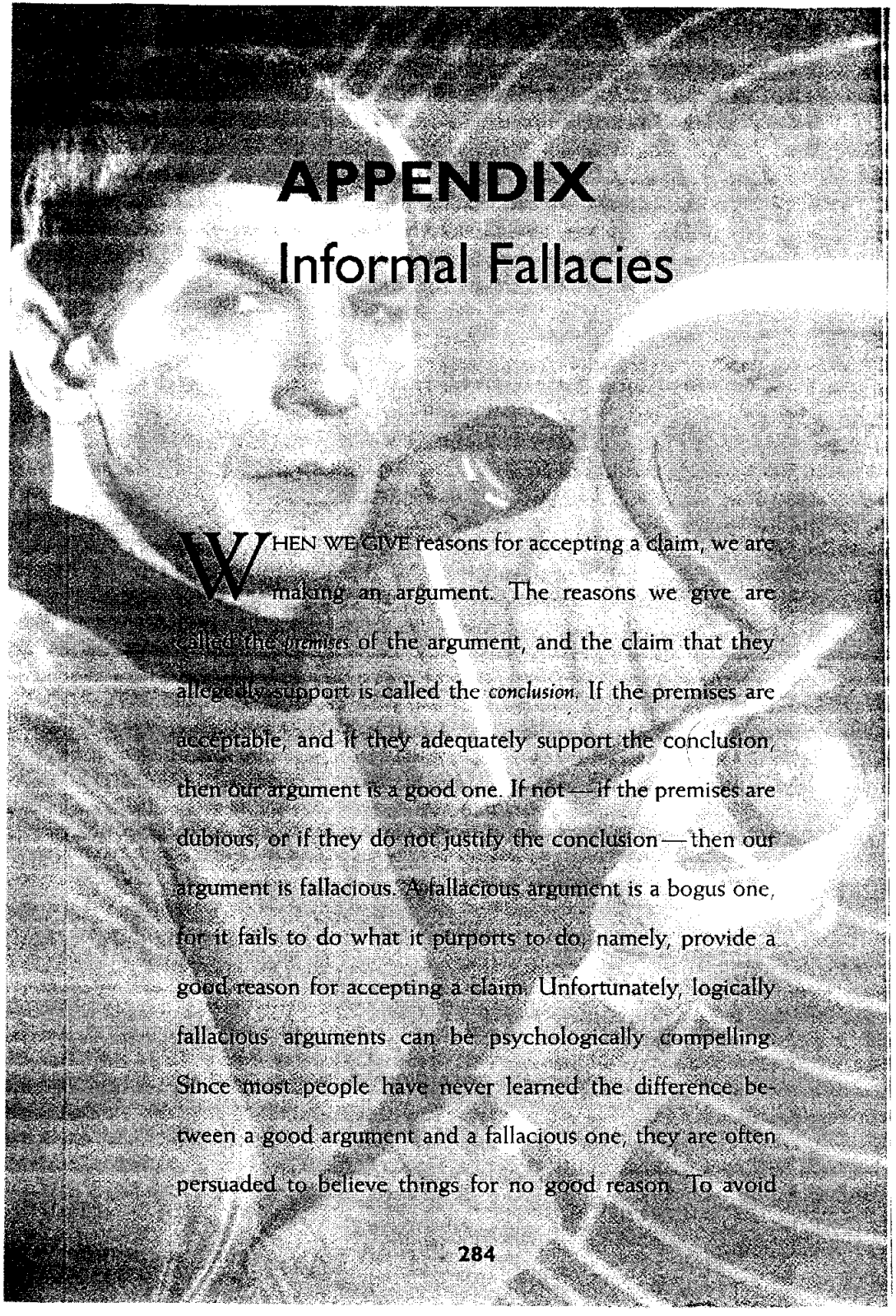

APPENDIX
Informal Fallacies

WHEN WE GIVE reasons for accepting a claim, we are making an argument. The reasons we give are called the *premises* of the argument, and the claim that they allegedly support is called the *conclusion*. If the premises are acceptable, and if they adequately support the conclusion, then our argument is a good one. If not—if the premises are dubious, or if they do not justify the conclusion—then our argument is fallacious. A fallacious argument is a bogus one, for it fails to do what it purports to do, namely, provide a good reason for accepting a claim. Unfortunately, logically fallacious arguments can be psychologically compelling. Since most people have never learned the difference between a good argument and a fallacious one, they are often persuaded to believe things for no good reason. To avoid holding irrational beliefs, then, it is important to understand the many ways in which an argument can fail.

An argument is fallacious if it contains (1) unacceptable premises, (2) irrelevant premises, or (3) insufficient premises.[1] Premises are *unacceptable* if they are at least as dubious as the claim they are supposed to support. In a good argument, you see, the premises provide a firm basis for accepting the conclusion. If the premises are shaky, the argument is inconclusive. Premises are *irrelevant* if they have no bearing on the truth of the conclusion. In a good argument, the conclusion follows from the premises. If the premises are logically unrelated to the conclusion, they provide no reason to accept it. Premises are *insufficient* if they do not establish the conclusion beyond a reasonable doubt. In a good argument, the premises eliminate reasonable grounds for doubt. If they fail to do this, they don't justify the conclusion.

So when someone gives you an argument, you should ask yourself: Are the premises acceptable? Are they relevant? Are they sufficient? If the answer to any of these questions is no, then the argument is not logically compelling.

UNACCEPTABLE PREMISES

Begging the Question

An argument begs the question—or argues in a circle—when its conclusion is used as one of its premises. For example, some people claim that one should believe that God exists because the Bible says so. But when asked why we should believe the Bible, they answer that we should believe it because God wrote it. Such people are begging the question, for they are assuming what they are trying to prove, namely that God exists. Here's another example: "Jane has telepathy," says Susan. "How do you know?" asks Jill. "Because she can read my mind," replies Susan. Since telepathy is, by definition, the ability to read someone's mind, all Susan has told us is that she believes that Jane can read her mind because she believes that Jane can read her mind. Her reason merely reiterates her claim in different words. Consequently, her reason provides no additional justification for her claim.

False Dilemma

An argument proposes a false dilemma when it presumes that only two alternatives exist when in actuality there are more than two. For example, "Either science can explain how she was cured or it was a miracle. Science can't explain how she was cured. So it must be a miracle." These two alternatives do not exhaust all the possibilities. It's

possible, for example, that she was cured by some natural cause that scientists don't yet understand. Because the argument doesn't take this possibility into account, it's fallacious. Again: "Either have your horoscope charted by an astrologer or continue to stumble through life without knowing where you're going. You certainly don't want to continue your wayward ways. So you should have your horoscope charted by an astrologer." If someone is concerned about the direction his or her life is taking, there are other things he or she can do about it than consult an astrologer. Since there are other options, the argument is fallacious.

IRRELEVANT PREMISES

Equivocation

Equivocation occurs when a word is used in two different senses in an argument. For example, consider this argument: "(i) Only man is rational. (ii) No woman is a man. (iii) Therefore no woman is rational." The word *man* is used in two different senses here: in the first premise it means human being while in the second it means male. As a result, the conclusion doesn't follow from the premises. Here's another example: "It's the duty of the press to publish news that's in the public interest. There is great public interest in UFOs. Therefore the press fails in its duty if it does not publish articles on UFOs." In the first premise, the phrase *the public interest* means the public welfare, but in the second, it means what the public is interested in. The switch in meaning invalidates the argument.

Composition

An argument may claim that what is true of the parts is also true of the whole; this is the fallacy of composition. For example, consider this argument: "Subatomic particles are lifeless. Therefore anything made out of them is lifeless." This argument is fallacious because a whole may be greater than the sum of its parts; that is, it may have properties not possessed by its parts. A property had by a whole but not by its parts is called an *emergent* property. Wetness, for example, is an emergent property. No individual water molecule is wet, but get enough of them together and wetness emerges.

Just as what's true of a part may not be true of the whole, what's true of a member of a group may not be true of the group itself. For example, "Belief in the supernatural makes Joe happy. Therefore, universal belief in the supernatural would make the nation happy." This doesn't follow because everybody's believing in the supernatural could have effects quite different from one person's believing in it. Not all arguments from part to whole are fallacious, for there are some properties that parts and wholes share. The fallacy lies in *assuming* that what's true of the parts is true of the whole.

Division

The fallacy of division is the converse of the fallacy of composition. It occurs when one assumes that what is true of a whole is also true of its parts. For example: "We are alive and we are made out of subatomic particles. So they must be alive too." To argue in this way is to ignore the very real difference between parts and wholes. Here's another example: "Society's interest in the occult is growing. Therefore Joe's interest in the occult is growing." Since groups can have properties that are not had by their members, such an argument is fallacious.

Appeal to the Person

When someone tries to rebut an argument by criticizing or denigrating its presenter rather than by dealing with the argument itself, that person is guilty of the fallacy of appeal to the person. This fallacy is referred to as *ad hominem*, or "to the man." For example: "This theory has been proposed by a believer in the occult. Why should we take it seriously?" Or: "You can't believe Dr. Jones's claim that there is no evidence for life after death. After all, he's an atheist." The flaw in these arguments is obvious: an argument stands or falls on its own merits; who proposes it is irrelevant to its soundness. Crazy people can come up with perfectly sound arguments, and sane people can talk nonsense.

Genetic Fallacy

To argue that a claim is true or false on the basis of its origin is to commit the genetic fallacy. For example: "Jones's idea is the result of a mystical experience, so it must be false (or true)." Or: "Jane got that message from a Ouija board, so it must be false (or true)." These arguments are fallacious because the origin of a claim is irrelevant to its truth or falsity. Some of our greatest advances have originated in unusual ways. For example, the chemist August Kekulé discovered the benzene ring while staring at a fire and seeing the image of a serpent biting its tail. The theory of evolution came to British naturalist Alfred Russell Wallace while in a delirium. Archimedes supposedly arrived at the principle of displacement while taking a bath, from which he leapt shouting, "Eureka!" The truth or falsity of an idea is determined not by where it came from, but by the evidence supporting it.

Appeal to Authority

We often try to support our views by citing experts. This sort of appeal to authority is perfectly valid—provided that the person cited really is an expert in the field in question. If not, it is fallacious. Celebrity endorsements, for example, often involve fallacious appeals to authority, because being famous doesn't necessarily give you any special expertise. The fact that Dionne Warwick is a great singer, for example, doesn't make her an expert on the efficacy of psychic hot lines. Similarly, the fact that Linus Pauling is a Nobel Prize winner doesn't make him an expert on the efficacy of vitamin C. Pauling claimed that taking massive doses of vitamin C would help prevent colds and increase the life expectancy of people suffering from cancer. That may be the case, but the fact that he said it doesn't justify our believing it. Only rigorous clinical studies confirming these claims can do that.

Appeal to the Masses

A remarkably common but fallacious form of reasoning is: "It must be true (or good) because everybody believes it (or does it)." Mothers understand that this is a fallacy; they often counter this argument by asking: "If everyone jumped off a cliff, would you do it, too?" Of course you wouldn't. What this shows is that just because a lot of people believe something or like something doesn't mean that it's true or good. A lot of people used to believe that the Earth was flat, but that certainly didn't make it so. Similarly, a lot of people used to believe that women should not have the right to vote. Popularity is not a reliable indication of either reality or value.

Appeal to Tradition

We appeal to tradition when we argue that something must be true (or good) because it is part of an established tradition. For example: "Astrology has been around for ages, so there must be something to it." Or "Mothers have always used chicken soup to fight colds, so it must be good for you." These arguments are fallacious because traditions can be wrong. This becomes obvious when you consider that slavery was once an established tradition. The fact that people have always done or believed something is no reason for believing that we should continue to do or believe something.

Appeal to Ignorance

The appeal to ignorance comes in two varieties: using an opponent's inability to disprove a conclusion as proof of the conclusion's correctness, and using an opponent's inability to prove a conclusion as proof of its incorrectness. In the first case, the claim is that since there is no proof that something is true, it must be false. For example: "There is no proof that the parapsychology experiments were fraudulent, so I'm sure they weren't." In the second case, the claim is that since there is no proof that something is false, it must be true. For example: "Bigfoot must exist because no one has been able to prove that he doesn't." The problem with these arguments is that they take a lack of evidence for one thing to be good evidence for another. A lack of evidence, however, proves nothing. In logic, as in life, you can't get something for nothing.

Appeal to Fear

To use the threat of harm to advance one's position is to commit the fallacy of the appeal to fear. It is also known as swinging the big stick. For example: "If you do not convict this criminal, one of you may be her next victim." This is fallacious because what a defendant might do in the future is irrelevant to determining whether she is responsible for a crime committed in the past. Or "You should believe in God because if you don't you'll go to hell." Such an argument is fallacious because it gives us no reason for believing that God exists. Threats extort; they do not help us arrive at the truth.

INSUFFICIENT PREMISES

Hasty Generalization

You are guilty of hasty generalization, or jumping to conclusions, when you draw a general conclusion about all things of a certain type on the basis of evidence concerning only a few things of that type. For example: "Every medium that's been investigated has turned out to be a fraud. You can't trust any of them." Or "I know one of those psychics. They're all a bunch of phonies." You can't make a valid generalization about an entire class of things from observing only one—or even a number of them. An inference from a sample of a group to the whole group is legitimate only if the sample is representative—that is, only if the sample is sufficiently large and every member of the group has an equal chance to be part of the sample.

Faulty Analogy

An argument from analogy claims that things which resemble one another in certain respects resemble one another in further respects. For example: "The Earth has air, water, and living organisms. Mars has air

and water. Therefore Mars has living organisms." The success of such arguments depends upon the nature and extent of the similarities between the two objects. The greater their dissimilarities, the less convincing the argument will be. For example, consider this argument: "Astronauts wear helmets and fly in spaceships. The figure in this Mayan carving seems to be wearing a helmet and flying in a spaceship. Therefore it is a carving of an ancient astronaut." Although features of the carving may bear a resemblance to a helmet and spaceship, they may bear a greater resemblance to a ceremonial mask and fire. The problem is that any two things have some features in common. Consequently an argument from analogy can be successful only if the dissimilarities between the things being compared are insignificant.

False Cause

The fallacy of false cause consists of supposing that two events are causally connected when they are not. People often claim, for example, that because something occurred after something else it is caused by it. Latin scholars dubbed this the fallacy of *post hoc, ergo propter hoc*, which means "After this, therefore because of this." Such reasoning is fallacious, because from the fact that two events are constantly conjoined, it doesn't follow that they are causally related. Night follows day, but that doesn't mean that day causes night. Suppose that ever since you wore crystals around your neck you haven't caught a cold. From this you can't conclude that the crystals caused you to stay healthy, because any number of other factors could be involved. Only if it has been established beyond a reasonable doubt that other factors were not involved—through a controlled study, for example—can you justifiably claim that there is a causal connection between the two events.

NOTE

1. Ludwig F. Schlecht, "Classifying Fallacies Logically," *Teaching Philosophy* 14:1 (1991): 53–64.

EPILOGUE

Mysteries in Perspective

THIS BOOK IS ABOUT SOLVING mysteries. Some people wish we would leave well enough alone. They don't want to solve mysteries, but preserve them. They want to put mysteries on the endangered species list. To them, a mystery is precious, a thing of beauty, a source of enchantment, part of what makes life interesting and meaningful. We recall the radio commentator who described the attempts of scientists to solve the mystery of the crop circles in Britain. To her, the cause and meaning of the crops that had been flattened in strange patterns was a near perfect mystery, a pure delight in itself, a relief from the world of dull facts, something to enjoy as one would a fine painting.

How to Think about Weird Things

Critical Thinking for a New Age

SECOND EDITION

Theodore Schick, Jr.
Muhlenberg College

Lewis Vaughn

Foreword by Martin Gardner