Syllogisms in Ordinary Language

7.1 Syllogistic Arguments
7.2 Reducing the Number of Terms to Three
7.3 Translating Categorical Propositions into Standard Form
7.4 Uniform Translation
7.5 Enthymemes
7.6 Sorites
7.7 Disjunctive and Hypothetical Syllogisms
7.8 The Dilemma

7.1 Syllogistic Arguments

In ordinary discourse the arguments we encounter rarely appear as neatly packaged, standard-form categorical syllogisms. So the syllogistic arguments that arise in everyday speech cannot always be readily tested. They can be tested, however, if we put them into standard form—and we can generally do that by reformulating their constituent propositions. The term *syllogistic argument* refers to any argument that either is a standard-form categorical syllogism or that can be reformulated as a standard-form categorical syllogism without any loss or change of meaning.

We want to test the validity of syllogistic arguments. If they are fallacious or misleading, that will be most easily detected, as Immanuel Kant pointed out, when they are set out in correct syllogistic form. The process of reformulation is therefore important because the effective tests discussed in Chapter 6—Venn diagrams and the rules for categorical syllogisms—cannot be applied directly until the syllogism is in standard form. Putting it into standard form is called *reduction (or translation) to standard form*. When we reformulate (or reduce) a loosely put argument that appears in ordinary language into a classical syllogism, the resulting argument is called a *standard-form translation* of the original argument. Effecting this reformulation can present some difficulties.
We already know the tests for validity (Venn diagrams and the rules for syllogisms). What we need, to evaluate syllogistic arguments using these tests, are techniques for translating syllogistic arguments from their loose forms into standard form. With these techniques in hand, we can first translate the argument into standard form, and then test that argument using the Venn diagram method or the syllogistic rules.

To describe the various techniques for reduction to standard form, we begin by noting the kinds of problems that create the need for them—that is, by noting different ways in which a syllogistic argument in ordinary language may deviate from a standard-form categorical argument. Understanding those deviations, we can proceed to counteract them.

First deviation. The premises and conclusion of an argument in ordinary language may appear in an order that is not the order of the standard-form syllogism. This difficulty is easily remedied by reordering the premises: The major premise is put first, the minor premise second, and the conclusion third. (Recall that the major premise is the premise that contains the term that is the predicate term of the conclusion, whereas the minor premise contains the term that is the subject term of the conclusion.)

Second deviation. A standard-form categorical syllogism always has exactly three terms. The premises of an argument in ordinary language may appear to involve more than three terms—but that appearance may be deceptive. If the number of terms can be reduced to three without loss of meaning, the reduction to standard form may be successful.

Third deviation. The component propositions of the syllogistic argument in ordinary language may not all be standard-form propositions. This deviation is very common, but if the components can be converted into standard-form propositions without loss of meaning, the reduction to standard form may be successful.

To cope with the second and third of these deviant patterns, there are known techniques, which we now explain.

### 7.2 Reducing the Number of Terms to Three

A valid syllogism must have exactly three terms. If more than three terms seem to be involved in an argument of apparently syllogistic form, it may be possible to translate the argument into a standard-form categorical syllogism that is equivalent to it but that contains only three terms and is perfectly valid. How can that be done?

One way is by eliminating synonyms. A synonym of one of the terms in the syllogism is not really a fourth term, but only another way of referring to one of the three classes involved. So we begin by eliminating synonyms, if any
appear. For example, the following syllogistic argument appears to contain six terms:

- No wealthy persons are vagrants.
- All lawyers are rich people.
- Therefore no attorneys are tramps.

However, “wealthy” and “rich” are synonyms, as are “lawyer” and “attorney,” and also “vagrant” and “tramp.” If the synonyms are eliminated, the argument becomes

- No wealthy persons are vagrants.
- All lawyers are wealthy persons.
- Therefore no lawyers are vagrants.

This argument in standard form, EAE–1 (Celarent), is plainly valid.

A second way to reduce the number of terms to three is by eliminating class complements, a concept explained in Section 5.6. We illustrate this using the following syllogistic argument, whose propositions are standard-form categorical propositions:

- All mammals are warm-blooded animals.
- No lizards are warm-blooded animals.
- Therefore all lizards are nonmammals.

On the surface, this argument appears to be invalid, because it seems to have four terms—and it also draws an affirmative conclusion from a negative premise, which breaks one of the rules of the syllogism.

This argument, however, is in fact perfectly valid when it is translated into standard form. We can reduce the number of terms to three, because two of the terms in it (“mammals” and “nonmammals”) are complements of one another. So, by obverting the conclusion (to obvert a proposition, we change its quality and replace the predicate term by its complement), we get “No lizards are mammals.” Using this valid immediate inference, we derive the following standard-form translation of the original argument:

- All mammals are warm-blooded animals.
- No lizards are warm-blooded animals.
- Therefore no lizards are mammals.

which is logically equivalent to the original because it has identically the same premises and a logically equivalent conclusion. This standard-form translation conforms to all the syllogistic rules and thus is known to be valid. Its form is AEE–2 (Camestres).
There may be more than one translation of a syllogistic argument into standard form, but if any one of those translations yields a valid syllogism, all the others must be valid as well. Thus, for example, the preceding illustrative argument can also be reduced to standard form in a different (but logically equivalent) way. This time we leave the conclusion unchanged and work with the premises. We take the contrapositive of the first premise, and we obvert the second premise. We then get:

- All non(warm-blooded animals) are nonmammals.
- All lizards are non(warm-blooded animals).
- Therefore all lizards are nonmammals.

This is also a valid translation; its form is **AAA–1 (Barbara)**, and it conforms to all the rules of the syllogism.

Any syllogistic argument that appears to contain four terms can be reduced to standard form (that is, can be translated into a logically equivalent standard-form categorical syllogism) if one of its terms is the complement of one of the other three. Likewise, reduction from an argument with five terms is possible if two of its terms are complements of other terms in the argument; and even arguments with as many as six terms may be reduced to standard form if three of those terms are complements of other terms in the argument. The key to such reductions is to use the valid immediate inferences discussed in Chapter 5: conversion, obversion, and contraposition.

More than one immediate inference may be needed to reduce the argument to standard form. Consider this example:

- No nonresidents are citizens.
- All noncitizens are nonvoters.
- Therefore all voters are residents.

The argument has six terms, but it is in fact valid, and that can be shown by reducing it to standard form, which can be done in more than one way. Perhaps the most natural reduction is to convert and then obvert the first premise. This yields “All citizens are residents.” Then take the contrapositive of the second premise, which yields “All voters are citizens.” The argument is then in standard form:

- All citizens are residents.
- All voters are citizens.
- Therefore all voters are residents.

The middle term (“citizens”) is the subject term of the major premise and the predicate term of the minor premise, so the syllogism is in the first figure. Its
three propositions are universal affirmatives. This is a syllogism in *Barbara*, AAA–1, and it is plainly valid.

**EXERCISES**

Translate the following syllogistic arguments into standard form, and test their validity by using either Venn diagrams or the syllogistic rules set forth in Chapter 6.

**EXAMPLE**

1. Some preachers are persons of unfailing vigor. No preachers are non-intellectuals. Therefore some intellectuals are persons of unfailing vigor.

**SOLUTION**

This argument may be translated into: Some preachers are persons of unfailing vigor. (Some *P* is *V*.) All preachers are intellectuals. (By obversion: All *P* is *I*.) Therefore some intellectuals are persons of unfailing vigor. (Some *I* is *V*.) Shown on a Venn diagram, this syllogism is seen to be valid:

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I   V

      X

P
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2. Some metals are rare and costly substances, but no welder’s materials are nonmetals; hence some welder’s materials are rare and costly substances.

3. Some Asian nations were nonbelligerents, because all belligerents were allies either of Germany or Britain, and some Asian nations were not allies of either Germany or Britain.

4. Some nondrinkers are athletes, because no drinkers are persons in perfect physical condition, and some people in perfect physical condition are not nonathletes.

*5. All things inflammable are unsafe things, so all things that are safe are nonexplosives, because all explosives are flammable things.
6. All worldly goods are changeable things, for no worldly goods are things immaterial, and no material things are unchangeable things.

7. All those who are neither members nor guests of members are those who are excluded; therefore no nonconformists are either members or guests of members, for all those who are included are conformists.

8. All mortals are imperfect beings, and no humans are immortals, whence it follows that all perfect beings are nonhumans.

9. All things present are nonirritants; therefore no irritants are invisible objects, because all visible objects are absent things.

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

7.3 Translating Categorical Propositions into Standard Form

We noted in Section 7.1 that syllogistic arguments in ordinary language may deviate from standard-form categorical syllogisms not only because they may appear to contain more than three terms (as discussed in Section 7.2), but also because the component propositions of the syllogism in ordinary language may not all be standard-form propositions. A, E, I, and O propositions are clearly somewhat stilted, and many syllogistic arguments in everyday life contain non-standard-form propositions. To reduce these arguments to standard form requires that their constituent propositions be translated into standard form.

It would be very convenient if there were some neat list of rules that we could use to effect such translations. Unfortunately, ordinary language is too rich and too multiform to permit the compilation of such a set of rules. Different sorts of transformation are called for in different settings, and to know what is called for we must, in every case, understand fully the given non-standard-form proposition that needs to be reformulated. If we understand the proposition, we can reformulate it without losing or changing its meaning.

Although no complete set of rules can be given, we can describe a number of well-tested methods for translating nonstandard propositions of different sorts. These methods—we will present nine of them in this section—must be regarded as guides rather than rules; they are techniques with which nonstandard-form propositions of certain describable kinds can be reformulated into standard-form propositions that may serve as constituents of syllogistic arguments.
I. **Singular Propositions.** Some propositions affirm or deny that a specific individual or object belongs to a given class—for example, “Socrates is a philosopher,” and “This table is not an antique.” These are called **singular propositions**. Such propositions do not affirm or deny the inclusion of one class in another (as standard-form propositions do), but we can nevertheless interpret a singular proposition as a proposition dealing with classes and their interrelations. We do this 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 we 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 are provided for singular propositions; traditionally they have 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.”

The situation, however, is not quite so simple. Bear in mind that particular propositions have existential import, but universal propositions do not. Using this Boolean interpretation (for reasons explained in Section 5.7), we find that if singular propositions are treated mechanically as **A** and **E** propositions in syllogistic arguments, and we check the validity of those arguments using Venn diagrams or the rules set forth in Chapter 6, serious difficulties arise.

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

\[
\begin{align*}
\text{All } H \text{ is } M. & \quad \text{goes into the obviously valid } \\
\text{s is an } H. & \quad \text{AAA–1 categorical syllogism in } \text{Barbara } \\
\therefore \text{All } S \text{ is } M. & \quad \therefore \text{All } S \text{ is } M.
\end{align*}
\]
In other cases, however, obviously valid two-premise arguments containing singular propositions translate into categorical syllogisms that are invalid, such as when

\[
\begin{align*}
&\text{s is } M. \quad \text{goes into the invalid} \quad \text{All } S \text{ is } M. \\
&\text{s is } H. \quad \text{AAI-3 categorical syllogism} \quad \text{All } S \text{ is } H. \\
\therefore & \text{Some } H \text{ is } M. \quad \therefore \text{All } H \text{ is } M.
\end{align*}
\]

which commits the existential fallacy, violating Rule 6.

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-premise arguments containing singular propositions translate into valid categorical syllogisms, such as when

\[
\begin{align*}
&\text{All } H \text{ is } M. \quad \text{goes into the obviously valid} \quad \text{All } H \text{ is } M. \\
&\text{s is an } H. \quad \text{All-1 categorical syllogism in } \text{Darii} \quad \text{Some } S \text{ is } H. \\
\therefore & \text{s is an } M. \quad \therefore \text{Some } S \text{ is } M.
\end{align*}
\]

In other cases, however, obviously valid two-premise arguments containing singular propositions translate into categorical syllogisms that are invalid, such as when

\[
\begin{align*}
&\text{s is } M. \quad \text{goes into the invalid} \quad \text{Some } S \text{ is } M. \\
&\text{s is } H. \quad \text{III-3 categorical syllogism} \quad \text{Some } S \text{ is } H. \\
\therefore & \text{Some } H \text{ is } M. \quad \therefore \text{Some } H \text{ is } M.
\end{align*}
\]

which commits the fallacy of the undistributed middle, violating Rule 2.

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 dia-
grams for affirmative and negative singular propositions are shown in Figure 7-1.

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.

If 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.

II. Categorical Propositions 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” are categorical propositions, and yet they must be translated into standard-form categorical propositions; they deviate from standard form only in that their predicates, “beautiful” and “available for active duty,” designate attributes rather than classes. However, every attribute determines a class, the class of things having that attribute, so every such proposition corresponds to a logically equivalent proposition that is in standard form. The two examples cited correspond to the I and E propositions “Some flowers are beauties” and “No warships are things available for active duty.” When 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.

III. Categorical Propositions Whose Main Verbs Are Other than the Standard-Form Copula “To Be.” Examples of this very common type are “All people seek recognition” and “Some people drink Greek wine.” The usual method of translating such a statement into standard form is to regard all of it, except the subject term and the quantifier, as naming a
class-defining characteristic. Those words can then be replaced by a term designating the class determined by that class-defining characteristic and may be linked to the subject with a standard copula. Thus the two examples given translate into the standard-form categorical propositions, “All people are seekers of recognition” and “Some people are Greek-wine drinkers.”

IV. Statements in Which the Standard-Form Ingredients Are All Present But Not Arranged in Standard-Form Order. Two examples 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. Such translations are usually quite straightforward. It is clear that the two preceding statements translate into the \( A \) propositions “All racehorses are thoroughbreds” and “All things that end well are things that are well.”

V. Categorical Propositions Whose Quantities Are Indicated by Words Other than the Standard-Form Quantifiers “All,” “No,” and “Some.” Statements beginning with the words “every” and “any” are easily translated. The propositions “Every dog has its 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,” “whosoever,” “who,” “one who,” and the like. These should present no difficulty.

The grammatical particles “a” and “an” may also serve to indicate quantity, but whether they are being used to mean “all” or “some” depends largely on the context. 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; they are properly reduced to “Some bats are creatures that flew in the window” and “Some elephants are creatures that escaped.”

The particle “the” may be used to refer either to a particular individual or to all the members of a class. There is little 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 (a singular proposition having existential import) as discussed in the first subparagraph of this section.
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. Their translations are much less obvious and require great care. Thus, for example, “Not every $S$ is $P$” means that some $S$ is not $P$, whereas “Not any $S$ is $P$” means that no $S$ is $P$.

VI. Exclusive Propositions. 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.” Propositions beginning with “only” or “none but” usually translate into *A* propositions using this general rule: Reverse the subject and the predicate, and replace the “only” with “all.” Thus “Only $S$ is $P$” and “None but $S$’s are $P$’s” are usually understood to express “All $P$ is $S$.”

There are some contexts in which “only” and “none but” are used to convey some further meaning. “Only $S$ is $P$” or “None but $S$’s are $P$’s” may suggest either that “All $S$ is $P$” or that “Some $S$ is $P$.” This is not always the case, however. Where context helps to determine meaning, attention must be paid to it, of course. But in the absence of such additional information, the translations first suggested are adequate.

VII. Categorical Propositions That Contain No Words to Indicate Quantity. Two examples are “Dogs are carnivorous” and “Children are present.” Where there is no quantifier, what the sentence is intended to express may be doubtful. We may be able to determine its meaning only by examining the context in which it occurs, and that examination usually will clear up our doubts. In the first example it is very probable that “Dogs are carnivorous” refers to all dogs, and is to be translated as “All dogs are carnivores.” In the second example, on the other hand, it is plain that only some children are referred to, and thus the standard-form translation of “Children are present” is “Some children are beings who are present.”

VIII. Propositions That Do Not Resemble Standard-Form Categorical Propositions But Can Be Translated Into Standard Form. Some examples are “Not all children believe in Santa Claus,” “There are white elephants,” “There are no pink elephants,” and “Nothing is both round and square.” On reflection, these propositions will be seen to be logically equivalent to, and therefore to translate into, the following standard-form propositions: “Some children are not believers in Santa Claus,”
"Some elephants are white things," "No elephants are pink things," and "No round objects are square objects."

IX. Exceptive Propositions. Some examples of exceptive propositions are "All except employees are eligible," "All but employees are eligible," and "Employees alone are not eligible." Translating exceptive propositions into standard form is somewhat complicated, because propositions of this kind (much like singular propositions) make two assertions rather than one. Each of the logically equivalent examples just given asserts not merely that all nonemployees are eligible but also (in the usual context) that no employees are eligible. Where "employees" is abbreviated to S and "eligible persons" to P, these two propositions can be written as "All non-S is P" and "No S is P." These are clearly independent and together assert that S and P are complementary classes.

Each of these exceptive propositions is compound and therefore cannot be translated into a single standard-form categorical proposition. Rather, each must be translated into an explicit conjunction of two standard-form categoricals. Thus the three illustrative propositions about eligibility translate identically into "All nonemployees are eligible persons, and no employees are eligible persons."

It should be noted that some arguments depend for their validity on numerical or quasi-numerical information that cannot be put into standard form. Such arguments may have constituent propositions that mention quantity more specifically than standard-form propositions do, usually by the use of quantifiers such as "one," "two," "three," "many," "a few," "most," and so on. When such specific quantitative information is critical to the validity of the argument in which it is mentioned, the argument itself is asyllogistic and therefore requires a more complicated analysis than that provided by the simple theory of the categorical syllogism. Yet some quasi-numerical quantifiers occur in arguments that do lend themselves to syllogistic analysis. These include "almost all," "not quite all," "all but a few," and "almost everyone." Propositions in which these phrases appear as quantifiers may be treated like the explicitly exceptive propositions just described. Thus the following exceptive propositions with quasi-numerical quantifiers are also compound: "Almost all students were at the dance," "Not quite all students were at the dance," "All but a few students were at the dance," and "Only some students were at the dance." Each of these affirms that some students were at the dance and denies that all students were at the dance. The quasi-numerical information they present is irrelevant from the point of view of syllogistic
inference, and all are translated as “Some students are persons who were at the dance, and some students are not persons who were at the dance.”

Because exceptive propositions are not categorical propositions but conjunctions, arguments containing them are not syllogistic arguments as we are using that term. But they may nevertheless be susceptible to syllogistic analysis and appraisal. How an argument containing an exceptive proposition should be tested depends on the exceptive proposition’s position in the argument. If it is a premise, then the argument may have to be given two separate tests. For example, consider the argument:

Everyone who saw the game was at the dance.

Not quite all the students were at the dance.

So some students didn’t see the game.

Its first premise and its conclusion are categorical propositions, which are easily translated into standard form. Its second premise, however, is an exceptive proposition, not simple but compound. To discover whether its premises imply its conclusion, first test the syllogism composed of the first premise of the given argument, the first half of its second premise, and its conclusion. In standard form, we have

All persons who saw the game are persons who were at the dance.

Some students are persons who were at the dance.

Therefore some students are not persons who saw the game.

The standard-form categorical syllogism is of form *AIO–2* and commits the fallacy of the undistributed middle, violating Rule 2. However, the original argument is not yet proved to be invalid, because the syllogism just tested contains only part of the premises of the original argument. We now have to test the categorical syllogism composed of the first premise and the conclusion of the original argument together with the second half of the second premise. In standard form we then get a very different argument:

All persons who saw the game are persons who were at the dance.

Some students are not persons who were at the dance.

Therefore some students are not persons who saw the game.

This is a standard-form categorical syllogism in *Baroko, AOO–2*, and it is easily shown to be valid. Hence the original argument is valid, because the conclusion is the same, and the premises of the original argument include the premises of this valid standard-form syllogism. Thus, to test the validity of an argument, one of whose premises is an exceptive proposition, may require testing two different standard-form categorical syllogisms.
If the premises of an argument are both categorical propositions, and its conclusion is exceptive, then we know it to be invalid, for although the two categorical premises may imply one or the other half of the compound conclusion, they cannot imply them both. Finally, if an argument contains exceptive propositions as both premises and conclusion, all possible syllogisms constructable out of the original argument may have to be tested to determine its validity. Enough has been explained to enable the student to cope with such situations.

It is important to acquire facility in translating the many varieties of non-standard-form propositions into standard form, because the tests of validity that we have developed—Venn diagrams and the syllogistic rules—can be applied directly only to standard-form categorical syllogisms.

**EXERCISES**

Translate the following into standard-form categorical propositions.

**EXAMPLE**

1. Roses are fragrant.

**SOLUTION**

Standard-form translation: All roses are fragrant things.

2. Orchids are not fragrant.

3. Many a person has lived to regret a misspent youth.

4. Not everyone worth meeting is worth having as a friend.

5. If it’s a Junko, it’s the best that money can buy.

6. If it isn’t a real beer, it isn’t a Bud.

7. Nothing is both safe and exciting.

8. Only brave people have ever won the Congressional Medal of Honor.

9. Good counselors are not universally appreciated.

10. He sees not his shadow who faces the sun.

11. To hear her sing is an inspiration.

12. He who takes the sword shall perish by the sword.

13. Only members can use the front door.


15. The Young Turks support no candidate of the Old Guard.
16. All styles are good, except the tiresome.
17. They also serve who only stand and wait.
18. Happy indeed is she who knows her own limitations.
19. A thing of beauty is a joy forever.
20. He prayeth well who loveth well.
21. All that glitters is not gold.
22. None think the great unhappy but the great.
23. He jests at scars that never felt a wound.
24. Whosoever a man soweth, that shall he also reap.

*25. A soft answer turneth away wrath.

### 7.4 Uniform Translation

For a syllogistic argument to be testable, it must be expressed in propositions that together contain exactly three terms. Sometimes this aim is difficult to accomplish and requires a more subtle approach than those suggested in the preceding sections. Consider the proposition, “The poor always you have with you.” It clearly does not assert that all the poor are with you, or even that some (particular) poor are always with you. There are alternative methods of reducing this proposition to standard form, but one perfectly natural route is by way of the key word “always.” This word means “at all times” and suggests the standard-form categorical proposition, “All times are times when you have the poor with you.” The word “times,” which appears in both the subject and the predicate terms, may be regarded as a parameter, an auxiliary symbol that is helpful in expressing the original assertion in standard form.

Care should be taken not to introduce and use parameters in a mechanical, unthinking fashion. One must be guided always by an understanding of the proposition to be translated. Thus the proposition, “Smith always wins at billiards,” pretty clearly does not assert that Smith is incessantly, at all times, winning at billiards! It is more reasonable to interpret it as meaning that Smith wins at billiards whenever he plays. And so understood, it translates directly into “All times when Smith plays billiards are times when Smith wins at billiards.”

Not all parameters need be temporal. To translate some propositions into standard form, the words “places” and “cases” can be introduced as parameters. Thus “Where there is no vision the people perish” and “Jones loses a sale whenever he is late” translate into “All places where there is no vision are places where the people perish” and “All cases in which Jones is late are cases in which Jones loses a sale.”
The introduction of parameters often is requisite for the uniform translation of all three constituent propositions of a syllogistic argument into standard form. Because a categorical syllogism contains exactly three terms, to test a syllogistic argument we must translate its constituent propositions into standard-form categorical propositions that contain just three terms. The elimination of synonyms and the applications of conversion, obversion, and contraposition have already been discussed in Section 7.2. However, for many syllogistic arguments, the number of terms cannot be reduced to three either by eliminating synonyms or by applying conversion, obversion, or contraposition. Here uniform translation requires the introduction of a parameter—the same parameter—into all three of the constituent propositions. Consider the following argument:

Soiled paper plates are scattered only where careless people have picnicked.

There are soiled paper plates scattered about here.

Therefore careless people must have been picnicking here.

This argument is perfectly valid, but before it can be proved valid by our diagrams or rules, its premises and conclusion must be translated into standard-form categorical propositions involving only three terms. The second premise and the conclusion may be translated most naturally into “Some soiled paper plates are things that are scattered about here” and “Some careless people are those who have been picnicking here,” but these two statements contain four different terms. To reduce the argument to standard form, we begin with the first premise, which requires a parameter for its standard-form expression, and then we use the same parameter in translating the second premise and the conclusion into standard form. The word “where” in the first premise suggests that the parameter “places” can be used. If this parameter is used to obtain uniform standard-form translations of all three propositions, the argument translates into:

All places where soiled paper plates are scattered are places where careless people have picnicked.

This place is a place where soiled paper plates are scattered.

Therefore this place is a place where careless people have picnicked.

This standard-form categorical syllogism is in Barbara with mood and figure AAA–1 and has already been proved valid.

The notion of standardizing expressions through the use of a parameter is not an altogether easy one to grasp, but some syllogistic arguments cannot be translated into standard-form categorical syllogisms by any other method. Another example may help to make clear the technique involved. Let us take the argument:

The hounds bay wherever a fox has passed, so the fox must have taken another path, because the hounds are quiet.
First, we must understand what is asserted in the given argument. We may take the statement that the hounds are quiet as asserting that the hounds are not baying here and now. This step is part of the necessary process of eliminating synonyms, because the first assertion makes explicit reference to the baying of hounds. And in the same manner we may understand the conclusion that the fox must have taken another path as asserting that the fox did not pass here. The word “wherever” in the first assertion should suggest that the parameter “places” can be used in its translation. The standard-form translation thus arrived at is

All places where a fox has passed are places where the hounds bay.

This place is not a place where the hounds bay.

Therefore this place is not a place where a fox has passed.

This standard-form categorical syllogism is in *Camestres*, with mood and figure AEE–2, and its validity is easy to establish.

**EXERCISES**

A. Translate the following propositions into standard form, using parameters where necessary.

**EXAMPLE**

1. He groans whenever he is reminded of his loss.

**SOLUTION**

Standard-form translation: All times when he is reminded of his loss are times when he groans.

2. She never drives her car to work.
3. He walks where he chooses.
4. He always orders the most expensive item on the menu.
5. She does not give her opinion unless she is asked to do so.
6. She tries to sell life insurance wherever she may happen to be.
7. His face gets red when he gets angry.
8. If he is asked to say a few words, he talks for hours.
9. Error of opinion may be tolerated where reason is left free to combat it.
10. People are never so likely to settle a question rightly as when they discuss it freely.
B. For each of the following arguments:

a. Translate the argument into standard form.

b. Name the mood and figure of its standard-form translation.

c. Test its validity using a Venn diagram. If it is valid, give its traditional name.

d. If it is invalid, name the fallacy it commits.

EXAMPLE

1. Since all knowledge comes from sensory impressions and since there’s no sensory impression of substance itself, it follows logically that there is no knowledge of substance.


SOLUTION

a. Standard-form translation:

   No things derived from sensory impressions are items of knowledge of substance itself.

   All items of knowledge are things derived from sensory impressions.

   Therefore, no items of knowledge are items of knowledge of substance itself.

b. Mood and figure: EAE–1

c. Valid; Celarent

\[
\begin{array}{c}
K \\
S \\
D
\end{array}
\]

2. . . . no names come in contradictory pairs; but all predicables come in contradictory pairs; therefore no name is a predicatable.


3. Barcelona Traction was unable to pay interest on its debts; bankrupt companies are unable to pay interest on their debts; therefore, Barcelona Traction must be bankrupt.

4. Extremism in defense of liberty, or virtue, or whatever is always a vice—because extremism is but another name for fanaticism which is a vice by definition.


5. All syllogisms having two negative premises are invalid. Some valid syllogisms are sound. Therefore some unsound arguments are syllogisms having two negative premises.

6. Not all is gold that glitters, for some base metals glitter, and gold is not a base metal.

7. Where there’s smoke there’s fire, so there’s no fire in the basement, because there’s no smoke there.

8. It seems that mercy cannot be attributed to God. For mercy is a kind of sorrow, as Damascene says. But there is no sorrow in God; and therefore there is no mercy in Him.

—Thomas Aquinas, Summa Theologiae, I, question 21, art. 3

9. . . . because intense heat is nothing else but a particular kind of painful sensation; and pain cannot exist but in a perceiving being; it follows that no intense heat can really exist in an unperceiving corporeal substance.

—George Berkeley, Three Dialogues Between Hylas and Philonous, in Opposition to Sceptics and Atheists, 1713

10. Only those who ignore the facts are likely to be mistaken. No one who is truly objective is likely to be mistaken. Hence no one who ignores the facts is truly objective.

11. All bridge players are people. All people think. Therefore all bridge players think.

—Oswald and James Jacoby, “Jacoby on Bridge,” Syndicated Column, 5 November 1966

12. Whenever I’m in trouble, I pray. And since I’m always in trouble, there is not a day when I don’t pray.

—Isaac Bashevis Singer, interview in The New York Times

13. The after-image is not in physical space. The brain-process is. So the after-image is not a brain-process.

14. It must have rained lately, because the fish are not biting, and fish
never bite after a rain.

*15. . . it is obvious that irrationals are uninteresting to engineers, since
they are concerned only with approximations, and all approximations
are rational.

—G. H. Hardy, *A Mathematician’s Apology*
(Cambridge: Cambridge University Press, 1940)

16. Since to fight against neighbors is an evil, and to fight against the
Thebans is to fight against neighbors, it is clear that to fight against the
Thebans is an evil.

—Aristotle, *Prior Analytics*

17. According to Aristotle, none of the products of Nature are due to
chance. His proof is this: That which is due to chance does not reappear
continuously nor frequently, but all products of Nature reappear either
continuously or at least frequently.


18. Not all who have jobs are temperate in their drinking. Only debtors
drink to excess. So not all the unemployed are in debt.

19. It will be a good game tomorrow, for the conference title is at stake,
and no title contest is ever dull.

*20. Bill didn’t go to work this morning, because he wore a sweater, and he
never wears a sweater to work.

21. Cynthia must have complimented Henry, because he is cheerful
whenever Cynthia compliments him, and he’s cheerful now.

22. There must be a strike at the factory, for there is a picket line there, and
pickets are present only at strikes.

23. Epidemiology is not merely the study of epidemics of infectious dis-
ease; it is the broad examination of the rates and patterns of disease in
the community. By almost any standard drug abuse can be regarded as a
disease; accordingly it can be profitably investigated by the meth-
ods of epidemiology.

—“Science and the Citizen,” *Scientific American*, February 1975

24. Since morals, therefore, have an influence on the actions and affections, it
follows, that they cannot be deriv’d from reason; and that because reason
alone, as we have already prov’d, can never have any such influence.

—David Hume, *A Treatise of Human Nature*, 1739
*25. All valid syllogisms distribute their middle terms in at least one premise, so this syllogism must be valid, for it distributes its middle term in at least one premise.

26. No valid syllogisms have two negative premises. No syllogisms on this page are invalid. Therefore no syllogisms on this page have two negative premises.

27. Good poll numbers raise money. Good press gets you good poll numbers. Good press gets you money.

—an advisor to Elizabeth Dole, during her campaign for the Republican presidential nomination, quoted in *The New York Times*, 15 April 2000

28. There are plants growing here, and since vegetation requires water, water must be present.

29. No one present is out of work. No members are absent. Therefore all members are employed.

*30. The competition is stiff, for there is a great deal of money involved, and there is never easy competition where much money is at stake.

31. There are handsome men, but only man is vile, so it is false that nothing is both vile and handsome.

32. What is simple cannot be separated from itself. The soul is simple; therefore, it cannot be separated from itself.

—Duns Scotus, *Oxford Commentary on the Sentences of Peter Lombard*, 1302

33. Although he complains whenever he is sick, his health is excellent, so he won’t complain.

34. We... define a metaphysical sentence as a sentence which purports to express a genuine proposition, but does, in fact, express neither a tautology nor an empirical hypothesis. And as tautologies and empirical hypotheses form the entire class of significant propositions, we are justified in concluding that all metaphysical assertions are nonsensical.


*35. This syllogism is valid, for all invalid syllogisms commit an illicit process, and this syllogism commits no illicit process.

### 7.5 Enthymemes

Syllogistic arguments occur frequently, but their premises and conclusions are not always stated explicitly. Often only part of the argument is expressed, the rest being “understood.” Thus one may justify the conclusion
that “Jones is a citizen” by mentioning only the one premise, “Jones is a native-born American.” As stated, the argument is incomplete, but the missing premise is easily supplied from knowledge of the Constitution of the United States. If the missing premise were stated, the completed argument would appear as

All native-born Americans are citizens.

Jones is a native-born American.

Therefore Jones is a citizen.

Stated in full, the argument is a categorical syllogism of form AAA–1, Barbara, and is perfectly valid. An argument that is stated incompletely, part being “understood” or only “in the mind,” is called an enthymeme. An incompletely stated argument is characterized as being enthymematic.

In everyday discourse, and even in science, many inferences are expressed enthymematically. The reason is easy to understand. A large body of propositions can be presumed to be common knowledge, and many speakers and writers save themselves trouble by not repeating well-known and perhaps trivially true propositions that their hearers or readers can perfectly well be expected to supply for themselves. Moreover, it is not at all unusual for an argument to be rhetorically more powerful and persuasive when stated enthymematically than when enunciated in complete detail. As Aristotle wrote in his *Rhetoric*, “Speeches that . . . rely on enthymemes excite the louder applause.”

Because an enthymeme is incomplete, its omitted parts must be taken into account when testing its validity. Without the missing premise, the inference is invalid. However, when the unexpressed premise is easily supplied, in all fairness it ought to be included as part of the argument when one is appraising it. In such a case, one assumes that the maker of the argument did have more in mind than was stated explicitly. In most cases there is no difficulty in supplying the tacit premise that the speaker (or writer) intended but did not express. Thus, for example, as he explains the solution to the mystery in “The Adventure of Silver Blaze,” Sherlock Holmes formulates an argument of which one critical premise is left unstated yet is very plainly supposed:

A dog was kept in the stalls, and yet, though someone had been in and fetched out a horse, the dog had not barked. . . . Obviously the visitor was someone whom the dog knew well.

We all understand very well what is tacit here, that the dog would have barked had the visitor been a stranger. In fairness to the author, Arthur Conan Doyle, that premise must be seen as part of Holmes’s argument.
In supplying a suppressed premise, a cardinal principle is that the proposition must be one that speakers can safely presume their hearers to accept as true. Thus it would be foolish to suggest taking the conclusion itself as a suppressed premise, for if the arguer could have expected the auditors to accept that proposition as a premise, without proof, it would have been idle to present it to them as the conclusion of an argument.

Any kind of argument can be expressed enthymematically, but the kinds of enthymemes that have been most extensively studied are incompletely expressed syllogistic arguments. We confine our attention to these in the remainder of this section. Enthymemes traditionally have been divided into different orders, according to which part of the syllogism is left unexpressed. A first-order enthymeme is one in which the syllogism’s major premise is not stated. The preceding example is of the first order. A second-order enthymeme is one in which only the major premise and the conclusion are stated, the minor premise being suppressed. An example of this type is “All students are opposed to the new regulations, so all sophomores are opposed to them.” Here the minor premise is easily supplied, being the obviously true proposition, “All sophomores are students.” A third-order enthymeme is one in which both premises are stated, but the conclusion is left unexpressed. An example of this type is the following:

Our ideas reach no farther than our experience: we have no experience of divine attributes and operations: I need not conclude my syllogism: you can draw the inference yourself. \(^3\)

Two steps are involved in testing an enthymeme for validity: The first is to supply the missing part of the argument, the second is to test the resulting syllogism. Formulating the unstated proposition fairly may require sensitivity to the context and an understanding of the intentions of the speaker. Consider the following argument: “No true Christian is vain, but some churchgoers are vain.” It is the conclusion that remains unstated, so this is plainly a third-order syllogism. What is the intended conclusion? If the speaker intends to imply only that “Some churchgoers are not true Christians,” the argument is valid \((EIO–2, Festino)\). However, if the speaker’s intention is to establish that “Some true Christians are not churchgoers,” the enthymeme is invalid \((IEO–2)\), because in that case the fallacy of illicit process of the major term is committed.

Usually, the context indicates unambiguously what the unstated proposition is. For example, in a U.S. Supreme Court opinion in which federal legislation regulating intrastate violence motivated by gender (the Violence Against Women Act) was held unconstitutional, the critical argument of the majority was expressed thus:

Gender-motivated crimes of violence are not, in any sense of the phrase, economic activity. . . . Thus far in our nation’s history our cases have upheld Commerce Clause regulation of intrastate activity only where that activity is economic in nature. \(^4\)
The proposition that is understood but not stated in this argument is assumedly its conclusion: that gender-motivated crimes of violence may not be regulated by Congress under the long-existing precedent of Supreme Court cases.

To test this third-order enthymeme, we reformulate the argument so that its premises and (tacit) conclusion are in standard form. The major premise (the premise containing the predicate of the conclusion) is stated first; then mood and figure are identified:

**Major premise:** All activities that may be regulated by Congress under the precedent of Supreme Court cases are economic activities.

**Minor premise:** No intrastate gender-motivated crimes of violence are economic activities.

**Conclusion** (unstated but clearly indicated by the context): No intrastate gender-motivated crimes of violence are activities that may be regulated by Congress under the precedent of Supreme Court cases.

The mood of this syllogism is **AEE**; it is in the second figure because the middle term is the predicate of both premises. Its form is therefore **Camestres**, a valid syllogistic argument.

In some cases a third-order enthymeme may seem to be invalid without regard to context—for example, when both premises are negative, or when both premises are particular propositions, or when their common term is undistributed. In such cases, no syllogistic conclusion could follow validly, and hence such enthymemes are invalid in any context.

If it is one of the premises of the argument that is missing, it may be possible to make the argument valid only by adding a premise that is highly implausible—and pointing this out is certainly a legitimate criticism of an enthymematic argument. An even more crushing criticism, of course, would be to show that no additional premise, however implausible, can transform the enthymeme into a valid categorical syllogism.

The difference between enthymemes and normal syllogisms is essentially rhetorical, not logical. No new logical principles need be introduced in dealing with enthymemes, and they must be tested, ultimately, by the same methods that apply to standard-form categorical syllogisms.

**Exercises**

For each of the following enthymematic arguments:

a. Formulate the plausible premise or conclusion, if any, that is missing but understood.
7.5 Enthymemes

b. Write the argument in standard form, including the missing premise or conclusion needed to make the completed argument valid—if possible—using parameters if necessary.

c. Name the order of the enthymeme.

d. If the argument is not valid even with the understood premise included, name the fallacy that it commits.

EXAMPLE

1. Transgenic animals are manmade and as such are patentable.

   —Alan E. Smith, cited in Genetic Engineering
   (San Diego, CA: Greenhaven Press, 1990)

SOLUTION

a. The premise understood but not stated here is that whatever is manmade is patentable.

b. Standard-form translation:
   
   All manmade things are patentable things.
   
   All transgenic animals are manmade things.

   Therefore, all transgenic animals are patentable things.

c. The enthymeme is first-order, because the premise taken as understood is the major premise of the completed argument.

   d. This is a valid syllogism of the form AAA–1, Barbara.

2. Abraham Beame. . . campaigned for mayor—as has been mentioned in recent weeks more often and with more irony than he might have wished—on the slogan “If you don’t know the buck, you don’t know the job—and Abe knows the buck.”

   —The New Yorker, 26 August 1974

3. Although these textbooks purport to be a universal guide to learning of great worth and importance—there is a single clue that points to another direction. In the six years I taught in city and country schools, no one ever stole a textbook.

   —W. Ron Jones, Changing Education, Winter 1974

4. As a matter of fact, man, like woman, is flesh, therefore passive, the plaything of his hormones and of the species, the restless prey of his desires.

   —Simone De Beauvoir, The Second Sex, 1949

*5. You never lose respect for a man who is a vicious competitor, and you never hate a man you respect.

   —Pancho Gonzalez, former U.S. tennis champion
6. . . . I am an Idealist, since I believe that all that exists is spiritual.

—John McTaggart Ellis McTaggart,
*Philosophical Studies*, 1922

7. And why not become a perfect anthropomorphite? Why not assert the deity or deities to be corporeal, and to have eyes, a nose, mouth, ears, etc.? Epicurus maintained that no man had ever seen reason but in a human figure; therefore, the gods must have a human figure. And this argument, which is deservedly so much ridiculed by Cicero, becomes, according to you, solid and philosophical.

—David Hume, *Dialogues Concerning Natural Religion*, part V, 1779

8. Small countries tend to remember history especially well, since it often turns out badly for them.


9. It must have rained lately, because the fish just aren’t biting.

*10. It is not likely that the lies, misstatements, and omissions in President Carter’s book are the result of ignorance. They must be the result, therefore, of malevolence.*


11. No enthymemes are complete, so this argument is incomplete.

12. The chairman of the Student Conduct Legislative Council [at Stanford] argued that free speech rights extend only to victimized minorities, since the white majority does not need such protections.


13. Only demonstrative proof should be able to make you abandon the theory of the Creation; but such a proof does not exist in Nature.


14. It is probably true that the least destructive nuclear weapons are the most dangerous, because they make it easier for a nuclear war to begin.


*15. Man tends to increase at a greater rate than his means of subsistence; consequently he is occasionally subject to a severe struggle for existence.*

—Charles Darwin, *The Descent of Man*, 1871
16. No internal combustion engines are free from pollution; but no internal combustion engine is completely efficient. You may draw your own conclusion.

17. A nation without a conscience is a nation without a soul. A nation without a soul is a nation that cannot live.
   —Winston Churchill

18. Liberty means responsibility. That is why most men dread it.
   —George Bernard Shaw, Maxims for Revolutionists, 1903

19. Who controls the past controls the future. Who controls the present controls the past.
   —George Orwell, 1984

*20. Productivity is desirable because it betters the condition of the vast majority of the people.
   —Stephen Miller, “Adam Smith and the Commercial Republic,” The Public Interest, Fall 1980

21. Advertisements perform a vital function in almost any society, for they help to bring buyers and sellers together.
   —Burton M. Leiser, Liberty, Justice, and Morals, 1986

22. Logic is a matter of profound human importance precisely because it is empirically founded and experimentally applied.
   —John Dewey, Reconstruction in Philosophy, 1920

23. Iphigeneia at Aulis is a tragedy because it demonstrates inexorably how human character, with its itch to be admired, combines with the malice of heaven to produce wars which no one in his right mind would want and which turn out to be utterly disastrous for everybody.
   —George E. Dimock, Jr., Introduction to Iphigeneia at Aulis by Euripides, 1992

24. . . . the law does not expressly permit suicide, and what it does not expressly permit it forbids.
   —Aristotle, Nichomachean Ethics

*25. The man who says that all things come to pass by necessity cannot criticize one who denies that all things come to pass by necessity: for he admits that this too happens of necessity.
   —Epicurus, Fragment XL, Vatican Collection
7.6 Sorites

Sometimes a single categorical syllogism will not suffice to account for our ability
to draw a desired conclusion from a group of premises. Thus, from the premises

All diplomats are tactful.

Some government officials are diplomats.

All government officials are people in public life.

one cannot draw the conclusion

Some people in public life are tactful.

using a single syllogistic inference. Yet the indicated conclusion is entailed by
the stated premises. To derive it requires two syllogisms rather than one. A step-
wise process of argumentation must be resorted to, in which each step is a
separate categorical syllogism. When stated explicitly, the required argument is

All diplomats are tactful individuals.

Some government officials are diplomats.

Therefore some government officials are tactful individuals.

All government officials are people in public life.

Therefore some people in public life are tactful individuals.

This argument is not a syllogism but a chain of categorical syllogisms, connect-
ed by the conclusion of the first, which is a premise of the second. This chain
has only two links, but more extended arguments may consist of a greater
number. Because a chain is no stronger than its weakest link, an argument of
this type is valid if, and only if, all of its constituent syllogisms are valid.

Where such an argument is expressed enthymematically, with only the
premises and the final conclusion stated, it is called a sorites *(pronounced
sō-rĭ-tēz). Sorites may have three, four, or any number of premises. Some are
very lengthy indeed. The following example is drawn from the Monadology of
the philosopher Gottfried Leibniz:

The human soul is a thing whose activity is thinking. A thing whose activity is thinking is one whose activity is immediately apprehended, and without any represen-
tation of parts therein. A thing whose activity is immediately apprehended without any representation of parts therein is a thing whose activity does not contain parts. A thing whose activity does not contain parts is one whose activity is not motion. A thing whose activity is not motion is not a body. What is not a body is not in space. What is not in space is insusceptible of motion. What is insusceptible of motion is indissoluble (for dissolution is a movement of parts). What is indissoluble is incor-
ruptible. What is incorruptible is immortal. Therefore the human soul is immortal.

*From the Greek, soros, meaning heap or pile; a sorites is a pile of syllogisms.
This sorites contains ten premises! Any sorites may be tested by making its intermediate conclusions or steps explicit, then testing separately the various categorical syllogisms thus obtained. If we ignore the possibility that an equivocation is present, then the validity of Leibniz’s sorites is easily verified.

It is convenient to note here, in connection with the exercises at the end of this section, that a sorites is in standard form when all of its propositions are in standard form, when each term occurs exactly twice, and when every proposition (except the last) has a term in common with the proposition that immediately follows it. Thus one standard-form translation of Lewis Carroll’s sorites

\[
(1) \quad \text{Every one who is sane can do Logic.}
(2) \quad \text{No lunatics are fit to serve on a jury.}
(3) \quad \text{None of your sons can do Logic.}
\]

Therefore none of your sons is fit to serve on a jury.

is

\[
(2) \quad \text{All persons fit to serve on a jury are sane persons.}
(1') \quad \text{All sane persons are persons who can do Logic.}
(3') \quad \text{No sons of yours are persons who can do Logic.}
\]

Therefore no sons of yours are persons fit to serve on a jury.

One can test it by stating the suppressed subconclusion explicitly and then testing the resulting categorical syllogisms.

**EXERCISES**

A. Translate the following sorites into standard form, and test their validity.\(^5\)

**EXAMPLE**

1. (1) Babies are illogical.
   (2) Nobody is despised who can manage a crocodile.
   (3) Illogical persons are despised.

Therefore babies cannot manage crocodiles.

**SOLUTION**

Standard-form translation:

(1') All babies are illogical persons.
(2') All illogical persons are despised persons.
(3') No persons who can manage crocodiles are despised persons.

Therefore, no babies are persons who can manage crocodiles.
This sorites consists of two syllogisms, as follows:

All $I$ is $D$. No $M$ is $D$.

All $B$ is $I$. All $B$ is $D$.

Therefore all $B$ is $D$. Therefore no $B$ is $M$.

2. (1) No experienced person is incompetent.
   (2) Jenkins is always blundering.
   (3) No competent person is always blundering.

Therefore Jenkins is inexperienced.

3. (1) The only books in this library that I do not recommend for reading are unhealthy in tone.
   (2) The bound books are all well written.
   (3) All the romances are healthy in tone.
   (4) I do not recommend that you read any of the unbound books.

Therefore all the romances in this library are well written.

4. (1) Only profound scholars can be dons at Oxford.
   (2) No insensitive souls are great lovers of music.
   (3) No one whose soul is not sensitive can be a Don Juan.
   (4) There are no profound scholars who are not great lovers of music.

Therefore all Oxford dons are Don Juans.

*5. (1) No interesting poems are unpopular among people of real taste.
   (2) No modern poetry is free from affectation.
   (3) All your poems are on the subject of soap bubbles.
   (4) No affected poetry is popular among people of real taste.
   (5) Only a modern poem would be on the subject of soap bubbles.

Therefore all your poems are uninteresting.
6. (1) None but writers are poets.
   (2) Only military officers are astronauts.
   (3) Whoever contributes to the new magazine is a poet.
   (4) Nobody is both a military officer and a writer.

   Therefore not one astronaut is a contributor to the new magazine.

B. Each of the following sets of propositions can serve as premises for a valid sorites. For each, find the conclusion and establish that the argument is valid.

*1. (1) No one reads the *Times* unless he is well educated.
   (2) No hedgehogs can read.
   (3) Those who cannot read are not well educated.

2. (1) All puddings are nice.
   (2) This dish is a pudding.
   (3) No nice things are wholesome.

3. (1) The only articles of food that my doctor allows me are such as are not very rich.
   (2) Nothing that agrees with me is unsuitable for supper.
   (3) Wedding cake is always very rich.
   (4) My doctor allows me all articles of food that are suitable for supper.

4. (1) All my daughters are slim.
   (2) No child of mine is healthy who takes no exercise.
   (3) All gluttons who are children of mine are fat.
   (4) No son of mine takes any exercise.

*5. (1) When I work a logic example without grumbling, you may be sure it is one that I can understand.
   (2) These sorites are not arranged in regular order, like the examples I am used to.
   (3) No easy example ever makes my head ache.
   (4) I can't understand examples that are not arranged in regular order, like those I am used to.
   (5) I never grumble at an example, unless it gives me a headache.
Disjunctive and Hypothetical Syllogisms

Propositions are categorical when they affirm or deny the inclusion or exclusion of categories or classes. Syllogisms, arguments consisting of two premises and a conclusion, are called categorical when the propositions they contain are categorical. Up to this point our analysis has been of categorical syllogisms only. However, a syllogism may contain propositions that are not categorical. Such cases are not called categorical syllogisms but are instead named on the basis of the kind of propositions they contain. Here we look briefly at some other kinds of propositions and the syllogisms to which they give rise.

The categorical propositions with which we are familiar are simple in the sense that they have a single component, which affirms or denies some class relation. In contrast, some propositions are compound, in that they contain more than one component, each of which is itself some other proposition.

Consider first the disjunctive (or alternative) proposition. An example is “She was driven either by stupidity or by arrogance.” Its two components are “she was driven by stupidity” and “she was driven by arrogance.” The disjunctive proposition contains those two component propositions, which are called its disjuncts. The disjunctive proposition does not categorically affirm the truth of either one of its disjuncts, but says that at least one of them is true, allowing for the possibility that both may be true.

If we have a disjunction as one premise, and as another premise the denial or contradictory of one its two disjuncts, then we can validly infer that the other disjunct in that disjunction is true. Any argument of this form is a valid disjunctive syllogism. A letter writer, critical of a woman nominated for high office by President George W. Bush, wrote:

In trying to cover up her own illegal peccadillo or stonewall her way out of it, she was driven either by stupidity or arrogance. She’s obviously not stupid; her plight must result, then, from her arrogance.

As we use the term in this section, not every disjunctive syllogism is valid. The argument

She was either arrogant or stupid.
She was arrogant.
Therefore she was not stupid.

is an example of what may be called an invalid disjunctive syllogism. We readily see that, even if the premise were true, she may have been arrogant and stupid. The truth of one disjunct of a disjunction does not imply the falsehood of the other disjunct, because both disjuncts of a disjunction can be true. We have
a valid disjunctive syllogism, therefore, only where the categorical premise contradicts one disjunct of the disjunctive premise and the conclusion affirms the other disjunct of the disjunctive premise.

An objection might be raised at this point, based on such an argument as the following:

Either Smith is in New York or Smith is in Paris.

Smith is in New York.

Therefore Smith is not in Paris.

Here the categorical premise affirms one disjunct of the stated disjunction, and the conclusion contradicts the other disjunct, yet the conclusion seems to follow validly. Closer analysis shows, however, that the stated disjunction plays no role in the argument. The conclusion follows enthymematically from the second, categorical premise, with the unexpressed additional premise being the obviously true proposition that “Smith cannot be both in New York and in Paris,” which can be stated in disjunctive form as

Either Smith is not in New York or Smith is not in Paris.

When this tacit premise is supplied and the superfluous original disjunction is discarded, the resulting argument is easily seen to be a valid disjunctive syllogism. The apparent exception is not really an exception, and the objection is groundless.

The second kind of compound proposition we consider is the conditional (or hypothetical) proposition, an example of which is “If the first native is a politician, then the first native lies.” A conditional proposition contains two component propositions: The one following the “if” is the antecedent, and the one following the “then” is the consequent. A syllogism that contains conditional propositions exclusively is called a pure hypothetical syllogism; for example,

If the first native is a politician, then he lies.

If he lies, then he denies being a politician.

Therefore if the first native is a politician, then he denies being a politician.

In this argument it can be observed that the first premise and the conclusion have the same antecedent, that the second premise and the conclusion have the same consequent, and that the consequent of the first premise is the same as the antecedent of the second premise. It should be clear that any pure hypothetical syllogism whose premises and conclusion have their component parts so related is a valid argument.

A syllogism that has one conditional premise and one categorical premise is called a mixed hypothetical syllogism. Two valid forms of the mixed
hypothetical syllogism have been given special names. The first is illustrated by

If the second native told the truth, then only one native is a politician.
The second native told the truth.
Therefore only one native is a politician.

Here the categorical premise affirms the antecedent of the conditional premise, and the conclusion affirms its consequent. Any argument of this form is valid and is said to be in the **affirmative mood** or **modus ponens** (from the Latin ponere, meaning “to affirm”). One must not confuse the valid form *modus ponens* with the clearly invalid form displayed by the following argument:

If Bacon wrote *Hamlet*, then Bacon was a great writer.
Bacon was a great writer.
Therefore Bacon wrote *Hamlet*.

This argument differs from *modus ponens* in that its categorical premise affirms the consequent, rather than the antecedent, of the conditional premise. Any argument of this form is said to commit the **fallacy of affirming the consequent**.

The other valid form of mixed hypothetical syllogism is illustrated by:

If the one-eyed prisoner saw two red hats, then he could tell the color of the hat on his own head.
The one-eyed prisoner could not tell the color of the hat on his own head.
Therefore the one-eyed prisoner did not see two red hats.

Here the categorical premise denies the consequent of the conditional premise, and the conclusion denies its antecedent. Any argument of this form is valid and is said to be in the form **modus tollens** (from the Latin tollere, meaning “to deny”). One must not confuse the valid form *modus tollens* with the clearly invalid form displayed by the following argument:

If Carl embezzled the college funds, then Carl is guilty of a felony.
Carl did not embezzle the college funds.
Therefore Carl is not guilty of a felony.

This argument differs from *modus tollens* in that its categorical premise denies the antecedent, rather than the consequent, of the conditional premise. Any argument of this form is said to commit the **fallacy of denying the antecedent**.
Principal Kinds of Syllogisms

1. **Categorical syllogisms**, which contain only categorical propositions affirming or denying the inclusion or exclusion of categories. Example:
   
   All $M$ is $P$.
   
   All $S$ is $M$.
   
   Therefore all $S$ is $P$.

2. **Disjunctive syllogisms**, which contain a compound, disjunctive (or alternative) premise asserting the truth of at least one of two alternatives, and a premise that asserts the falsity of one of those alternatives. Example:
   
   Either $P$ is true or $Q$ is true.
   
   $P$ is not true.
   
   Therefore $Q$ is true.

3. **Hypothetical syllogisms**, which contain one or more compound, hypothetical (or conditional) propositions, affirming that if one of its components (the antecedent) is true then the other of its components (the consequent) is true. Two subtypes are distinguished:

   **A. Pure hypothetical syllogisms** contain conditional propositions only. Example:
   
   If $P$ is true, then $Q$ is true.
   
   If $Q$ is true, then $R$ is true.
   
   Therefore if $P$ is true, then $R$ is true.

   **B. Mixed hypothetical syllogisms** contain both a conditional premise and a categorical premise.
   
   If the categorical premise affirms the truth of the antecedent of the conditional premise, and the consequent of that conditional premise is the conclusion of the argument, the form is valid and is called *modus ponens*. Example:
   
   If $P$ is true, then $Q$ is true.
   
   $P$ is true.
   
   Therefore $Q$ is true.

   If the categorical premise affirms the falsity of the consequent of the conditional premise, and the falsity of the antecedent of that

   *(Continued)*
conditional premise is the conclusion of the argument, the form is valid and is called *modus tollens*. Example:

If $P$ is true, then $Q$ is true.

$Q$ is false.

Therefore $P$ is false.

**EXERCISES**

Identify the form and discuss the validity or invalidity of each of the following arguments.

**EXAMPLE**

1. If a man could not have done otherwise than he in fact did, then he is not responsible for his action. But if determinism is true, it is true of every action that the agent could not have done otherwise. Therefore, if determinism is true, no one is ever responsible for what he does.

   —Winston Nesbit and Stewart Candlish, “Determinism and the Ability to Do Otherwise,” *Mind*, July 1978

**SOLUTION**

This is a pure hypothetical syllogism. Valid.

2. Men, it is assumed, act in economic matters only in response to pecuniary compensation or to force. Force in the modern society is largely, although by no means completely, obsolete. So only pecuniary compensation remains of importance.


3. If each man had a definite set of rules of conduct by which he regulated his life he would be no better than a machine. But there are no such rules, so men cannot be machines.


4. If the second native told the truth, then the first native denied being a politician. If the third native told the truth, then the first native denied
being a politician. Therefore if the second native told the truth, then the third native told the truth.

*5. If the one-eyed prisoner does not know the color of the hat on his own head, then the blind prisoner cannot have on a red hat. The one-eyed prisoner does not know the color of the hat on his own head. Therefore the blind prisoner cannot have on a red hat.

6. If all three prisoners have on white hats, then the one-eyed prisoner does not know the color of the hat on his own head. The one-eyed prisoner does not know the color of the hat on his own head. Therefore all three prisoners have on white hats.

7. The stranger is either a knave or a fool. The stranger is a knave. Therefore the stranger is no fool.

8. If the first native is a politician, then the third native tells the truth. If the third native tells the truth, then the third native is not a politician. Therefore if the first native is a politician, then the third native is not a politician.

9. Mankind, he said, judging by their neglect of him, have never, as I think, at all understood the power of Love. For if they had understood him they would surely have built noble temples and altars, and offered solemn sacrifices in his honor; but this is not done.

—Plato, Symposium

*10. I have already said that he must have gone to King’s Pyland or to Capleton. He is not at King’s Pyland, therefore he is at Capleton.

—Arthur Conan Doyle, The Adventure of Silver Blaze

11. If then, it is agreed that things are either the result of coincidence or for an end, and that these cannot be the result of coincidence or spontaneity, it follows that they must be for an end.

—Aristotle, Physics

12. There is no case known (neither is it, indeed, possible) in which a thing is found to be the efficient cause of itself; for in such a case it would be prior to itself, which is impossible.

—Thomas Aquinas, Summa Theologiae, I, question 2, art. 3

13. Either wealth is an evil or wealth is a good; but wealth is not an evil; therefore wealth is a good.

—Sextus Empiricus, Against the Logicians, second century A.D.
14. I do know that this pencil exists; but I could not know this, if Hume’s principles were true; therefore, Hume’s principles, one or both of them, are false.


*15. It is clear that we mean something, and something different in each case, by such words [as substance, cause, change, etc.]. If we did not we could not use them consistently, and it is obvious that on the whole we do consistently apply and withhold such names.

—C. D. Broad, Scientific Thought, 1923

16. If number were an idea, then arithmetic would be psychology. But arithmetic is no more psychology than, say, astronomy is. Astronomy is concerned, not with ideas of the planets, but with the planets themselves, and by the same token the objects of arithmetic are not ideas either.

—Gottlob Frege, The Foundations of Arithmetic, 1893

17. . . . If a mental state is to be identical with a physical state, the two must share all properties in common. But there is one property, spatial localizability, that is not so shared; that is, physical states and events are located in space, whereas mental events and states are not. Hence, mental events and states are different from physical ones.


18. When we regard a man as morally responsible for an act, we regard him as a legitimate object of moral praise or blame in respect of it. But it seems plain that a man cannot be a legitimate object of moral praise or blame for an act unless in willing the act he is in some important sense a “free” agent. Evidently free will in some sense, therefore, is a precondition of moral responsibility.

—C. Arthur Campbell, In Defence of Free Will, 1938

19. In spite of the popularity of the finite-world picture, however, it is open to a devastating objection. In being finite the world must have a limiting boundary, such as Aristotle’s outermost sphere. That is impossible, because a boundary can only separate one part of space from another. This objection was put forward by the Greeks, reappeared in the scientific skepticism of the early Renaissance and probably occurs to any schoolchild who thinks about it today. If one accepts the objection, one must conclude that the universe is infinite.

*20. Total pacifism might be a good principle if everyone were to follow it. 
But not everyone does, so it isn’t.
—Gilbert Harman, The Nature of Morality, 1977

7.8 The Dilemma

The dilemma is a common form of argument in ordinary language. It is, in essence, an argumentative device in which syllogisms on the same topic are combined, sometimes with devastating effect. Each of the constituent syllogisms may be quite ordinary, and therefore the dilemma is not of special importance from a strictly logical point of view. But the premises of the syllogisms so combined are formulated disjunctively, and devised in a way designed to trap the opponent by forcing him to accept one or the other of the disjuncts. Thus the opponent is forced to accept the truth of the conclusion of one or the other of the syllogisms combined. When this is done successfully, the dilemma can prove to be a powerful instrument of persuasion.

We say somewhat loosely that a person is “in” a dilemma (or “impaled on the horns of a dilemma”) when that person must choose between two alternatives, both of which are bad or unpleasant. The dilemma is a form of argument intended to put one’s opponent in just that kind of position. In debate, one uses a dilemma to offer alternative positions to one’s adversary, from which a choice must be made, and then to prove that no matter which choice is made, the adversary is committed to an unacceptable conclusion.

The distinguished physicist Richard Feynman, recounting his experiences in the 1986 investigation of the catastrophic explosion of the Challenger space shuttle, was caustic in his criticism of mismanagement by administrators in the National Aeronautics and Space Administration (NASA). He said:

Every time we talked to higher level managers, they kept saying they didn’t know anything about the problems below them. . . . Either the group at the top didn’t know, in which case they should have known, or they did know, in which case they were lying to us.

An attack of this kind is designed to push the adversaries (in this case the NASA administrators) into a corner and there annihilate them. The only explicitly stated premise of the argument is a disjunction, but one of the disjuncts must obviously be true; Either they knew or they didn’t know about the problems below them. And whichever disjunct is chosen, the result for the adversary is very bad. The conclusion of a dilemma can itself be a disjunction (for example, “Either the NASA administrators did not know what they should have known, or they lied”) in which case we call the dilemma a
complex dilemma. But the conclusion may also be a categorical proposition, in which case we call it simple dilemma.

A dilemma need not always have an unpleasant conclusion. An example of one with a happy conclusion is provided by the following simple dilemma:

If the blest in heaven have no desires, they will be perfectly content; so they will be also if their desires are fully gratified; but either they will have no desires, or have them fully gratified; therefore they will be perfectly content.

The premises of a dilemma need not be stated in any special order; the disjunctive premise that offers the alternatives may either precede or follow the other. And the consequences of those alternatives may be stated in a conjunctive proposition or in two separate propositions. An argument in dilemma form is often expressed enthymematically; that is, its conclusion generally is thought to be so obvious that it scarcely needs to be spelled out. This is well illustrated in a passage from a letter of President Abraham Lincoln, defending the Emancipation Proclamation that freed the slaves of the Confederacy:

But the proclamation, as law, either is valid, or is not valid. If it is not valid, it needs no retraction, if it is valid, it cannot be retracted, any more than the dead can be brought to life.°

Three ways of evading or refuting the conclusion of a dilemma have been given special names, all relating to the fact that a dilemma has two (or more) “horns.” These three ways of defeating a dilemma are known as “going (or escaping) between the horns,” “taking (or grasping) it by the horns,” and “rebutting it by means of a counterdilemma.” Note that these are not ways to prove the dilemma invalid; rather, they are ways in which one seeks to avoid its conclusion without challenging the formal validity of the argument.

One escapes between the horns of a dilemma by rejecting its disjunctive premise. This method is often the easiest way to evade the conclusion of a dilemma, for unless one half of the disjunction is the explicit contradictory of the other, the disjunction may very well be false. For example, one justification sometimes offered for giving grades to students is that recognizing good work will stimulate the students to study harder. Students may criticize this theory using the following dilemma:

If students are fond of learning, they need no stimulus, and if they dislike learning, no stimulus will be of any avail. But any student is either fond of learning or dislikes it. Therefore a stimulus is either needless or of no avail.

This argument is formally valid, but we can evade its conclusion by going between the horns. The disjunctive premise is false, for students have all kinds of attitudes toward learning: Some may be fond of it, many dislike it, and many are indifferent. For that third group a stimulus may be both needed and of
some avail. Going between the horns does not prove the conclusion to be false but shows merely that the argument does not provide adequate grounds for accepting that conclusion.

When the disjunctive premise is unassailable, as when the alternatives exhaust the possibilities, it is impossible to escape between the horns. Another method of evading the conclusion must be sought. One such method is to grasp the dilemma by the horns, which involves rejecting the premise that is a conjunction. To deny a conjunction, we need only deny one of its parts. When we grasp the dilemma by the horns, we attempt to show that at least one of the conditionals is false. The dilemma just above, attacking the use of grades in school, relies on the conditional “If students are fond of learning, they need no stimulus.” The proponent of grading may grasp this dilemma by the horns and argue that even students who are fond of learning may sometimes need stimulus, and that the additional stimulus provided by grades promotes careful study by even the most diligent students. There may be good response to this, of course—but the original dilemma has been grasped firmly by the horns.

Rebutting a dilemma by means of a counterdilemma is the most ingenious method of all, but it is seldom cogent, for reasons that will appear presently. To rebut a given dilemma in this way, one constructs another dilemma whose conclusion is opposed to the conclusion of the original. Any counterdilemma may be used in rebuttal, but ideally it should be built up out of the same ingredients (categorical propositions) that the original dilemma contained.

A classical example of this elegant kind of rebuttal concerns the legendary argument of an Athenian mother attempting to persuade her son not to enter politics:

If you say what is just, men will hate you; and if you say what is unjust, the gods will hate you; but you must either say the one or the other; therefore you will be hated.

Her son rebutted that dilemma with the following one:

If I say what is just, the gods will love me; and if I say what is unjust, men will love me. I must say either the one or the other. Therefore I shall be loved!

In public discussion, where the dilemma is one of the strongest weapons of controversy, the use of a rebuttal of this kind, which derives an opposite conclusion from almost the same premises, is a mark of great rhetorical skill. But if we examine the dilemma and rebutting counterdilemma more closely, we see that their conclusions are not as opposed as they might at first have seemed.

The conclusion of the first dilemma is that the son will be hated (by men or by the gods), whereas that of the rebutting dilemma is that the son will be loved (by the gods or by men). But these two conclusions are perfectly compatible.
The rebutting counterdilemma serves merely to establish a conclusion different from that of the original. Both conclusions may very well be true together, so no refutation has been accomplished. But in the heat of controversy analysis is unwelcome, and if such a rebuttal occurred in a public debate, the average audience might agree that the rebuttal was an effective reply to the original argument.

That this sort of rebuttal does not refute the argument but only directs attention to a different aspect of the same situation is perhaps more clearly shown in the case of the following dilemma, advanced by an “optimist”:

If I work, I earn money, and if I am idle, I enjoy myself. Either I work or I am idle. Therefore either I earn money or I enjoy myself.

A “pessimist” might offer the following counterdilemma:

If I work, I don’t enjoy myself, and if I am idle, I don’t earn money. Either I work or I am idle. Therefore either I don’t earn money or I don’t enjoy myself.

These conclusions represent merely different ways of viewing the same facts; they do not constitute a disagreement over what the facts are.

No discussion of dilemmas would be complete unless it mentioned the celebrated lawsuit between Protagoras and Euathlus. Protagoras, a teacher who lived in Greece during the fifth century B.C., specialized in teaching the art of pleading before juries. Euathlus wanted to become a lawyer, but not being able to pay the required tuition, he made an arrangement according to which Protagoras would teach him but not receive payment until Euathlus won his first case. When Euathlus finished his course of study, he delayed going into practice. Tired of waiting for his money, Protagoras brought suit against his former pupil for the tuition money that was owed. Unmindful of the adage that the lawyer who tries his own case has a fool for a client, Euathlus decided to plead his own case in court. When the trial began, Protagoras presented his side of the case in a crushing dilemma:

If Euathlus loses this case, then he must pay me (by the judgment of the court); if he wins this case, then he must pay me (by the terms of the contract). He must either lose or win this case. Therefore Euathlus must pay me.

The situation looked bad for Euathlus, but he had learned well the art of rhetoric. He offered the court the following counterdilemma in rebuttal:

If I win this case, I shall not have to pay Protagoras (by the judgment of the court); if I lose this case, I shall not have to pay Protagoras (by the terms of the contract, for then I shall not yet have won my first case). I must either win or lose this case. Therefore I do not have to pay Protagoras?

Had you been the judge, how would you have decided?
Note that the conclusion of Euathlus’s rebutting dilemma is not compatible with the conclusion of Protagoras’s original dilemma. One conclusion is the explicit denial of the other. However, it is rare that a counterdilemma stands in this relation to the dilemma against which it is directed. When it does, the premises involved are themselves inconsistent, and it is this implicit contradiction that the two dilemmas make explicit.

**EXERCISES**

Discuss the various arguments that might be offered to refute each of the following.

**EXAMPLE**

1. If we interfere with the publication of false and harmful doctrines, we shall be guilty of suppressing the liberties of others, whereas if we do not interfere with the publication of such doctrines, we run the risk of losing our own liberties. We must either interfere or not interfere with the publication of false and harmful doctrines. Hence we must either be guilty of suppressing the liberties of others or else run the risk of losing our own liberties.

**SOLUTION**

It is impossible to go between the horns. It is possible to grasp it by either horn, arguing either (a) that liberties do not properly include the right to publish false and harmful doctrines or (b) that we run no risk of losing our own liberties if we vigorously oppose false and harmful doctrines with true and helpful ones. And it could plausibly be rebutted (but not refuted) by the use of its ingredients to prove that “we must either be guiltless of suppressing the liberties of others or else run no risk of losing our own liberties.”

2. If you tell me what I already understand, you do not enlarge my understanding, whereas if you tell me something that I do not understand, then your remarks are unintelligible to me. Whatever you tell me must be either something I already understand or something that I do not understand. Hence whatever you say either does not enlarge my understanding or else is unintelligible to me.

3. If the conclusion of a deductive argument goes beyond the premises, then the argument is invalid, while if the conclusion of a deductive argument does not go beyond the premises, then the argument brings nothing new to light. The conclusion of a deductive argument must
310  CHAPTER 7  Syllogisms in Ordinary Language

either go beyond the premises or not go beyond them. Therefore either
deductive arguments are invalid or they bring nothing new to light.

4. If a deductive argument is invalid, it is without value, whereas a de-
ductive argument that brings nothing new to light is also without
value. Either deductive arguments are invalid or they bring nothing
new to light. Therefore deductive arguments are without value.

*5. If the general had been loyal, he would have obeyed his orders, and if
he had been intelligent, he would have understood them. The general
either disobeyed his orders or else he did not understand them.
Therefore the general must have been either disloyal or unintelligent.

6. If he was disloyal, then his dismissal was justified, and if he was unin-
telligent, then his dismissal was justified. He was either disloyal or un-
intelligent. Therefore his dismissal was justified.

7. If the several nations keep the peace, the United Nations is unneces-
sary, while if the several nations go to war, the United Nations will
have been unsuccessful in its purpose of preventing war. Now, either
the several nations keep the peace or they go to war. Hence the United
Nations is unnecessary or unsuccessful.

8. If people are good, laws are not needed to prevent wrongdoing,
whereas if people are bad, laws will not succeed in preventing wrong-
doing. People are either good or bad. Therefore either laws are not
needed to prevent wrongdoing or laws will not succeed in preventing
wrongdoing.

9. Archbishop Morton, Chancellor under Henry VII, was famous for
his method of extracting “contributions” to the king’s purse. A per-
son who lived extravagantly was forced to make a large contribu-
tion, because it was obvious that he could afford it. Someone who
lived modestly was forced to make a large contribution because it
was clear that he must have saved a lot of money on living expenses.
Whichever way he turned he was said to be “caught on Morton’s
fork.”

—Dorothy Hayden, Winning Declarer Play

*10. All political action aims at either preservation or change. When desir-
ing to preserve, we wish to prevent a change to the worse; when desir-
ing to change, we wish to bring about something better. All political
action is then guided by some thought of better and worse.

—Leo Strauss, What Is Political Philosophy?, 1959
11. If a thing moves, it moves either in the place where it is or in that where it is not; but it moves neither in the place where it is (for it remains therein) nor in that where it is not (for it does not exist therein); therefore nothing moves.

—Sextus Empiricus, *Against the Physicists*

12. And what a life should I lead, at my age, wandering from city to city, ever changing my place of exile, and always being driven out! For I am quite sure that wherever I go, there, as here, the young men will flock to me; and if I drive them away, their elders will drive me out at their request; and if I let them come, their fathers and friends will drive me out for their sakes.

—Plato, *Apology*

13. If Socrates died, he died either when he was living or when he was dead. But he did not die while living; for assuredly he was living, and as living he had not died. Nor did he die when he was dead, for then he would be twice dead. Therefore Socrates did not die.

—Sextus Empiricus, *Against the Physicists*

14. Inevitably, the use of the placebo involved built-in contradictions. A good patient–doctor relationship is essential to the process, but what happens to that relationship when one of the partners conceals important information from the other? If the doctor tells the truth, he destroys the base on which the placebo rests. If he doesn’t tell the truth, he jeopardizes a relationship built on trust.

—Norman Cousins, *Anatomy of an Illness*

*15. The decision of the Supreme Court in *U.S. v. Nixon* (1974), handed down the first day of the Judiciary Committee’s final debate, was critical. If the President defied the order, he would be impeached. If he obeyed the order, it was increasingly apparent, he would be impeached on the evidence.


16. If we are to have peace, we must not encourage the competitive spirit, whereas if we are to make progress, we must encourage the competitive spirit. We must either encourage or not encourage the competitive spirit. Therefore we shall either have no peace or make no progress.

17. The argument under the present head may be put into a very concise form, which appears altogether conclusive. Either the mode in
which the federal government is to be constructed will render it sufficiently dependent on the people, or it will not. On the first supposition, it will be restrained by that dependence from forming schemes obnoxious to their constituents. On the other supposition, it will not possess the confidence of the people, and its schemes of usurpation will be easily defeated by the State governments, who will be supported by the people.

—James Madison, *The Federalist Papers*, no. 46, 1788

18. . . . a man cannot enquire either about that which he knows, or about that which he does not know; for if he knows, he has no need to enquire; and if not, he cannot; for he does not know the very subject about which he is to enquire.

—Plato, *Meno*

19. We tell clients to try to go through the entire first interview without even mentioning money. If you ask for a salary that is too high, the employer concludes that he can’t afford you. If you ask for one that is too low, you’re essentially saying, “I’m not competent enough to handle the job that you’re offering.”


*20. “Pascal’s wager” is justifiably famous in the history of religion and also of betting. Pascal was arguing that agnostics—people unsure of God’s existence—are best off betting that He does exist. If He does but you end up living as an unbeliever, then you could be condemned to spend eternity in the flames of Hell. If, on the other hand, He doesn’t exist but you live as a believer, you suffer no corresponding penalty for being in error. Obviously, then, bettors on God start out with a big edge.


**SUMMARY**

In this chapter we have examined syllogistic argument as it is used in ordinary language, exhibiting the different guises in which syllogisms appear and showing how they may be best understood, used, and evaluated.

In Section 7.1, we explained the need for techniques to translate syllogistic arguments of any form into standard form, and we identified the ways in which syllogistic arguments may deviate from standard-form categorical syllogisms.
In Section 7.2, we explained how syllogisms in ordinary language appearing to have more than three terms may sometimes have the number of terms in them appropriately reduced to three—by elimination of synonyms, and by elimination of complementary classes.

In Section 7.3, we explained how the propositions of a syllogistic argument, when not in standard form, may be translated into standard form so as to allow the syllogism to be tested either by Venn diagrams or by use of the rules governing syllogisms. Nonstandard propositions of nine different kinds were examined, and the methods for translating each kind were explained and illustrated:

1. Singular propositions
2. Propositions having adjectives as predicates
3. Propositions having main verbs other than the copula “to be”
4. Statements having standard-form ingredients, but not in standard-form order
5. Propositions having quantifiers other than “all,” “no,” and “some”
6. Exclusive propositions, using “only” or “none but”
7. Propositions without words indicating quantity
8. Propositions not resembling standard-form propositions at all
9. Exceptive propositions, using “all except” or similar expressions

In Section 7.4, we explained how the uniform translation of propositions into standard form, essential for testing, may be assisted by the use of parameters.

In Sections 7.5 and 7.6, we explained enthymemes, syllogistic arguments in which one of the constituent propositions has been suppressed, and sorites, in which a chain of syllogisms may be compressed into a cluster of linked propositions.

In Section 7.7, we explained syllogisms other than categorical: disjunctive syllogisms and hypothetical syllogisms, so called because they contain disjunctive or hypothetical premises.

In Section 7.8, we discussed the rhetorical use of dilemmas, disjunctive arguments that give to the adversary a choice of alternatives neither of which is acceptable. We explained and illustrated the three possible patterns of rhetorical response: going between the horns of the dilemma, grasping the dilemma by its horns, or devising a counterdilemma.
End Notes

1Immanuel Kant, *Critique of Pure Reason*, 1787, The Analytic of Concepts, chap. 1, sec. 2. More than a century later, Bertrand Russell presented a very different interpretation of singular propositions and universal propositions, and he later argued (in *My Philosophical Development*, 1959) that logic “cannot get far” until the two forms are seen to be “completely different” because the one (the singular) attributes a predicate to a named subject, while the other (the universal) expresses a relation between two predicates. Russell’s interpretation had by that time become central to the theory of quantification in modern symbolic logic, discussed at length below, in Chapter 10; Kant’s observation pertained to the use of singular propositions in traditional syllogisms, which he knew to be very powerful logical instruments.

2In some contexts the article “the” is deliberately omitted to achieve desired ambiguity. When United Nations Resolution 242 was adopted, calling for the return of “territory” captured by Israel in the Six-Day War in 1967, it was formally agreed that the English version of the Resolution would be authoritative, because the Resolution when expressed in French would require the definite article (*le territoire*), of which the English translation is “the territory,” meaning all the territory captured, which is precisely what the agreed-upon English version carefully refrains from saying. The omission of the definite article in English can be logically significant.

3David Hume, *Dialogues Concerning Natural Religion*, part 2 (1779).


5All the following exercises, except 4 and 6 under A, are taken, with little or no modification, from Lewis Carroll’s *Symbolic Logic* (New York: C. N. Potter, 1977).


8Letter to James C. Conkling, 26 August 1863.