take away from the words of the book of this prophecy, God shall take away his part out of the book of life, and out of the holy city and from the things which are written in this book.

—Rev. 22: 18–19

7. **Anytus:** “Socrates, I think that you are too ready to speak evil of men: and, if you will take my advice, I would recommend you to be careful. Perhaps there is no city in which it is not easier to do men harm than to do them good, and this is certainly the case at Athens, as I believe that you know.”

—Plato, *Meno*

8. The Greek historian Thucydides, in his *History of the Peloponnesian War,* gave the following account of an Athenian’s appeal to representatives of the small island of Melos, to join Athens in its war against Sparta:

You know as well as we do that, in the logic of human nature, right only comes into question where there is a balance of power, while it is might that determines what the strong exhort and the weak concede . . . . Your strongest weapons are hopes yet unrealized, while the weapons in your hands are somewhat inadequate for holding out against the forces already arranged against you . . . . Reflect that you are taking a decision for your country, a country whose fate hangs upon a single decision right or wrong.

9. In that melancholy book, *The Future of an Illusion,* Dr. Freud, himself one of the last great theorists of the European capitalist class, has stated with simple clarity the impossibility of religious belief for the educated man of today.

—John Strachey, *The Coming Struggle for Power,* 1933

10. The classic trap for any revolutionary is always “What’s your alternative?” But even if you *could* provide the interrogator with a blueprint, this does not mean he would use it; in most cases he is not sincere in wanting to know.


### 4.4 Fallacies of Defective Induction

The premises of the fallacious arguments described in the preceding section are not relevant to the conclusions drawn. However, there are many fallacious arguments in which the premises are relevant and yet are wholly inadequate.
These we call *fallacies of defective induction*. What are asserted as premises simply do not serve as good reasons to reach the conclusion drawn.

**D1. THE ARGUMENT FROM IGNORANCE**

*ARGUMENT AD IGNORANTIAM*

If some proposition has not yet been proved false, we are not entitled to conclude that it is true. The same point can be made in reverse: If some proposition has not yet been proved true, we are not entitled to conclude that it is false. Many true propositions have not yet been proved true, of course, just as many false propositions have not yet been proved false. The fact that we cannot now be confident rarely serves as a good reason to assert knowledge of falsity, or of truth. Such an inference is defective; the fallacy is called the *argument from ignorance*, or the argument *ad ignorantiam*. Ignorance sometimes obliges us to suspend judgment, assigning neither truth nor falsity to the proposition in doubt.

As a current illustration, the great abolitionist, Frederick Douglass, will soon have a memorial, now being built at the northwest corner of Central Park in New York City. Beneath an 8-foot statue of Douglass himself is planned a quilt in granite, an array of squares that are supposed, in legend, to be part of a secret code used along the Underground Railroad to aid slaves escaping from their southern owners. But prominent historians now agree that there never was such a code. There is no surviving example of such a quilt, and there is not a single mention of quilting codes in any diaries or memoirs from that period. The designer of the memorial, Algernon Miller, nevertheless insists that the quilt remain part of the memorial project. “No matter what anyone has to say,” argues Miller, “they [his scholarly critics] weren’t there in that particular moment.” Not knowing that the legend is false, he concludes that we are justified in presuming it true.

The fallacious appeal to ignorance crops up in science when plausible claims are held to be false because evidence of their truth cannot be provided. There may be good reason for its absence: In archeology or in paleontology, for instance, that evidence may have been destroyed over time. In astronomy or in physics, the evidence desired may be so distant in space or in time that it is physically unobtainable. The fact that some desired evidence has not been gathered does not justify the conclusion that an otherwise plausible claim is false.

The argument from ignorance is particularly attractive to those who defend propositions that are very doubtful, even far-fetched. Pseudo-scientists who make unverifiable claims about psychic phenomena (for example, about telepathy, or about contact with the dead) may insist that the truth of their claims is supported by the fact that their critics have been unable to prove their falsehood.

An argument from ignorance was confronted by Galileo, whose newly invented telescope, early in the seventeenth century, plainly revealed the
mountains and valleys of the moon. In his day, the “truth” that the moon was a perfect crystalline sphere was unquestioned; it had to be perfect because that was what Aristotle had taught. Confronted by the evidence the telescope revealed, Galileo’s Aristotelian opponents responded with an argument that seemed irrefutable: Any apparent irregularities on the moon’s surface are in fact filled in with a crystalline substance that is, of course, invisible! This hypothesis saved the moon’s perfection, was in accord with what Aristotle had taught—and could not be proved false. This fallacy deserved ridicule. Galileo answered with an *argumentum ad ignorantiam* of his own, absurd enough to expose his critics: The moon is not a perfect sphere, he replied, because there are surely crystal mountains—invisible!—rising high from its surface. Because my theological critics cannot prove the claim false, we cannot conclude that such mountains are not there!

Whenever some great change is proposed, within an institution, or in society at large, those threatened by it are likely to attack with an argument from ignorance. How do we know it will work? How do we know that it is safe? We do not know; and without the knowledge that it is workable and safe, we must not adopt the change proposed. To prove workability or safety in advance, however, is often impossible. The objection sometimes takes the form of questions that suggest (but do not assert) the most horrific outcomes.

The fallacy can be a serious hindrance to progress. When the recombination of DNA, now an invaluable tool in medical science, first became possible in the 1970s, objections to further experimentation in that field were based largely on ignorance. All experiments with recombinant DNA should be stopped immediately, said one prominent scientist, who asked: “If Dr. Frankenstein must go on producing his little biological monsters . . . how can we be sure what would happen once the little beasts escaped from the laboratory?” Another fearful scientist who sought to block these investigations made the appeal to ignorance explicitly:

> Can we predict the consequences? We are ignorant of the broad principles of evolution. . . . We simply do not know. We are ignorant of the various factors we currently perceive to participate in the evolutionary process. We are ignorant of the depth of security of our own environmental niche. . . . We do not know.

What we do not know does not justify condemning the effort to learn. Fortunately, these appeals to ignorance were not successful in halting experimentation in a scientific realm whose value in saving and improving lives has proved, in the years since, to be incalculable.

Policy changes may be supported, as well as opposed, by an appeal to ignorance. When the federal government issued a waiver allowing Wisconsin to reduce the additional benefits it had been giving to welfare mothers for
having more than one child, the governor of Wisconsin was asked if there was any evidence that unwed mothers were having additional children simply to gain the added income. His reply, *ad ignorantiam*, was this: “No, there isn’t. There really isn’t, but there is no evidence to the contrary, either.”

In some circumstances, of course, the fact that certain evidence or results have not been obtained, even after they have been actively sought in ways calculated to reveal them, may have substantial argumentative force. New drugs being tested for safety, for example, are commonly given to rodents or other animal subjects for prolonged periods; the absence of any toxic effect on the animals is taken to be evidence (although not conclusive evidence) that the drug is probably not toxic to humans. Consumer protection often relies on evidence of this kind. In circumstances like these we rely, not on ignorance, but on our knowledge, or conviction, that if the result we are concerned about were likely to arise, it would have arisen in some of the test cases. This use of the inability to prove something true supposes that investigators are highly skilled, and that they very probably would have uncovered the evidence sought had that been possible. Tragic mistakes sometimes are made in this sphere, but if the standard is set too high—if what is required is a conclusive proof of harmlessness that cannot ever be given—consumers will be denied what may prove to be valuable, even life-saving, medical therapies.

Similarly, when a security investigation yields no evidence of improper conduct by the persons investigated, it would be wrong to conclude that the investigation has left us ignorant. A thorough investigation will properly result in the persons being “cleared.” *Not* to draw a conclusion, in some cases, is as much a breach of correct reasoning as it would be to draw a mistaken conclusion.

The appeal to ignorance is common and often appropriate in a criminal court, where an accused person, in U.S. jurisprudence and British common law, is presumed innocent until proved guilty. We adopt this principle because we recognize that the error of convicting the innocent is far more grave than that of acquitting the guilty—and thus the defense in a criminal case may legitimately claim that if the prosecution has not proved guilt beyond a reasonable doubt, the only verdict possible is not guilty. The U.S. Supreme Court strongly reaffirmed this standard of proof in these words:

> The reasonable-doubt standard . . . is a prime instrument for reducing the risk of convictions resting on factual error. The standard provides concrete substance for the presumption of innocence—that bedrock axiomatic and elementary principle whose enforcement lies at the foundation of the administration of our criminal law.

However, *this* appeal to ignorance succeeds only when innocence must be assumed in the absence of proof to the contrary; in other contexts, such an appeal is indeed an argument *ad ignorantiam*. 
D2. THE APPEAL TO INAPPROPRIATE AUTHORITY
(ARGUMENT AD VERECUNDIAM)

In attempting to make up one’s mind about some difficult or complicated question, it is entirely reasonable to be guided by the judgment of an acknowledged expert. When we argue that a given conclusion is correct on the ground that an expert authority has come to that judgment, we commit no fallacy. Indeed, such recourse to authority is necessary for most of us on very many matters. Of course, an expert’s judgment constitutes no conclusive proof; experts disagree, and even in agreement they may err, but expert opinion surely is one reasonable way to support a conclusion.

The fallacy of the appeal to inappropriate authority (ad verecundiam) arises when the appeal is made to parties who have no legitimate claim to authority in the matter at hand. Thus, in an argument about morality, an appeal to the opinions of Darwin, a towering authority in biology, would be fallacious, as would be an appeal to the opinions of a great artist such as Picasso to settle an economic dispute. Care must be taken in determining whose authority it is reasonable to rely on, and whose to reject. Although Picasso was not an economist, his judgment might plausibly be given some weight in a dispute pertaining to the economic value of an artistic masterpiece; and if the role of biology in moral questions were in dispute, Darwin might indeed be an appropriate authority.

The most blatant examples of misplaced appeals to authority appear in advertising “testimonials.” We are urged to drive an automobile of a particular make because a famous golfer or tennis player affirms its superiority; we are urged to drink a beverage of a certain brand because some movie star or football coach expresses enthusiasm about it. Whenever the truth of some proposition is asserted on the basis of the authority of one who has no special competence in that sphere, the appeal to inappropriate authority is the fallacy committed.

This appears to be a simple-minded mistake that is easy to avoid, but there are circumstances in which the fallacious appeal is tempting, and therefore intellectually dangerous. Here are two examples: In the sphere of international relations, in which weapons and war unhappily play a major role, one opinion or another is commonly supported by appealing to those whose special competence lies in the technical design or construction of weapons. Physicists such as Robert Oppenheimer and Edward Teller, for example, may indeed have been competent to give authoritative judgments regarding how certain weapons can (or cannot) function, but their knowledge in this sphere did not give them special wisdom in determining broad political goals. An appeal to the strong judgment of a distinguished physicist as to the wisdom of ratifying some international treaty would be an argument ad verecundiam. Similarly, we admire the depth and insight of great fiction—say, in the novels of Alexander...
Solzhenitsyn or Saul Bellow—but to resort to their judgment in determining the real culprit in some political dispute would be an appeal *ad verecundiam.*

The argument *ad verecundiam* is an appeal to one who has no legitimate claim to authority. Even one who does have a legitimate claim to authority may well prove mistaken, of course, and we may later regret our choice of experts. But if the experts we chose deserved their reputation for knowledge, it was no fallacy to rely on them even if they erred. Our mistake becomes one of reasoning (a fallacy) when our conclusion is based on the verdict of an authority who has no rational claim to expertise in that matter.

D3. FALSE CAUSE (ARGUMENT NON CAUSA PRO CAUSA)

It is obvious that any reasoning that relies on treating as the cause of some thing or event what is not really its cause must be seriously mistaken. But often we are tempted to suppose, or led to suppose, that we understand some specific cause-and-effect relation when in fact we do not. The nature of the connection between cause and effect, and how we determine whether such a connection is present, are central problems of inductive logic and scientific method, discussed in detail in Part III of this book. Presuming the reality of a causal connection that does not really exist is a common mistake; in Latin the mistake is called the fallacy of *non causa pro causa*; we call it simply the fallacy of false cause.

Whether the causal connection alleged is indeed mistaken may sometimes be a matter for dispute. Some college faculty members, it has been argued, grade leniently because they fear that rigorous grading will cause lowered evaluations of them by their students and damage to their careers. Gradual “grade inflation” is said to be the result of this fear. One college professor wrote this:

> Course evaluation forms [completed by students] are now required in many institutions, and salaries are influenced by the results. When I joined the University of Michigan 30 years ago, my salary was higher than that of any member of the anthropology department who is still active today. My standards for grading have not followed the trend toward inflation. Student complaints about grades have increased, and now my salary is at the bottom of the professorial list.

Do you think the author of this passage commits the fallacy of false cause?

We sometimes mistakenly presume that one event is caused by another because it follows that other closely in time. In primitive cultures such mistakes were common; the sun would invariably reappear after an eclipse if the drums had been beaten in the darkness, but we know that it is absurd to suppose that the beating of the drums was the cause of the sun’s reappearance. Mere temporal succession does not establish a causal connection. This variety of false cause is called the fallacy of *post hoc ergo propter hoc*—“after the thing, therefore because of the thing.”
Even very sophisticated people sometimes commit this fallacy. A few years ago, a critic ridiculed the reasoning of a U.S. Congressman this way:

I’m getting tired of assertions like those of Rep. Ernest Istook, Jr.—“As prayer has gone out of the schools, guns, knives, drugs, and gangs have come in”—with the unsupported implication that there is some causal connection between these events. . . . We could just as well say, “After we threw God out of the schools, we put a man on the moon.” Students may or may not need more faith, but Congress could certainly use more reason.24

Mistakes of this kind are widespread. Unusual weather conditions are blamed on some unrelated celestial phenomenon that happened to precede them; an infection really caused by a virus is thought to be caused by a chill wind, or wet feet, and so on. Perhaps no sphere is more vulnerable to this sort of argument than that of crimes and punishments. Typical is this remark in a letter to the New York Times:

The death penalty in the United States has given us the highest crime rate and greatest number of prisoners per 100,000 population in the industrialized world.25

*Post hoc ergo propter hoc* is an easy fallacy to detect when it is blatant, but even the best of scientists and statesmen are occasionally misled by it.

False cause is also the fallacy committed when one mistakenly argues against some proposal on the ground that any change in a given direction is sure to lead to further changes in the same direction—and thus to grave consequences. Taking this step, it may be said, will put us on a slippery slope to disaster—and such reasoning is therefore called the fallacy of the *slippery slope*. Whether the feared consequences will indeed arise is not determined by the first step in a given direction; the suggestion that a change in that direction will trigger a catastrophic chain reaction is not generally warranted, although such argument is commonly invoked in defense of the status quo. What needs to be determined is what, in fact, probably will (or will not) cause the results feared.

Consider the following illustration. One common objection to the legalization of assisted suicide is that once formal permission has been given to medical doctors to act in a way that is of disputable morality, doctors will be led to engage in more and greater immorality of the same or similar type. The first leniency ought to be avoided, according to this argument, because it will leave us insecure on a slope so slippery that our first step down cannot be our last. To this argument one keen critic responded:

The slippery slope argument, although influential, is hard to deal with rationally. It suggests that once we allow doctors to shorten the life of patients who request it, doctors could and would wantonly kill burdensome patients who do not want to die. This suggestion is not justified. . . .
Physicians often prescribe drugs which, in doses greater than prescribed, would kill the patient. No one fears that the actual doses prescribed will lead to their use of lethal doses. No one objects to such prescriptions in fear of a “slippery slope.” Authorizing physicians to assist in shortening the life of patients who request this assistance no more implies authority to shorten the life of patients who want to prolong it, than authority for surgery to remove the gall bladder implies authority to remove the patient’s heart.

The supposition that moving in a given direction, however prudently, is sure to produce the dreadful result of moving in the same direction to excess, is the fallacy of the slippery slope.

There are circumstances, of course, in which the first step in a new direction does establish a precedent that makes additional movement in that direction easier to achieve. This may be good or bad. Opposing new legislation that would punish crimes more severely if they were motivated by racial hatred, one critic writes:

There should not be a separate category for hate crimes. A murder is a murder; a beating is a beating. We should prosecute people for the crimes they commit, not why they commit them. If we start to categorize crimes by their motivation, we start down a very slippery slope.

Some arguments of this kind have merit, because precedent can affect subsequent decision making. The slippery slope is indeed a fallacy—but the mere allegation that that fallacy has been committed does not prove the argument in question faulty.

D4. HASTY GENERALIZATION

Throughout our lives, we rely on statements about how things generally are and how people generally behave. But general claims, although critical in reasoning, must be carefully scrutinized: The universality of their application ought never be accepted or assumed without justification. Hasty generalization is the fallacy we commit when we draw conclusions about all the persons or things in a given class on the basis of our knowledge about only one (or only a very few) of the members of that class. We all know of persons who have generalized mistakenly about certain companies or governments because of a single experience. Stereotypes about people who come from certain countries, or cultures, are widespread and commonly mistaken; hasty generalizations about foreign cultures can be downright nasty, and are good illustrations of the fallacious leap to broad generalization on the basis of very little evidence.

An anecdote or single instance may indeed be relevant support for a general rule or theory. But when it is treated as proof of that theory, the generalization is not well founded; the induction is defective. Here is an example: Eating deep-fried foods tends to raise one’s cholesterol level. A single instance
in which it does not do so is hardly sufficient to show that such foods are
healthy. The owner of a “fish and chips” shop in England fallaciously defended
the healthfulness of his deep-fried cookery with this argument:

Take my son, Martyn. He’s been eating fish and chips his whole life, and he just
had a cholesterol test, and his level is below the national average. What better
proof could there be than a fryer’s son?28

Foods or drugs that are harmless in one context may be harmful in another.
To move from a single case, or a very few cases, to a large-scale generalization
about all or most cases, is fallacious reasoning, but it is common and often
tempting. It is also called the fallacy of converse accident because it is the
reverse of another common mistake, known as the fallacy of accident, in which
generalizations are misused in another way. We turn to it next.

OVERVIEW

Fallacies of Defective Induction

D1. The Argument from Ignorance (ad ignorantiam)
An informal fallacy in which a conclusion is supported by an illegitimate
appeal to ignorance, as when it is supposed that something is likely to be
true because we cannot prove that it is false.

D2. The Appeal to Inappropriate Authority (ad verecundiam)
An informal fallacy in which the appeal to authority is illegitimate because
the authority appealed to has no special claim to expertise on the matter in
question.

D3. False Cause
An informal fallacy in which the mistake arises from accepting as the cause
of an event what is not really its cause.

D4. Hasty Generalization
An informal fallacy in which a principle that is true of a particular case is
applied, carelessly or deliberately, to the great run of cases.

4.5 Fallacies of Presumption

Some mistakes in everyday reasoning are the consequence of an unjustified
assumption, often suggested by the way in which the argument is formulated.
That suggestion may be deliberate, or the assumption may be only an over-
sight. In either case, the upshot is that the reader, the listener, and even the
author of the passage may be led to assume the truth of some unproved and