

PEARSON NEW INTERNATIONAL EDITION

Introduction to Logic
Irving M. Copi Carl Cohen
Kenneth McMahon
Fourteenth Edition

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Basic Logical Concepts

This asset is intentionally omitted from this text. It may be accessed at www.mcescher.com. (Waterfall by M.C. Escher)

Basic Logical Concepts

- 1 What Logic Is
- 2 Propositions and Arguments
- 3 Recognizing Arguments
- 4 Arguments and Explanations
- 5 Deductive and Inductive Arguments
- 6 Validity and Truth

1 What Logic Is

Logic is the study of the methods and principles used to distinguish correct from incorrect reasoning.

When we reason about any matter, we produce arguments to support our conclusions. Our arguments include reasons that we think justify our beliefs. However, not all reasons are good reasons. Therefore we may always ask, when we confront an argument: Does the conclusion reached *follow* from the premises assumed? To answer this question there are objective criteria; in the study of logic we seek to discover and apply those criteria.

Reasoning is not the only way in which people support assertions they make or accept. They may appeal to authority or to emotion, which can be very persuasive, or they may rely, without reflection, simply on habits. However, when someone wants to make judgments that can be completely relied upon, their only solid foundation will be correct reasoning. Using the methods and techniques of logic—one can distinguish reliably between sound and faulty reasoning.

2 Propositions and Arguments

We begin by examining more closely the most fundamental concepts in the study of logic, concepts presupposed in the paragraphs just above. In reasoning we construct and evaluate *arguments*; arguments are built with *propositions*. Although these concepts are apparently simple, they require careful analysis.

A. Propositions

Propositions are the building blocks of our reasoning. A **proposition** asserts that something is the case or it asserts that something is not. We may affirm a proposition, or deny it—but every proposition either asserts what really is the case, or it asserts something that is not. Therefore every proposition is either true or false.

Logic

The study of the methods and principles used to distinguish correct from incorrect reasoning.

Proposition

A statement; what is typically asserted using a declarative sentence, and hence always either true or false—although its truth or falsity may be unknown.

Biography

Aristotle

Of all the great philosophers and logicians, ancient and modern, none is greater than Aristotle (384–322 BCE), whose works and influence largely ruled the world of intellect for two millennia. He was often referred to as “The Philosopher”; his authority (even when he was mistaken!) was rarely questioned.

Born in Macedonia, in the city of Stagira, where his father was physician to the king, he was viewed from birth as a member of the aristocracy, and was a friend of the king’s son, Philip. When Philip became king of Macedonia, he summoned Aristotle, who had for many years been studying in Athens at Plato’s school, The Academy, to return to Macedonia as tutor to his son Alexander (who later would be known as Alexander the Great). As he advanced on his subsequent conquests in Asia, Alexander remained in contact with his respected teacher, sending back, at Aristotle’s request, specimens and artifacts that contributed to the early growth of the sciences.

Aristotle—one of the trio, with Plato and Socrates, who largely founded Western philosophy—had a truly encyclopedic mind. He investigated, contributed to, wrote about, and taught virtually all subjects on which some knowledge had been accumulated at his time: the natural sciences (biology, zoology, embryology, anatomy, astronomy, meteorology, physics, and optics); the arts (poetry, music, theater, and rhetoric); government and politics; psychology and education; economics; ethics; metaphysics—and of course logic, of which he alone was the systematic founder. His treatises on logic, later combined into one great work entitled *The Organon* (“The Instrument”), constitute the earliest formal study of our subject. The penetration and coherence of his logical analyses, and the comprehensiveness and general accuracy of his scientific studies, justify his acknowledged status as one of the finest thinkers ever to have graced our planet.

At the age of 49 Aristotle returned to Athens and established his own highly influential school, the Lyceum, where he taught for twelve years. He died of natural causes in 322 BCE. In his will, he asked to be buried next to his wife, Pythias.

In logic Aristotle grasped the overriding necessity of determining the rules of correct reasoning. He explained validity and characterized the four fundamental types of categorical propositions and their relations. In the *Prior*



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Analytics, one of the six books of *The Organon*, he developed a sophisticated theoretical account of categorical syllogisms, an account that long dominated the realm of deductive logic and that remains today an effective tool of sound reasoning.

It is said of Aristotle that he was probably the last person to know everything there was to be known in his own time. ■



There are many propositions about whose truth we are uncertain. “There is life on some other planet in our galaxy,” for example, is a proposition that, so far as we now know, may be true or may be false. Its “truth value” is unknown, but this proposition, like every proposition, must be either true or false.

A question *asserts* nothing, and therefore it is not a proposition. “Do you know how to play chess?” is indeed a sentence, but that sentence makes no claim about the world. Neither is a command a proposition (“Come quickly!”), nor is an exclamation a proposition (“Oh my gosh!”). Questions, commands, and exclamations—unlike propositions—are neither true nor false.

When we assert some proposition, we do so using a sentence in some language. However, the proposition we assert is not identical to that sentence. This is evident because two different sentences, consisting of different words differently arranged, may have the same meaning and may be used to assert the very same proposition. For example, “Leslie won the election” and “The election was won by Leslie” are plainly two different sentences that make the same assertion.

Sentences are always parts of some language, but propositions are not tied to English or to any given language. The four sentences

It is raining.	(English)
Está lloviendo.	(Spanish)
Il pleut.	(French)
Es regnet.	(German)

are in different languages, but they have a single meaning: all four, using different words, may be uttered to assert the very same proposition. *Proposition* is the term we use to refer to what it is that declarative sentences are typically used to assert.

The term **statement** is not an exact synonym of *proposition*, but it is often used in logic in much the same sense. Some logicians prefer *statement* to *proposition*, although the latter has been more commonly used in the history of logic. Other logicians eschew both terms as metaphysical, using only the term *sentence*.

Statement

A proposition; what is typically asserted by a declarative sentence, but not the sentence itself. Every statement must be either true or false, although the truth or falsity of a given statement may be unknown.

However, the concept of a proposition is seen by many as making a useful distinction between a sentence and what the sentence asserts..

The very same sentence can be used to make very different statements (or to assert very different propositions), depending on the context in which it is expressed. For example, the sentence, “The largest state in the United States was once an independent republic,” once expressed a true statement or proposition (about Texas), but if asserted today would express a false statement or proposition (about Alaska). The same words assert different propositions at different times.

Propositions may be *simple*, like those used in the preceding illustrations, but they may also be *compound*, containing other propositions within themselves. Consider the following proposition, from a recent account of the exploitation of the Amazon Basin in Brazil:

The Amazon Basin produces roughly 20 percent of the Earth’s oxygen, creates much of its own rainfall, and harbors many unknown species.¹

This sentence simultaneously asserts three propositions, concerning what the Amazon Basin produces and what it creates and what it harbors. The passage thus constitutes a *conjunctive* proposition. Asserting a conjunctive proposition is equivalent to asserting each of its component propositions separately.

Some compound propositions do not assert the truth of their components. In *disjunctive* (or *alternative*) *propositions*, no one of the components is asserted. Abraham Lincoln (in a message to Congress in December 1861) said, “Circuit courts are useful, or they are not useful.” This disjunctive proposition is plainly true, but either one of its components might be false.

Other compound propositions that do not assert their components are *hypothetical* (or *conditional*) *propositions*. The eighteenth-century freethinker, Voltaire, said, “If God did not exist, it would be necessary to invent him.” Here, again, neither of the two components is asserted. The proposition “God does not exist,” is not asserted, nor is the proposition, “it is necessary to invent him.” Only the “if-then” proposition is asserted by the hypothetical or conditional statement, and that compound statement might be true even if both of its components were false.

In logic, the internal structure of propositions is important. To evaluate an argument we need a full understanding of the propositions that appear in that argument. Propositions of many different kinds will be analyzed in this chapter.

B. Arguments

With propositions as building blocks, we construct *arguments*. In any argument we affirm one proposition on the basis of some other propositions. In doing this, an *inference* is drawn. **Inference** is a process that may tie together a cluster of propositions. Some inferences are *warranted* (or correct); others are not. The logician analyzes these clusters, examining the propositions with which the process begins and with which it ends, as well as the relations among these propositions.

Inference

A process by which one proposition is arrived at and affirmed on the basis of some other proposition or propositions.

Such a cluster of propositions constitutes an *argument*. Arguments are the chief concern of logic.

Argument is a technical term in logic. It need not involve disagreement, or controversy. In logic, **argument** refers strictly to any group of propositions of which one is claimed to follow from the others, which are regarded as providing support for the truth of that one. For every possible inference there is a corresponding argument.

In writing or in speech, a passage will often contain several related propositions and yet contain no argument. An argument is not merely a collection of propositions; it is a cluster with a structure that captures or exhibits some inference. We describe this structure with the terms *conclusion* and *premise*. The **conclusion** of an argument is the proposition that is affirmed on the basis of the other propositions of the argument. Those other propositions, which are affirmed (or assumed) as providing support for the conclusion, are the **premises** of the argument.

We will encounter a vast range of arguments in this text—arguments of many different kinds, on many different topics. We will analyze arguments in politics, in ethics, in sports, in religion, in science, in law, and in everyday life. Those who defend these arguments, or who attack them, are usually aiming to establish the truth (or the falsehood) of the conclusions drawn. As logicians, however, our interest is in the arguments as such. As agents or as citizens we may be deeply concerned about the truth or falsity of the conclusions drawn. However, as logicians we put those interests aside. Our concerns will be chiefly two. First, we will be concerned about the *form* of an argument under consideration, to determine if that argument is *of a kind* that is likely to yield a warranted conclusion. Second, we will be concerned about the *quality* of the argument, to determine whether it *does in fact* yield a warranted conclusion.

Arguments vary greatly in the degree of their complexity. Some are very simple. Other arguments, as we will see, are quite intricate, sometimes because of the structure or formulation of the propositions they contain, sometimes because of the relations among the premises, and sometimes because of the relations between premises and conclusion.

The simplest kind of argument consists of one premise and a conclusion that is claimed to follow from it. Each may be stated in a separate sentence, as in the following argument that appears on a sticker affixed to biology textbooks in the state of Alabama:

No one was present when life first appeared on earth. Therefore any statement about life's origins should be considered as theory, not fact.

Both premise and conclusion may be stated within the same sentence, as in this argument arising out of recent advances in the science of human genetics:

Since it turns out that all humans are descended from a small number of African ancestors in our recent evolutionary past, believing in profound differences between the races is as ridiculous as believing in a flat earth.²

Argument

Any group of propositions of which one is claimed to follow from the others, which are regarded as providing support or grounds for the truth of that one.

Conclusion

In any argument, the proposition to which the other propositions in the argument are claimed to give support, or for which they are given as reasons.

Premises

In an argument, the propositions upon which inference is based; the propositions that are claimed to provide grounds or reasons for the conclusion.

Biography

Chrysippus

Of all the logicians of ancient times, Aristotle and Chrysippus stand out as the two greatest. The enormous influence of Aristotle, who first systematized logic and was its principal authority for two thousand years, has already been recognized. Born a century later, Chrysippus (c. 279–c. 206 BCE) developed a conceptual scheme whose influence has only more recently been appreciated.

The logic of Aristotle was one of classes. In the Aristotelian argument “All men are mortal; Greeks are men; therefore Greeks are mortal,” the fundamental elements are the categories, or terms (“men,” “mortal things,” and “Greeks”). In contrast, the logic of Chrysippus was one built of *propositions* and the connections between them (e.g., “If it is now day, it is now light. It is now day. Therefore it is now light.”). This simple argument form (now called *modus ponens*) and many other fundamental argument forms, Chrysippus analyzed and classified. His logical insights were creative and profound.

Born in Asia Minor, in Soli, Chrysippus studied the philosophy of the Stoics—most famous among them Zeno and Cleanthes—and eventually became head of the Stoic school in Athens. In that capacity he taught the need to control one’s emotions, which he thought to be disorders or diseases. He urged the patient acceptance of the outcomes of a fate one cannot control, and the recognition that the one God (of which the traditional Greek gods are but aspects) is the universe itself.

But it is as a logician that his influence has been greatest. He grasped, as Aristotle did not, the central role of the proposition—“*that which is, in itself, capable of being denied or affirmed.*” From this base he developed the first coherent system of propositional logic. ■



Classic Image/
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The order in which premises and conclusion appear can also vary, but it is not critical in determining the quality of the argument. It is common for the conclusion of an argument to *precede* the statement of its premise or premises. On the day Babe Ruth hit his 700th home run (13 July 1934), the following argument appeared in *The New York Times*:

A record that promises to endure for all time was attained on Navin Field today when Babe Ruth smashed his seven-hundredth home run in a lifetime career. It promises to live, first because few players in history have enjoyed the longevity on the diamond of the immortal Bambino, and, second, because only two other players in the history of baseball have hit more than 300 home runs.

This is an example of an argument whose two premises, each numbered, appear after the conclusion is stated. It is also an example of a very plausible argument whose conclusion is false, given that Hank Aaron hit his 700th home run on 21 July 1973, thirty-nine years later.

Even when premise and conclusion are united in one sentence, the conclusion of the argument may come first. The English utilitarian philosopher, Jeremy Bentham, presented this crisp argument in his *Principles of Legislation* (1802):

Every law is an evil, for every law is an infraction of liberty.

Although this is only one short sentence, it is an argument because it contains two propositions, of which the first (every law is an evil) is the conclusion and the second (every law is an infraction of liberty) is the premise. However, no single proposition can be an argument, because an argument is made up of a group of propositions. Yet some propositions, because they are compound, do sound like arguments, and care must be taken to distinguish them from the arguments they resemble. Consider the following hypothetical proposition:

If a state aims to be a society composed of equals, then a state that is based on the middle class is bound to be the best constituted.

Neither the first nor the second component of this proposition is asserted. All that is asserted is that the former implies the latter, and both might well be false. No inference is drawn, no conclusion is claimed to be true. Aristotle, who studied the constitution and quality of actual states in Greece more than two thousand years ago, wrote confidently in *Politics*, Book IV, Chapter 11:

A state aims at being a society composed of equals, and therefore a state that is based on the middle class is bound to be the best constituted.

In this case we *do* have an argument. This argument of Aristotle is short and simple; most arguments are longer and more complicated. Every argument, however—short or long, simple or complex—consists of a group of propositions of which one is the conclusion and the other(s) are the premises offered to support it.

Although every argument is a structured cluster of propositions, not every structured cluster of propositions is an argument. Consider this very recent account of global inequality:

In the same world in which more than a billion people live at a level of affluence never previously known, roughly a billion other people struggle to survive on the purchasing power equivalent of less than one U.S. dollar per day. Most of the world's poorest people are undernourished—lack access to safe drinking water or even the most basic health services and cannot send their children to school. According to UNICEF, more than 10 million children die every year—about 30,000 per day—from avoidable, poverty-related causes.³

This report is deeply troubling—but there is no argument here.

Reasoning is an art, as well as a science. It is something we do, as well as something we understand. Giving reasons for our beliefs comes naturally, but skill in the art of building arguments, and testing them, requires practice. One

who has practiced and strengthened these skills is more likely to reason correctly than one who has never thought about the principles involved. Therefore we provide in this chapter very many opportunities for practice in the analysis of arguments.

EXERCISES

Identify the premises and conclusions in the following passages. Some premises do support the conclusion, others do not. Note that premises may support conclusions directly or indirectly and that even simple passages may contain more than one argument.

EXAMPLE

1. A well-regulated militia being necessary to the security of a free state, the right of the people to keep and bear arms shall not be infringed.
—*The Constitution of the United States, Amendment 2*

SOLUTION

Premise: A well-regulated militia is necessary for the security of a free state.

Conclusion: The right of the people to keep and bear arms shall not be infringed.

2. What stops many people from photocopying a book and giving it to a pal is not integrity but logistics; it's easier and inexpensive to buy your friend a paperback copy.
—Randy Cohen, *The New York Times Magazine*, 26 March 2000
3. Thomas Aquinas argued that human intelligence is a gift from God and therefore "to apply human intelligence to understand the world is not an affront to God, but is pleasing to him."
—Recounted by Charles Murray in *Human Accomplishment* (New York: HarperCollins, 2003)
4. Sir Edmund Hillary is a hero, not because he was the first to climb Mount Everest, but because he never forgot the Sherpas who helped him achieve this impossible feat. He dedicated his life to helping build schools and hospitals for them.
—Patre S. Rajashekhar, "Mount Everest," *National Geographic*, September 2003
5. Standardized tests have a disparate racial and ethnic impact; white and Asian students score, on average, markedly higher than their black and Hispanic peers. This is true for fourth-grade tests, college entrance exams, and every other assessment on the books. If a racial gap is evidence of discrimination, then all tests discriminate.
—Abigail Thernstrom, "Testing, the Easy Target," *The New York Times*, 15 January 2000
6. Good sense is, of all things in the world, the most equally distributed, for everybody thinks himself so abundantly provided with it that even

those most difficult to please in all other matters do not commonly desire more of it than they already possess.

—René Descartes, *A Discourse on Method*, 1637

7. When Noah Webster proposed a *Dictionary of the American Language*, his early 19th-century critics presented the following argument against it: “Because any words new to the United States are either stupid or foreign, there is no such thing as the American language; there’s just bad English.”

—Jill Lepore, “Noah’s Mark,” *The New Yorker*, 6 November 2006

8. The death penalty is too costly. In New York State alone taxpayers spent more than \$200 million in our state’s failed death penalty experiment, with no one executed.

In addition to being too costly, capital punishment is unfair in its application. The strongest reason remains the epidemic of exonerations of death row inmates upon post-conviction investigation, including ten New York inmates freed in the last 18 months from long sentences being served for murders or rapes they did not commit.

—L. Porter, “Costly, Flawed Justice,” *The New York Times*, 26 March 2007

9. Houses are built to live in, not to look on; therefore, let use be preferred before uniformity.

—Francis Bacon, “Of Building,” in *Essays*, 1597

10. To boycott a business or a city [as a protest] is not an act of violence, but it can cause economic harm to many people. The greater the economic impact of a boycott, the more impressive the statement it makes. At the same time, the economic consequences are likely to be shared by people who are innocent of any wrongdoing, and who can ill afford the loss of income: hotel workers, cab drivers, restaurateurs, and merchants. The boycott weapon ought to be used sparingly, if for no other reason than the harm it can cause such bystanders.

—Alan Wolfe, “The Risky Power of the Academic Boycott,” *The Chronicle of Higher Education*, 17 March 2000

11. Ethnic cleansing was viewed not so long ago as a legitimate tool of foreign policy. In the early part of the 20th century forced population shifts were not uncommon; multicultural empires crumbled and nationalism drove the formation of new, ethnically homogenous countries.

—Belinda Cooper, “Trading Places,” *The New York Times Book Review*, 17 September 2006

12. If a jury is sufficiently unhappy with the government’s case or the government’s conduct, it can simply refuse to convict. This possibility puts powerful pressure on the state to behave properly. For this reason a jury is one of the most important protections of a democracy.

—Robert Precht, “Japan, the Jury,” *The New York Times*, 1 December 2006

13. Without forests, orangutans cannot survive. They spend more than 95 percent of their time in the trees, which, along with vines and termites,

provide more than 99 percent of their food. Their only habitat is formed by the tropical rain forests of Borneo and Sumatra.

—Birute Galdikas, “The Vanishing Man of the Forest,” *The New York Times*, 6 January 2007

14. Omniscience and omnipotence are mutually incompatible. If God is omniscient, he must already know how he is going to intervene to change the course of history using his omnipotence. But that means he can’t change his mind about his intervention, which means he is not omnipotent.

—Richard Dawkins, *The God Delusion* (New York: Houghton Mifflin, 2006)

15. Reason is the greatest enemy that faith has; it never comes to the aid of spiritual things, but more frequently than not struggles against the divine Word, treating with contempt all that emanates from God.

—Martin Luther, *Last Sermon in Wittenberg*, 17 January 1546

3 Recognizing Arguments

Before we can evaluate an argument, we must *recognize* it. We must be able to distinguish argumentative passages in writing or speech. Doing this assumes, of course, an understanding of the language of the passage. However, even with a thorough comprehension of the language, the identification of an argument can be problematic because of the peculiarities of its formulation. Even when we are confident that an argument is intended in some context, we may be unsure about which propositions are serving as its premises and which as its conclusion. As we have seen, that judgment cannot be made on the basis of the order in which the propositions appear. How then shall we proceed?

A. Conclusion Indicators and Premise Indicators

One useful method depends on the appearance of certain common indicators, certain words or phrases that typically serve to signal the appearance of an argument’s conclusion or of its premises. Here is a partial list of **conclusion indicators**:

therefore	for these reasons
hence	it follows that
so	I conclude that
accordingly	which shows that
in consequence	which means that
consequently	which entails that
proves that	which implies that
as a result	which allows us to infer that
for this reason	which points to the conclusion that
thus	we may infer

Conclusion indicator

A word or phrase (such as “therefore” or “thus”) appearing in an argument and usually indicating that what follows it is the conclusion of that argument.

Other words or phrases typically serve to mark the premises of an argument and hence are called **premise indicators**. Usually, but not always, what follows any one of these will be the premise of some argument. Here is a partial list of premise indicators:

since	as indicated by
because	the reason is that
for	for the reason that
as	may be inferred from
follows from	may be derived from
as shown by	may be deduced from
inasmuch as	in view of the fact that

B. Arguments in Context

The words and phrases we have listed may help to indicate the presence of an argument or identify its premises or conclusion, but such indicators do not necessarily appear. Sometimes it is just the meaning of the passage, or its setting, that indicates the presence of an argument. For example, during the intense controversy over the deployment of additional U.S. troops to Iraq in 2007, one critic of that deployment wrote:

As we send our young men and women abroad to bring order to Iraq, many of its so-called leaders have abandoned their posts. We have given the Iraqis an opportunity to iron out their differences and they throw it back in our faces. Iraq does not deserve our help.⁴

No premise indicators or conclusion indicators are used here, yet the argument is clear. Indicators are also absent in the following argument in Sam Harris's *Letter to a Christian Nation*, whose premises and conclusions are unmistakable:

Half the American population believes that the universe is 6,000 years old. They are wrong about this. Declaring them so is not "irreligious intolerance." It is intellectual honesty.⁵

Often, however, the force of an argument can be appreciated only when one understands the *context* in which that argument is presented. For example, the undergraduate admission system of the University of Michigan that gave a fixed number of extra points to all members of certain minority groups was held unconstitutional by the U.S. Supreme Court in *Gratz v. Bollinger* in 2003. Justice Ruth Bader Ginsburg dissented, defending the Michigan system with the following argument:

Universities will seek to maintain their minority enrollment . . . whether or not they can do so in full candor. . . [They] may resort to camouflage. If honesty is the best policy, surely Michigan's accurately described, fully disclosed College affirmative action program is preferable to achieving similar numbers through winks, nods, and disguises.⁶

This argument derives its force from the realization that universities had in fact long disguised their preferential admission programs to avoid attacks based

Premise indicator

In an argument, a word or phrase (like "because" and "since") that normally signals that what follows it are statements serving as premises.

on the equal protection clause of the 14th Amendment to the U.S. Constitution. Chief Justice William Rehnquist's response to Justice Ginsburg's argument is also intelligible only in the context of her defense of the preferential admission system. Rehnquist wrote the following:

These observations are remarkable for two reasons. First, they suggest that universities—to whose academic judgment we are told we should defer—will pursue their affirmative action programs whether or not they violate the United States Constitution. Second, they recommend that these violations should be dealt with, not by requiring the Universities to obey the Constitution, but by changing the Constitution so that it conforms to the conduct of the universities.⁷

Rehnquist's reference to "changing the Constitution" must be understood in light of the fact that the Michigan undergraduate admission system had been held unconstitutional. His reference to the pursuit of affirmative action programs "whether or not they violate the United States Constitution" can best be understood in light of Ginsburg's earlier reference to the possible use of "winks, nods, and disguises."

The full force of argument and counterargument can be grasped, in most circumstances, only with an understanding of the *context* in which those arguments are presented. In real life, context is critical. For example, if you are told that I am bringing a lobster home for dinner, you will have little doubt that I intend to eat it, not feed it.

C. Premises or Conclusions Not in Declarative Form

It is not uncommon for the premises of an argument to be presented in the form of questions. However, if questions assert nothing, and do not express propositions, how is this possible? On the surface they make no assertions; beneath the surface an interrogative sentence can serve as a premise when its question is **rhetorical**—that is, when it suggests or assumes an answer that is made to serve as the premise of an argument. The sentence may be interrogative even though its meaning is declarative.

This use of questions is sometimes obvious, as in a letter dated 7 January 2007 to *The New York Times*, objecting to a new series of U.S. coins that will honor former presidential wives. Irit R. Rasooly wrote:

I am irked by the new set of coins being issued. While some first ladies have influenced our country, should we bestow this honor on people who are unelected, whose only credential is having a prominent spouse?

Plainly, the critic means to affirm the proposition that we should not bestow this honor on such people. He continues:

Wouldn't honoring women who have served as governors, Supreme Court justices or legislators be a more fitting tribute to this nation's women than coins featuring "First Spouses"?

This critic obviously believes that honoring such achievements would be a more fitting tribute, but he again expresses that proposition with a question. His

Rhetorical question

An utterance used to make a statement, but which, because it is in interrogative form and is therefore neither true nor false, does not literally assert anything.

letter also provides an illustration of the need to rely on context to interpret declarative statements that are actually made. The writer's report that he is "irked" by the new set of coins is no doubt true, but this statement is more than a mere description of his state of mind; he means to express the judgment that such a set of coins *ought not* be issued.

Using questions to express a premise is sometimes counterproductive, however, because it may invite answers (by the listener, or silently by the reader) that threaten the conclusion at which the argument aims. For example, the archbishop of the Anglican Church in Nigeria, who is an ardent opponent of homosexuality and views it as deeply sinful, argues thus:

Why didn't God make a lion to be a man's companion? Why didn't He make a tree to be a man's companion? Or better still, why didn't He make another man to be a man's companion? So even from the creation story you can see that the mind of God, God's intention, is for man and woman to be together.⁸

Conclusions drawn about God's intentions, using as premises questions that invite a myriad of different responses, may be undermined by the answers they elicit.

Questions can serve most effectively as premises when the answers assumed really do seem to be clear and inescapable. In such cases the readers (or hearers) are led to provide the apparently evident answers for themselves, thus augmenting the persuasiveness of the argument. Here is an example: Some who find euthanasia morally unacceptable reject the defense of that practice as grounded in the right to self-determination possessed by the terminally ill patient. They argue as follows:

If a right to euthanasia is grounded in self-determination, it cannot reasonably be limited to the terminally ill. If people have a right to die, why must they wait until they are actually dying before they are permitted to exercise that right?⁹

The question is forceful because its answer appears to be undeniable. It seems obvious that there is no good reason why, if people have a right to die grounded in self-determination, they must wait until they are dying to exercise that right. Hence (this critique concludes) the right to euthanasia, if there is one, cannot be limited to the terminally ill. The argument has much merit, but from the perspective of its religious advocates, it may prove to be a two-edged sword.

Arguments that depend on rhetorical questions are always suspect. Because the question is neither true nor false, it may be serving as a device to suggest the truth of some proposition while avoiding responsibility for asserting it. That proposition is likely to be dubious, and it may in fact be false. To illustrate: In 2007 Arab leaders in Jerusalem expressed great anxiety about the safety of the Al-Aqsa mosque when the Israeli government began construction of a ramp leading to the platform (also sacred to the Jews) on which that very holy mosque is

situated. In reviewing the situation, David Gelernter, an Israeli partisan asked: “Is it possible that Arab leaders are more interested in attacking Israel than protecting religious and cultural monuments?”¹⁰ Well, yes, that is possible, of course—but it may not be true, and the question framed in this way is plainly intended to cause the reader to believe that Arab leaders were being duplicitous in voicing their concerns. Did the author assert that such duplicity lay behind the Arab objections? No, he didn’t say that!

Gossip columnists thrive on suggestive questions. Celebrity tidbits commonly appear in the form, “Does Paris Hilton have any talent as an actress?” Similarly, in discussing social issues, rhetorical questions can be an effective method of covert assertion. When riots in France spread through Islamic neighborhoods, many wondered what motivated those rioters. Journalist Christopher Caldwell wrote:

Were they admirers of France’s majority culture, frustrated at not being able to join it on equal terms? Or did they simply aspire to burn to the ground a society they despised?¹¹

Accusers who protect themselves by framing their accusations in interrogative sentences may shield themselves from the indignant complaints of their target. “No,” they may insist, “that is not what I said!”

It is wise policy to refrain from arguing with questions.

In some arguments the conclusion appears in the form of an imperative. The reason, or reasons, we ought to perform a given act are set forth as premises, and we are then directed to act in that way. Thus in Proverbs 4:7 we read:

Wisdom is the principal thing; therefore get wisdom.

Here the second clause is a command, and a command, like a question, is neither true nor false and cannot express a proposition. Therefore, strictly speaking, it cannot be the conclusion of an argument. Nonetheless, it surely is meant to be the conclusion of an argument in this passage from Proverbs. How can we explain this apparent inconsistency? It is useful in many contexts to regard a command as no different from a proposition in which hearers (or readers) are told that they would be wise to act, or ought to act, in the manner specified in the command. Thus the conclusion of the argument in Proverbs may be rephrased as “Getting wisdom is what you should do.” Assertions of this kind may be true or false, as most will agree. What difference there is between a command to do something and a statement that it should be done is an issue that need not be explored here. By ignoring that difference (if there really is one), we are able to deal uniformly with arguments whose conclusions are expressed in this form.

Reformulations of this kind can clarify the roles of an argument’s constituent propositions. It is necessary to grasp the *substance* of what is being asserted, to understand which claims are serving to support which inferences, whatever their external forms. Some needed reformulations are merely grammatical. A

proposition that functions as a premise may take the form of a phrase rather than a declarative sentence. This is well illustrated in the following argumentative passage, whose conclusion is a very sharp criticism of the United States:

What is a failed state? It is one that fails to provide security for the population, to guarantee rights at home or abroad, or to maintain functioning democratic institutions. On this definition the United States is the world's biggest failed state.¹²

The second and third premises of this argument are compressed into phrases, but the propositions for which these phrases are shorthand are clear enough, and their critical role in the author's reasoning is evident.

D. Unstated Propositions

Arguments are sometimes obscure because one (or more) of their constituent propositions is not stated but is assumed to be understood. An illustration will be helpful here. The chair of the Department of Sociology at City College, CUNY, presented two strong but controversial arguments, in parallel, regarding the justifiability of the death penalty. The first premise of each argument is the hypothesis that the factual belief (of the proponent, or of the opponent, of the penalty) about what does in fact deter homicide is mistaken. The second premise of each argument, although entirely plausible, is not stated, leaving the reader the task of reconstructing it.

The first argument went like this:

If the proponent of the death penalty is incorrect in his belief that the [death] penalty deters homicide, then he is responsible for the execution of murderers who should not be executed.¹³

This argument relies on the unstated second premise: "No one should be executed to advance an objective that is not promoted by execution." Hence one who *mistakenly* believes that the objective (detering murders) is achieved by executing those convicted is responsible for the execution of murderers who should not be executed.

The second argument went like this:

If the opponent of the death penalty is incorrect in his belief that the death penalty doesn't deter, he is responsible for the murder of innocent individuals who would not have been murdered if the death penalty had been invoked.¹⁴

This argument relies on the unstated second premise: "Protecting the lives of innocent individuals from murder justifies the execution of murderers if other murderers are then deterred by the fear of execution." Hence one who *mistakenly* believes that the death penalty does not deter murderers is responsible for the lives of innocents who are subsequently murdered.

In each of these arguments the assumed but unstated second premise is plausible. One might find both arguments persuasive—leaving open for empirical investigation the question of whether, in fact, the death penalty does deter murder.

However, the force of each of the arguments depends on the truth of the unstated premise on which it relies.

A premise may be left unstated because the arguer supposes that it is unquestioned common knowledge. In the controversy over the cloning of human beings, one angry critic wrote:

Human cloning—like abortion, contraception, pornography and euthanasia—is intrinsically evil and thus should never be allowed.¹⁵

This is plainly an argument, but part of it is missing. The argument relies on the very plausible but unstated premise that “what is intrinsically evil should never be allowed.” Arguments in everyday discourse very often rely on some proposition that is understood but not stated. Such arguments are called **enthymemes**.

The unstated premise on which an enthymeme relies may not be universally accepted; it may be uncertain or controversial. An arguer may deliberately refrain from formulating that critical premise, believing that by allowing it to remain tacit, the premise is shielded from attack. For example, medical research using embryonic stem cells (cells found in the human embryo that can develop into other types of cells and into most types of tissue) is highly controversial. One U.S. senator used the following enthymeme in attacking legislation that would permit government financing of such research:

This research [involving the use of embryonic stem cells] is illegal, for this reason: The deliberate killing of a human embryo is an essential component of the contemplated research.¹⁶

The stated premise is true: Research of this kind is not possible without destroying the embryo. However, the conclusion that such research is illegal depends on the unstated premise that the killing of a human embryo is illegal—and *that* claim is very much in dispute.

The effectiveness of an enthymeme may depend on the hearer’s knowledge that some proposition is false. To emphasize the falsity of some proposition, a speaker may construct an argument in which the first premise is a hypothetical proposition of which the antecedent (the “if” component), is the proposition whose falsity the speaker wishes to show, and the consequent (the “then” component) is a proposition known by everyone to be false. The unstated falsehood of this second component is the second premise of the enthymematic argument. The unstated falsehood of the first component is the conclusion of the argument. To illustrate: The distinguished political philosopher John Rawls admired Abraham Lincoln as the president who most appreciated the moral equality of human beings. Rawls frequently quoted Lincoln’s enthymematic argument, “If slavery is not wrong, nothing is wrong.”¹⁷ It is of course wildly false to say that nothing is wrong—from which it follows that it is equally false to say that slavery is not wrong. Similarly, distinguished psychiatrist Bruno Bettelheim, survivor of both Dachau and Buchenwald, wrote: “If all men are good, then there never was an Auschwitz.”

Enthymeme

An argument that is stated incompletely, the unstated part of it being taken for granted.

4 Arguments and Explanations

Passages that appear to be arguments are sometimes not arguments but *explanations*. The appearance of words that are common indicators—such as “because,” “for,” “since,” and “therefore”—cannot settle the matter, because those words are used both in explanations and in arguments (although “since” can sometimes refer to temporal succession). We need to know the intention of the author. Compare the following two passages:

1. Lay up for yourselves treasures in heaven, where neither moth nor rust consumes and where thieves do not break in and steal. For where your treasure is, there will your heart be also.

—Matt. 7:19

2. Therefore is the name of it [the tower] called Babel; because the Lord did there confound the language of all the earth.

—Gen. 11:19

The first passage is clearly an argument. Its conclusion, that one ought to lay up treasures in heaven, is supported by the premise (here marked by the word “for”) that one’s heart will be where one’s treasure is laid up. The second passage, which uses the word “therefore” quite appropriately, is not an argument. It *explains* why the tower (whose construction is recounted in Genesis) is called Babel. The tower was given this name, we are told, because it was the place where humankind, formerly speaking one language, became confounded by many languages—the name is derived from a Hebrew word meaning “to confound.” The passage assumes that the reader knows that the tower had that name; the intention is to explain why that name was given to it. The phrase, “Therefore is the name of it called Babel,” is not a conclusion but a completion of the explanation of the naming. In addition, the clause, “because the Lord did there confound the language of all the earth,” is not a premise; it could not serve as a reason for believing that Babel was the name of the tower, because the fact that that *was* the name is known by those to whom the passage is addressed. In this context, “because” indicates that what follows will *explain* the giving of that name, Babel, to that tower.

These two passages illustrate the fact that superficially similar passages may have very different functions. Whether some passage is an argument or an explanation depends on the *purpose* to be served by it. If our aim is to establish the truth of some proposition, *Q*, and we offer some evidence, *P*, in support of *Q*, we may appropriately say “*Q* because *P*.” In this case we are giving an argument *for* *Q*, and *P* is our premise. Alternatively, suppose that *Q* is known to be true. In that case we don’t have to give any reasons to support its truth, but we may wish to give an account of *why* it is true. Here also we may say “*Q* because *P*”—but in this case we are giving not an argument *for* *Q*, but an explanation *of* *Q*.

In responding to a query about the apparent color of quasars (celestial objects lying far beyond our galaxy), one scientist wrote:

The most distant quasars look like intense points of infrared radiation. This is because space is scattered with hydrogen atoms (about two per cubic meter) that absorb blue light, and if you filter the blue from visible white light, red is what's left. On its multibillion-light-year journey to earth quasar light loses so much blue that only infrared remains.¹⁸

The author is not seeking to convince his reader that quasars have the apparent color they do, but rather giving the causes of this fact; he is explaining, not arguing.

However, it may be difficult at times to determine whether an author intends to be explaining some state of affairs, or to be arguing for some conclusion that is critical in that explanation. Here, for example, is a passage that may be interpreted in either way.

I would like to highlight another property of water, unique but also vital to making life on Earth possible. As water cools, approaching its freezing point, its density suddenly decreases, reversing the usual "natural convection" patterns in which colder fluids sink. This reversal causes the coldest strata of water to rise to the top of an ocean or lake. These large bodies of water now freeze from the top down. Were it not for this unique property of water, the oceans and lakes would have long and completely frozen over from the bottom up with dire consequences for any life-sustaining liquid water on Earth.¹⁹

More than one conclusion may be inferred from the same premise, thus presenting two arguments. Similarly, more than one thing may be accounted for by the same fact, thus presenting two explanations. Here is an illustration:

The *Oxford English Dictionary* is a historical dictionary, providing citations meant to show the evolution of every word, beginning with the earliest known usage. Therefore, a key task, and a popular sport for thousands of volunteer word aficionados, is antedating: finding earlier citations than those already known.²⁰

That antedating is a key task for the makers of that dictionary is accounted for by the fact that the *Oxford English Dictionary* is a *historical* dictionary. This fact about the dictionary also explains why, for word aficionados, antedating is a popular sport.

If an author writes "Q because P," how can we tell whether he intends to explain or to persuade? We can ask: What is the status of Q in that context? Is Q a proposition whose truth needs to be established or confirmed? In that case, "because P" is probably offering a premise in its support; "Q because P" is in that instance an argument. Or is Q a proposition whose truth is known, or at least not in doubt in that context? In that case, "because P" is probably offering some account of why Q has come to be true; "Q because P" is in that instance an explanation.

In an explanation, one must distinguish *what* is being explained from what the explanation *is*. In the explanation from Genesis given at the beginning of this section, what is being explained is how the tower of Babel came to have that name; the explanation is that it was there that the Lord did confound the language of all the Earth. In the astronomical example given subsequently, what is

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