

INTRODUCTION TO LOGIC

THIRTEENTH EDITION

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3.1 Language Functions

We reason using language, manipulating propositions in a logical or *informative* spirit. But language is used in a great variety of ways, only some of which are informative. Without the intention to inform, we may *express* ourselves using language: "That's really great!" we may say; and the poet, overcome by the beauty of an ancient city, channels his emotions in writing these lines:

Match me such marvel, save in Eastern clime—
A rose-red city—"half as old as time."¹

Of course, some expressive discourse also has informative content, and may express attitudes as well as beliefs.

Grow old along with me!
The best is yet to be,
The last of life for which the first was made²

Moreover, some discourse is *directive*, with or without expressive or informative elements. It seeks to guide or to command. "Step on the scale, please," we may be told. Or we may receive this good advice:

"Drive defensively. The cemetery is full of law-abiding citizens who had the right of way."

A mixture of functions is a natural feature of almost all our uses of language. We can see this in our own speech and writing. *Emotive* language may be used to advance our purposes in directing others: "That conduct is utterly

disgusting!" says parent to child, expressing an attitude, seeking to direct behavior, and (with those same words) probably reporting a fact. We may say that language has three major functions:

1. *Informative*
2. *Expressive*
3. *Directive*

To these we may add less common types of use:

4. *Ceremonial* language (as when we say, "How do you do?" upon being introduced to a stranger), in which words may combine expressive and other functions; and
5. *Performative* language (as when we say, "I apologize for my foolish remark,"), in which words themselves serve, when spoken or written, to perform the function they announce. Other examples are "I congratulate you, . . ." "I accept your offer, . . ." and "I promise you that. . . ."

When we reason—affirm or deny propositions, formulate or evaluate arguments, and so on—it is the informative use of language that is our principal concern.

The *uses* of language must be distinguished from the *forms* of language. The several uses of language (informative, expressive, etc.) are implemented using different forms. Sentences (the units of our language that express complete thoughts) may be *declarative* in form, or *exclamatory*, or *imperative*, or *interrogative*. When we are reasoning, our sentences are usually declarative; when we are expressing emotion, our sentences (e. g., "That's fantastic!") are often exclamatory. When we are seeking to direct conduct our sentences (e.g., "Take off your pants!") are likely to be imperative in form. But there is no strict correlation between function and form.

We saw earlier that a premise may be affirmed by asking a rhetorical question, but attitudes also may be expressed using an interrogative form: (e.g., "What can you possibly mean by that?"). Similarly, a directive function may be served by reporting a fact in declarative mode, as when we cause a companion to move more quickly by saying, "Good heavens, it's late!"

It would be convenient if a given function were invariably executed using language in some specific grammatical form, but that is simply not the case: Language is too loose and its uses too variable to expect that. In determining the real function of a sentence, therefore, context is again critical.

In the informative mode, we distinguish between facts a sentence formulates and facts about the speaker who formulates them. If someone says, "War is always the wrong solution to international conflict," that may indeed be true, but it is also evidence of the *beliefs* of the person who utters that remark.

When someone says, "I strongly oppose our involvement in this war on moral grounds," that is a statement (probably true) about the speaker, but it also serves to express a judgment about the morality of the war under discussion. To open an argument with a statement of one's own views is by no means deceptive; it is one of the common ways in which judgment and biographical report are appropriately integrated.

However, the combination of functions is in some cases not appropriate, and the clash can create troubling controversy. Here is a famous example: Protesting the military draft during the Vietnam War, a young man was arrested in the Los Angeles County Courthouse for wearing a jacket on which a deliberate obscenity was emblazoned; he was convicted of "offensive conduct" under the California penal code. But the recognition of very natural tension that sometimes arises between the different functions of language led to his ultimate exculpation by the United States Supreme Court. Justice John Harlan wrote:

[M]uch linguistic expression serves a dual communicative function: it conveys not only ideas capable of relatively precise, detached explication, but otherwise inexpressible emotions as well. In fact, words are often chosen as much for their emotive as their cognitive force. We cannot sanction the view that the Constitution, while solicitous of the cognitive content of individual speech, has little or no regard for that emotive function which, practically speaking, may often be the more important element of the message sought to be communicated. . . . and in the same vein, we cannot indulge the facile assumption that one can forbid particular words without also running a substantial risk of suppressing ideas in the process.³

Appellate courts can be very wise. Being sensitive to the flexibility of language and recognizing the different functions served by language in a given context are necessary precursors to the application of the logical analysis that is our central concern in this book.

In summary, the principal uses of language are three: informative, expressive, and directive; the grammatical forms of language are essentially four: declarative, interrogative, imperative, and exclamatory. There is no sure connection between the grammatical form of a passage and the use or uses its author intends. Language that serves any one of the three principal functions may take any one of the four grammatical forms.

EXERCISES

A. Which of the various functions of language are exemplified by each of the following passages?

1. Check the box on line 6a unless your parent (or someone else) can claim you as a dependent on his or her tax return.

—U.S. Internal Revenue Service, "Instructions," Form 1040, 2006

2. 'Twas brillig, and the slithy toves
Did gyre and gimble in the wabe;
All mimsy were the borogoves,
And the mome raths outgrabe.

—Lewis Carroll, *Through the Looking Glass*, 1871

3. What traveler among the ruins of Carthage, of Palmyra, Persepolis, or Rome, has not been stimulated to reflections on the transiency of kingdoms and men, and to sadness at the thought of a vigorous and rich life now departed. . . ?

—G. W. F. Hegel,
Lectures on the Philosophy of History, 1823

4. Moving due south from the center of Detroit, the first foreign country one encounters is not Cuba, nor is it Honduras or Nicaragua or any other Latin American nation; it is Canada.

5. I was a child and she was a child,
In this kingdom by the sea,
But we loved with a love that was more than love—
I and my Annabel Lee—

—Edgar Allan Poe, "Annabel Lee," 1849

6. Reject the weakness of missionaries who teach neither love nor brotherhood, but chiefly the virtues of private profit from capital, stolen from your land and labor. Africa awake, put on the beautiful robes of Pan-African Socialism!

—W. E. B. Dubois, "Pan-Africa," 1958

7. If I speak in the tongues of men and of angels, but have not love, I am a noisy gong or a clanging cymbal.

—I Cor. 13:1

8. I herewith notify you that at this date and through this document I resign the office of President of the Republic to which I was elected.

—President Fernando Collor De Mello,
in a letter to the Senate of Brazil, 29 December 1992

9. American life is a powerful solvent. It seems to neutralize every intellectual element, however tough and alien it may be, and to fuse it in the native good will, complacency, thoughtlessness, and optimism.

—George Santayana, *Character and Opinion in the United States*, 1934

10. The easternmost point of land in the United States—as well as the northernmost point and the westernmost point—is in Alaska.

B. What language functions are most probably *intended* to be served by each of the following passages?

1. There is no caste here. Our Constitution is color-blind, and neither knows nor tolerates classes among citizens. In respect of civil rights, all citizens are equal before the law. The humblest is the peer of the most powerful.

—Justice John Harlan, dissenting in *Plessy v. Ferguson*, 163 U.S. 537, 1896

2. Judges do not know how to rehabilitate criminals—because no one knows.

—Andrew Von Hirsch,
Doing Justice—The Choice of Punishment (New York: Hill & Wang, 1976)

3. When tillage begins, other arts follow. The farmers therefore are the founders of human civilization.

—Daniel Webster, “On Agriculture,” 1840

4. The only thing necessary for the triumph of evil is for good men to do nothing.

—Edmund Burke, letter to William Smith, 1795

5. They have no lawyers among them, for they consider them as a sort of people whose profession it is to disguise matters.

—Sir Thomas More, *Utopia*, 1516

6. White society is deeply implicated in the ghetto. White institutions created it, white institutions maintain it, and white society condones it.

—The National Commission on Civil Disorders
(Kerner Commission), 1968

7. The bad workmen who form the majority of the operatives in many branches of industry are decidedly of the opinion that bad workmen ought to receive the same wages as good.

—John Stuart Mill, *On Liberty*, 1859

8. War is the greatest plague that can afflict humanity; it destroys religion, it destroys states, it destroys families. Any scourge is preferable to it.

—Martin Luther, *Table Talk*, 1566

9. Human history becomes more and more a race between education and catastrophe.

—H. G. Wells, *The Outline of History*, 1920

10. The man who insists upon seeing with perfect clearness before he decides, never decides.

—Henri-Frederic Amiel, *Amiel's Journal*, 1885

11. Among other evils which being unarmed brings you, it causes you to be despised.

—Niccolò Machiavelli, *The Prince*, 1515

12. Eternal peace is a dream, and not even a beautiful one. War is a part of God's world order. In it are developed the noblest virtues of man: courage and abnegation, dutifulness and self-sacrifice. Without war the world would sink into materialism.

—Helmuth Von Moltke, 1892

13. Language! the blood of the soul, sir, into which our thoughts run, and out of which they grow.

—Oliver Wendell Holmes, *The Autocrat of the Breakfast-Table*, 1858

14. Over the past 133 years, more than 7,500 scientists, including social scientists, have been elected to the National Academy of Sciences. It appears that only three of them have been black.

—*The Journal of Blacks in Higher Education*, Summer 1996

15. A little philosophy inclineth man's mind to atheism; but depth in philosophy bringeth man's mind about to religion.

—Francis Bacon, *Essays*, 1601

16. You'll never have a quiet world until you knock the patriotism out of the human race.

—George Bernard Shaw, *O'Flaherty, V.C.*, 1915

17. If [he] does really think that there is no distinction between virtue and vice, why, sir, when he leaves our houses let us count our spoons.

—Samuel Johnson, 1763

18. Man scans with scrupulous care the character and pedigree of his horses, cattle, and dogs before he matches them; but when he comes to his own marriage he rarely, or never, takes any such care.

—Charles Darwin, *The Descent of Man*, 1871

19. The story of the whale swallowing Jonah, though a whale is large enough to do it, borders greatly on the marvelous; but it would have approached nearer to the idea of miracle if Jonah had swallowed the whale.

—Thomas Paine, *The Age of Reason*, 1796

20. The notion of race is the hydra-headed monster which stifles our most beautiful dreams before they are fairly dreamt, calling us away from the challenges of normal human interaction to a dissonance of suspicion and hatred in pursuit of a fantasy that never was.

—C. Eric Lincoln, *Coming Through the Fire*
(Durham, NC: Duke University Press, 1996)

C. For the following passages, indicate what propositions they may be intended to assert, if any; what overt actions they may be intended to cause, if any; and what they may be regarded as providing evidence for about the speaker, if anything.

1. I will not accept if nominated and will not serve if elected.

—William Tecumseh Sherman, message
to the Republican National Convention, 1884

2. The government in its wisdom considers ice a "food product." This means that Antarctica is one of the world's foremost food producers.

—George P. Will

3. Mankind has grown strong in eternal struggles and it will only perish through eternal peace.

—Adolf Hitler, *Mein Kampf*, 1925

4. Without music, earth is like a barren, incomplete house with the dwellers missing. Therefore the earliest Greek history and Biblical history, nay the history of every nation, begins with music.

—Ludwig Tieck, quoted in Paul Henry Lang,
Music in Western Civilization (New York: W. W. Norton, 1941)

5. Research is fundamentally a state of mind involving continual reexamination of doctrines and axioms upon which current thought and action are based. It is, therefore, critical of existing practices.

—Theobald Smith, *American Journal of Medical Science*, 1929

6. I have tried sedulously not to laugh at the acts of man, nor to lament them, nor to detest them, but to understand them.

—Baruch Spinoza, *Tractatus Theologico-politicus*, 1670

7. Of what use is political liberty to those who have no bread? It is of value only to ambitious theorists and politicians.

—Jean-Paul Marat, *L' Ami du peuple*, 1789

8. While there is a lower class I am in it, while there is a criminal element I am of it, and while there is a soul in prison I am not free.

—Eugene Debs, 1918

9. If there were a nation of gods they would be governed democratically, but so perfect a government is not suitable to men.

—Jean-Jacques Rousseau, *The Social Contract*, 1762

10. There are three classes of citizens. The first are the rich, who are indolent and yet always crave more. The second are the poor, who have nothing, are full of envy, hate the rich, and are easily led by demagogues. Between the two extremes lie those who make the state secure and uphold the laws.

—Euripides, *The Suppliant Women*

11. I am convinced that turbulence as well as every other evil temper of this evil age belongs not to the lower but to the middle classes—those middle classes of whom in our folly we are so wont to boast.

—Lord Robert Cecil, *Diary in Australia*, 1852

12. God will see to it that war shall always recur, as a drastic medicine for ailing humanity.

—Heinrich Von Treitschke, *Politik*, 1916

13. I would rather that the people should wonder why I wasn't President than why I am.

—Salmon P. Chase, at the Republican National Convention, 1860

14. He [Benjamin Disraeli] is a self-made man, and worships his creator.

—John Bright, 1882

15. We hear about constitutional rights, free speech and the free press. Every time I hear these words I say to myself, "That man is a Red, that man is a Communist." You never heard a real American talk in that manner.

—Frank Hague, speech before the Jersey City Chamber of Commerce,
12 January 1938

16. Even a fool, when he holdeth his peace, is counted wise: And he that shutteth his lips is esteemed a man of understanding.

—Prov. 17:28

17. A word fitly spoken is like apples of gold in ornaments of silver.

—Prov. 25:11

18. I have sworn upon the altar of God eternal hostility against every form of tyranny over the mind of man.

—Thomas Jefferson, 1800

19. A free man thinks of nothing less than of death, and his wisdom is not a meditation upon death but upon life.

—Baruch Spinoza, *Ethics*, 1677

20. I have seen, and heard, much of Cockney impudence before now; but never expected to hear a coxcomb ask two hundred guineas for flinging a pot of paint in the public's face.

—John Ruskin, on Whistler's painting, "Nocturne in Black and Gold," 1878

3.2 Emotive Language, Neutral Language, and Disputes

Because a given sentence, or passage, can serve several functions—that is, for example, it can express feelings while reporting facts—the clever use of language can be deceptive or manipulative, and the careless use of language can lead to needless misunderstanding and dispute.

The words we use to convey *beliefs* may be neutral and exact, but they may also have (by accident or by design) an impact on the *attitudes* of our listeners. A rose by any other name would smell as sweet (as Shakespeare wrote), but our response to a flower is likely to be influenced if we are told, as it is handed to us, that it is commonly called "skunkweed." The negative attitudes that are commonly evoked by some words lead to the creation of *euphemisms* to replace them—gentle words for harsh realities. Janitors become "maintenance workers," and then "custodians." "Waiters" become "waitpersons," and then "servers,"—and so on.

The medical vocabulary dealing with human reproduction and elimination is neutral and not offensive, but the four-letter words that are vulgar synonyms of those medical terms are shocking to many because of the attitudes they evoke. There are "seven dirty words" that may not be used on the broadcast media in the United States—because they have unacceptable emotive meanings that are sharply distinguishable from their literal meanings.⁴

Emotionally colored language is appropriate in some contexts—in poetry for example—but it is highly inappropriate in other contexts—in survey research, for example. The responses to a survey will certainly depend in good measure on the words used in asking the questions. Whether we should avoid emotive language, or rely on it, depends on the purpose language is intended to serve in the context. If we aim to provide an unbiased report of facts, we undermine that objective if we use words that are heavily charged with emotional meaning. Sometimes, however, it is nearly impossible to avoid some emotive content—such as when those in conflict about the morality of abortion call themselves either "pro-life," or "pro-choice." In logic we generally strive for

language that is, so far as possible, free of the distortion that emotive meanings introduce.

Playing on the emotions of readers and listeners is a central technique in the advertising industry. When the overriding aims are to persuade and sell, manipulating attitudes becomes a sophisticated professional art. Rhetorical tricks are also common in political campaigns, and the choice of words is critical. The best defense against trickery, for voters as for consumers, is an awareness of the real uses to which the language before us is being put. We must be on guard against those who use words to make the worse appear the better cause. "With words," said Benjamin Disraeli, "we govern men."

When parties are in dispute, the differences between them that lead to that dispute may be disagreements in beliefs about the facts, or disagreements in attitude about facts that are actually agreed upon. This uncertainty, and the confusion to which it can lead, may arise because the words being used in the dispute have very different emotive meanings. To illustrate this, imagine a dispute between X and Y about legislation authorizing the death penalty for murder. X and Y may agree or disagree about the facts: whether capital punishment really is an effective deterrent to murder. They may also agree or disagree about whether it is right for the state to execute criminals, whatever may be the facts about its deterrent effectiveness. So it is possible that they could agree about factual beliefs but disagree in their attitudes, or they might agree in their attitudes but disagree about their beliefs. It is also possible, of course, that they disagree both in attitude and in belief.

When we seek to resolve disputes that have both factual and emotional aspects, it is important to determine what really is at issue between the disputing parties. If the disagreement truly is one about whether the death penalty deters in fact, then resolution of the dispute will require, first of all, an effort to determine those facts objectively—although this may not be easy to do. If, on the other hand, the disagreement arises from conflicting convictions about the rightness of state-authorized executions, whether or not the death penalty deters, coming to agreement about the facts is likely to prove insufficient to resolve the dispute.

In many cases a disagreement in attitude about some event or possible outcome is rooted in a disagreement in some belief about facts; in other cases it is not. One of the greatest of all football coaches and one of the greatest of all writers on sports differed profoundly about the importance of winning. Wrote the journalist, Grantland Rice:

For when the One Great Scorer comes
To write against your name.
He marks—not that you won or lost—
But how you played the game.

Said the coach, Vince Lombardi:

Winning isn't everything. It's the only thing.

Do you believe that this disagreement in attitude was rooted in a disagreement in belief?

Of course we do not reach agreement simply by recognizing the nature of the dispute. But until we recognize the real nature of a dispute, and the differing functions of the language used by the conflicting parties, it is unlikely that the resolution of differences can be achieved.

EXERCISES

Identify the kinds of agreement or disagreement most probably exhibited by the following pairs.

1. a. Answer a fool according to his folly,
Lest he be wise in his own conceit.

—Prov. 26:5

- b. Answer not a fool according to his folly,
Lest thou also be like unto him.

—Prov. 26:4

2. a. Our country: in her intercourse with foreign nations may she
always be in the right; but our country, right or wrong!
—Stephen Decatur, toast at a dinner in Norfolk, Virginia, April 1816

- b. Our country, right or wrong. When right, to be kept right; when
wrong, to be put right.

—Carl Schurz, speech in the U.S. Senate, January 1872

3. a. A bad peace is even worse than war.

—Tacitus, *Annals*

- b. The most disadvantageous peace is better than the most just
war.

—Desiderius Erasmus, *Adagia*, 1539

4. a. A stitch in time saves nine.

- b. Better late than never.

5. a. Absence makes the heart grow fonder.

- b. Out of sight, out of mind.

6. a. The race is not to the swift, nor the battle to the strong.

—Eccl. 9:11

- b. But that's the way to bet.

—Jimmy the Greek

7. a. For that some should rule and others be ruled is a thing not only necessary, but expedient; from the hour of their birth, some are marked out for subjection, others for rule. . . . It is clear, then, that some men are by nature free, and others slaves, and that for these latter slavery is both expedient and right.

—Aristotle, *Politics*

- b. If there are some who are slaves by nature, the reason is that men were made slaves against nature. Force made the first slaves, and slavery, by degrading and corrupting its victims, perpetuated their bondage.

—Jean-Jacques Rousseau, *The Social Contract*, 1762

8. a. War alone brings up to its highest tension all human energy and puts the stamp of nobility upon the peoples who have the courage to face it.

—Benito Mussolini, *Encyclopedia Italiana*, 1932

- b. War crushes with bloody heel all justice, all happiness, all that is Godlike in man. In our age there can be no peace that is not honorable; there can be no war that is not dishonorable.

—Charles Sumner, *Addresses on War*, 1904

9. a. Next in importance to freedom and justice is popular education, without which neither freedom nor justice can be permanently maintained.

—James A. Garfield, 1880

- b. Education is fatal to anyone with a spark of artistic feeling. Education should be confined to clerks, and even them it drives to drink. Will the world learn that we never learn anything that we did not know before?

—George Moore, *Confessions of a Young Man*, 1888

10. a. Belief in the existence of god is as groundless as it is useless. The world will never be happy until atheism is universal.

—J. O. La Mettrie, *L'Homme Machine*, 1865

- b. Nearly all atheists on record have been men of extremely debauched and vile conduct.

—J. P. Smith, *Instructions on Christian Theology*

11. a. I know of no pursuit in which more real and important services can be rendered to any country than by improving its agriculture, its breed of useful animals, and other branches of a husbandman's cares.

—George Washington, letter to John Sinclair

- b. With the introduction of agriculture mankind entered upon a long period of meanness, misery, and madness, from which they are only now being freed by the beneficent operations of the machine.

—Bertrand Russell, *The Conquest of Happiness*, 1930

12. a. Whenever there is, in any country, uncultivated land and unemployed poor, it is clear that the laws of property have been so far extended as to violate natural right.

—Thomas Jefferson

- b. Every man has by nature the right to possess property of his own. This is one of the chief points of distinction between man and the lower animals.

—Pope Leo XIII, *Rerum Novarum*, 1891

13. a. The right of revolution is an inherent one. When people are oppressed by their government, it is a natural right they enjoy to relieve themselves of the oppression, if they are strong enough, either by withdrawal from it, or by overthrowing it and substituting a government more acceptable.

—Ulysses S. Grant, *Personal Memoirs*, vol. 1

- b. Inciting to revolution is treason, not only against man, but against God.

—Pope Leo XIII, *Immortale Dei*, 1885

14. a. Language is the armory of the human mind; and at once contains the trophies of its past, and the weapons of its future conquests.

—Samuel Taylor Coleridge

- b. Language—human language—after all, is little better than the croak and cackle of fowls, and other utterances of brute nature—sometimes not so adequate.

—Nathaniel Hawthorne, *American Notebooks*, 1835

15. a. How does it become a man to behave towards the American government today? I answer, that he cannot without disgrace be associated with it.

—Henry David Thoreau, *An Essay on Civil Disobedience*, 1849

- b. With all the imperfections of our present government, it is without comparison the best existing, or that ever did exist.

—Thomas Jefferson

3.3 Disputes and Ambiguity

Many disputes, whether about beliefs or about attitudes, are genuine. However, some disputes are merely verbal, arising only as a result of linguistic misunderstanding. The terms used by the disputing parties may have more than one meaning—they may be *ambiguous*—but such ambiguity may be unrecognized by the disputing parties. To uncover and to resolve verbal disagreements, ambiguities must be identified, and the alternative meanings of the critical terms in the dispute must be distinguished and clarified.

Disputes fall into three categories. The first is the *obviously genuine dispute*. If A roots for the Yankees, and B for the Red Sox, they are in genuine disagreement, although they disagree mainly in attitude. If C believes that Miami is south of Honolulu, and D denies this, they too are in genuine disagreement, but in this dispute about geographic facts a good map can settle the matter.

A second category is disputes in which the apparent conflict is not genuine and can be resolved by coming to agreement about how some word or phrase is to be understood. These may be called *merely verbal disputes*. F may hold that a tree falling in the wilderness with no person to hear it creates no sound, while G insists that a sound really is produced by the falling tree. If a “sound” is the outcome of a human auditory sensation, then F and G may agree that there was none; or if a “sound” is simply what is produced by vibrations in the air, then they may agree that a sound was indeed produced. Getting clear about what is meant by “sound” will resolve the disagreement, which was no more than verbal.

A third category, more slippery, is disputes that are *apparently verbal but really genuine*. A misunderstanding about the use of terms may be involved in such cases, but when that misunderstanding has been cleared up there remains a disagreement that goes beyond the meanings of the words. For example, should a film in which explicit sexual activity is depicted be considered “pornography”? J holds that its explicitness makes it pornographic and offensive; K holds that its beauty and sensitivity make it art and not pornography. Plainly they disagree about what “pornography” means—but after that

ambiguity has been exposed, it is likely that the parties will still disagree in their judgment of that film. Whether the film is “pornographic” may be settled by a definition of that term, but a deeper disagreement is then likely to be exposed. The word “pornographic” plainly carries pejorative associations. J, who finds the film objectionable, understands the word “pornographic” in one way, while K, who approves of the film, uses the word “pornographic” differently. Does the sexually explicit content of the film make it objectionable and thus “pornographic”? J and K differ in their uses of the word, but for both of them the emotional meaning of the word is very negative; and they also differ about the criteria for the application of that negative word, “pornography.”

In summary, when confronting a dispute that arises in discourse, we must first ask whether there is some ambiguity that can be eliminated by clarifying the alternative meanings in play. If there is, then we must ask whether clearing up that linguistic issue will resolve the matter. If it does, the dispute was indeed merely verbal. If it does not, the dispute was genuine, although it may have appeared to be merely verbal.

EXERCISES

A. Identify three disagreements in current political or social controversy that are of the three types described in this section: one that is genuine, one that is merely verbal, and one that is apparently verbal but really genuine. Explain the disagreements in each case.

B. Discuss each of the following disputes. If the dispute is obviously genuine, indicate each of the disputers' positions with respect to the proposition at issue. If it is merely verbal, resolve it by explaining the different senses attached by the disputers to the key word or phrase that is used ambiguously. If it is an apparently verbal dispute that is really genuine, locate the ambiguity and explain the real disagreement involved.

1. **Daye:** Pete Rose was the greatest hitter in the history of baseball. He got more hits than any other major league player.
Knight: No, Barry Bonds deserves that title. He hit more home runs than any other major league player.
2. **Daye:** Despite their great age, the plays of Sophocles are enormously relevant today. They deal with eternally recurring problems and values such as love and sacrifice, the conflict of generations, life and death—as central today as they were over two thousand years ago.
Knight: I don't agree with you at all. Sophocles has nothing to say about the pressing and immediate issues of our time:

- inflation, unemployment, the population explosion, and the energy crisis. His plays have no relevance to today.
3. **Daye:** Bob Jones is certainly a wonderful father to his children. He provides a beautiful home in a fine neighborhood, buys them everything they need or want, and has made ample provision for their education.
- Knight:** I don't think Bob Jones is a good father at all. He is so busy getting and spending that he has no time to be with his children. They hardly know him except as somebody who pays the bills.
4. **Daye:** Amalgamated General Corporation's earnings were higher than ever last year, I see by reading their annual report.
- Knight:** No, their earnings were really much lower than in the preceding year, and they have been cited by the Securities and Exchange Commission for issuing a false and misleading report.
5. **Daye:** Business continues to be good for National Conglomerate, Inc. Their sales so far this year are 25 percent higher than they were at this time last year.
- Knight:** No, their business is not so good now. Their profits so far this year are 30 percent lower than they were last year at this time.
6. **Daye:** Ann is an excellent student. She takes a lively interest in everything and asks very intelligent questions in class.
- Knight:** Ann is one of the worst students I've ever seen. She never gets her assignments in on time.
7. **Daye:** Tom did it of his own free will. No pressure was brought to bear on him; no threats were made; no inducements were offered; there was no hint of force. He deliberated about it and made up his own mind.
- Knight:** That is impossible. Nobody has free will, because everything anyone does is inevitably determined by heredity and environment according to inexorable causal laws of nature.
8. **Daye:** Professor Graybeard is one of the most productive scholars at the university. The bibliography of his publications is longer than that of any of his colleagues.
- Knight:** I wouldn't call him a productive scholar. He is a great teacher, but he has never produced any new ideas or discoveries in his entire career.

9. **Daye:** Betty finally got rid of that old Chevy and bought herself a new car. She's driving a Buick now.
- Knight:** No, Betty didn't buy herself a new car. That Buick is a good three years old.
10. **Daye:** Dick finally got rid of that old Ford of his and bought himself a new car. He's driving a Pontiac now.
- Knight:** No, Dick didn't buy himself a new car. It's his roommate's new Pontiac that he's driving.
11. **Daye:** Helen lives a long way from campus. I walked out to see her the other day, and it took me nearly two hours to get there.
- Knight:** No, Helen doesn't live such a long way from campus. I drove her home last night, and we reached her place in less than ten minutes.
12. **Daye:** Senator Gray is a fine man and a genuine liberal. He votes for every progressive measure that comes before the legislature.
- Knight:** He is no liberal, in my opinion. The old skinflint contributes less money to worthy causes than any other man in his income bracket.
13. **Daye:** The University of Winnemac overemphasizes athletics, for it has the largest college stadium in the world and has constructed new sports buildings instead of badly needed classroom space.
- Knight:** No, the University of Winnemac does not overemphasize athletics. Its academic standards are very high, and it sponsors a wide range of extracurricular activities for students in addition to its athletic program.
14. **Daye:** It was in bad taste to serve roast beef at the banquet. There were Hindus present, and it is against their religion to eat beef.
- Knight:** Bad taste, nothing! That was the tastiest meal I've had in a long time. I think it was delicious!
15. **Daye:** Don't ask your wife about it. You ought to use your own judgment.
- Knight:** I will use my own judgment, and in my judgment, I should ask my wife.

3.4 Definitions and Their Uses

Good definitions are plainly very helpful in eliminating verbal disputes, but there are other uses of definition that are important in logic. Before distinguishing these uses, one feature of all definitions must be emphasized: Definitions are definitions of *symbols* (not of objects), because only symbols *have* the meanings that definitions may explain. To illustrate, we can define the word "chair" because it has meaning; but a chair itself we cannot define. We can sit on a chair, or paint it, or burn it, or describe it—but we cannot define it because an actual chair is not a symbol that has a meaning to be explained. Sometimes we say, misleadingly, that the thing is being defined; in fact, what we *define* are always *symbols*.

Two commonly used technical terms are useful in discussing definitions. The **definiendum** is the symbol being defined. The **definiens** is the symbol (or group of symbols) used to explain the meaning of the definiendum. Put otherwise, the definiendum is the term to be defined, the definiens is the definition of it. However, it would be a mistake to say that the definiens is the *meaning* of the definiendum—rather, it is another symbol (or group of symbols) that *has the same meaning* as the definiendum.

With this preface, we may say that definitions, depending on how they are used, are of five kinds: (1) stipulative, (2) lexical, (3) precisising, (4) theoretical, and (5) persuasive. We shall consider each in turn:

A. STIPULATIVE DEFINITIONS

A definition that has a meaning that is deliberately assigned to some symbol is called a **stipulative definition**. One who introduces a new symbol is free to assign to it, or *stipulate*, whatever meaning she cares to. Even an old term put into a new context may have its meaning stipulated. Definitions of this sort are sometimes called *nominal*.

Why introduce a term by stipulation? Many reasons can justify doing so. It may simply be convenient; one word may stand for many words in a message. It may protect secrecy, if the sender and the receiver are the only persons who understand the stipulation. It may advance economy of expression. In the sciences, new symbols are often defined by stipulation to mean what has been meant by a long sequence of familiar words, thus saving time and increasing clarity. Many numbers that would be cumbersome to write out, for example, have been given names by stipulation: The number equal to a billion trillions (10^{21}) has been named a "zeta," and the number equal to a trillion trillions (10^{24}) is called a "yotta."⁵

Some stipulative definitions are introduced in science to free the investigator from the distractions of the emotive associations of more familiar terms. In modern psychology, for example, the word "intelligence" is widely replaced by Spearman's "g factor"—a term intended to convey the same descriptive meaning without any emotional baggage. Excitement and interest may also be provided by introducing a catchy new term, as when "black hole" was introduced to replace "gravitationally completely collapsed star."⁶ The word "quark," now widely used in physics, was introduced by the physicist Murray Gell-Mann in 1963 to name a type of subatomic particle about which he had been theorizing.⁷ In philosophy, Charles Sanders Pierce had long referred to his philosophy as "pragmatism," but when that word came to be used carelessly he stipulated that his views would henceforth be known as "pragmaticism"—a word that is ugly enough, he said, that no one would want to steal it!

A stipulative definition is neither true nor false; it is neither accurate nor inaccurate. A symbol defined by a stipulative definition did not have that meaning before it was given that meaning by the definition, so the definition cannot be a report of the term's meaning. For anyone who accepts the stipulative definition, the definiendum and the definiens have the *same* meaning; that is a consequence of the definition, not a fact asserted by it. *A stipulative definition is a proposal* (or a resolution or a request or an instruction) *to use the definiendum to mean what is meant by the definiens*. Such a definition is therefore directive rather than informative. Proposals may be rejected, requests refused, instructions disobeyed—but they can be neither true nor false.

Stipulative definitions may be evaluated as useful in advancing some purpose, or as useless because they are too complex or unclear, but they cannot resolve genuine disagreements. By reducing the emotive role of language, however, and by simplifying discourse, they can help to prevent fruitless conflict.

B. LEXICAL DEFINITIONS

Most often the term being defined has some established use. When the purpose of the definition is to explain that use, or to eliminate ambiguity, the definition is called lexical. A **lexical definition** reports a meaning the definiendum already has. That report may be correct, or incorrect—and therefore it is clear that a lexical definition may be either true or false. Thus the definition "the word 'bird' means any warm-blooded vertebrate with feathers" is true; that is a correct report of how the word "bird" is generally used by speakers of English. On the other hand, the definition "the word 'bird' means any two-footed mammal" is obviously false.

Mistakes in word usage are usually not so obvious. We may call muddy water "turgid" when we mean to say that it is "turbid"; the lexical definition of "turgid" is "swollen" or "pompous." Some mistakes are downright funny, as when Mrs. Malaprop, a comically misspeaking character of the Restoration dramatist Richard Sheridan, gives the order to "illiterate him . . . from your memory" or uses the phrase "as headstrong as an allegory on the banks of the Nile." Nor are such confusions always fictional. At a U.S. university not long ago, students defined "actuary" as "a home for birds," and the definition of "duodenum" was given as "a number system in base 2."⁸ Whether they are funny or sad, these are mistakes—incorrect reports of how English-speaking people use these words.

Here lies the central difference between lexical and stipulative definitions: Truth or falsity may apply to the former but not the latter. In a stipulative definition the definiendum has no meaning apart from (or before) the definition that introduces it, so that the definition cannot be true or false. But the definiendum of a lexical definition does have a prior and independent meaning, and therefore its definition may be true, or false, depending on whether that meaning is reported correctly or incorrectly.

What we here call a *lexical* definition has been referred to by some as a "real" definition—to indicate that the definiendum really does have the meaning identified. However, the question of whether the definiendum names any real or actually existing thing has nothing to do with whether the definition is lexical or stipulative. The definition "the word 'unicorn' means an animal like a horse but having a single straight horn projecting from its forehead" surely is a lexical definition, and a correct one; its definiendum means exactly what is meant by the definiens—but the definiendum in this case does not name or denote any existing thing, because there are no unicorns.

A qualification must be made at this point. Some definitions are indeed simply mistaken, but some uses that depart from what is normal may be better described as unusual or unorthodox. Word usage is a statistical matter, subject to variation over time—and therefore we cannot always specify "the" correct meaning of a term, but must give an account of its various meanings, as determined by the uses it has in actual speech and writing.

Some lexicographers try to overcome this variability by referring to "best" usage or "correct" usage. This effort cannot fully succeed, however, because "best" usage is also an inexact matter, measured by the number of prominent authors and speakers whose uses of the given term are in accord with that definition. Literary and academic uses of words lag behind changes in a living language, so definitions that report meanings accepted by some intellectual aristocracy are likely to be out of date. What is unorthodox at a given time may soon become commonplace. So lexical definitions

must not ignore the ways in which a term is used by great numbers of those who speak that language, because if lexical definitions are not true to actual usage, the reports they give will not be entirely correct. To take account of language growth, good dictionaries often indicate which meanings of words are "archaic" or "obsolete," and which meanings are "colloquial" or "slang."

With this qualification understood—that is, bearing in mind the variability of a living language—lexical definitions are in essence true or false, in the sense that they may be true to actual usage, or may fail to be true to it.

C. PRECISING DEFINITIONS

Some terms are ambiguous; some terms are vague. A term is *ambiguous* in a given context when it has more than one distinct meaning and the context does not make clear which meaning is intended. A term is *vague* when there are borderline cases to which the term might or might not apply. A word or a phrase—for example, "libel" or "freedom of speech"—may be both ambiguous and vague. **Precising definitions** are those used to eliminate ambiguity or vagueness.

Every term is vague to some degree, but excessive vagueness causes serious practical problems. This is particularly true in the law, where acts that are forbidden (or permitted) by some statute need to be sharply demarcated. For example, as this is being written the precise meaning of the Second Amendment to the U.S. Constitution is being disputed in the federal courts. The Amendment reads:

"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."

Many U.S. states have passed laws that prohibit handguns, and that require even lawfully owned guns to be kept in the home, unloaded and disassembled. Some appellate courts have struck down such laws as infringing the right to "bear arms." If the Amendment refers only to military affairs, then the right to bear arms is a *civic* but not an *individual* right. If, on the other hand, the Amendment's reference to a militia indicates only the purpose of the Amendment, while the right guaranteed is that of an *individual* "to keep and bear arms," such laws are unconstitutional. A precising definition of the phrase "keep and bear arms" is surely needed, and is likely to be soon forthcoming from the Supreme Court of the United States.*

*In March 2007 a precising definition by the U.S. Supreme Court was made more likely when the Circuit Court of the District of Columbia decided the case of *Parker v. District of Columbia*, striking down some gun control laws as violations of the Second Amendment, viewed (in this decision) as being a guarantee of the right of *individuals* to keep and bear arms.

CHAPTER 9

The vagueness of units of measurement in science is a serious problem. "Horsepower" for example, is commonly used in reporting the power of motors, but its vagueness invited commercial deception. To overcome that, a precise definition was needed. "One horsepower" is now defined precisely as "the power needed to raise a weight of 550 pounds by one foot in one second"—calculated to be equal to 745.7 watts.*

A meter is the internationally accepted unit of measure for distance. Originally it was defined, by stipulation, as one ten-millionth of the distance from one of the earth's poles to the equator, and this was represented by a pair of carefully inscribed scratches on a metal bar made of platinum-iridium, kept in a vault near Paris, France. However, scientific research required more precision. A "meter" is now defined, precisely, as "the distance light travels in one 299,792,458th of a second." Building on this, a "liter" is defined precisely as the volume of a cube having edges of 0.1 meter.

The vagueness of terms such as "horsepower" and "meter" cannot be eliminated by appealing to ordinary usage, because ordinary usage is not sufficiently exact. If it were, the terms would not have been vague. Therefore, borderline cases can be resolved only by going beyond the report of normal usage with the definition given. Such definitions are called *precising definitions*.

A precising definition differs from both lexical and stipulative definitions. It differs from stipulative definitions in that its definiendum is not a new term, but one whose usage is known, although unhappily vague. In constructing a precising definition, therefore, we are not free to assign to the definiendum any meaning we please. Established usage must be respected as far as possible, while making the known term more precise. Neither can a precising definition be a simple report, because it must go beyond established usage if the vagueness of the definiendum is to be reduced. How that is done—how the gaps in ordinary language are filled in—may indeed be a matter of outright stipulation.

Appellate court judges are often obliged to define some common terms more precisely. The definitions they provide are not mere stipulations, because even when the judges go beyond established usage, they will explain their reasons for the refinements being introduced. For example, unreasonable searches and seizures are forbidden by the Fourth Amendment of the U.S. Constitution, and evidence obtained though an unreasonable seizure is

*The power of one real horse—say, one weighing 600 kilograms (or 1323 pounds)—is much greater, estimated to be about equal to 18,000 watts! A 200-horsepower automobile, therefore, has approximately the power of ten real horses.

generally held to be inadmissible in court. But what is a "seizure"? Suppose a suspect, running from the police, throws away a packet of drugs, which is then confiscated. Have those drugs been seized? A precisising definition was formulated by the U.S. Supreme Court to resolve this matter. A seizure, the Court concluded, must involve either the use of some physical force that restrains movement, or the assertion of authority (such as an order to stop) to which a subject yields. If the subject keeps running, no seizure has occurred; the packet of drugs he throws while running from the police therefore cannot be the product of an unreasonable seizure, and will be admissible as evidence.⁹

The precise definitions of terms can be very important in the world of commerce. For example, is a sport utility vehicle (SUV) a car or a light truck? The fuel economy standards applied to "light trucks" are more lenient than those applied to "cars," and therefore auto manufacturers must know the criteria that will be used by the U.S. Department of Transportation to define these categories precisely.¹⁰

If a law is so vague that a citizen cannot be expected to be sure when he is disobeying it, it may be struck down by a court. U.S. Supreme Court Justice Thurgood Marshall long ago explained the need for precisising definitions in law:

It is a basic principle of due process that an enactment is void for vagueness if its prohibitions are not clearly defined. Vague laws offend several important values. First . . . we insist that laws give the person of ordinary intelligence a reasonable opportunity to know what is prohibited, so that he may act accordingly. Vague laws may trap the innocent by not providing fair warning. Second, if arbitrary and discriminatory enforcement is to be prevented, law must provide explicit standards for those who apply them. A vague law impermissibly delegates basic policy matters to policemen, judges, and juries for resolution on an ad hoc and subjective basis, with the attendant dangers of arbitrary and discriminatory application. Third . . . where a vague statute abuts upon sensitive areas of basic First Amendment freedoms, it operates to inhibit the exercise of those freedoms. Uncertain meanings inevitably lead citizens to "steer far wider of the unlawful zone" than if the boundaries of the forbidden areas were clearly marked.¹¹

This principle was applied in 1996 when a federal law making it illegal to transmit "indecent" or "patently offensive" materials on the Internet was struck down as impermissibly vague.¹² To avoid such uncertainties, legislatures often preface the operative portions of a statute with a section called "definitions," in which the precise meanings of key terms in that statute are spelled out. Similarly, in labor-management contracts, the terms setting forth the agreed-upon rules of the workplace will be very carefully defined. Precisising definitions are conceptual instruments of wide importance.

D. THEORETICAL DEFINITIONS

In science, and in philosophy, definitions often serve as a compressed summary, or recapitulation, of some theory. Such definitions, when they are faulty, are criticized not so much because they are not precise as because they are not adequate—they do not correctly encapsulate the theory in question.

How, for example, should we define the word “planet”? For many years it was believed with little controversy, and all children were taught, that planets are simply bodies in orbit around the sun and that there are nine planets in the solar system—of which the smallest is Pluto, made of unusual stuff, with an unusual orbit, and most distant from the Sun. But other bodies, larger than Pluto and oddly shaped, have been recently discovered orbiting the sun. Are they also planets? Why not? Older definitions had become conceptually inadequate. An intense controversy within the International Astronomical Union (IAU), still not fully resolved, has recently resulted in a new definition of “planet,” according to which there are only eight planets in our solar system. And now a new category, “dwarf planet” (for bodies such as Pluto, Ceres, and Eris) has been defined. Needed were definitions that would accommodate new discoveries as well as old, while maintaining a consistent and fully intelligible account of the entire system. Such definitions (not as simple as we might like) were adopted by the IAU in 2006. A planet is “a celestial body that, within the Solar System, (1) is in orbit around the Sun; and (2) has sufficient mass for its self-gravity to overcome rigid body forces so that it assumes a hydrostatic equilibrium (nearly round) shape; and (3) has cleared the neighborhood around its orbit.”¹³

In such controversies it is not simply the use of some word, such as “planet,” that is at issue. What is wanted is a comprehensive grasp of the theory in which that term is a key element. A definition that encapsulates this larger understanding we rightly call a *theoretical definition*.

In philosophy also, theoretical definitions are sought. When Socrates struggles to find the correct definition of “justice” in Plato’s *Republic*, he is not simply seeking a set of words that can serve as a synonym for justice. When Spinoza, in the *Ethics*, seeks to define “bondage” and “freedom,” he is not examining how people use those words, nor is he merely hoping to eliminate borderline cases. Neither lexical nor *précising* (and certainly not stipulative) definitions are the philosophical objectives. More deeply, philosophers commonly seek to develop an account of human virtues that will help us to understand these and other forms of right conduct.

The quest for theoretical definitions remains compelling. What is a “right”? Is health care a right? Do nonhuman animals have rights? How might we best define the term? Which nations truly manifest “democracy”? Is the fact that leaders are elected by popular vote sufficient to make a government democratic? If not, what other political institutions or patterns of citizen conduct

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characterize democratic communities? What is the most appropriate application of that term? Theoretical definitions are the *products* of our comprehensive understanding in some sphere.

E. PERSUASIVE DEFINITIONS

The four categories we have discussed so far are concerned chiefly with the informative use of language. But definitions are also used at times to express feelings as well, so as to influence the conduct of others. A definition put forward to resolve a dispute by influencing attitudes or stirring emotions may be called a **persuasive definition**.

Persuasive definitions are common in political argument. From the left we hear "socialism" defined as "democracy extended to the economic sphere." From the right we hear "capitalism" defined as "freedom in the economic sphere." The directive intent of the emotive language in these definitions is obvious—but emotive coloration may also be injected subtly into wording that purports to be a correct lexical definition, and that appears on the surface to be that. As we seek to distinguish good reasoning from bad, we must be on guard against *persuasive* definitions.

In summary, we have distinguished five ways in which definitions are used. Thus any definition may be categorized in accordance with its principal function:

Stipulative

Lexical

Precising

Theoretical

Persuasive

Of course, some definitions may serve more than one of these functions. A stipulative definition may be intended to influence hearers manipulatively. A lexical definition may be used objectively to make discussion of some matter more precise, and so on. Here, as everywhere in language, context is critical.

EXERCISES

- A. Find examples of definitions that function in each of the five ways distinguished and explain, in each case, how the definition serves that purpose.
- B. Discuss the following.

Federal law imposes a five-year mandatory prison sentence on anyone who "uses or carries a firearm" in connection with a narcotics crime. In 1998 the U.S. Supreme Court faced this question: Does traveling in a car with a gun in a locked glove compartment or trunk—as opposed to carrying a gun on

one's person—satisfy the meaning of “carry” in that law? Justice Stephen Breyer argued that Congress intended the word in its ordinary, everyday meaning, without the artificial limitation that it be immediately accessible. Quoting *Robinson Crusoe* and *Moby Dick*, he pointed to the common use of “carry” to mean “convey in a vehicle.” The mandatory sentence, he concluded, is thus properly imposed. Justice Ruth Bader Ginsburg found Breyer’s literary evidence selective and unpersuasive; in response, she offered quotations from Rudyard Kipling, the TV series *M.A.S.H.*, and President Theodore Roosevelt’s “Speak softly and carry a big stick” to show that “carry” is properly understood in the federal statute to mean “the gun at hand, ready for use as a weapon” [*Muscarello v. U.S.*, U.S. 96-1654 (1998)]. In this controversy, which side puts forward the better precisifying definition?

3.5 The Structure of Definitions: Extension and Intension

A definition states the *meaning* of a term. When we look closely at the literal (or descriptive) meaning of a term, however, we see that there are different *senses* in which that term has meaning. With those different senses distinguished (our object just below), we will also see that definitions may be grouped and understood not only on the basis of their functions (as in the preceding section), but in view of the way those definitions are built: their *structure*.

We focus on *general* terms—terms that are applicable to more than one object—which are of critical importance in reasoning. The word “planet” is a typical general term; it is applicable to a number of objects, and it applies in the same sense equally to Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, and Neptune.* What is meant by the word “planet” is (in one sense) that set of objects. The collection of planets constitutes the meaning of the term, its *extensional* meaning. If I say that all planets have elliptical orbits, part of what I assert is that Mars has an elliptical orbit, and another part is that Venus has an elliptical orbit, and so on. The *extension* of the general term “planet” consists of the objects to which the term may be correctly applied. The *extensional meaning* (also called the *denotative meaning*) of a general term is the collection of the objects that constitutes the **extension** (or *denotation*) of the term.

To understand the meaning of a general term is to know how to apply it correctly. But it is not necessary to know all of the objects to which it may be applied correctly in order to apply it correctly. All the objects within the extension of a given term have some *common attributes* or characteristics that lead us

*But not to Pluto! As explained in the preceding section, Pluto is now classified by the International Astronomical Union as a “dwarf planet.”

to use the same term to denote them. If we know these attributes, we may know the meaning of a term in a different sense, without knowing its extension. In this second sense, *meaning* supposes some *criterion for deciding*, with respect to any given object, whether it falls within the extension of that term. This sense of meaning is called the *intensional meaning* (or, sometimes, *connotative meaning*) of the term. The set of attributes shared by all and only those objects to which a general term refers is called the **intension** (or *connotation*) of that term.

Every general term has *both* an *intensional* (or *connotative*) meaning and an *extensional* (or *denotative*) meaning. Consider the general term "skyscraper." It applies correctly to *all buildings over a certain height*; that is its intension. The extension of the term "skyscraper" is the class of buildings that contains the Empire State Building in New York, the Sears Tower in Chicago, the Shanghai World Financial Center, the Petronas Twin Towers in Kuala Lumpur, and others also—that is, the collection of the objects to which the term applies.

The extension of a term (its membership) is determined by its intension. The intension of the term "equilateral triangle" is the attribute of being a plane figure enclosed by three straight lines of equal length. The extension of "equilateral triangle" is the class of all those objects, and only those objects, that have this attribute. Because any object that has this attribute must be a member of that class, we say that the term's intension *determines* its extension.

However, the reverse is not true: The extension of a term does *not* determine its intension. Consider "equiangular triangle," which has an intension different from that of "equilateral triangle." The intension of "equiangular triangle" is the attribute of being a plane figure enclosed by three straight lines that intersect each other to form equal angles. It is true, of course, that the extension of the term "equiangular triangle" is exactly the same as the extension of the term "equilateral triangle." So if we were to identify the extension of one of these terms, that would leave the intension of the class uncertain; intension is not determined by extension. Terms may have different intensions and the same extension; but terms with different extensions cannot possibly have the same intension.

When attributes are added to the intension of a term, we say that the intension increases. Begin with a general term such as "person." Add "living." Add "over twenty years old." Add "born in Mexico." With each such addition the intension increases; the intension of the term "Living person over twenty years old born in Mexico" is far greater than that of "person." So these terms are given here in order of *increasing* intension. However, increasing their intension *decreases* their extension. The number of living persons is much lower than that of persons, and the number of living persons over twenty years old is lower still, and so on.

One may be tempted to say that extension and intension always vary inversely, but in fact that is not the case. This is because there comes a point when increasing the intension of the term has no effect on its extension. Consider this series: "living person," "living person with a spinal column," "living person with a spinal column less than one thousand years old," "living person with a spinal column less than one thousand years old who has not read all the books in the Library of Congress." These terms are clearly in order of increasing intension, but the extension of each of them is exactly the same, not decreasing at all. So we can say that, if terms are arranged in order of increasing intension, their extensions will be in *nonincreasing* order. That is, if extensions vary, they will vary inversely with the intensions.

Note that the extensions of some terms are empty; there simply are no objects having the indicated attributes. In Greek mythology, Bellerophon killed the fire-breathing Chimera, a monster with a lion's head, a goat's body, and a serpent's tail. We fully understand the intension of the term Chimera, but it has no extension.

Some bad arguments play on the fact that meaning can refer to extension or to intension, while extension may be empty. For example:

The word "God" is not meaningless; therefore it has a meaning. But by definition, the word "God" means a being who is all-powerful and supremely good. Therefore that all-powerful and supremely good being, God, must exist.

The word "God" is certainly not meaningless, and so there is an intension that is its meaning. But it does not follow from the fact that a term has an intension that it denotes any existent thing.* A contemporary critic has argued in similar fashion:

Kitsch is the sign of vulgarity, sleaze, schlock, sentimentality, and bad faith that mark and mar our human condition. That is why utopia can be defined as a state of affairs in which the term has disappeared because it no longer has a referent.¹⁴

Here the writer has failed to distinguish between *meaning* and *referent*. Many valuable terms—those naming mythological creatures, for example—have no existing referent, no extension, but we do not want or expect such terms to disappear. Terms with intension but no extension are very useful. If utopia someday comes, we may wish to express our good fortune in having eliminated "kitsch" and "sleaze," but to do that we will need to be able to use those very words meaningfully.

*The useful distinction between intension and extension was introduced and emphasized by St. Anselm of Canterbury (1033–1109), who is best known for his "ontological argument"—to which the preceding fallacious argument has little resemblance.

We now use the distinction between intension and extension to explain some techniques for constructing definitions. Some definitions approach a general term by focusing on the class of *objects* to which the term refers. Some definitions approach a general term by focusing on the *attributes* that determine the class. Each approach, as we shall see, has advantages and disadvantages.

EXERCISES

A. Arrange each of the following groups of terms in order of increasing intension.

1. Animal, feline, lynx, mammal, vertebrate, wildcat.
2. Alcoholic beverage, beverage, champagne, fine white wine, white wine, wine.
3. Athlete, ball player, baseball player, fielder, infielder, shortstop.
4. Cheese, dairy product, Limburger, milk derivative, soft cheese, strong soft cheese.
5. Integer, number, positive integer, prime number, rational number, real number.

B. Divide the following list of terms into five groups of five terms each, arranged in order of increasing intension.

Aquatic animal, beast of burden, beverage, brandy, cognac, domestic animal, filly, fish, foal, game fish, horse, instrument, liquid, liquor, musical instrument, muskellunge, parallelogram, pike, polygon, quadrilateral, rectangle, square, Stradivarius, string instrument, violin.

A. EXTENSION AND DENOTATIVE DEFINITIONS

Denotative definitions employ techniques that identify the extension of the term being defined. The most obvious way to explain the extension of a term is to identify the objects denoted by it. This is one very effective technique, but it has serious limitations.

We saw in the preceding section that two terms with different intensions (e.g., “equilateral triangle” and “equiangular triangle”) may have the same extension. Therefore, even if we could enumerate all the objects denoted by a general term, that would not distinguish it from another term that has the very same extension.

Of course it is usually impossible to enumerate all the objects in a class. The objects denoted by the term “star” are literally astronomical in number;

the objects denoted by the term "number" are infinitely many. For most general terms, complete enumeration is practically out of the question. Therefore denotative definitions are restricted to partial enumerations of the objects denoted—and this limitation gives rise to serious difficulties. The core of the problem is this: Partial enumeration of a class leaves the meaning of the general term very uncertain.

Any given object has a great many attributes and thus may be included in the extensions of a great many different general terms. Therefore, any object given as an example of a general term is likely to be an example of many general terms with very different intensions. If I give the example of the Empire State Building to explain the term "skyscraper," there are many other classes of things to which I could be referring. And even if we give two examples, or three, or four, the same problem arises. Suppose I list, along with the Empire State Building, the Chrysler Building, and the Trump Tower. What is the class I have in mind? It could be skyscrapers. But all these are also "great structures of the twentieth century," "expensive pieces of real estate in Manhattan," or "landmarks in New York City." And each of these general terms denotes objects not denoted by the others. So partial enumeration cannot distinguish among terms that have different extensions.

We may seek to overcome this problem by naming groups of members of the class as examples. This technique, definition by subclass, does sometimes make complete enumeration possible. Thus we might define "vertebrate" to mean "amphibians and birds and fishes and reptiles and mammals." The completeness of the list gives some psychological satisfaction—but the meaning of the term "vertebrate" has not been adequately specified by such a definition.

Instead of naming or describing the objects denoted by the term being defined, as ordinary denotative definitions do, we might try *pointing* at them. Such definitions are called **ostensive definitions** or *demonstrative definitions*. An example of an ostensive definition is that "the word 'desk' means *this*," accompanied by a gesture such as pointing a finger in the direction of a desk.

Ostensive definitions have all the limitations mentioned earlier, as well as some limitations peculiar to themselves. Gestures have a geographic limitation; one can only indicate what is visible. We cannot ostensively define the word "ocean" in an inland valley. More seriously, gestures are invariably ambiguous. To point to a desk is also to point to a part of it, and also to its color and its size and its shape and material, and so on—in fact, one points to everything that lies in the general direction of the desk, including the lamp or the wall behind it.

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This ambiguity might sometimes be resolved by adding a descriptive phrase to the *definiens*, thus producing a **quasi-ostensive definition**—for example, “the word ‘desk’ means *this* article of furniture” accompanied by the appropriate gesture. But such an addition supposes the prior understanding of the phrase “article of furniture,” which defeats the purpose that ostensive definitions have been claimed to serve, having been alleged by some to be the “primary” (or primitive) definitions, the way we first learn the meanings of words. In fact, however, we first learn language by observing and imitating, not by relying on definitions.

Beyond such difficulties, all denotative definitions have this further inadequacy: They *cannot* define words that, although perfectly meaningful, do not denote anything at all. When we say that there are no unicorns we are asserting, meaningfully, that the term “unicorn” does not denote, that its extension is empty. Terms with no extension are very important, and this shows that techniques of definition that rely on extension cannot reach the heart of the matter. “Unicorn” has no extension, but the term is certainly not meaningless. If it were meaningless, it would also be meaningless to say, “There are no unicorns.” But this statement we fully understand, and it is true. Meaning pertains more to intension than to extension; the real key to definition is intension.

EXERCISES

C. Define the following terms by example, enumerating three examples for each term.

1. actor
2. boxer
3. composer
4. dramatist
5. element
6. flower
7. general (officer)
8. harbor
9. inventor
10. poet

D. For each of the terms given in Exercise Set A, find a nonsynonymous general term that your three examples serve equally well to illustrate.

B. INTENSION AND INTENSIONAL DEFINITIONS*

The *intension* of a term, we have said, consists of the attributes shared by all the objects denoted by the term, and shared only by those objects. If the attributes that define the term "chair" are "being a single raised seat" and "having a back," then *every* chair is a single raised seat with a back, and *only* chairs are single raised seats with a back.

Even within this restriction, three different senses of intension must be distinguished: the subjective, the objective, and the conventional. The **subjective intension** of a word for a speaker is the set of all the attributes the speaker believes to be possessed by objects denoted by that word. This set varies from individual to individual, and even from time to time for the same individual, and thus cannot serve the purposes of definition. The public meanings of words, not their private interpretations, are the logician's concern. The **objective intension** of a word is the total set of characteristics shared by all the objects in the word's extension. Within the objective intension of the term "circle," therefore, is the attribute that a circle encloses a greater area than any other plane figure having an equal perimeter. However, this attribute of circles is one that many who use the word are completely unaware of. No one possesses the omniscience required to understand all the attributes shared by the objects denoted by general terms, and therefore objective intension cannot be the public meaning whose explanation we seek to give.

People do communicate with one another and therefore do understand the terms they use; hence there must be publicly available intensions that are neither subjective nor objective in the senses just explained. Terms have stable meanings because there is an implicit agreement to use the same criterion for deciding about any object whether it is part of the term's extension. What makes a thing a circle, in common discourse, is its being a closed plane curve, all points of which are equidistant from a point within called the center. It is by convention that this criterion is established, and this meaning is the **conventional intension** of the term "circle." This is the important sense of intension for purposes of definition: It is public but does not require omniscience to use. The word "intension" is normally taken to mean *conventional intension*, and that is our usage here.

*A term that is sometimes used instead of "intension" is "connotation"; intensional definitions are connotative definitions. We avoid the use of the word "connotation" here because, in everyday English, the *connotation* of a term is its total significance, including especially its emotive as well as its descriptive meaning. Because we are concerned here only with informative significance, we put the term "connotation" aside; this section therefore uses the terms "intension" and "intensional."

What are the techniques, using intension, for defining terms? Several methods are common. The simplest and most frequently used is that of providing another word, whose meaning is already understood, that has the same meaning as the word being defined. Two words with the same meaning are called synonyms, so a definition given in this way is called a **synonymous definition**. Dictionaries, especially smaller ones, rely heavily on this method of defining terms. Thus a dictionary may define "adage" as meaning "proverb"; "bashful" may be defined as "shy"; and so on. Synonymous definitions are particularly useful when it is the meanings of words in another language that call for explanation. The word *chat* means "cat" in French; *amigo* means "friend" in Spanish; and so on. One learns the vocabulary of a foreign language by studying definitions using synonyms.

This is a good method of defining terms; it is easy, efficient, and helpful. But it has very serious limitations. Many words have no exact synonym, and therefore synonymous definitions are often not fully accurate and may mislead. Translation from one language to another can never be perfectly faithful to the original, and often fails to catch its spirit or convey its depth. From this realization comes the Italian proverb, "*Traduttore, traditore*" ("Translator, traitor").

A more serious limitation of synonymous definitions is this: When the concept the word aims to convey is simply not understood, every synonym may be as puzzling to the reader or hearer as the definiendum itself. Synonyms are virtually useless, therefore, when the aim is to construct a precisizing or a theoretical definition.

One may seek to explain the intension of a term by tying the definiendum to some clearly describable set of actions or operations; doing that is giving the term what is called an **operational definition**.¹⁵

For example, in the wake of the success of Einstein's theory of relativity, space and time could no longer be defined in the abstract way that Newton had used. It was therefore proposed to define such terms "operationally," that is, by means of the operations actually undertaken when we measure distances and durations. An operational definition of a term states that the term is applied correctly to a given case if and only if the performance of specified operations in that case yields a specified result. The numerical value given for length can be defined operationally by referring to the results of a specified measuring procedure, and so on. Only public and repeatable operations are accepted in the definiens of an operational definition. Social scientists have also applied this technique. Some psychologists, for example, have sought to replace abstract definitions of "mind" and "sensation" by operational definitions that refer only to behavior or to physiological observations.

Of all the kinds of definition, the one that is most widely applicable is **definition by genus and difference**. This is the most important of all uses of

the intension of general terms, and it is far and away the technique that is most commonly relied on in defining terms. We therefore devote the next and final section of this chapter to a detailed examination of definition by genus and difference, and the rules that properly guide its use.

The following table summarizes the kinds of definition by function (of which there are five), and the six techniques that depend on extension (three) and intension (three).

Five Types of Definition	
1. Stipulative	
2. Lexical	
3. Precising	
4. Theoretical	
5. Persuasive	
Six Techniques for Defining Terms	
<i>A. Extensional Techniques</i>	<i>B. Intensional Techniques</i>
1. Definitions by example	4. Synonymous definitions
2. Ostensive definitions	5. Operational definitions
3. Quasi-ostensive definitions	6. Definitions by genus and difference

EXERCISES

E. Give synonymous definitions for each of the following terms.

- | | |
|--------------|---------------|
| 1. absurd | 11. kine |
| 2. buffoon | 12. labyrinth |
| 3. cemetery | 13. mendicant |
| 4. dictator | 14. novice |
| 5. egotism | 15. omen |
| 6. feast | 16. panacea |
| 7. garret | 17. quack |
| 8. hasten | 18. rostrum |
| 9. infant | 19. scoundrel |
| 10. jeopardy | 20. tepee |

3.6 Definition by Genus and Difference

Definition by genus and difference relies directly on the intension of the terms defined, and it does so in the most helpful way. In view of their exceedingly common use, we look very closely at definitions of this type.*

Earlier we referred to the attributes that define a class. Normally these attributes are complex—that is, they can be analyzed into two or more other attributes. This complexity and analyzability can be understood in terms of classes. Any class of things having members may have its membership divided into subclasses. For example, the class of all triangles can be divided into three nonempty subclasses: equilateral triangles, isosceles triangles, and scalene triangles. The class whose membership is thus divided into subclasses is called the *genus*, and the various subclasses are its *species*. As used here, the terms “genus” and “species” are *relative* terms, like “parent” and “offspring.” The same persons may be parents in relation to their children, but also offspring in relation to their parents. Likewise, a class may be a genus in relation to its own subclasses, but also a species in relation to some larger class of which it is a subclass. Thus the class of all triangles is a genus relative to the species *scalene triangle* and a species relative to the genus *polygon*. The logician’s use of the words “genus” and “species” as relative terms is different from the biologist’s use of them as fixed or absolute terms, and the two uses should not be confused.

A *class* is a collection of entities having some common characteristic. Therefore all members of a given genus have some characteristic in common. All members of the genus *polygon* (for example) share the characteristic of being closed plane figures bounded by straight line segments. This genus may be divided into different species or subclasses, such that all the members of each subclass have some further attribute in common that is shared by no member of any other subclass. The genus *polygon* is divided into triangles, quadrilaterals, pentagons, hexagons, and so on. Each species of the genus *polygon* differs from all the rest. What differentiates members of the subclass *hexagon* from the members of all other subclasses is *having precisely six sides*. In general, all members of all species of a given genus share some attribute that makes them members of the genus, but the members of any one species share some further attribute that differentiates them from the members of every other species of that genus. The characteristic that serves to distinguish them is called the *specific difference*. Having six sides is the specific difference between the species *hexagon* and all other species of the genus *polygon*.

*Definitions by genus and difference are also called *analytical* definitions, or by their Latin name, definitions *per genus et differentia*.

Thus, we may say that the attribute of being a hexagon is analyzable into the attributes of (1) being a polygon and (2) having six sides. To someone who did not know the meaning of the word "hexagon" or of any synonym of it, but who did know the meanings of the words "polygon," "sides," and "six," the meaning of the word "hexagon" can be readily explained by means of a definition by genus and difference: The word "hexagon" means "a polygon having six sides."

Using the same technique, we can readily define "prime number": A prime number is any natural number greater than one that can be divided exactly, without remainder, only by itself or by one.

Two steps are required to define a term by genus and difference. First, a genus must be named—the genus of which the species designated by the definiendum is the subclass. Second, the specific difference must be named—the attribute that distinguishes the members of that species from members of all others species in that genus. In the definition of prime number just given, the genus is the class of natural numbers greater than one: 2, 3, 4, . . . , and so on; the specific difference is the quality of being divisible without remainder only by itself or by one: 2, 3, 5, 7, 11, . . . , and so on. Definitions by genus and difference can be very precise.

Two limitations of definitions by genus and difference deserve notice, although such definitions remain, nevertheless, exceedingly useful. First, the method is applicable only to terms whose attributes are complex in the sense indicated above. If there are any attributes that are absolutely *unanalyzable*, then the words with those intensions cannot be defined by genus and difference. The sensed qualities of the specific shades of a color have been thought by some to be simple and unanalyzable in this sense. Whether there really are such unanalyzable attributes remains an open question, but if there are, they limit the applicability of definition by genus and difference. Second, the technique is not applicable when the attributes of the term are universal. Words such as "being," "entity," "existent," and "object," cannot be defined by the method of genus and difference because the class of all entities (for example) is not a species of some broader genus. A universal class (if there is one) constitutes the very highest class, or *summum genus*, as it is called. The same limitation applies to words referring to ultimate metaphysical categories, such as "substance" or "attribute." Neither of these limitations, however, is a serious handicap in most contexts in which definitions are needed.

Constructing good definitions by genus and difference is by no means a simple task; it requires thoughtful selection of the most appropriate genus for the term in question, as well as identification of the most helpful specific difference for that term. In appraising proposed definitions by genus and difference, especially when they are intended as lexical, there are five good rules that have been traditionally laid down.

Rule 1: A definition should state the essential attributes of the species.

Earlier we distinguished the conventional intension of a term from the subjective intension and the objective intension. To define a term using, as its specific difference, some attribute that is not normally recognized as its attribute, even though it may be a part of that term's objective intension, would be a violation of the spirit of this rule. The rule itself might best be expressed, using our terminology, by saying that *a definition should state the conventional intension of the term being defined*.

The conventional intension of a term is not always an intrinsic characteristic of the things denoted by that term. It may concern the origin of those things, or relations of the members of the class defined to other things, or the uses to which the members of that class are normally put. Thus the term "Stradivarius violin," which denotes a number of violins, has as its conventional intension no actual physical characteristic but rather the attribute of being a violin made in the Cremona workshop of Antonio Stradivari. The essential attributes of "governors" or "senators" would not be any specific mental or physical features that differentiate them from other persons, but the special relations they have to other citizens. The use of shape, or material, as the specific difference of a class is usually an inferior way to construct a definition. It is not an essential attribute of a "shoe," for example, that it is made of leather; what is critical in its definition is the use to which it is put, as an outer covering for the foot.

Rule 2: A definition must not be circular.

If the definiendum itself appears in the definiens, the definition can explain the meaning of the term being defined only to those who already understand it. So if a definition is *circular* it must fail in its purpose, which is to explain the meaning of the definiendum.

A book on gambling contains this blatant violation of the rule: "A compulsive gambler is a person who gambles compulsively."¹⁶ And a sophisticated scientist, writing in a medical journal, lapses into definitional circularity in this passage: "This review defines stress as a specific morphological, biochemical, physiological, and/or behavioral change experienced by an organism in response to a stressful event or stressor."¹⁷

As applied to definitions by genus and difference, avoiding circularity rules out the use, in the definiens, of any synonym of the definiendum. For example, there is no point in defining "lexicon" as "a compilation of words like a dictionary." If the synonym "dictionary" is assumed to be understood, one could as well give a straightforward synonymous definition of "lexicon" instead of resorting to the more powerful but more complicated technique of

genus and difference. By the same token, antonyms of the definiendum are also ruled out.

Rule 3: A definition must be neither too broad nor too narrow.

This is an easy rule to understand, but it is often difficult to respect. We don't want the definiens to denote more things than are denoted by the definiendum, or fewer things either, of course. But mistakes are often made. When Plato's successors in the Academy at Athens settled on the definition of "man" as "featherless biped," their critic, Diogenes, plucked a chicken and threw it over the wall into the Academy. There was a featherless biped—but no man! The definiens was too broad. Legend has it that to narrow the definition of "man," the attribute "having broad nails" was added to the definiens.

Finding or constructing the definiens that has precisely the correct breadth is the task faced by the lexicographer, and it is often very challenging. But if Rule 1 has been fully observed, the essence of the *definiendum* stated in the definiens, this rule will have been obeyed, because the conventional intension of the term cannot be too broad or too narrow.

Rule 4: Ambiguous, obscure, or figurative language must not be used in a definition.

Ambiguous terms in the definiens obviously prevent the definition from performing its function of explaining the definiendum. Obscure terms also defeat that purpose, but obscurity is a relative matter. What is obscure to amateurs may be perfectly familiar to professionals. A "dynatron oscillator" does truly mean "a circuit that employs a negative-resistance volt-ampere curve to produce an alternating current." Although it may be obscure to the ordinary person, the language of this definiens is wholly intelligible to the students of electrical engineering for whom the definition was written; its technical nature is unavoidable. Obscure language in nontechnical definitions may result in an effort to explain the unknown using what is even more unknown. Dr. Samuel Johnson, in his great *Dictionary of the English Language* (1755), defined "net" as meaning "anything reticulated or decussated at equal distances with interstices between the intersections"—a good example of obscurity in definition.

Another sort of obscurity arises when the language of the definiens is metaphorical. Figurative language may convey a "feel" for the term being defined, but it cannot give a clear explanation of the term. We do not learn the meaning of the word "bread" if we are told only that it is "the staff of life." *The Devil's Dictionary* (1911), by Ambrose Bierce, is a collection of witty definitions,

many of which have a cynical bite. Bierce defined "fib" as "a lie that has not cut its teeth," and "oratory" as "a conspiracy between speech and action to cheat the understanding." Entertaining and insightful such definitions may be, but serious explanations of the definiendums they are not.

Rule 5: A definition should not be negative when it can be affirmative.

What a term *does* mean, rather than what it does *not* mean, is what the definition seeks to provide. There are far too many things that the vast majority of terms do not mean; we are unlikely to cover them all in a definition. "A piece of furniture that is not a bed or a chair or a stool or a bench" does not define a couch; neither does it define a dresser. We need to identify the attributes that the definiendum has, rather than those it does not have.

Of course there are some terms that are essentially negative and therefore require negative definitions. The word "bald" means "the state of not having hair on one's head," and the word "orphan" means "a child who does not have parents." Sometimes affirmative and negative definitions are about equally useful; we may define a "drunkard" as "one who drinks excessively," but also as "one who is not temperate in drinking." In those cases in which negatives are used appropriately in specifying the essential attributes, the genus must first be mentioned affirmatively. Then, sometimes, the species can be characterized accurately by rejecting all other species of that genus. Only rarely are the species few enough to make this possible. If, for example, we define "scalene" triangle as "a triangle that is neither equilateral nor isosceles," we respect poorly the spirit of Rule 1—because it is the essential attribute that the class does possess, "having sides of unequal length," that best defines it. In general, affirmative definitions are much preferred over negative ones.

In summary, intensional definitions, and among them definitions by genus and difference especially, can serve any of the purpose for which definitions are sought. They may help to eliminate ambiguity, to reduce vagueness, to give theoretical explanation, and even to influence attitudes. They are also commonly used to increase and enrich the vocabulary of those to whom they are provided. For most purposes, intensional definitions are much superior to extensional definitions, and of all definitions that rely on intensions, those constructed by genus and difference are usually the most effective and most helpful.

EXERCISES

A. Construct definitions for the following terms (in the box on the left side) by matching the *definiendum* with an appropriate genus and difference (from the box on the right side.)

Definiendum		Definiens	
		Genus	Difference
1. banquet	11. lamb	1. offspring	1. female
2. boy	12. mare	2. horse	2. male
3. brother	13. midget	3. man	3. very large
4. child	14. mother	4. meal	4. very small
5. foal	15. pony	5. parent	5. young
6. daughter	16. ram	6. sheep	
7. ewe	17. sister	7. sibling	
8. father	18. snack	8. woman	
9. giant	19. son	9. person	
10. girl	20. stallion		

B. Criticize the following in terms of the rules for definition by genus and difference. After identifying the difficulty (or difficulties), state the rule (or rules) that are being violated. If the definition is either too narrow or too broad, explain why.

1. A genius is one who, with an innate capacity, affects for good or evil the lives of others.

—Jacqueline Du Pre, in *Jacqueline Du Pre: Her Life, Her Music, Her Legend* (Arcade Publishing, 1999)

2. Knowledge is true opinion.

—Plato, *Theaetetus*

3. Life is the art of drawing sufficient conclusions from insufficient premises.

—Samuel Butler, *Notebooks*

4. "Base" means that which serves as a base.

—Ch'eng Wei-Shih Lun, quoted in Fung Yu-Lan, *A History of Chinese Philosophy*, 1959

5. Alteration is combination of contradictorily opposed determinations in the existence of one and the same thing.

—Immanuel Kant, *Critique of Pure Reason*, 1787

6. Honesty is the habitual absence of the intent to deceive.

7. Hypocrisy is the homage that vice pays to virtue.

—François La Rochefoucauld, *Reflections*, 1665

8. The word *body*, in the most general acceptation, signifieth that which filleth, or occupieth some certain room, or imagined place; and dependeth not on the imagination, but is a real part of that we call the universe.

—Thomas Hobbes, *Leviathan*

9. Torture is "any act by which severe pain or suffering, whether physical or mental, is intentionally inflicted on a person for such purposes as obtaining from him or a third person information or a confession."

—United Nations Convention Against Torture, 1984

10. "Cause" means something that produces an effect.

11. War . . . is an act of violence intended to compel our opponent to fulfill our will.

—Carl Von Clausewitz, *On War*, 1911

12. A raincoat is an outer garment of plastic that repels water.

13. A hazard is anything that is dangerous.

—*Safety with Beef Cattle*, U.S. Occupational Safety and Health Administration, 1976

14. To sneeze [is] to emit wind audibly by the nose.

—Samuel Johnson, *Dictionary*, 1814

15. A bore is a person who talks when you want him to listen.

—Ambrose Bierce, 1906

16. Art is a human activity having for its purpose the transmission to others of the highest and best feelings to which men have risen.

—Leo Tolstoi, *What Is Art?*, 1897

17. Murder is when a person of sound memory and discretion unlawfully killeth any reasonable creature in being, and under the king's peace, with malice aforethought, either express or implied.

—Edward Coke, *Institutes*, 1684

18. A cloud is a large semi-transparent mass with a fleecy texture suspended in the atmosphere whose shape is subject to continual and kaleidoscopic change.

—U. T. Place, "Is Consciousness a Brain Process?"
The British Journal of Psychology, February 1956

19. Freedom of choice: the human capacity to choose freely between two or more genuine alternatives or possibilities, such choosing being always limited both by the past and by the circumstances of the immediate present.

—Corliss Lamont, *Freedom of Choice Affirmed*, 1967

20. Health is a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity.

—Constitution of the World Health Organization, 1946

21. By analysis, we mean analyzing the contradictions in things.

—Mao Zedong, *Quotations from Chairman Mao*, 1966

22. Noise is any unwanted signal.

—Victor E. Ragosine, "Magnetic Recording,"
Scientific American, February 1970

23. To explain (explicate, *explicare*) is to strip reality of the appearances covering it like a veil, in order to see the bare reality itself.

—Pierre Duhem, *The Aim and Structure of Physical Theory*, 1991

24. The Master said, Yu, shall I teach you what knowledge is? When you know a thing, to recognize that you know it, and when you do not know a thing, to recognize that you do not know it. That is knowledge.

—Confucius, *The Analects*

25. I would define political correctness as a form of dogmatic relativism, intolerant of those, such as believers in "traditional values," whose positions are thought to depend on belief in objective truth.

—Philip E. Devine, *Proceedings of the American Philosophical Association*,
June 1992

C. Discuss the following definitions.

1. Faith is the substance of things hoped for, the evidence of things not seen.

—Heb. 11:1

2. "Faith is when you believe something that you know ain't true."

—Definition attributed to a schoolboy by William James in
"The Will to Believe," 1897

3. Faith may be defined briefly as an illogical belief in the occurrence of the improbable.

—H. L. Mencken, *Prejudice*, 1922

4. Poetry is simply the most beautiful, impressive, and widely effective mode of saying things.

—Matthew Arnold, 1865

5. Poetry is the record of the best and happiest moments of the happiest and best minds.

—Percy Bysshe Shelley, *The Defence of Poetry*, 1821

6. Dog, n. A kind of additional or subsidiary Deity designed to catch the overflow and surplus of the world's worship.

—Ambrose Bierce, *The Devil's Dictionary*, c. 1911

7. Conscience is an inner voice that warns us somebody is looking.

—H. L. Mencken, 1949

8. A bond is a legal contract for the future delivery of money.

—Alexandra Lebenthal, Lebenthal and Company, 2001

9. "The true," to put it very briefly, is only the expedient in the way of our thinking, just as "the right" is only the expedient in the way of our behaving.

—William James, "Pragmatism's Conception of Truth," 1907

10. To be conceited is to tend to boast of one's own excellences, to pity or ridicule the deficiencies of others, to daydream about imaginary triumphs, to reminisce about actual triumphs, to weary quickly of conversations which reflect unfavorably upon oneself, to lavish one's society upon distinguished persons and to economize in association with the undistinguished.

—Gilbert Ryle, *The Concept of Mind*, 1949

11. Economics is the science which treats of the phenomena arising out of the economic activities of men in society.

—J. M. Keynes, *Scope and Methods of Political Economy*, 1891

12. Justice is doing one's own business, and not being a busybody.

—Plato, *The Republic*

13. Legend has it that the distinguished economist, John Maynard Keynes, enjoyed referring to a university education as "the inculcation of the incomprehensible into the indifferent by the incompetent."

14. By good, I understand that which we certainly know is useful to us.

—Baruch Spinoza, *Ethics*, 1677

15. Political power, then, I take to be a right of making laws with penalties of death, and consequently all less penalties, for the regulating and preserving of property, and of employing the force of the community in the execution of such laws, and in defense of the commonwealth from foreign injury, and all this only for the public good.

—John Locke, *Essay Concerning Civil Government*, 1690

16. And what, then, is belief? It is the demi-cadence which closes a musical phrase in the symphony of our intellectual life.

—Charles Sanders Peirce, "How to Make Our Ideas Clear," 1878

17. Political power, properly so called, is merely the organized power of one class for oppressing another.

—Karl Marx and Friedrich Engels, *The Communist Manifesto*, 1847

18. Grief for the calamity of another is *pity*; and ariseth from the imagination that the like calamity may befall himself.

—Thomas Hobbes, *Leviathan*, 1651

19. We see that all men mean by justice that kind of state of character which makes people disposed to do what is just and makes them act justly and wish for what is just.

—Aristotle, *Nichomachean Ethics*

20. Inquiry is the controlled or directed transformation of an indeterminate situation into one that is so determinate in its constituent distinctions and relations as to convert the elements of the original situation into a unified whole.

—John Dewey, *Logic: The Theory of Inquiry*, 1938

21. A fanatic is one who can't change his mind and won't change the subject.

—Winston Churchill

22. Regret is the pain people feel when they compare what is with what might have been.

—Richard Gotti, "How Not to Regret Regret," *Bottom Line Personal*, 30 September 1992

23. Happiness is the satisfaction of all our desires, *extensively*, in respect of their manifoldness, *intensively*, in respect of their degree, and *potensively*, in respect of their duration.

—Immanuel Kant, *Critique of Pure Reason*, 1787

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24. A tragedy is the imitation of an action that is serious and also, as having magnitude, complete in itself; in language with pleasurable accessories, each kind brought in separately in the parts of the work; in a dramatic, not in a narrative form; with incidents arousing pity and fear, wherewith to accomplish its catharsis of such emotions.
—Aristotle, *Poetics*
25. Propaganda is manipulation designed to lead you to a simplistic conclusion rather than a carefully considered one.
—Anthony Pratkanis, *The New York Times*, 27 October 1992
26. . . . the frequently celebrated female intuition . . . is after all only a faculty for observing tiny insignificant aspects of behavior and forming an empirical conclusion which cannot be syllogistically examined.
—Germaine Greer, *The Female Eunuch*, 1971
27. A fetish is a story masquerading as an object.
—Robert Stoller, "Observing the Erotic Imagination," 1985
28. Religion is a complete system of human communication (or a "form of life") showing in primarily "commissive," "behabitive," and "exercitive" modes how a community comports itself when it encounters an "untranscendable negation of . . . possibilities."
—Gerald James Larson, "Prolegomenon to a Theory of Religion," *Journal of the American Academy of Religion*, 1978
29. Robert Frost, the distinguished New England poet, used to define a liberal as someone who refuses to take his own side in an argument.
—"Dreaming of JFK," *The Economist*, 17 March 1984
30. The meaning of a word is what is explained by the explanation of the meaning.
—Ludwig Wittgenstein, *Philosophical Investigations*, 1953

SUMMARY

In this chapter we have been concerned with the uses of language, and with definitions.

In Section 3.1 we identified the three chief uses of language—the *informative*, the *expressive*, and the *directive*—and two less common uses—the *ceremonial* and the *performative*.

In Section 3.2 we discussed the emotive and the neutral meanings of words. Disputes, we explained, may arise from conflicting beliefs about facts,

or from conflicting attitudes about facts whose truth may (or may not) be agreed on, and we emphasized the importance of the neutral uses of language in logical discourse.

In Section 3.3 we explained that ambiguous terms are those that have more than one distinct meaning in a given context. We distinguished three different kinds of disputes: those that are *genuine*, whether the conflict be about beliefs or attitudes; those that are *merely verbal*, arising from the unrecognized use of ambiguous terms, and those that are *genuine but appear on the surface to be verbal*, in which a real difference remains even after apparent ambiguity has been eliminated.

In Section 3.4 we began the discussion of definitions, distinguishing the definiendum (the symbol that is to be defined) from the definiens (the symbol or group of symbols used to explain the meaning of the definiendum). We distinguished five different kinds of definition based on their functions: (1) *stipulative definitions*, with which a meaning is assigned to a term (and hence which cannot be true or false); (2) *lexical definitions*, which report the meaning that the term already has (and hence can be true or false); (3) *precising definitions*, which aim is to eliminate vagueness or ambiguity; (4) *theoretical definitions*, which aim is to encapsulate our understanding of some intellectual sphere; and (5) *persuasive definitions*, which aim to influence conduct.

In Section 3.5 we explained the structure of definitions, first distinguishing the *extension* of a general term, the objects denoted by it, from its *intension*, the attributes shared by all and only the members of the class designated by that term. We explained three varieties of extensional definition: *definition by example*, in which we list, or give examples of the objects denoted by the term; *ostensive definitions*, in which we point to, or indicate by gesture the extension of the term being defined; and *semi-ostensive definitions*, in which the pointing or gesture is accompanied by a descriptive phrase whose meaning is assumed known.

We also distinguished three varieties of intensional definition: *synonymous definitions*, in which we provide another word whose meaning is already understood that has the same meaning as the word being defined; *operational definitions*, which state that a term is applied correctly to a given case if and only if the performance of specified operations in that case yields a specified result; and *definitions by genus and difference*, of which a full account is given in the following Section.

In Section 3.6 we closely examined definitions by genus and difference, in which we first name the genus of which the species designated by the definiendum is a subclass, and then name the attribute (or specific difference) that distinguishes the members of that species from members of all other species of that genus. We formulated and explained five rules for the construction of good definitions by genus and difference: (1) A definition should

state essential attributes; (2) a definition must not be circular; (3) a definition must not be too broad or too narrow; (4) definitions should not rely on ambiguous, obscure, or figurative language; and (5) when possible, definitions should not be negative.

End Notes

¹John Burgon, "Petra" (1845), on the ruins of Petra, now in Jordan.

²Robert Browning, "Rabbi Ben Ezra," 1864.

³*Cohen v. California*, 403 U.S. 15, at p. 26 (1971).

⁴By provision of the Federal Communications Decency Act. The reason those seven words are held not fit to broadcast is the reason they are not listed here. But the letters with which they begin are: S, P, F, C, C, M, and T.

⁵Defined stipulatively in 1991 by the *Conference generale des poids et mesures* (General Committee on Weights and Measures), the international body that governs in the realm of scientific units. At the other extreme, a billionth of a trillionth has been stipulatively named a "zepto," and a trillionth of a trillionth is called a "yocto." Perhaps the most famous of all stipulations was the arbitrary naming of the number 10^{100} (represented by the digit 1 followed by 100 zeros) as a "googol"—a name suggested by the 9-year-old nephew of the mathematician, Edward Kasner, when he was asked for a word that might appropriately represent a very large number. The name of the now-famous Internet search firm, Google, is a deliberate misspelling of this term.

⁶The term was introduced by Dr. John Archibald Wheeler at a 1967 meeting of the Institute for Space Studies in New York City.

⁷In James Joyce's novel *Finnegan's Wake*, the word "quark" appears in the line, "Three quarks for Muster Mark," but Dr. Gell-Mann reported that he had chosen this name for the particle before he had encountered it in that novel.

⁸See *The Chronicle of Higher Education*, 30 May 1993.

⁹*California v. Hoary D.*, 499 U.S. 621 (1991).

¹⁰D. Hakim, "Government May Alter Line Between a Car and Truck," *The New York Times*, 25 March 2003.

¹¹*Greyned v. City of Rockford*, 408 U.S. 104 (1972).

¹²*American Civil Liberties Union v. Reno*, 929 Fed. Supp. 824 (1996).

¹³In a system other than our solar system, the new definition requires that the body be (1) in orbit around a star or stellar remnant; and (2) have a mass below the limiting mass for thermonuclear fusion of deuterium; and (3) be above the minimum mass/size requirement for planetary status in the solar system.

¹⁴John P. Sisk, "Art, Kitsch and Politics," *Commentary*, May 1988.

¹⁵The term *operational definition* was first used by the Nobel Prize-winning physicist P. W. Bridgeman in his 1927 book, *The Logic of Modern Physics*.

¹⁶Jay Livingston, *Compulsive Gamblers* (New York: Harper & Row, 1974), p. 2.

¹⁷W. H. Voge, "Stress—The Neglected Variable in Experimental Pharmacology and Toxicology," *Trends in Pharmacological Science*, January 1987.