2

Language: Meaning and Definition

2.1 Varieties of Meaning

Ordinary language, as most of us are at least vaguely aware, serves various functions in our day-to-day lives. The twentieth-century philosopher Ludwig Wittgenstein thought the number of these functions to be virtually unlimited. Thus, among other things, language is used to

ask questions	tell jokes
tell stories	flirt with someone
tell lies	give directions
guess at answers	sing songs
form hypotheses	issue commands
launch verbal assaults	greet someone

and so on.

For our purpose, two linguistic functions are particularly important: (1) to convey information and (2) to express or evoke feelings. Consider, for example, the following statements:

> The death penalty, which is legal in thirty-six states, has been carried out most often in Georgia; however, since 1977 Texas holds the record for the greatest number of executions.
>
> The death penalty is a cruel and inhuman form of punishment in which hapless prisoners are dragged from their cells and summarily slaughtered only to satiate the bloodlust of a vengeful public.

The first statement is intended primarily to convey information; the second is intended, at least in part, to express or evoke feelings. These statements accomplish their respective functions through the distinct kinds of terminology in which they are phrased. Terminology that conveys information is said to have **cognitive meaning,**

and terminology that expresses or evokes feelings is said to have **emotive meaning.** Thus, in the first statement the words "legal," "thirty-six," "most often," "Georgia," "record," and so on have primarily a cognitive meaning, while in the second statement the words "cruel," "inhuman," "hapless," "dragged," "slaughtered," "bloodlust," and "vengeful" have a strong emotive meaning. Of course, these latter words have cognitive meaning as well. "Cruel" means tending to hurt others, "inhuman" means inappropriate for humans, "hapless" means unfortunate, and so on.

The emotively charged statement about the death penalty illustrates two important points. The first is that statements of this sort usually have *both* cognitive meaning and emotive meaning. Therefore, since logic is concerned chiefly with cognitive meaning, it is important that we be able to distinguish and disengage the cognitive meaning of such statements from the emotive meaning. The second point is that part of the cognitive meaning of such statements is a value claim. A **value claim** is a claim that something is good, bad, right, wrong, or better, worse, more important or less important than some other thing. For example, the statement about the death penalty asserts the value claim that the death penalty is wrong or immoral. Such value claims are often the most important part of the cognitive meaning of emotive statements. Thus, for the purposes of logic, it is important that we be able to disengage the value claims of emotively charged statements from the emotive meaning and treat these claims as separate statements.

These observations suggest the reason that people use emotive terminology as often as they do: Value claims as such normally require evidence to support them. For example, the claim that the death penalty is immoral cannot simply stand by itself. It cries out for reasons to support it. But when value claims are couched in emotive terminology, the emotive "clothing" tends to obscure the fact that a value claim is being made, and it simultaneously gives psychological momentum to that claim. As a result, readers and listeners are inclined to swallow the value claim whole without any evidence. Furthermore, the intellectual laziness of many speakers and writers, combined with their inability to supply supporting reasons for their value claims, reinforces the desirability of couching such claims in emotive terminology.

Many people, for example, will refer to someone as "crazy," "stupid," or "weird" when they want to express the claim that what that person is doing is bad or wrong and when they are unable or unwilling to give reasons for this claim. Also, many people will refer to things or situations as "awesome" or "gross" for the same reasons. Those who happen to be listening, especially if they are friendly with the speaker, will often accept these claims without hesitation.

For a subtler example of emotive terminology, consider the word "harvest." This word evokes feelings associated with honest, hardworking farmers being rewarded for their labor in planting and tending their crops. To capitalize on this positive feeling, wood products companies speak of harvesting the trees in 200-year-old forests, even though they had nothing to do with planting them, and surgeons speak of harvesting the organs from the bodies of donors and the tissue from aborted fetuses. In all of

these cases, the use of the word "harvest" is specifically calculated to elicit a favorable or agreeable response from the listener.

Let us now consider emotive terminology as it occurs in arguments. In arguments, emotive terminology accomplishes basically the same function as emotive terminology in statements. It allows the arguer to make value claims about the subject matter of the argument without providing evidence, and it gives the argument a kind of steamroller quality by which it tends to crush potential counterarguments before the reader or listener has a chance to think of them. This steamroller quality also tends to paralyze the logical thought processes of readers or listeners so that they are not able to see illogical arguments in their true light. These effects of emotive terminology can be avoided if the reader or listener will disengage the value claims and other cognitive meanings from the emotive meaning of the language and reexpress them as distinct premises.

Consider, for example, the following emotively charged argument taken from the letters to the editor section of a newspaper:

> Now that we know that the rocks on the moon are similar to those in our backyard and that tadpoles can exist in a weightless environment, and now that we have put the rest of the world in order, can we concentrate on the problems here at home? Like what makes people hungry and why is unemployment so elusive?
>
> (Robert J. Boland)

The conclusion of this argument is that our government should take money that has been spent on the space program and on international police actions and redirect it to solving domestic problems. The author minimizes the importance of the space program by covertly suggesting that it amounts to nothing more than work on ordinary rocks and tadpoles (which, by themselves are relatively insignificant), and he exaggerates the scope of the international effort by covertly suggesting that it has solved every problem on earth but our own. Also, the phrase "put . . . in order" suggests that the international effort has been no more important than restoring order to a room in one's house. We might rephrase the argument in emotively neutral language, making the implicit suggestions and value claims explicit, as follows:

> The space program has been confined to work on ordinary rocks and tadpoles.
> Ordinary rocks and tadpoles are less important than domestic hunger and unemployment.
> Our international efforts have restored order to every nation on earth but our own.
> These efforts have been directed to problems that are less important than our own domestic problems.
> Therefore, our government should redirect funds that have been spent on these projects to solving our own domestic problems.

By restructuring the argument in this way, we can more easily evaluate the degree to which the premises support the conclusion. Inspection of the premises reveals that

the first, third, and possibly fourth premises are false. Thus, the actual support provided by the premises is less than what we might have first expected. If the argument were to be rephrased a second time so that the premises turned out true (for example, the first premise might read "*Part* of the space program has been devoted to research on ordinary rocks and tadpoles"), the support given to the conclusion would still be weaker than the author intended.

Now that we have distinguished emotive meaning from cognitive meaning, let us explore some of the ways that cognitive meanings can be defective. Two of them are vagueness and ambiguity. A linguistic expression is said to be **vague** if there are borderline cases in which it is impossible to tell if the expression applies or does not apply. Vague expressions often allow for a continuous range of interpretations. The meaning is hazy, obscure, and imprecise. For example, words such as "love," "happiness," "peace," "excessive," "fresh," "rich," "poor," "normal," "conservative," and "polluted" are vague. We can rarely tell with any precision whether they apply to a given situation or not. How fresh does something have to be in order to be called fresh?

Vagueness can also affect entire statements. Such vagueness may arise not so much from the individual words as from the way in which the words are combined. For example, suppose someone were to say, "Today our job situation is more transparent." First, what is the meaning of "job situation"? Does it refer to finding a job, keeping a job, filling a job, completing a job, or bidding on a job? And what exactly does it mean for a job situation to be "transparent"? Does it mean that the job is more easily perceived or comprehended? That the job is more easily completed? That we can anticipate our future job needs more clearly? Or what else?

Not all cases of vagueness, however, are problematic. To describe an acquaintance as "tall" or "thin" often causes no trouble in ordinary conversation. Indeed, it may be overly burdensome to describe this person in more precise language. Trouble arises only when the language is not sufficiently precise for what the situation demands.

The other way in which cognitive meanings can be defective is ambiguity. An expression is said to be **ambiguous** when it can be interpreted as having more than one clearly distinct meaning in a given context. For example, words such as "light," "proper," "critical," "stress," "mad," "inflate," "chest," "bank," "sound," and "race" can be used ambiguously. Thus, if one were to describe a beer as a light pilsner, does this mean that the beer is light in color, light in calories, or light in taste? If one were to describe an action as proper, does this mean proper in a moral sense or proper in the sense of being socially acceptable? Or if one were to describe a person as critical, does this mean that the person is essential for a certain task or that the person tends to criticize others?

As is the case with vagueness, ambiguity can also affect entire statements. Such ambiguity often results from the way in which certain words are combined. For example, there was a newspaper headline that read, "Tuna are biting off the Washington coast." Does this mean that the tuna are nibbling away at the coastline or that fishermen

are catching them off the coast? Presumably it means the latter. And another headline read, "College students are turning to vegetables." Does this mean that the students are metamorphosing into vegetables or that they are incorporating more vegetables into their diet? Again, the intended meaning is probably the latter.

The difference between ambiguity and vagueness is that vague terminology allows for a relatively continuous range of interpretations, whereas ambiguous terminology allows for multiple discrete interpretations. In a vague expression there is a blur of meaning, whereas in an ambiguous expression there is a mix-up of otherwise clear meanings. However, there are many forms of expression that are ambiguous in one context and vague in another. For example, the word "slow" in one context could mean either mentally retarded or physically slow, but when the word refers to physical slowness, it could be vague. How slow is slow? Similar remarks apply to "light," "fast," and "rich."

Ambiguity and vagueness are important in logic because there are countless occasions in which the evaluation of an argument leads to the observation, "Well, that depends on what you mean by . . ." Certain phraseology in the argument is vague or ambiguous, and its meaning must be clarified before any evaluation can proceed. For example, Scientologists argue that their organization should be exempt from paying taxes because, they claim, Scientology is a religion. Evaluating their argument requires that we clarify the meaning of "religion." Pro-life advocates argue that abortion is wrong because it results in the killing of human beings. But what is the meaning of "human being"? And feminists argue that leering glances constitute sexual harassment. To evaluate their arguments we must clarify the meaning of "leering glances" and "sexual harassment."

The role of vagueness and ambiguity in arguments may be conveniently explored in the context of conflicting arguments between individuals. Such conflicts are called disputes:

> CLAUDIA: Mrs. Wilson abuses her children. And how do I know that? I saw her spank one of her kids the other day after the kid misbehaved.
>
> JANE: Don't be silly. Kids need discipline, and by disciplining her children, Mrs. Wilson is showing that she loves them.

Here the problem surrounds the vagueness of the words "abuse" and "discipline." When does discipline become abuse? The line separating the two is hazy at best, but unless it is clarified, disputes of this sort will never be resolved.

Another example:

> BRENDA: I'm afraid that Smiley is guilty of arson. Last night he confided to me that he was the one who set fire to the old schoolhouse.
>
> WARREN: No, you couldn't be more mistaken. In this country no one is guilty until proven so in a court of law, and Smiley has not yet even been accused of anything.

In this case the dispute arises over the ambiguity of the word "guilty." Brenda is using the word in the moral sense. Given that Smiley has admitted to setting fire to the old schoolhouse, it is very likely that he did indeed set fire to it and therefore is guilty of arson in the moral sense of the term. Warren, on the other hand, is using the word in the legal sense. Because Smiley has not been convicted in a court of law, he is not legally guilty of anything.

Disputes that arise over the meaning of language are called *verbal disputes*. But not all disputes are of this sort. Some disputes arise over a disagreement about facts, and these are called *factual disputes*. Example:

> KEITH: I know that Freddie stole a computer from the old schoolhouse. Barbara told me that she saw Freddie do it.
>
> PHYLLIS: That's ridiculous! Freddie has never stolen anything in his life. Barbara hates Freddie, and she is trying to pin the theft on him only to shield her criminal boyfriend.

Here the dispute centers on the factual issues of whether Barbara told the truth and whether Freddie stole the computer.

In dealing with disputes, the first question is whether the dispute is factual, verbal, or some combination of the two. If the dispute is verbal, then the second question to be answered is whether the dispute concerns ambiguity or vagueness.

EXERCISE 2.1

I. The following selection is taken from a speech delivered by George C. Wallace, former Governor of Alabama, on July 4, 1964. In this speech Wallace attacked Lyndon Johnson's signing of the Civil Rights Act. The speech is liberally sprinkled with emotive terminology. Make a list of what you consider to be the twenty-five most highly charged words or phrases, and then indicate whether they are intended to evoke a favorable or an unfavorable attitude from the listener.

> We come here today in deference to the memory of those stalwart patriots who on July 4, 1776, pledged their lives, their fortunes, and their sacred honor to establish and defend the proposition that governments are created by the people, empowered by the people, derive their just powers from the consent of the people, and must forever remain subservient to the will of the people.
>
> Today, 188 years later, we celebrate that occasion and find inspiration and determination and courage to preserve and protect the great principles of freedom enunciated in the Declaration of Independence.
>
> It is therefore a cruel irony that the President of the United States has only yesterday signed into law the most monstrous piece of legislation ever enacted by the United States Congress.
>
> It is a fraud, a sham, and a hoax.

This bill will live in infamy. To sign it into law at any time is tragic. To do so upon the eve of the celebration of our independence insults the intelligence of the American people.

It dishonors the memory of countless thousands of our dead who offered up their very lives in defense of principles which this bill destroys.

Never before in the history of this nation have so many human and property rights been destroyed by a single enactment of the Congress. It is an act of tyranny. It is the assassin's knife stuck in the back of liberty.

With this assassin's knife and a blackjack in the hand of the federal force-cult, the left-wing liberals will try to force us back into bondage. Bondage to a tyranny more brutal than that imposed by the British Monarchy which claimed power to rule over the lives of our forefathers under sanction of the omnipotent black-robed despots who sit on the bench of the United States Supreme Court.

This bill is fraudulent in intent, in design and in execution.

It is misnamed. Each and every provision is mistitled. It was rammed through the Congress on the wave of ballyhoo, promotions, and publicity stunts reminiscent of P. T. Barnum.

It was enacted in an atmosphere of pressure, intimidation, and even cowardice, as demonstrated by the refusal of the United States Senate to adopt an amendment to submit the bill to a vote of the people.

To illustrate the fraud—it is not a civil rights bill. It is a federal penal code. It creates federal crimes which would take volumes to list and years to tabulate because it affects the lives of 192 million American citizens. Every person in every walk and station of life and every aspect of our daily lives become subject to the criminal provisions of this bill.

It threatens our freedom of speech, of assembly, of association, and makes the exercise of these freedoms a federal crime under certain conditions.

It affects our political rights, our right to trial by jury, our right to the full use and enjoyment of our private property, the freedom from search and seizure of our private property and possessions, the freedom from harassment by federal police and, in short, all the rights of individuals inherent in a society of free men.

Ministers, lawyers, teachers, newspapers, and every private citizen must guard his speech and watch his actions to avoid the deliberately imposed booby traps put into this bill. It is designed to make federal crimes of our customs, beliefs, and traditions. Therefore, under the fantastic powers of the federal judiciary to punish for contempt of court and under their fantastic powers to regulate our most intimate aspects of our lives by injunction, every American citizen is in jeopardy and must stand guard against these despots.

II. The following selections were taken from the letters to the editor section of a newspaper. Each can be interpreted as expressing one or more arguments. Begin by identifying the conclusion of each. Then disengage the covert assumptions, value claims, and other cognitive assertions from the emotive language and translate them into emotively neutral premises. Use the two examples in the text as models. Finally, evaluate the restructured arguments. Some may turn out to be good ones.

★1. Why don't animal lovers do something about these dog sled races? Have you ever witnessed a race on television? Talk about torture. It's sickening to watch the dogs, panting and their tongues hanging out, pull a heavily laden sled with a driver through snow and ice in bitter cold.

(Joe Shapiro)

2. How anyone who has seen even one photo of the fly-covered, starving children in Somalia can still believe in a loving, everpresent, omnipotent God is beyond intelligent reasoning.

(William Blanchard)

3. The creationists have no right to impose their mistaken, ignorant, superstitious beliefs on others. They claim the constitutional right to the free exercise of religion. How about the rights of the majority of people who want their children taught the scientific truth about evolution—not fallacious myths and superstitions from primitive societies.

(Andrew M. Underhill, Jr.)

★4. God, guts, and guns made this great country of ours free, and you can bet your buns it will take more of the same to keep it that way. One of the very last things in this world we need is handgun control.

(R. Kinzie)

5. The insanity plea should be done away with; criminals should lose this easy way out. Killers can theoretically spend as little as six months in a mental hospital, then be released. It's time to take a stand for safety and put psychotic killers in prison.

(Keith Aikens)

6. Until now, the protest against the holocaust in our own nation has been vocal but far too small. The massacre of an unwanted generation through abortion and infanticide has sounded an alarm that should wake up every Christian. Helpless and guiltless little infants are mercilessly butchered daily in hospitals and clinics across our land. For the love of God, let us all urge the passage of the Human Life Bill, now before Congress.

(Jim Key)

★7. It's time to challenge all this nonsense about the "celebration of diversity" in our society. The more the schizophrenics preach the glories of diversity, the more we pull apart. This is not to deny appreciation of the ethnic roots, rituals, and foods, which add color to life. But to lay undue emphasis upon diversification results in destruction of the "social glue" that binds us together. Our forefathers framed one nation, indivisible. In the misguided effort to "celebrate" the uniqueness of every disparate culture and subculture, we betray our heritage and dilute our identities as Americans.

(Ruth M. Armstrong)

8. A kind and loving God surely favors the pro-choice attitude. He wants his world inhabited by happy, well-fed children with parents who love and care for them.

   Our burgeoning population in Third World nations with constant famine and disease, and many other human miseries, could be relieved if the Catholic Church were to adjust more of its ancient policies to our current civilization.

   (Art Bates)

9. Thousands of years of organized religion have done nothing to solve any problems and have almost always exacerbated them by promoting fear, superstition and irrational mythologies. Kneeling in prayer to some supernatural entity seeking "divine guidance" or, even more implausibly, "divine intervention," is not only a waste of time, it is counterproductive because it lulls the supplicant into inactivity.

   We must stand up, open our eyes and face life's challenges head-on in a problem-solving approach that is reality based, empirical, and above all, rational.

   (James W. Baugh)

★10. Liberalism has turned our welfare system from a social safety net into a hammock. We hand out money with few questions asked. When welfare recipients are asked for some contribution to our society in return, liberals scream that it's unconstitutional.

   Liberalism has transformed our criminal justice system into one that cares more about the criminal's past childhood problems than for the victim. Liberalism in its never ending quest for "social justice" has sacrificed the rights of the majority while continuing to push the rights of a few to new limits.

   Liberalism has turned our school system from one of excellence to one where condoms and metal detectors are more important than prayer.

   (Marc Sexton)

III. Determine whether the following disputes are verbal, factual, or some combination of the two. If verbal, discuss whether the dispute arises from vagueness or ambiguity.

★1. FRANK: Look at that huge tree that fell last night. It must have made a tremendous crash when it came down.

   SHIRLEY: No, I'm afraid you're quite wrong. Sound is a perception, and perceptions depend on a perceiver. Therefore, since nobody was around here last night, there was no crash.

2. VICKIE: Yesterday I visited the exhibition of the work of Jean Michel Basquiat at the Central Gallery. What an interesting artist he is!

   BARBARA: Don't be ridiculous! That's not art, it's just graffiti.

3. PHIL: That was a great basketball game last night. Shaquille O'Neal scored 37 points.

   ARTHUR: Your statistics are all wet. O'Neal scored only 34 points.

★4. ROGER: I think modern society is becoming more and more violent every day. Just look at the increase in murder, rape, and robbery. Violence is clearly an evil that must be eradicated.

   MARK: You might be right about the increase in crime, but the idea that violence is an evil is nonsense. Violence is quite natural. The universe was created in a tremendously violent Big Bang, the nuclear reactions that bring us sunlight are extremely violent, and insects and animals kill and devour one another all the time.

5. KATHY: I was saddened to hear about the death of your uncle. He was such a wonderful man. You must be consoled knowing that he's enjoying his heavenly reward.

   ANNE: Thanks, but I'm afraid I don't know what you mean. If death is the end of life, how could my uncle be alive right now in heaven?

6. HEIDI: This morning I heard a lecture on the life of Jane Austen. She was such a wonderfully educated woman.

   DAVID: That's not true at all. Jane Austen dropped out of school when she was only eleven, and she never even attended high school, much less college or graduate school.

★7. LESLIE: Your friend Paul told us that he would be visiting his parents in Knoxville this weekend. Therefore, he must not be at home.

   DIANA: I agree that Paul is probably not at home, but you didn't hear him right. He said that his parents live in Nashville.

8. KARL: There's a euthanasia measure on the ballot today, and I think I'll vote for it. It seems reasonable that terminally ill patients should be allowed to be disconnected from life-support systems so that they can die peacefully and naturally.

   SERGIO: You must be crazy! Euthanasia means giving people lethal injections, and that's clearly murder.

9. CHERYL: Tomorrow I'm going to the Megadeath concert. Their music is fabulous.

   OLIVER: You call that music? Really it's just noise, and incredibly loud noise at that.

★10. CAROL: Nelson could not have fought in the battle of Trafalgar, because that battle occurred in 1806, and Nelson died in 1804.

   JUSTIN: Your knowledge of history is atrocious! Nelson did fight in Trafalgar, and the date was October 21, 1805.

11. ERIC: I've just signed up for Philosophy 502—Dr. Peterson's class in metaphysics. I know I'm going to enjoy it because I've always been fascinated by magic and ghosts.

    LEAH: I'm afraid you're in for a surprise.

12. HAROLD: Professor Steinbeck is the most intelligent man I know. His lecture series on matter and consciousness was simply brilliant.

    JOYCE: Steinbeck is actually an idiot. Yesterday I watched while he tried to get his car started. When it wouldn't start, he opened the hood, and he didn't even notice that someone had stolen the battery.

★13. THOMAS: George Foreman committed those crimes of child abuse through his own free choice. Nobody put a gun to his head. Therefore he should be punished for them.

    EMILIE: That's not true. It's been established that Foreman was severely abused himself when he was a child, and such children have an irresistible obsession to abuse others when they grow up.

14. ANTHONY: The sun is much smaller than the earth. You see, it's just a small thing up there in the sky. Therefore, since the sun's gravitational attraction is proportional to its mass, the sun's gravity is less than the earth's.

    CINDY: You are as stupid as they come. I agree the mass of the sun is less than that of the earth, but its volume is greater. Therefore, since gravitational attraction is proportional to volume, the sun's gravity is greater than the earth's.

15. MINDY: President Clinton should have been removed from office because he lied about having sexual relations with Monica Lewinsky.

    KAREN: Don't be silly. President Clinton only had oral sex with Lewinsky, and oral sex does not constitute sexual relations.

★16. FRED: Today's professional athletes are overpaid. Many of them make millions of dollars a year.

    SHAWN: I don't think they are overpaid at all. Just look at the owners of some of these teams. They make ten times as much as the athletes do.

17. BRIAN: That new morning-after pill, RU-486, causes abortion. Therefore, since abortion is wrong, you should never take that pill.

    ELAINE: How ignorant you are! RU-486 merely prevents implantation of the fertilized ovum. Therefore, since the woman never gets pregnant, there is no abortion.

18. PENNY: In my mind, the use of marijuana should be legalized. After all, caffeine and alcohol are no less of a drug than marijuana, and it's not illegal to enjoy a glass of beer or drink a cup of coffee.

    SAM: Your conclusion is way off. Beer and coffee are not drugs, they're foods.

★19. JERRY: In spite of the great strides technology has made in this country, poverty remains a terrible problem. Why, some people earn less than $10,000 per year. The government should do something about it.

FRANKIE: I hardly think that $10,000 per year constitutes poverty. Why, in many third world countries the majority of inhabitants earn less than $1,000 per year.

20. JOSEPH: Adult human beings have the right to marry whomever they please, as long as that person is not a close relative. From this it follows that homosexuals have the right to marry someone of their own sex.

STEPHEN: Your argument makes no sense. Rights are created by laws, and since there is no federal or state law that gives homosexuals the right to marry, they have no such right.

2.2 The Intension and Extension of Terms

The main task of logic is the evaluation of arguments. However, as we saw in the previous section, there are countless arguments in which this task leads to the observation, "Well, that depends on what you mean by . . ." Such an observation usually indicates that the meaning of certain words in the argument is vague or ambiguous. Clearing up the problem often involves supplying a definition. Thus, the study of meaning and definition is closely related to the main task of logic. In this section we continue our inquiry into aspects of linguistic meaning, and the results of this inquiry provide the basis for the theory of definition in the next section.

The basic units of any ordinary language are *words*. Our main concern in this chapter, however, is not with words in general but with terms. A **term** is any word or arrangement of words that may serve as the subject of a statement. Terms consist of proper names, common names, and descriptive phrases. Here are some examples:

Proper names	Common names	Descriptive phrases
Napoleon	animal	first president of the United States
North Dakota	restitution	author of *Hamlet*
The United States Senate	house	books in my library
Gore Vidal	activity	officers in the Swiss Navy
Robinson Crusoe	person	blue things
		those who study hard

Words that are not terms include verbs, nonsubstantive adjectives, adverbs, prepositions, conjunctions, and all nonsyntactic arrangements of words. The following words or phrases are not terms; none can serve as the subject of a statement:

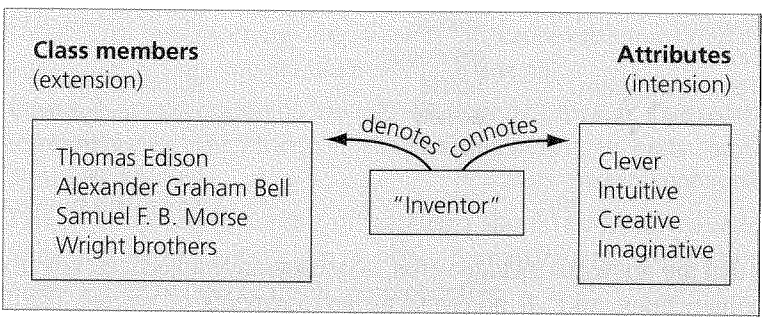
dictatorial	moreover
runs quickly	craves
above and beyond	cabbages into again the forest

The last example is a nonsyntactic arrangement.

At this point it is important to distinguish the *use* of a word from the *mention* of a word. Without this distinction any word can be imagined to serve as the subject of a statement and, therefore, to count as a term. The word "wherever," for example, is not a term, but "wherever" (in quotes) can serve as the subject of a statement, such as "'Wherever' is an eight-letter word." But in this statement, it is not the word itself that is the subject but rather the *quoted* word. The word is said to be *mentioned*—not *used*. On the other hand, "wherever" is *used* in this statement: "I will follow you wherever you go." In distinguishing terms from nonterms one must be sure that the word or group of words can be *used* as the subject of a statement.

Words are usually considered to be symbols, and the entities they symbolize are usually called **meanings.** Terms, being made up of words, are also symbols, but the meanings they symbolize are of two kinds: intensional and extensional. The **intensional meaning** consists of the qualities or attributes that the term *connotes,* and the **extensional meaning** consists of the members of the class that the term *denotes.* For example, the intensional meaning of the term "cat" consists of the attributes of being furry, of having four legs, of moving in a certain way, of emitting certain sounds, and so on, while the extensional meaning consists of cats themselves—all the cats in the universe. The term connotes the attributes and denotes the cats.

The intensional meaning of a term is otherwise known as the **intension,** or **connotation,** and the extensional meaning is known as the **extension,** or **denotation.** "Intension" and "extension" are roughly equivalent to the more modern terms "sense" and "reference," respectively. Also, it should be noted that logic uses the terms "connotation" and "denotation" differently from the way they are used in grammar. In grammar, "connotation" refers to the subtle nuances of a word, whereas "denotation" refers to the word's direct and specific meaning.



Exactly how a term connotes a set of attributes allows for at least two different interpretations. Some philosophers take an objective approach and hold that a term connotes whatever attributes something must have in order to be denoted by the term. Others take what might be called a subjective approach and hold that a term connotes the attributes that occur in the minds of the people who use that term. This book takes the latter approach.

In connection with this approach, however, we encounter the problem of terms connoting different things to different people. Thus, to a cat lover the term "cat" might connote the attributes of being cuddly and adorable, while to someone who hates cats it might connote the attributes of being obnoxious and disgusting. To avoid this problem, we restrict the meaning of connotation to what is usually called the conventional connotation. The **conventional connotation** of a term includes the attributes that the term *commonly* calls forth in the minds of competent speakers of the language. Under this interpretation, the connotation of a term remains more or less the same from person to person and from time to time.

The denotation of a term also typically remains the same from person to person, but it may change with the passage of time. The denotation of "currently living cat," for example, is constantly fluctuating as some cats die and others are born. The denotation of the term "cat," on the other hand, is presumably constant because it denotes all cats, past, present, and future.

Sometimes the denotation of a term can change radically with the passage of time. The terms "currently living dodo bird" and "current king of France," for example, at one time denoted actually existing entities, but today all such entities have perished. Accordingly, these terms now have what is called **empty extension.** They are said to denote the empty (or "null") class, the class that has no members. Other terms with empty extension include "unicorn," "leprechaun," "gnome," "elf," and "griffin." While these terms have empty extension, however, they do not have empty intension. "Currently living dodo bird" and "current king of France," as well as "unicorn," "elf," and "griffin," connote a variety of intelligible attributes.

The fact that some terms have empty extension leads us to an important connection between extension and intension—namely, that *intension determines extension.* The intensional meaning of a term serves as the criterion for deciding what the extension consists of. Because we know the attributes connoted by the term "unicorn," for example, we know that the term has empty extension. That is, we know that there are no four-legged mammals having a single straight horn projecting from their forehead. Similarly, the intension of the word "cat" serves as the criterion for determining what is and what is not a member of the class of cats.

One kind of term that raises problems for the intension-determines-extension rule is proper names. For example, the name "David" might not appear to have any intension, but it denotes the person who has this name. Although philosophers have disagreed about this, it would seem that proper names must have some kind of intension

or we would not know what persons, if any, they denote. One possible solution to this problem is that names are shorthand symbols for descriptions or bundles of descriptions. For example, "David" could be shorthand for "the person who lives next door" or "the person who works at the corner store and who drives a green Chevy."

Another possible solution to the problem of proper names is that the intension of proper names consists of the causal chain of events leading from the point at which the name is first assigned to the point at which a certain person learns about the name. Thus, the first link in such a chain might be the baptismal event at which the name "David" is given to a certain infant, the second link would be the event in which a certain third party is informed of the first event, and so on. This entire chain of events extending through the linguistic community would then constitute the intension of "David." Thus, we conclude that for all terms, including proper names, intension determines extension.

The distinction between intension and extension may be further illustrated by comparing the way in which these concepts can be used to give order to random sequences of terms. Terms may be put in the order of increasing intension, increasing extension, decreasing intension, and decreasing extension. A series of terms is in the order of **increasing intension** when each term in the series (except the first) connotes more attributes than the one preceding it. In other words, each term in the series (except the first) is *more specific* than the one preceding it. (A term is specific to the degree that it connotes more attributes.) The order of **decreasing intension** is the reverse of that of increasing intension.

A series of terms is in the order of **increasing extension** when each term in the series (except the first) denotes a class having more members than the class denoted by the term preceding it. In other words, the class size gets larger with each successive term. **Decreasing extension** is, of course, the reverse of this order. Examples:

increasing intension:	animal, mammal, feline, tiger
increasing extension:	tiger, feline, mammal, animal
decreasing intension:	tiger, feline, mammal, animal
decreasing extension:	animal, mammal, feline, tiger

These examples illustrate a fact pertaining to most such series: The order of increasing intension is usually the same as that of decreasing extension. Conversely, the order of decreasing intension is usually the same as that of increasing extension. There are some exceptions, however. Consider the following series:

> unicorn; unicorn with blue eyes; unicorn with blue eyes and green horn; unicorn with blue eyes, green horn, and a weight of over 400 pounds

Each term in this series has empty extension; so, while the series exhibits the order of increasing intension, it does not exhibit the order of decreasing extension. Here is another, slightly different, example:

living human being; living human being with a genetic code; living human being with a genetic code and a brain; living human being with a genetic code, a brain, and a height of less than 100 feet

In this series none of the terms has empty extension, but each term has exactly the *same* extension as the others. Thus, while the intension increases with each successive term, once again the extension does not decrease.

EXERCISE 2.2

LC I. The following exercises deal with words and terms.

1. Determine which of the following words or groups of words are terms and which are nonterms.

extortion	Thomas Jefferson
laborious	Empire State Building
cunningly	annoy
practitioner	render satisfactory
seriousness	graceful dancer
forever	wake up
whoever studies	not only
interestingly impassive	tallest man on the squad
scarlet	mountaintop
reinvestment	between
therefore	since

2. Name some of the attributes connoted by the following terms. Express your answer with adjectives or adjectival phrases. Example: The term "elephant" connotes the attributes of being large, having tusks, having a trunk.

drum	wolf	fanatic	riot
politician	Mona Lisa	carrot	piano
devil	Statue of Liberty		

3. Name three items denoted by the terms in the left-hand column below and all items denoted by the terms in the right-hand column.

newspaper	tallest mountain on earth
scientist	prime number less than 10
manufacturer	governor of New York
river	language of Switzerland
opera	Scandinavian country

4. Put the following sequences of terms in the order of increasing intension:

★a. conifer, Sitka spruce, tree, spruce, plant

b. Italian sports car, car, vehicle, Maserati, sports car

c. doctor of medicine, person, brain surgeon, professional person, surgeon

d. wallaby, marsupial, mammal, animal, kangaroo

e. parallelogram, polygon, square, rectangle, quadrilateral

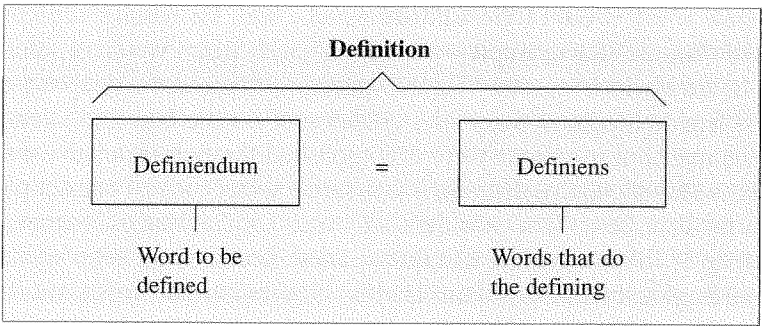
5. Construct a series of four terms that exhibits increasing intension but non-decreasing extension.

II. Answer "true" or "false" to the following statements:

1. All words have an intensional meaning and an extensional meaning.
2. The intensional meaning of a term consists of the attributes connoted by the term.
3. The extensional meaning of a term consists of the members of the class denoted by the term.
4. The extension of a term always remains the same with the passage of time.
5. Some terms have empty intension.
6. Some terms have empty extension.
7. The intension of a term determines the extension.
8. The intension of a term determines how specific the term is.
9. The order of increasing intension is always the same as that of decreasing extension.
10. "Leprechaun" and "unicorn" have the same extension.

2.3 Definitions and Their Purposes

Over the years philosophers have held various conflicting views about the purpose of definitions. For Plato, to mention just one, definitions were intended to explicate the meaning of certain eternal essences or forms, such as justice, piety, and virtue. For most logicians today, however, definitions are intended exclusively to explicate the meaning of *words*. In conformity with this latter position, we may define **definition** as a group of words that assigns a meaning to some word or group of words. Accordingly, every definition consists of two parts: the definiendum and the definiens. The **definiendum** is the word or group of words that is supposed to be defined, and the **definiens** is the word or group of words that does the defining. For example, in the definition "'Tiger' means a large, striped, ferocious feline indigenous to the jungles of India and Asia," the word "tiger" is the definiendum, and everything after the word "means" is the definiens. The definiens is not itself the meaning of the definiendum; rather, it is the group of words that symbolizes (or that is supposed to symbolize) the



same meaning as the definiendum. Because we presumably know in advance what the definiens symbolizes, we are led, via the definition, to understand what the definiendum symbolizes. It is in this way that the definition "assigns" a meaning to its definiendum.

Once it has been decided that definitions explicate the meaning of words, other disagreements emerge among the philosophers. Some argue that since a definition is merely a rule that allows one set of words (the definiens) to be used in place of another set (the definiendum), definitions communicate no information at all about the subject matter of the definiendum. Others take the opposite tack and argue that since definitions result in a clarification of language, they provide a means for the discovery of deeper philosophical truths. It seems, however, that neither of these approaches is able to make good sense of all the various kinds of definitions that are actually employed in ordinary usage. As a result, instead of beginning their analysis of definitions with a set of a priori criteria, many logicians take a pragmatic approach and begin with a survey of the various kinds of definitions that are actually used and of the functions that they actually serve. This is the approach taken here.

Stipulative Definitions

A **stipulative definition** assigns a meaning to a word for the first time. This may involve either coining a new word or giving a new meaning to an old word. The purpose of a stipulative definition is usually to replace a more complex expression with a simpler one.

The need for a stipulative definition is often occasioned by some new phenomenon or development. For example, a few years ago the attempt was made at a certain zoo to crossbreed tigers and lions. Because of the genetic similarity of the two species, the attempt succeeded. Offspring were produced from a male tiger and a female lion and from a male lion and a female tiger. When the offspring were born, it became appropriate to give them names. Of course, the names "offspring of male tiger and female lion" and "offspring of male lion and female tiger" could have been used, but these names were hardly convenient. Instead, the names "tigon" and "liger" were selected.

Any two new words would have sufficed equally well for naming the offspring—"topar" and "largine" for example—but "tigon" and "liger" were considered more appropriate, for obvious reasons. "Tigon" was taken to mean the offspring of a male tiger and a female lion, and "liger" the offspring of a male lion and a female tiger. These assignments of meanings were accomplished through stipulative definitions.

Another use for stipulative definitions is to set up secret codes. For example, during World War II, "Tora, Tora, Tora" was the code name Admiral Yamamoto transmitted to the war office in Tokyo signaling that the Japanese fleet had not been spotted in the hours preceding the bombing of Pearl Harbor; "Operation Barbarosa" was the name the Germans gave to the invasion of Russia; and "Operation Overlord" was the name the allied forces gave to the planned invasion of Normandy. More recently, "Operation Desert Storm" was the code name given to the military invasion of Iraq. Law enforcement organizations have adopted similar code names for sting operations against organized crime.

Because people are continually coming up with new creations, whether it be new food concoctions, new inventions, new modes of behavior, new kinds of apparel, new dances, or whatever, stipulative definitions are continually being used to introduce names for these things. Sometimes these definitions are only implicit and amount to little more than the spontaneous association of the word with some action—as was probably the case when the words "bop," "twist," "jerk," and "chicken" came to be known as names of dances a few decades ago. At other times, they are definitely explicit, as when the word "penicillin" was selected as the name for an antibacterial substance produced by certain *Penicillium* molds, or when the symbol "10^5" was chosen as a simple substitute for "$10 \times 10 \times 10 \times 10 \times 10$."

Because a stipulative definition is a completely arbitrary assignment of a meaning to a word for the first time, there can be no such thing as a "true" or "false" stipulative definition. Furthermore, for the same reason, a stipulative definition cannot provide any new information about the subject matter of the definiendum. The fact that the word "tigon" was selected to replace "offspring of a male tiger and a female lion" tells us nothing new about the nature of the animal in question. One stipulative definition may, however, be more or less convenient or more or less appropriate than another.

Stipulative definitions are misused in verbal disputes when one person covertly uses a word in a peculiar way and then proceeds to assume that everyone else uses that word in the same way. Under these circumstances that person is said to be using the word "stipulatively." In such cases the assumption that other persons use the word in the same way is rarely justified.

Lexical Definitions

A **lexical definition** is used to report the meaning that a word already has in a language. Dictionary definitions are all instances of lexical definitions. Thus, in contrast with a stipulative definition, which assigns a meaning to a word for the first

time, a lexical definition may be true or false depending on whether it does or does not report the way a word is actually used. Because words are frequently used in more than one way, lexical definitions have the further purpose of eliminating the ambiguity that would otherwise arise if one of these meanings were to be confused with another.

As we saw in the first section of this chapter, an expression is **ambiguous** when it can be interpreted as having two or more clearly distinct meanings in a given context. Words such as "light," "mad," and "bank" can be used ambiguously. Because a lexical definition lists the various meanings that a word can have, a person who consults such a definition is better prepared to avoid ambiguous constructions of his or her own and to detect those of others. Undetected ambiguity causes the most trouble. In many cases the problem lies not with the obvious differences in meaning that words such as "light" and "bank" may have but with the subtle shadings of meaning that are more likely to be confused with one another. For example, if a woman is described as "nice," any number of things could be intended. She could be fastidious, refined, modest, pleasant, attractive, or even lewd. A good lexical definition will distinguish these various shadings and thereby guard against the possibility that two such meanings will be unconsciously jumbled together into one.

Precising Definitions

The purpose of a **precising definition** is to reduce the vagueness of a word. As we saw in the first section of this chapter, an expression is **vague** if there are borderline cases in which it is impossible to tell if the word applies or does not apply. Words such as "fresh," "rich," and "poor" are vague. Once the vagueness of such words is reduced by a precising definition, one can reach a decision as to the applicability of the word to a specific situation. For example, if legislation were ever introduced to give direct financial assistance to the poor, a precising definition would have to be supplied specifying exactly who is poor and who is not. The definition "'Poor' means having an annual income of less than $4,000 and a net worth of less than $20,000" is an example of a precising definition.

Whenever words are taken from ordinary usage and used in a highly systematic context such as science, mathematics, medicine, or law, they must always be clarified by means of a precising definition. The terms "force," "energy," "acid," "element," "number," "equality," "contract," and "agent" have all been given precising definitions by specific disciplines.

Sometimes the substance of a court trial may revolve around the precise usage of a term. A trial in California addressed the question of whether a man who had driven a bicycle while intoxicated violated the motor vehicle code. The question concerned whether, for these purposes, a bicycle could be considered a "vehicle." The court decided in the affirmative, and the decision amounted to an incremental extension of an already existent precising definition of the word "vehicle."

Another example involves the practice of surgical transplantation of vital organs. Before a heart transplant can be conducted, the donor must be dead; otherwise the surgeon will be accused of murder. If the donor is dead for too long, however, the success of the transplant will be imperiled. But exactly when is a person considered to be dead? Is it when the heart stops beating, when the person stops breathing, when rigor mortis sets in, or some other time? The question involves the meaning of the term "moment of death." The courts have decided that "moment of death" should be taken to mean the moment the brain stops functioning, as measured by an electroencephalograph. This decision amounts to the acceptance of a precising definition for "moment of death."

A precising definition differs from a stipulative definition in that the latter involves a purely arbitrary assignment of meaning, whereas the assignment of meaning in a precising definition is not at all arbitrary. A great deal of care must be taken to ensure that the assignment of meaning in a precising definition is appropriate and legitimate for the context within which the term is to be employed.

Theoretical Definitions

A **theoretical definition** assigns a meaning to a word by suggesting a theory that gives a certain characterization to the entities that the term denotes. Such a definition provides a way of viewing or conceiving these entities that suggests deductive consequences, further investigation (experimental or otherwise), and whatever else would be entailed by the acceptance of a theory governing these entities. The definition of the term "heat" found in texts dealing with the kinetic theory of heat provides a good example: "'heat' means the energy associated with the random motion of the molecules of a substance." This definition does more than merely assign a meaning to a word; it provides a way of conceiving the physical phenomenon that is heat. In so doing, it suggests the deductive consequence that as the molecules of a substance speed up, the temperature of the substance increases. In addition, it suggests a number of experiments—experiments investigating the relationship between molecular velocity and the phenomena of radiation, gas pressure, molecular elasticity, and molecular configuration. In short, this definition of "heat" provides the impetus for an entire theory about heat.

Other examples of theoretical definitions are the definition of "light" as a form of electromagnetic radiation and the definition of "force," "mass," and "acceleration" in Newton's second law of motion as expressed in the equation "$F = MA$." The latter is a kind of contextual definition in which each term is defined in terms of the other two. Both definitions entail numerous deductive consequences about the phenomena involved and suggest numerous avenues of experimental investigation.

Not all theoretical definitions are associated with science. Many terms in philosophy, such as "substance," "form," "cause," "change," "idea," "good," "mind," and "God," have been given theoretical definitions. In fact, most of the major philosophers

in history have given these terms their own peculiar theoretical definitions, and this fact accounts in part for the unique character of their respective philosophies. For example, Gottfried Wilhelm Leibniz's definition of "substance" in terms of what he called "monads" laid the foundation for his metaphysical theory, and John Stuart Mill's definition of "good" as the greatest happiness of the greatest number provided the underpinnings for his utilitarian theory of ethics.

Like stipulative definitions, theoretical definitions are neither true nor false, strictly speaking. The reason is that theoretical definitions function as proposals to see or interpret some phenomenon in a certain way. Since proposals have no truth value, neither do theoretical definitions. They may, however, be more or less interesting or more or less fruitful, depending on the deductive consequences they entail and on the outcome of the experiments they suggest.

Persuasive Definitions

The purpose of a **persuasive definition** is to engender a favorable or unfavorable attitude toward what is denoted by the definiendum. This purpose is accomplished by assigning an emotionally charged or value-laden meaning to a word while making it appear that the word really has (or ought to have) that meaning in the language in which it is used. Thus, persuasive definitions amount to a certain synthesis of stipulative, lexical, and, possibly, theoretical definitions backed by the rhetorical motive to engender a certain attitude. As a result of this synthesis, a persuasive definition masquerades as an honest assignment of meaning to a term while condemning or blessing with approval the subject matter of the definiendum. Here are some examples of opposing pairs of persuasive definitions:

"Abortion" means the ruthless murdering of innocent human beings.
"Abortion" means a safe and established surgical procedure whereby a woman is relieved of an unwanted burden.

"Liberal" means a drippy-eyed do-gooder obsessed with giving away other people's money.
"Liberal" means a genuine humanitarian committed to the goals of adequate housing and health care and of equal opportunity for all of our citizens.

"Capitalism" means the economic system in which individuals are afforded the God-given freedom to own property and conduct business as they choose.
"Capitalism" means the economic system in which humanity is sacrificed to the wanton quest for money, and mutual understanding and respect are replaced by alienation, greed, and selfishness.

"Taxation" means the procedure by means of which our commonwealth is preserved and sustained.
"Taxation" means the procedure used by bureaucrats to rip off the people who elected them.

The objective of a persuasive definition is to influence the attitudes of the reader or listener; thus, such definitions may be used with considerable effectiveness in political speeches and editorial columns. While persuasive definitions may, like lexical definitions, be evaluated as either true or false, the primary issue is neither truth nor falsity but the effectiveness of such definitions as instruments of persuasion.

EXERCISE 2.3

LC I. Determine whether the following definitions are stipulative, lexical, precising, theoretical, or persuasive.

★1. "Blind" means, for federal income tax purposes, either the inability to see better than 20/200 in the better eye with glasses or having a field of vision of 20 degrees or less.

2. "Football" means a sport in which modern-day gladiators brutalize one another while trying to move a ridiculously shaped "ball" from one end of the playing field to the other.

3. "Wristovision" means a miniature television set that can be worn on the wrist.

★4. "Diffident" means lacking confidence in oneself; characterized by modest reserve.

5. "Magnetism" means a property of certain substances such as iron, cobalt, and nickel that arises from the spin of the electrons in the unfilled inner shell of the atoms that compose the substance.

6. "Fiduciary" means having to do with a confidence or trust; a person who holds something in trust.

★7. "Politician" means a person of unquestioned honesty and integrity whom the people, in their collective wisdom, have duly elected to guide the ship of state and protect it from the reefs and shoals that threaten it on every side.

8. "Intoxicated," for purposes of driving a car in many states, means having a blood-alcohol content of 0.1% (.001) or greater.

9. "Gweed" means a thoroughly immature person who feigns intellectual prowess; a total loser.

★10. "Sound" means a compression wave in air or some other elastic medium having a frequency ranging (for humans) from 20 to 20,000 vibrations per second.

11. "Radioactive area" means, for purposes of the U.S. Nuclear Regulatory Commission, any area accessible to individuals in which there exists radiation at such levels that a major portion of the body could receive in any one hour a dose in excess of 5 millirems or in any five consecutive days a dose in excess of 100 millirems.

12. "Neurosis" means a chronic emotional disturbance that arises from suppressed or forgotten emotional stress (such as resentment, hostility, aggression, or guilt) experienced in early childhood.

★13. "Scaling" means a sport in which people race four-wheel drive vehicles up the face of boulder-strewn hillsides.

14. "Smoker" means a rude and disgusting individual who callously emits noxious tobacco fumes into the air, threatening the health and comfort of everyone in the vicinity.

15. "Diadem" means an ornamental headband worn as a badge of royalty; a crown.

★16. "Psychiatry" means the fortuitous melding of modern medicine with psychology that promises relief to thousands of poor, desperate souls who suffer the pains of emotional disorder.

17. "Gene" means the hereditary unit that occupies a fixed chromosomal locus, which through transcription has a specific effect on phenotype and which can mutate to various allelic forms.

18. "Subgression" means moving oneself and one's family to a subterranean bomb shelter for the purpose of escaping nuclear attack.

★19. "Intractable" means not easily governed; obstinate; unruly; not disposed to be taught.

20. "Recession" means, for purposes of the National Bureau of Economic Research, two consecutive quarters of negative growth in real GNP or in aggregate output for the entire economy.

21. "Gravity" means a force that results from the universal attraction that every particle of matter has for every other particle, and which varies directly with the mass of the particles and inversely with the square of the distance between them.

★22. "Assault" means, for legal purposes, an intentional and unprivileged act resulting in the apprehension of an immediate harmful or offensive contact.

23. "Television" means the electronic medium that keeps an entire nation of viewers in a state of seminarcosis by feeding them a steady stream of inane drivel.

24. "Obelisk" means an upright, four-sided pillar that terminates in a pyramid; a dagger.

★25. "Aereomobile" means a vehicle that is normally driven on the ground but that has the capability of flying through the air to avoid traffic congestion.

II. The following exercises involve constructing definitions:

1. Invent stipulative definitions for two new words that you wish to introduce into the language for the first time.

2. Construct lexical definitions for "capital" and "depression," and indicate two different meanings for each.
3. Construct precising definitions for "middle-aged" and "alcoholic." Interpret both words as relating to people and specify the purpose for which the definitions are to be used.
4. Construct theoretical definitions for "energy" and "atom."
5. Construct opposing pairs of persuasive definitions for "conservative" and "socialism."

III. Answer "true" or "false" to the following statements:

1. From the standpoint of logic, many definitions are concerned not with words but with things.
2. The definiendum is the word or term that is supposed to be defined.
3. The definiens is the word or group of words that assigns a meaning to the word being defined.
4. A stipulative definition is either true or false.
5. A lexical definition reports the way a word is actually used in a language.
6. One of the purposes of a lexical definition is to guard against the ambiguous use of a word.
7. The meaning given to a word by a precising definition is completely arbitrary.
8. Theoretical definitions are either true or false, just as are lexical definitions.
9. Theoretical definitions provide a theoretical characterization of the entity or entities denoted by the word being defined.
10. The purpose of a persuasive definition is to influence attitudes.

2.4 Definitional Techniques

In the last section we presented a survey of some of the kinds of definitions actually in use and the functions they are intended to serve. In this section we will investigate some of the techniques used to produce these definitions. These techniques may be classified in terms of the two kinds of meaning, intensional and extensional, discussed in Section 2.2.

Extensional (Denotative) Definitions

An **extensional definition** is one that assigns a meaning to a term by indicating the members of the class that the definiendum denotes. There are at least three ways of indicating the members of a class: pointing to them, naming them individually, and