represents all members of S, so the exterior of the circle represents all members of $\bar{S}$.

To diagram a standard-form categorical proposition, not one but two circles are required. The skeleton or framework for diagramming any standard-form proposition whose subject and predicate terms are abbreviated by S and P is constructed by drawing two intersecting circles, as in Figure 5.

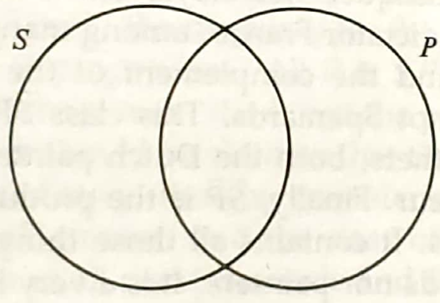


FIGURE 5

This figure diagrams the two classes of S and P, but diagrams no proposition concerning them. It does not affirm that either or both have members, nor does it deny that they have. As a matter of fact, there are more than two classes diagrammed by the two intersecting circles. The part of the circle labeled S that does not overlap the circle labeled P diagrams all S's that are not P's and can be thought of as representing the product of the classes S and $\bar{P}$. We may label it $S\bar{P}$. The overlapping part of the two circles represents the product of the classes S and P and diagrams all things belonging to both of them. It is labeled SP. The part of the circle labeled P that does not overlap the circle labeled S diagrams all P's that are not S's and represents the product of the class $\bar{S}$ and P. It is labeled $\bar{S}P$. Finally, the part of the diagram external to both circles represents all things that are neither in S nor in P; it diagrams the fourth class $\bar{S}\bar{P}$, so labeled. With these labels inserted, Figure 5 becomes Figure 6.

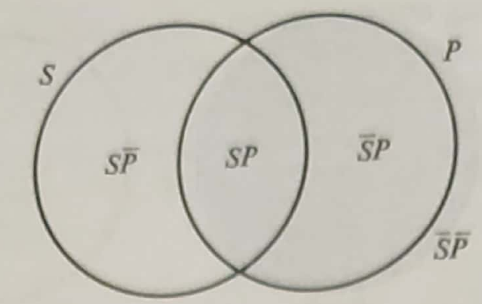
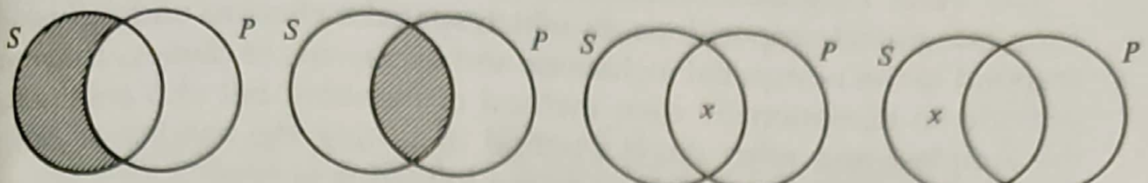


FIGURE 6

This diagram can be interpreted in terms of the various different classes determined by the class of all Spaniards (S) and the class of all painters (P). SP is the product of these two classes, containing all those things and only those things that belong to both of them. Every member of SP must be a member of both S and P; every member must be both a Spaniard and a painter. This product class SP is the class of all Spanish painters, which contains, among others, Velásquez and Goya. $S\bar{P}$ is the product of the first class and the complement of the second, containing all those things and only those things that belong to the class S but not to the class P. It is the class of all Spaniards who are not painters, all Spanish nonpainters, and it will contain neither Velásquez nor Goya, but it will include both the novelist Cervantes and the dictator Franco, among many others. $\bar{S}P$ is the product of the second class and the complement of the first, and is the class of all painters who are not Spaniards. This class $\bar{S}P$ of all non-Spanish painters includes, among others, both the Dutch painter Rembrandt and the French painter Rosa Bonheur. Finally, $\bar{S}\bar{P}$ is the product of the complements of the two original classes. It contains all those things and only those things that are neither Spaniards nor painters. It is a very large class indeed, containing not merely English admirals and Swiss mountain climbers, but such things as the Mississippi River and Mount Everest. All these classes are diagrammed in Figure 6, where the letters S and P are interpreted as in the present paragraph.

By shading or inserting x's in various parts of this picture we can diagram any one of the four standard-form categorical propositions. To diagram the **A** proposition "All S is P," symbolized as $S\bar{P} = 0$, we simply shade out the part of the diagram that represents the class $S\bar{P}$, thus indicating it has no members, or is empty. To diagram the **E** proposition "No S is P," symbolized as $SP = 0$, we shade out that part of the diagram which represents the class SP, to indicate that it is empty. To diagram the **I** proposition "Some S is P," symbolized $SP \neq 0$, we insert an x into that part of the diagram which represents the class SP. This insertion indicates that the class product is not empty but has at least one member. Finally, for the **O** proposition "Some S is not P," symbolized $S\bar{P} \neq 0$, we insert an x into that part of the diagram which represents the class $S\bar{P}$, to indicate that it is not empty but has at least one member. Placed side by side, diagrams for the four standard-form categorical propositions display their different meanings very clearly, as shown in Figure 7.

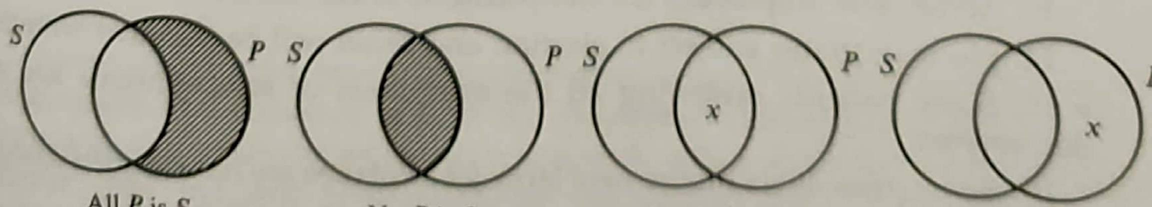


A: All *S* is *P*. $S\bar{P} = 0$ *E*: No *S* is *P*. $SP = 0$ *I*: Some *S* is *P*. $SP \neq 0$ *O*: Some *S* is not *P*. $S\bar{P} \neq 0$

FIGURE 7

One aspect of these Venn Diagrams [named for the English mathematician and logician John Venn (1834–1923), who introduced them] must be emphasized. The bare two-circle diagram, labeled but not otherwise marked, represents classes but diagrams no proposition. That a space is left blank signifies nothing—neither that there are nor that there are not members of the class represented by that space. Propositions are diagrammed only by those diagrams in which a part has been shaded out or in which an *x* has been inserted.

We have constructed diagrammatic representations for "No *S* is *P*" and "Some *S* is *P*," and since these are logically equivalent to their converses "No *P* is *S*" and "Some *P* is *S*," the diagrams for the latter have already been shown. To diagram the ***A*** proposition "All *P* is *S*," symbolized as $P\bar{S} = 0$, within the same framework we must shade out the part of the diagram which represents the class $P\bar{S}$. It should be obvious that the class $P\bar{S}$ is the same as the class $\bar{S}P$, if not immediately, then by considering that every object that belongs to the class of all painters and the class of all non-Spaniards must (also) belong to the class of all non-Spaniards and the class of all painters—all painting non-Spaniards are non-Spanish painters, and vice versa. And to diagram the ***O*** proposition "Some *P* is not *S*," symbolized by $P\bar{S} \neq 0$, we insert an *x* into the part of the diagram which represents the class $P\bar{S}$ ($= \bar{S}P$). Diagrams for these propositions then appear as shown in Figure 8.



All *P* is *S*. $P\bar{S} = 0$ No *P* is *S*. $PS = 0$ Some *P* is *S*. $PS \neq 0$. Some *P* is not *S*. $P\bar{S} \neq 0$

FIGURE 8

This further adequacy of the two-circle diagrams is mentioned because in the following chapter it will be important to be able to use a given pair of overlapping circles with given labels, say, *S* and *M*, to diagram any standard-form categorical proposition containing S and M as its terms, regardless of the order in which they occur in it.

The Venn Diagrams constitute an *iconic* representation of the standard-form categorical propositions, in which spatial inclusions and exclusions correspond to the nonspatial inclusions and exclusions of classes. They not only provide an exceptionally clear method of notation, but also are the basis of the simplest and most direct method of testing the validity of categorical syllogisms, as will be explained in the following chapter.

EXERCISES

Express each of the following propositions as equations or inequalities, representing each class by the first letter of the English term designating it and symbolize them by means of Venn Diagrams.

★ 1. Some sculptors are painters.

2. No peddlers are millionaires.

3. All merchants are speculators.

4. Some musicians are not pianists.

★ 5. No shopkeepers are members.

6. Some political leaders of high reputation are scoundrels.

7. All physicians licensed to practice in this state are medical college graduates who have passed special qualifying examinations.

8. Some stockbrokers who advise their customers about making investments are not partners in companies whose securities they recommend.

9. All puritans who reject all useless pleasure are strangers to much that makes life worth living.

★ 10. No modern paintings are photographic likenesses of their objects.

11. Some student activists are middle-aged men and women striving to recapture their lost youth.

12. All medieval scholars were pious monks living in monasteries.

13. Some state employees are not public-spirited citizens.

14. No magistrates subject to election and recall will be punitive tyrants.

★ 15. Some patients exhibiting all the symptoms of schizophrenia are manic-depressives.

16. Some passengers on the new large jet airplanes are not satisfied customers.

17. Some priests are militant advocates of radical social change.

18. Some stalwart defenders of the existing order are not members of political parties.

19. No pipelines laid across foreign territories are safe investments.

20. All pornographic films are menaces to civilization and decency.

10. All useful things are objects no more than six feet long, since all difficult things to store are useless things, and no objects over six feet long are easy things to store.

7.2 *Translating Categorical Propositions into Standard Form*

The somewhat stilted **A, E, I,** and **O** forms are not the only ones in which categorical propositions may be expressed. Many syllogistic arguments contain nonstandard-form propositions. To reduce these arguments to standard form requires that their constituent propositions be translated into standard form. But ordinary language is too rich and multiform to permit a complete set of rules for such translation. In every case the crucial element is the ability to understand the given nonstandard-form proposition. We can, however, note a number of conventional techniques that are often useful. These must be regarded as guides rather than as rules, of course. Nine methods of dealing with various nonstandard-form propositions will be described in the present section.

(1) We ought first to mention singular propositions, such as "Socrates is a philosopher" and "This table is not an antique." These do not affirm or deny the inclusion of one class in another but, rather, affirm or deny that a specified individual or object belongs to a class. A singular proposition, however, can be interpreted as a proposition dealing with classes and their interrelations in the following way. To every individual object there corresponds a unique *unit class* (one-membered class) whose only member is that object itself. Then to assert that an object *s* belongs to a class *P* is logically equivalent to asserting that the unit class *S* containing just that object *s* is wholly included in the class *P*. And to assert that an object *s* does *not* belong to a class *P* is logically equivalent to asserting that the unit class *S* containing just that object *s* is wholly excluded from the class *P*. It is customary to make this interpretation automatically without any notational adjustment. Thus it is customary to take any affirmative singular proposition of the form "*s* is *P*" as if it were already expressed as the logically equivalent *A* proposition "All *S* is *P*," and similarly understand any negative singular proposition "*s* is not *P*" as an alternative formulation of the logically equivalent *E* proposition "No *S* is *P*"—in each case understanding "*S*" to designate the unit class whose only member is the object *s*. Thus no explicit translations have been provided for singular propositions; they have usually been classified as *A* and *E* propositions as they stand. As Kant remarked, "Logicians are justified in saying that, in the employment of judgments in syllogisms, singular judgments can be treated like those that are universal."[1]

[1]Immanuel Kant's *Critique of Pure Reason*, trans. N. K. Smith, p. 107. But compare Bertrand Russell's *My Philosophical Development*, p. 66.

The situation, however, is not quite so simple. If singular propositions are treated mechanically as *A* and *E* propositions in syllogistic arguments, and those arguments have their validity checked by Venn Diagrams or the Rules of the preceding chapter, serious difficulties arise.

In some cases obviously valid two-premiss arguments containing singular propositions translate into valid categorical syllogisms, as when

All *H* is *M*.	goes into the obviously valid	All *H* is *M*.
s is an *H*.	***AAA*–1** categorical syllogism	All *S* is *H*.
∴ *s* is an *M*.		∴ All *S* is *M*.

But in other cases obviously valid two-premiss arguments containing singular propositions translate into categorical syllogisms that are *invalid*, as when

s is *M*.	goes into the invalid	All *S* is *M*.
s is *H*.	***AAI*–3** categorical syllogism	All *S* is *H*.
∴ Some *H* is *M*.		∴ Some *H* is *M*.

which violates Rule 6 and commits the Existential Fallacy.

On the other hand, if we translate singular propositions into particular propositions, there is the same kind of difficulty. In some cases obviously valid two-premiss arguments containing singular propositions translate into valid categorical syllogisms, as when

All *H* is *M*.	goes into the obviously valid	All *H* is *M*.
s is an *H*.	***AII*–1** categorical syllogism	Some *S* is *H*.
∴ *s* is an *M*.		∴ Some *S* is *M*.

But in other cases obviously valid two-premiss arguments containing singular propositions translate into categorical syllogisms that are *invalid*, as when

s is *M*.	goes into the invalid	Some *S* is *M*.
s is *H*.	***III*–3** categorical syllogism	Some *S* is *H*.
∴ Some *H* is *M*.		∴ Some *H* is *M*.

which violates Rule 2 and commits the Fallacy of the Undistributed Middle.

The difficulty arises from the fact that a singular proposition contains more information than is contained in any single one of the four standard-form categorical propositions. If "*s* is *P*" is construed as "All *S* is *P*," then what is lost is the existential import of the singular proposition, the fact that *S* is not empty. But if "*s* is *P*" is construed as "Some *S* is *P*," then what is lost is the universal aspect of the singular proposition, which distributes its subject term, the fact that *all S* is *P*.

The solution to the difficulty is to construe singular propositions as conjunctions of standard-form categorical propositions. An affirmative singular proposition is equivalent to the conjunction of the related **A** and **I** categorical propositions. Thus "*s* is *P*" is equivalent to "All *S* is *P*" *and* "Some *S* is *P*."

A negative singular proposition is equivalent to the conjunction of the related **E** and **O** categorical propositions. Thus "*s* is not *P*" is equivalent to "No *S* is *P*" *and* "Some *S* is not *P*." Venn Diagrams for affirmative and negative singular propositions are shown in Figure 18.

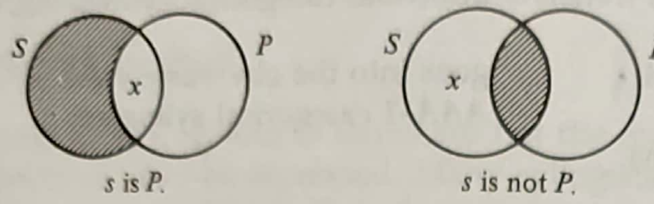


FIGURE 18

And in applying the Syllogistic Rules to evaluate a syllogistic argument containing singular propositions, we must take account of *all* the information contained in those singular propositions, both distribution and existential import.

Provided that we keep in mind the existential import of singular propositions when we invoke the Syllogistic Rules or apply Venn Diagrams to test the validity of syllogistic arguments, it is acceptable practice to regard singular propositions as Universal (*A* or *E*) Propositions.

(2) The first group of categorical propositions that require translation into standard form contains those that have adjectives or adjectival phrases as predicates rather than substantives or class *terms*. For example, "Some flowers are beautiful" and "No warships are available for active duty" deviate from standard form only in that their predicates "beautiful" and "available for active duty" designate attributes rather than classes. But every attribute *determines* a class, the class of things having that attribute; so to every such proposition corresponds a logically equivalent proposition that is in standard form. To the two examples cited correspond the *I* and *E* propositions "Some flowers are beauties" and "No warships are things available for active duty." Where a categorical proposition is in standard form except that it has an adjectival predicate instead of a predicate term, the translation into standard form is made by replacing the adjectival predicate with a term designating the class of all objects of which the adjective may truly be predicated.

(3) Next we turn to categorical propositions whose main verbs are other than the standard-form copula "to be." Examples of this type are "All people desire recognition" and "Some people drink." The usual method of translating such a statement into standard form is to regard all of it except the subject term and quantifier as naming a class-defining characteristic and replace it by a standard copula and a term designating the class determined by that class-defining characteristic. Thus the two examples cited translate into the standard-form categorical propositions "All people are desirers of recognition" and "Some people are drinkers."

(4) Another type of statement easily put into standard form is that in which the standard-form ingredients are all present but not arranged in standard-form order. Two examples of this kind are "Racehorses are all thoroughbreds" and "All is well that ends well." In such cases we first decide which is the subject term and then rearrange the words to express a standard-form categorical proposition. It is clear that the preceding two statements translate into the *A* propositions "All racehorses are thoroughbreds" and "All things that end well are things that are well."

(5) Many categorical propositions have their quantities indicated by words other than the standard-form quantifiers "all," "no," and "some." Statements involving the words "every" and "any" are very easily translated. The propositions "Every dog has his day" and "Any contribution will be appreciated" reduce to "All dogs are creatures that have their days" and "All contributions are things that are appreciated." Similar to "every" and "any" are "everything" and "anything." Paralleling these, but clearly restricted to classes of persons, are "everyone," "anyone," "whoever," "whoso," "who," "one who," and the like. These should occasion no difficulty. The grammatical particles "a," "an," and "the" can also serve to indicate quantity. The first two sometimes mean "all" and in other contexts mean "some." Thus "A bat is a mammal" and "An elephant is a pachyderm" are reasonably interpreted as meaning "All bats are mammals" and "All elephants are pachyderms." But "A bat flew in the window" and "An elephant escaped" quite clearly do not refer to all bats or all elephants, but are properly reduced to "Some bats are creatures that flew in the window" and "Some elephants are creatures that escaped." The word "the" may be used to refer either to a particular individual or to all the members of a class. But there is little or no danger of ambiguity here, for such a statement as "The whale is a mammal" translates in almost any context into the *A* proposition "All whales are mammals," whereas the singular proposition "The first president was a military hero" is already in standard form as an *A* proposition (with existential import) as discussed in the first part of this section.

On the other hand, although affirmative statements beginning with "Every" and "Any" are translated into "All *S* is *P*," negative statements beginning with "Not every" and "Not any" are quite different. "Not every *S* is *P*" means that *some* S *is not* P, whereas "Not any *S* is *P*" means that *no* S *is* P.

(6) Categorical propositions involving the words "only" or "none but" are often called "exclusive" propositions, because in general they assert that the predicate applies exclusively to the subject named. Examples of such usages are "Only citizens can vote" and "None but the brave deserve the fair." The first translates into the standard-form categorical proposition "All those who can vote are citizens," and the second into the standard-form categorical proposition "All those who deserve the fair are those who are brave." So-called exclusive propositions, beginning with "only" or "none but," translate