

Chapter 1

The Philosophical Enterprise



Philosophy consists not in airy schemes or idle speculations; the rule and conduct of all social life is her great province.

—JAMES THOMSON

The discovery of what is true, and the practice of that which is good, are the two most important objects of philosophy.

—VOLTAIRE

Philosophy, Plato tells us, “begins in wonder”—wonder about the universe, its contents, and our place in it. What is the universe? Is it composed solely of matter, or does it contain immaterial things like spirits? How can we tell? Is sense experience the only source of knowledge, or are there other ways of knowing? Why are we here? Were we created by God as part of a divine plan, or did we come into being as the result of purely natural processes? Is there a God? If so, what sort of being is he (she) (it)? What kind of creatures are we? Do we have a soul that will survive the death of our bodies, or will we cease to exist when our bodies die? Are we masters of our destiny, or are our actions determined by forces beyond our control? What are our obligations to other people? Do we have a duty to help others, or is our only obligation to not harm them? Such questions are at once both familiar and strange: familiar because most of us have had to face them at some point in our lives; strange because it’s unclear how we should go about answering them. Unlike most questions, they can’t be answered by scientific investigation. Some would say that that makes the answers unknowable. But to say that something is unknowable is to have already answered the question about the nature of knowledge. You can’t claim that something is unknowable without assuming a particular theory of knowledge. Philosophical questions are unavoidable because any attempt to avoid them requires taking a stand on them. As Pascal put it, “To ridicule philosophy is to philosophize.”

Whether you know it or not, you assume that certain answers to the foregoing questions are true. These assumptions constitute your philosophy. The discipline of philosophy critically examines such assumptions in an attempt to determine whether they are true. The word “philosophy” means “love of wisdom.” It’s derived from the Greek *philo* meaning “love” and *sophia* meaning “wisdom.” The desire to know the truth—the love of wisdom—is only one motivation for doing philosophy, however. The desire to lead a good life is another. Actions are based on beliefs, and actions based on true beliefs have a better chance of succeeding than those based on false ones. So it’s in your best interest to have true philosophical beliefs. This text is designed to help you achieve that goal. By describing, explaining, and encouraging you to do philosophy, it attempts to provide you with the intellectual tools necessary to develop your own philosophy.

“An expert,” says physicist Werner Heisenberg, “is someone who knows some of the worst mistakes that can be made in his subject and how to avoid them.”¹ In philosophy, knowing the major theories and the problems they face is particularly important. As you construct your own philosophy, you don’t want to commit the same mistakes made by others, and as you study the problems faced by various philosophical theories, you may discover that some of your philosophical beliefs are mistaken. To help you avoid making philosophical errors, this text traces both the logical and historical development of philosophical thinking on a number of central philosophical problems. After reading each chapter, you should have a good sense of the strength and weak-

nesses of past theories, as well as the most promising avenues for future research.

Philosophy is a search for the truth about the world and our place in it. By doing philosophy, you'll learn to distinguish good reasons from bad ones, strong arguments from weak ones, and plausible theories from implausible ones. You'll find that every view is not as good as every other. Whereas everyone may have a right to an opinion, not every opinion is right. Acquiring such critical thinking skills will improve your ability to make sound judgments and lessen the chance that you'll be taken in by frauds, swindlers, and charlatans.

Doing philosophy involves reflecting on the beliefs and values you use to organize your experience and guide your decisions. It entails questioning assumptions, analyzing concepts, and drawing inferences. In the process, you'll come to see connections, relationships, and meanings that you were previously unaware of. As a result, doing philosophy will refine your worldview, enrich your experience, and broaden your horizons.

We will begin our philosophical explorations by examining the nature and import of a number of central philosophical problems. We will then take a look at the methods philosophers use to solve these problems. Philosophical thinking is nothing if not logical. To distinguish between plausible and implausible philosophical claims, you must know the difference between logical and illogical arguments. The second section of this chapter provides an overview of the different types of arguments people use to make their points. The final section examines one of the most useful techniques for testing philosophical theories: thought experiments. Philosophical problems are conceptual problems, and conceptual problems can be most effectively solved in the laboratory of the mind.

Objectives

After reading this chapter, you should be able to

- identify the various branches of philosophy.
- describe a number of basic philosophical problems.
- distinguish necessary from sufficient conditions and logical from causal possibility.
- identify and evaluate different types of arguments.
- summarize the criteria of adequacy used to evaluate hypotheses.
- explain the nature and function of thought experiments.

Section 1.1

Explaining the Possibility of the Impossible

Philosophical Problems and Theories

Philosophy is the art and law of life, and it teaches us what to do in all cases, and, like good marksmen, to hit the white at any distance.

—SENECA

The extent to which our thoughts and actions are influenced by our philosophy becomes most evident when we examine the lives of those who don't share our philosophy. For example, many in the West believe that the world contains physical objects, that our senses give us knowledge of those objects, and that our selves are legitimate objects of concern. Many in the Orient, however, deny all three of these claims. For them, consciousness is the only reality, mystical experience is the only source of knowledge, and belief in the existence of the self is the root of all evil. As a result, they lead very different lives than we do. (Compare the life of a Hindu monk with that of a Wall Street tycoon.) Because the kind of lives we lead is determined by the philosophical beliefs we hold, we ignore philosophy at our peril. If our philosophy is flawed, we may well spend our lives pursuing false ideals, worshipping false gods, and nurturing false hopes. That is why the ancient Greek philosopher Socrates maintained that the unexamined life is not worth living.

If we have not examined our philosophy, not only may the quality of our lives suffer, but so may our freedom. Every society, every religion, and every ideology provides answers to philosophical questions. We internalize those answers in the process of growing up. But if we never question those answers—if we never critically evaluate them in light of the alternatives—then our beliefs aren't truly our own. If we haven't freely chosen the principles on which our thoughts and actions are based, our thoughts and actions aren't truly free. By replacing the blind acceptance of authority with a reasoned consideration of the evidence, philosophical inquiry liberates us from preconceived ideas and prejudices.

*Man is made by his belief.
As he believes, so he is.*

—BHAGAVAD GITA

Because our lives are shaped by our philosophy, many have been willing to die for their philosophy. Revolutions, for example, are often inspired by a philosophy. The American, Russian, and Iranian revolutions, for example, were fueled, respectively, by the philosophies of democratic capitalism, Marxist communism, and Islamic fundamentalism. Whether a revolution ultimately

succeeds is determined not by force of arms but by the strength of its philosophy. As Napoleon realized, “There are two powers in the world, the sword and the mind. In the long run, the sword is always beaten by the mind.” But the mind can overcome the sword only if it is armed with viable ideas. The goal of philosophical inquiry is to determine whether our philosophical beliefs are, in fact, viable.

Philosophical Problems

Philosophical beliefs fall into four broad categories, which correspond to the major fields of philosophy: (1) *metaphysics*, the study of ultimate reality, (2) *epistemology*, the study of knowledge, (3) *axiology*, the study of value, and (4) *logic*, the study of correct reasoning. Some of the questions explored by the various branches of philosophy include the following:

Science without epistemology is—insofar as it is thinkable at all—primitive and muddled.

—ALBERT EINSTEIN

Metaphysics

- What is the world made of?
- Does the world contain only one basic type of substance (e.g., matter), or are there other types (e.g., mind)?
- What is the mind?
- How is the mind related to the body?
- Can the mind survive the death of the body?
- Do we have free will, or is every action determined by prior causes?
- What is a person?
- Under what conditions is a person at one time identical with a person at another time?
- Is there a God?

Epistemology

- What is knowledge?
- What are the sources of knowledge?
- What is truth?
- Can we acquire knowledge of the external world?
- Under what conditions are we justified in believing something?

Axiology

- What is value?
- What are the sources of value?
- What makes an action right or wrong?
- What makes a person good or bad?

- What makes a work of art beautiful?
- Are value judgments objective or subjective?
- Does morality require God?
- Are there universal human rights?
- What is the best form of government?
- Is civil disobedience ever justified?

Logic

- What is an argument?
- What kinds of arguments are there?
- What distinguishes a good argument from a bad one?
- When are we justified in believing the conclusion of an argument?

Each of these fields has various subfields. For example, *ethics* is the branch of axiology that deals with the study of moral value, and *aesthetics* is the branch of axiology that focuses on the study of artistic value. We all have beliefs about what is real, what is valuable, and how we come to know what is real and valuable. Philosophy examines these beliefs in an attempt to develop a way of looking at the world that makes sense of it.

Philosophical beliefs affect how we conduct our inquiries as well as how we lead our lives. What we look for is determined by our theory of reality, how we look for something is determined by our theory of knowledge, and what we do with what we find is determined by our theory of value. In science, as in everyday life, having a good philosophy is important, for as English philosopher Alfred North Whitehead observed, “No science can be more secure than the unconscious metaphysics which it tacitly presupposes.” The philosophical assumptions underlying various endeavors are studied by such additional subfields of philosophy as the philosophy of science, philosophy of religion, philosophy of art, philosophy of history, philosophy of education, and philosophy of law. Even though every intellectual pursuit takes certain answers to philosophical questions for granted, the correct answer to those questions is by no means obvious. What makes definitive answers to philosophical questions so hard to come by is that conflicting views of reality, knowledge, and value often appear equally plausible.

Consider, for example, the beliefs that the universe contains only material objects and that we have minds. The success of science lends credence to the former, whereas our personal experience supports the latter. It also seems that both of these beliefs can't be true, for minds do not appear to be material objects. Material objects have properties like mass, spin, and electric charge; minds, apparently, do not. Take, for example, your thought that you're reading a book right now. How much does that thought weigh? How long is that thought? What is its electric charge? Such questions seem absurd because thoughts do not seem to be the type of things that can have physical properties. Does that mean that the mind is immaterial? If so, how can the mind affect the body (and vice versa)? Such are the issues raised by the **mind-body problem**.

*Metaphysics is the
anatomy of the soul.*

—STANISLAS
BOUFFLERS

The **problem of personal identity** arises from the beliefs that we change in many ways throughout our lives and that these changes happen to the same person. But if we change, we're different. So how is it possible for a person to change and yet remain the same?

The **problem of free will** arises from the beliefs that every event has a cause and that humans have free will. Yet if every event is caused by some prior event, how can anything we do be up to us?

The **problem of evil** arises from the beliefs that there is an all-powerful, all-knowing, and all-good being (namely, God) and that there is evil in the world. If God is all-knowing, he knows that evil exists; if he is all-good, he doesn't want evil to exist; and if he is all-powerful, he can prevent evil from existing. So how can there be evil in a world created by such a being?

The **problem of moral relativism** arises from the beliefs that certain actions are objectively right or wrong and that all moral judgments are relative. If all moral judgments are relative (to individuals, societies, religions, etc.), then no actions are objectively right or wrong. But if no actions are objectively right or wrong, how is moral disagreement possible? If believing something to be right makes it right, how can anyone legitimately claim that what another did was wrong?

The **problem of skepticism** arises from the beliefs that knowledge requires certainty and that we have knowledge of the external world. Our knowledge of the external world is based on sense experience. But our senses sometimes deceive us. Given that we can't be certain of what we've learned through our senses, how can we have knowledge of the external world?

Philosophical problems arise from the realization that some of our most fundamental beliefs seem to be inconsistent with one another. To anyone who wants to understand the world and our place in it, these inconsistencies should be disturbing. If the beliefs in question really are inconsistent with one another, at least one of them must be false. And any view of the world that is based on false beliefs must be mistaken. In an attempt to arrive at a comprehensive and coherent worldview, philosophical inquiry tries to eliminate these inconsistencies from our belief system.

The Stakes in Philosophical Inquiry

Making our belief system consistent is no idle task, for not only do our individual thoughts and actions depend on the truth of certain philosophical beliefs, but so do many of our social institutions. If those beliefs turned out to be false, the institutions that rely on them would have to be radically altered or even abolished. To get an idea of what's at stake in philosophical inquiry, let's examine the implications of accepting or rejecting some of the beliefs just mentioned.

The Mind-Body Problem

Many philosophers and scientists have held that the mind is nothing but the brain. Francis Crick, the Nobel Prize-winning codiscoverer of the structure of

Philosophy is an attempt to see how things, in the broadest possible sense of the term, hang together, in the broadest possible sense of the term.

—WILFRED SELLERS

mind-body problem

The philosophical problem of explaining how it is possible for a material object to have a mind.

problem of personal identity

The philosophical problem of explaining how it is possible for a person to change and yet remain the same person.

problem of free will

The philosophical problem of explaining how it is possible for a causally determined action to be free.

problem of evil

The philosophical problem of explaining how it is possible for there to be evil in a world created by an all-powerful, all-knowing, and all-good being.

problem of moral relativism

The philosophical problem of explaining how it is possible for there to be absolute moral standards.

problem of skepticism

The philosophical problem of explaining how it is possible for there to be knowledge.

An idea that is not dangerous is unworthy of being called an idea at all.

—ELBERT HUBBARD

DNA, has defended this view. In his book *The Astonishing Hypothesis*, Crick claims, “The astonishing hypothesis is that you, your joys and your sorrows, your memories and ambitions, your sense of personal identity and free will, are in fact no more than the behavior of a vast assembly of nerve cells and their associated molecules. As Lewis Carroll’s Alice might have phrased it, ‘You’re nothing but a pack of neurons.’”² Although Crick’s hypothesis may be astonishing, it is by no means new. The idea that we are purely material beings was proposed more than twenty-five hundred years ago by the ancient Greek philosophers Leucippus and Democritus. In their view, we are nothing but a pack of atoms—indivisible material particles that are in constant random motion. If Crick and Leucippus are right, then most religious believers are wrong—we can’t survive the death of our bodies. When our bodies die, we cease to exist.

What’s more, if the mind is a physical thing, it should be possible to construct one. Many working in the field of artificial intelligence believe that it’s only a matter of time before we produce a robot that is as intelligent as we are. Because computers evolve much more rapidly than we do, intelligent robots could quickly become much smarter than us. Of such robots, Marvin Minsky, head of MIT’s artificial-intelligence laboratory, has reportedly said, “If we’re lucky, maybe they’ll want to keep us around as pets.”

The Problem of Free Will

It is commonly believed that we can be held responsible only for those actions that we freely perform. If we are forced to do something against our will, we aren’t to blame. But if every event has a cause, then it would seem that nothing we do is up to us, for all of our actions are determined by forces beyond our control. The principle of universal causation, then, seems to be inconsistent with the notion of free will.

The view that we have no free will has long been thought to follow from materialism. The ancient Greeks realized that if everything happens as the result of a collision between atoms, then we are powerless to change the future. Whatever will be, will be. We may seem to be masters of our destiny, but that is just an illusion.

In recent years, this view has been most forcefully argued by the late Harvard psychologist B. F. Skinner. Skinner claims that the belief in free will is a prescientific belief left over from animist days when we believed that every object contained a spirit. Physics, chemistry, and biology advanced only after they had given up that notion. Similarly, he says, psychology can become a science only if it gives up the belief that human behavior is caused by an indwelling agent. According to Skinner, we are robots that are programmed by our environment. What we do as adults is the result of what happened to us as children. Consequently, we should not be held responsible for our actions and should not be given credit for our achievements. A truly enlightened society would have no use for the notions of freedom and dignity.³

Although Skinner believes that our behavior is determined primarily by how we are brought up or nurtured, other scientists believe that it is determined primarily by our genetic endowment or nature. According to these sci-

entists, the information encoded in our genes determines not only what proteins our bodies manufacture but also how we respond to our environment. As biologist Richard Dawkins puts it, “We are survival machines—robot vehicles blindly programmed to preserve the selfish molecules known as genes.”⁴ So Dawkins shares Skinner’s belief that we are robots. He simply has a different view about where our dominant program comes from.

If either of these scientists is right, then a good number of our social institutions need to be overhauled. Skinner recognized this and wrote a novel, *Walden II*, depicting what life would be like in a world where the idea of free will had been abolished. In such a world, there would be no lawyers, for lawyers determine responsibility, and, according to Skinner, individuals are not responsible for their actions. There would also be no jails, for if individuals are not responsible for their actions, no one should be punished for what he or she does. Those who engage in antisocial behavior have simply been programmed improperly and thus need to be reprogrammed at a behavioral reconditioning center.

Some psychologists have argued that the use of behavioral reconditioning techniques should be much more widespread than it currently is. Psychologist James McConnell, for example, writes,

. . . the day has come when . . . it should be possible . . . to achieve a very rapid and highly effective type of positive brainwashing that would allow us to make dramatic changes in a person’s behavior and personality. . . .

We should reshape our society so that we all would be trained from birth to want to do what society wants us to do. We have the techniques now to do it. . . . No one owns his own personality. . . . You had no say about what kind of personality you acquired, and there is no reason to believe you should have the right to refuse to acquire a new personality if your old one is antisocial. . . . Today’s behavioral psychologists are the architects and engineers of the Brave New World.⁵

A world in which these techniques were the norm would indeed be a brave new world.

The Problem of Personal Identity

The belief that people retain their identity over time is a cornerstone of our legal system. If you sign a thirty-year mortgage contract, for example, you will normally be expected to honor the terms of that contract even though your body and your memories will change considerably during that time. The law recognizes, however, that under certain circumstances people change enough to alter their legal responsibilities. At parole hearings, for example, it isn’t uncommon to hear the following sort of argument: “He isn’t the same person he was ten years ago. He has realized the error of his ways and has completely reformed. Therefore, he should be granted parole.” But how much and in what ways must someone change in order to be considered a different person?

Some maintain that any change, no matter how slight, makes us a different person. Buddhists, for example, maintain that because everything in the world is constantly changing, so are we. For them, the self is created anew each instant. Others maintain that only certain types of changes can alter our

To deny the freedom of the will is to make morality impossible.

—JAMES FROUDE

The philosophy of one century is the common sense of the next.

—HENRY WARD BEECHER

personal identity. Who we are seems to be closely tied to our memories. If we suffered from total amnesia and were unable to remember anything about ourselves, there would be grounds for saying that we had ceased to exist. Does that mean that we are our memories? If we have no memory of doing something, can we legitimately claim that we didn't do it? Would it be wrong to punish us for something that we had no recollection of doing? What if there were a way to transfer our memories from our present body to another, say through a brain transplant? (Partial brain transplants have already been performed.) Would we survive such a transfer? What if our memories were transferred into a body of a different sex? A number of computer scientists believe that it will soon be possible to transfer our memories from our brains into a computer. Could we exist inside a computer? What if we uploaded our memories into two different computers? Would there then be two of us? Although these questions may seem far-fetched, some believe that we will have to face them in the not-too-distant future. How we answer them will be determined by our notion of personal identity.

The Problem of Moral Relativism

When in Rome, do as the Romans do.

—ST. AMBROSE

All of us make moral judgments. Sometimes we even get into heated arguments about the morality of an action or policy. But the widespread disagreement about what is moral—as for example in discussions over abortion, capital punishment, and drug use—has led many to believe that there are no objective moral standards. If morality is just a matter of personal opinion, however, then there is no more reason to argue about what is right or wrong than there is to argue about what tastes better—chocolate or vanilla. There is no accounting for taste.

Furthermore, if there were nothing more to something's being right than our believing it to be right, we would be morally infallible. As long as we did what we thought was right, we could do no wrong. But that, too, seems implausible. Our believing something to be right doesn't make it right. If it did, we would have to say that what Hitler did was right (provided, of course, that he believed in what he was doing). Doing the right thing seems to involve more than simply doing what you believe in.

The notion that morality is subjective faces serious difficulties. But so does the notion that morality is objective. Resolving these difficulties is of the highest importance, for many of the problems we face as individuals and as a society are moral ones. When we ask, "What should we do about . . . ?" we are asking a moral question. How we answer such questions will be determined by what we consider our moral obligations to be. So it's important to be clear about just what those obligations are.

The Problem of Evil

We have seen that the existence of an all-powerful, all-knowing, and all-good being seems to be incompatible with the existence of evil. If God possessed only two of these three attributes, however, there would be no problem. For example, if God were all-knowing and all-good but not all-powerful, we could

account for the existence of evil by claiming that God is powerless to prevent it. If God were all-powerful and all-good but not all-knowing, we could account for the existence of evil by claiming that God is ignorant of its existence. If God were all-powerful and all-knowing but not all-good, we could account for the existence of evil by claiming that God isn't opposed to it. To many, however, a being that is limited in any of these ways would not be God. So unless a solution to this problem can be found, the traditional conception of God must be revised.

The Problem of Skepticism

We claim to know many things about the world around us. We claim to know, for example, that snow is white, that the earth orbits the sun, and that $E = mc^2$. If we really know something, however, it seems that we must be certain of it, for any possibility of error appears to undercut our claim to know. The problem is that most of our information about the external world comes to us through our senses, and we can't be certain of anything we have learned through our senses. There is always the possibility that we've misidentified or misinterpreted our sense experience. Because we can't rule out these possibilities, some claim that we can't have knowledge of the external world.

Skeptics in the Western intellectual tradition usually don't claim that our sense experience is illusory, only that it could be. As long as knowledge requires certainty, all the skeptics need to make their claim is the possibility that our sense experience misleads us. Many Oriental thinkers, however, go farther than the Western skeptics and claim that our sense experience is illusory. This doesn't mean that we cannot have knowledge of reality, however, because, for them, knowledge can be acquired through mystical experience. Mystical experience, they claim, puts us in direct contact with reality and reveals that our ordinary waking consciousness is just a dream. Because what the mystics tell us about reality seems similar to the claims of some modern physicists, some Western thinkers have endorsed the claim that mystical experience is a source of knowledge. If knowledge of the external world is impossible or if there are other sources of knowledge than those traditionally recognized in the West, our conception of education and intellectual inquiry would have to be radically altered.

It should now be clear that a lot hangs on our philosophy. The structure of our belief system can be compared to that of a tree. Just as certain branches support other branches, so certain beliefs support other beliefs. And just as bigger branches support more branches than little ones, so fundamental beliefs support more beliefs than secondary ones. Our philosophical beliefs are among our most fundamental because their truth is assumed by so many of our other beliefs. Consequently, rejecting a philosophical belief is like cutting off a large branch or even part of the tree's trunk: all the beliefs that depend on that fundamental belief must be rejected as well.

Philosophical inquiry attempts to arrive at a belief system or worldview that is both comprehensive and coherent: comprehensive in the sense that it can account for every aspect of our experience, coherent in the sense that

What we know here is very little, but what we are ignorant of is immense.

—PIERRE-SIMON
LAPLACE

It may well be doubted whether human ingenuity can construct an enigma of the kind which human ingenuity may not, by proper application, resolve.

—EDGAR ALLAN POE

What Is Your Philosophy?

Where do you stand on these issues? What are your philosophical beliefs? You can indicate your views by writing the appropriate number in the space provided at the end of each question. Use the following scale: 5 = true; 4 = probably true; 3 = neither probable nor improbable; 2 = probably false; and 1 = false.

1. The mind (soul) can exist independently of the body. ____
2. The mind is the brain or a by-product of the brain. ____
3. Humans have free will. ____
4. All of our actions are determined by forces beyond our control. ____
5. Persons retain their identity over time so that a seventy-year-old and a five-year-old can be one and the same person. ____

6. Persons do not retain their identity over time because they are constantly changing. ____
7. There are universal moral principles that apply to everyone everywhere. ____
8. Morality is relative to the individual or to society. ____
9. An all-powerful, all-knowing, all-good God exists. ____
10. There is no God. ____
11. We can have definite knowledge about the external world. ____
12. Real knowledge is impossible; all we can have are opinions. ____

Are your views consistent? After you've finished the book, you might want to take the survey again to see if your views have changed.

none of the beliefs contradict one another. Such a worldview would not only give us a better understanding of the world, it would also help us deal more effectively with it.

Necessary and Sufficient Conditions

Philosophical problems arise because the belief that certain concepts apply to certain things seems to conflict with other beliefs we have. For example, the belief that we have minds seems to conflict with the belief that we are purely physical organisms; the belief that we have free will seems to conflict with the belief that every event has a cause; the belief that we retain our identities over time seems to conflict with the belief that we are constantly changing; the belief that there are universal moral principles seems to conflict with the belief that different people make different moral judgments; the belief that God exists seems to conflict with the belief that there is evil in the world; and the belief that we have knowledge seems to conflict with the belief that nothing is certain. In each of these cases, it seems that a certain concept can't apply because the conditions required for its proper application are not present. To solve these problems, then, we have to explain how it's possible or why it's impossible for these concepts to apply. And to do that, we have to identify the conditions under which they apply.

The conditions that need to be met in order for something to occur or exist are known as **necessary conditions**. For example, being unmarried is a

necessary condition for being a bachelor because it's impossible to be a bachelor without being unmarried. A necessary condition, then, is a requirement—it's a condition that must be fulfilled whenever the thing in question occurs or exists.

The conditions that suffice for the application of a concept are known as **sufficient conditions**. For example, being an unmarried adult male is a sufficient condition for being a bachelor because it's impossible to be an unmarried adult male without being a bachelor. A sufficient condition, then, is a guarantee—it's a condition that, if met, ensures that the thing in question occurs or exists.

The relationship between necessary and sufficient conditions is a logical one. In general, if X is a necessary condition for Y , then Y implies X . For example, being three-sided is a necessary condition for being a triangle because being a triangle implies being three-sided. The words “only if” are often used to indicate that something is a necessary condition. For example, being three-sided is a necessary condition for being a triangle because something is a triangle *only if* it is three-sided.

If X is a sufficient condition for Y , then X implies Y . For example, being a closed three-sided plane figure is a sufficient condition for being a triangle because being a closed three-sided plane figure implies being a triangle. The word “if” is often used to indicate that something is a sufficient condition. For example, being a closed three-sided plane figure is a sufficient condition for being a triangle because something is a triangle *if* it's a closed three-sided plane figure.

Logicians use the phrase “if and only if” to indicate that a condition is both necessary and sufficient. For example, something is a noun *if and only if* it is a word used as a name or designation. A condition can be necessary without being sufficient, however. Completing the required number of courses is a necessary condition for graduating from college, but it's not sufficient, because if you haven't also paid all your college bills, you won't graduate. Similarly, a condition can be sufficient without being necessary. Getting your head cut off is a sufficient condition for dying, but it's not a necessary condition because you can die in many other ways.

Determining whether a proposed condition is necessary or sufficient for the application of a concept involves determining whether it's possible for the concept to apply without the condition being met or vice versa. If a concept can apply without the condition being met, then the condition is not necessary for the application of the concept. For example, suppose that someone claimed that being less than ten feet tall is a necessary condition for being a bachelor. Now it may well be that all bachelors who have ever lived—and all bachelors who ever will live—are less than ten feet tall. Nevertheless, being less than ten feet tall is not a necessary condition for being a bachelor because it's possible for someone to be a bachelor and be over ten feet tall. Conversely, if it's possible for a condition to be met without the concept applying, then the condition is not sufficient for the application of a concept. For example, being a closed four-sided plane figure is not a sufficient condition for being a square, because it's possible for something to be a closed four-sided plane figure and not be a square—it might be a

necessary condition

Something X is a necessary condition for something Y if and only if it is impossible for Y to exist without X .

sufficient condition

Something X is a sufficient condition for something Y if and only if it is impossible for X to exist without Y .

rectangle. Determining whether a proposed condition for the application of a concept is either necessary or sufficient is one of the most important tasks of philosophical inquiry.

Philosophical problems arise because, on reflection, it seems that certain concepts can't apply to the things we normally apply them to. To solve these problems, we have to get clear about the conditions under which they apply. Ideally, we would like to know both the necessary and sufficient conditions for their application, because if we knew only a necessary condition, we could identify some of the things to which the concept doesn't apply, but we couldn't be sure in any particular case whether it does apply. For example, if all we knew about bachelors was that they are unmarried, we wouldn't be able to tell whether an unmarried woman was a bachelor. Similarly, if we knew only a sufficient condition, we could identify some of the things to which the concept does apply, but we couldn't be sure in any particular case whether it doesn't apply. For example, if all we knew about bachelors was that priests are bachelors, we wouldn't be able to tell whether someone who wasn't a priest was a bachelor. It may not always be possible to specify complete, necessary, and sufficient conditions for a concept because it may not have precise boundaries. Nevertheless, it's usually possible to specify some necessary or sufficient conditions, and that may be all that's needed to solve a philosophical problem. In many cases, we can explain how it's possible for a concept to apply by showing that a condition is *not* necessary or sufficient.

Identifying necessary and sufficient conditions can be difficult because we can have a concept without being able to state the conditions for applying it. For example, we can have the concept of a joke without being able to say what it is that makes something a joke. When the conditions for applying concepts are unclear, clarifying them usually requires taking a hypothetical approach. This involves formulating a hypothesis about the conditions for applying a concept and testing that hypothesis to determine whether the conditions specified are necessary or sufficient. If you can identify a situation where the concept applies but the conditions do not, you've shown that the conditions specified are not necessary. If you can identify a situation where the conditions apply but the concept does not, you've shown that the conditions specified are not sufficient. This method of conceptual inquiry was pioneered by the celebrated Greek philosopher Socrates (470?–399 B.C.).

*The men of action are,
after all, only the uncon-
scious instruments of the
men of thought.*

—HEINRICH HEINE

Socrates and the Socratic Method

*It was a saying of the an-
cients, that "truth lies in
a well"; and to carry on
the metaphor, we may
justly say that logic
supplies us with steps
whereby we may go down
to reach the water.*

—ISAAC WATTS

Socrates is the pivotal figure in the history of Western philosophy. Not only was he the first to ask many of the questions that are central to the discipline, but he also pioneered a method of answering them that is still in use today. There were philosophers before Socrates, but they are known collectively as "pre-Socratics," again indicating his importance to the discipline. The pre-Socratics were concerned primarily with questions about the nature of reality. Socrates, too, was originally interested in such questions. He studied under Anaxagoras, who was charged with the crime of impiety for teaching that the sun was a molten mass of rock. Socrates eventually gave up the study of na-

In the News: The Oracle at Delphi

The Oracle at Delphi was one of the most revered and powerful people in ancient Greece. She advised farmers when to plant their crops and generals when to wage war. No great project was undertaken without the blessings of the Oracle. The oracle in the movie *The Matrix* was modeled after the Oracle at Delphi. Both foretold the future, and both had the saying “Know Thyself” hanging over the entrance to their chambers (although one was in Greek and the other in Latin). Who was this enigmatic figure? It turns out that the Oracle at Delphi was not any one person, but a succession of older women of impeccable virtue who served as the mouthpiece of the god Apollo.

Delphi, which is situated at the foot of Mt. Parnassus, was considered sacred to Apollo because it was there, according to Homer, that he slew the dragon Python. The dragon’s body allegedly fell into a fissure in the floor of a cave on the side of Mt. Parnassus. As it decomposed, it gave off fumes. The Oracle, also known as the Pythia, would sit on a tripod over the fissure in the cave, breathe in the fumes, and become possessed by the spirit of Apollo. In this intoxicated state, she gave her prophecies. They were often incoherent, but the Greek priests would make them more intelligible by translating them into hexameter verse.

Before Alexander the Great set out on his first military campaign, he traveled to Delphi to seek the Oracle’s counsel. When he arrived, legend has it that the Oracle was unavailable. Anxious to know his prospects for success, he tracked down the Oracle and forced her to make a prediction. She is reported to have cried out in exasperation, “Oh, child, you are invincible.” Alexander took this as a favorable omen and went on to conquer the world.

Recent geological research has identified a possible source of the fumes.

Several years ago, Greek researchers found a fault running east to west beneath the oracle’s temple. De Boer [a geologist at Wesleyan University] and his colleagues discovered a second fault, which runs north to south. “Those two faults do cross each other, and therefore interact with each other, below the site,” said De Boer. . . .

About every 100 years a major earthquake rattles the faults, the faults are heated by adjacent rocks and the hydrocarbon deposits stored in them are vaporized. These gases mix with ground water and emerge around springs.

De Boer conducted an analysis of these hydrocarbon gases in spring water near the site of the Delphi temple. He found that one is ethylene, which has a sweet smell and produces a narcotic effect described as a floating or disembodied euphoria.

“Ethylene inhalation is a serious contender for explaining the trance and behavior of the Pythia,” said Diane Harris-Cline, a classics professor at The George Washington University in Washington, D.C.

“Combined with social expectations, a woman in a confined space could be induced to spout off oracles,” she said.⁶

When the fissure at Delphi stopped producing gas, the Greek priests purportedly started burning belladonna and jimson weed in the cave and found that they could get some pretty good oracular declamations from the smoke that produced as well.

ture, perhaps because there seemed to be no way to decide among competing theories. (The experimental method that we associate with scientific investigation had not yet been invented.) Instead, he focused his considerable intellectual talents on the study of problems more directly relevant to human life. He sought answers to such questions as “What is justice?” “What is virtue?” “What is knowledge?” Because our lives are guided by what we take to be the correct answers to such questions, Socrates claimed that only those who had considered such questions could lead a good life.

Socrates was a native of Athens, Greece, and a stonemason by trade. Like most able-bodied Athenian men at that time, he served in the army. But unlike most of them, he distinguished himself on the battlefield. In the battle of Delium, he reportedly saved the life of Xenophon and retreated with dignity when the other Athenians were running for their lives. In the battle of Potidaea, he won a citation for valor for holding his ground throughout the night. He is most famous, however, for the public conversations he had with the leading figures of Athens.

Socrates' strength of character and force of mind were widely known. So much so, that when his friend Chaerophon asked the Oracle at Delphi whether anyone was wiser than Socrates, the priestess replied, "Of all men living, Socrates is the wisest." When word of this got back to Socrates, he thought the Oracle must have made a mistake. So he set out to prove the Oracle wrong. He reasoned that if he could find at least one person who was wiser than himself, he would have shown the Oracle to be in error. He sought out the greatest politicians, poets, and craftsmen of his day in an attempt to determine whether any of them possessed true wisdom. Socrates describes his search this way:

I went to one who had the reputation of wisdom, and observed him. When I began to talk with him, I could not help thinking that he was not really wise, although he was thought wise by many, and wiser still by himself; and I went and tried to explain to him that he thought himself wise, but was not really wise; and the consequence was that he hated me, and his enmity was shared by several who were present and heard me. So I left him, saying to myself, as I went away: Well, although I do not suppose that either of us knows anything really beautiful and good, I am better off than he is—for he knows nothing, and thinks that he knows. I neither know nor think that I know. In this latter particular, then, I seem to have slightly the advantage of him.⁷

Although Socrates was unable to find anyone wiser than himself, he did not conclude that he had any substantive knowledge that they lacked. What made him wiser than them, he claimed, was that, unlike them, he knew that he didn't have any wisdom.

Socrates liked to conduct his inquiries in the marketplace, and he often drew a large crowd. No one likes to be made a fool of in public, however, and eventually some of those who felt the sting of his sharp tongue brought charges against him. His accusers were Miletus the poet, Anytus the tanner, and Lycon the orator. They claimed that he was guilty of worshipping false gods and corrupting the youth. The penalty they sought was death. Socrates was tried before the Athenian Council of 500, and the proceedings were recorded by his pupil Plato. (Socrates never committed his thoughts to paper, so most of what we know about Socrates' philosophy comes from the dialogues of Plato in which Socrates always appears as the main character.) Socrates argued that the charges were false; that he was guilty of nothing more than seeking the truth. The council wasn't convinced, however, and by a vote of 280 to 220 found him guilty as charged. When asked, as was the custom, what an appropriate penalty would be, Socrates defiantly replied that he should

be kept in the Pyrtaneum (the dining hall of Olympic and military heroes) at the public expense in recognition of the service he had performed for the people of Athens. Outraged by his impudence, the council took another vote and by a vote of 360 to 140 sentenced him to death.

Normally, convicted criminals were executed the day after the trial. Socrates' execution was delayed for thirty days, however, because the sacred ship sent to Delos every year to celebrate Theseus's victory over the minotaur had just set sail. In honor of the god Apollo, no one was allowed to be executed while the ship was at sea. During that time, Socrates had a number of remarkable philosophical discussions with his disciples.

Socrates' friends knew that the charges brought against him were false and the conviction unjust, so they tried to help him escape. They prepared a ship for him and convinced the guard to unlock the door to his cell. Socrates refused to leave, however, arguing that because he had enjoyed the benefits of Athenian citizenship throughout his life, he owed it to the people of Athens to abide by their decision. When the sacred ship returned from Delos, Socrates drank a cup of hemlock and died.

According to the biographer, Diogenes Laertius, the citizens of Athens soon recognized the error of their judgment. He writes,

Not long afterward, the Athenians felt such remorse that they closed the training grounds and gymnasiums. They put Meletus to death and banished his other accusers. They erected a bronze statue of Socrates to honor him; it was the work of Lysippus and was placed in the hall of processions.⁸

Apparently the Athenians came to agree with Socrates that he had indeed performed a valuable public service in teaching them to seek virtue and wisdom.

When Socrates asked questions like "What is justice?" "What is virtue?" "What is knowledge?" those he interrogated often responded by citing instances of the concept in question. Socrates wouldn't accept such responses, however, for they didn't answer his question. He wanted to know what made a concept apply, and listing examples didn't give him that knowledge. Once he got his interlocutors to specify the conditions under which a concept applied, he would examine those conditions to determine whether they were necessary or sufficient.

For example, in Plato's dialogue *Euthyphro*, Socrates tries to determine what makes something holy. Believing that a theologian should know something about this, he questions the young theologian Euthyphro, who at the time was prosecuting his own father on a charge of murder. It seems that one of the father's hired laborers had killed one of his house slaves in a fit of drunken rage. Euthyphro's father captured the laborer, tied his hands and feet, and threw him into a ditch. He then sent a messenger to Athens to consult a religious authority to determine what should be done with the culprit. In the meantime, he neglected the laborer, figuring that it would not matter if he died, because he was a murderer. The laborer did die before the messenger returned, and Euthyphro alleged that his father was guilty of murdering the laborer. Socrates meets Euthyphro on the steps of the courthouse:

Pre-Socratic Philosophers

Philosophy and science have a common origin in ancient Greece. There, on the banks of the Aegean Sea around 600 B.C., Thales (ca. 624–547 B.C.) asked—and answered—a question that philosophers and scientists are struggling with to this day: “What is the world made of?” Two important assumptions underlie Thales’ question: (1) that the nature of a thing is determined by the stuff out of which it is made, and (2) that everything is made out of the same kind of stuff. These assumptions lie behind our most advanced physical theory: string theory. According to that theory, everything in the world is made out of infinitesimally small, multidimensional strings that vibrate at different frequencies. Thales’ basic stuff is not so arcane. According to him, the world is made of water. Although that theory may not seem very plausible, it should be noted that water can exist in a number of different states: solid, liquid, and gas. Thales apparently believed that everything in the world was a different state of water.

The Greeks traditionally recognized four different substances: earth, air, fire, and water. Thales claimed that there was only one—water—and that everything else was a modification of it. Thales’ pupil Anaximander (ca. 610–546 B.C.) didn’t find Thales’ explanation convincing, however, because it couldn’t account for fire. Earth and air may be types of water, but fire cannot be made out of water because water puts out fire. Furthermore, he argued that Thales’ theory couldn’t account for change. Water may exist in many different forms, but Thales doesn’t explain what causes it to assume all those forms.

Anaximander sought to improve on Thales’ theory by postulating a mechanism for change. He argued that change was the result of a war between opposites that he called “the hot,” “the cold,” “the wet,” and “the dry.” Because each of these forces is struggling for dominance, none of them can be basic. So the original stuff, Anaximander reasoned, must be utterly different from anything that currently exists. He referred to this stuff as “the Apeiron,” meaning the indefinite or the unbounded. The four forces precipitated out of this basic stuff and gave rise to the world as we know it.

Echoes of Anaximander can also be found in current scientific theories. Modern physics recognizes four basic forces—electromagnetism, gravity, the strong nuclear force, and the weak nuclear force—as the causes of change. It also teaches that the original stuff out of which everything came is no longer present. That stuff existed at the moment of the big bang (the explosion that brought our universe into existence), but as it cooled, it turned into the particles we are familiar with.

Anaximines (d. 528 B.C.), another student of Thales, thought that Anaximander’s theory was no better than Thales’ because it couldn’t explain how the four forces emerged out of the Apeiron. He thought that Thales had the right idea but the wrong substance. According to Anaximines, the basic stuff is air. Unlike Thales, however, he was able to explain how air could take on so many different forms: through the processes of condensation and rarefaction. Condense air, he claimed, and you get water. Condense water, and you get earth.

SOCRATES: Then tell me. How do you define the holy and the unholy?

EUTHYPHRO: Well then, I say that the holy is what I am now doing, prosecuting the wrongdoer who commits a murder or a sacrilegious robbery, or sins in any point like that, whether it be your father, or your mother, or whoever it may be. And not to prosecute would be unholy. . . .

SOCRATES: . . . my friend, you were not explicit enough before when I put the question. What is holiness? You merely said that what you are now doing is a holy deed—namely, prosecuting your father on a charge of murder.

EUTHYPHRO: And, Socrates, I told the truth.

Rarefy air, and you get fire. Thus, Anaximenes could account for all four elements in terms of one basic substance.

Pythagoras (fl. 530 B.C.) is the only pre-Socratic philosopher whose name is still widely known. We recognize him as the discoverer of the Pythagorean theorem. But he also pioneered a novel approach to understanding the world. According to Pythagoras, what makes something what it is, is not the stuff out of which it is made but the form that it possesses. What's more, Pythagoras claimed, that form can be represented mathematically. Pythagoras made a number of important mathematical discoveries, including square numbers, cube numbers, and irrational numbers. Modern science shares Pythagoras's insight that the underlying form of nature can be represented mathematically. (That's why all science students have to take math courses.)

Other pre-Socratics focused on the problem of change and developed radically different theories to deal with it. The problem is, How can something change and yet remain the same thing? If it has changed, it's different, and if it's different, it's no longer the same. Heraclitus (ca. 540–480 B.C.) took change to be an undeniable fact and concluded that we must give up the notion that things remain the same through change. "The only constant is change," he paradoxically proclaimed. "You can never step into the same river twice." Parmenides (b. 515 B.C.), on the other hand, believed that only that which is unchanging is real, so he denied that change occurred. For him, change was an illusion.

Parmenides' view is important because it was backed by a logical argument. He recognized that anything that involves a logical contradiction cannot exist. So he concluded that nonexistence cannot exist. What's more, he reasoned that if there is no place where there is nothing—if every place is occupied—there is no place to move to. So motion, and thus change, is impossible. It may seem that we can move from one place to another, but that is just an illusion. For Parmenides, the world is a solid ball of matter that never changes.

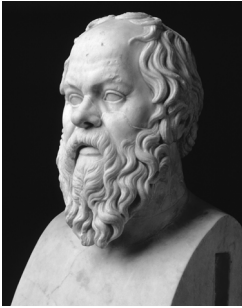
This view did not sit well with most Greek thinkers, although Parmenides' pupil Zeno of Elea (ca. 490–435 B.C.), provided a number of additional arguments to support his claim. To resolve the impasse, Democritus (ca. 460–370 B.C.) combined the insights of both Heraclitus and Parmenides. He affirmed the existence of empty space and claimed that the world is made of particles that are constantly moving through space. These particles are like Parmenidean worlds: they have no internal structure and cannot be broken down into any smaller constituents. Democritus called them "atoms," which comes from the Greek *atomon*, meaning "uncuttable." What we call atoms are not indivisible, but we do recognize the existence of indivisible particles, such as electrons and quarks, out of which everything is made. What's important about the pre-Socratics is not the details of their theories but the type of questions they asked and the type of answers they gave to them, for they have shaped Western intellectual history for more than two thousand years.

SOCRATES: Possibly. But, Euthyphro, there are many other things that you will say are holy.

EUTHYPHRO: Because they are.

SOCRATES: Well, bear in mind that what I asked of you was not to tell me one or two out of all the numerous actions that are holy; I wanted you to tell me what is the essential form of holiness which makes all holy actions holy. I believe you held that there is one ideal form by which unholy things are all unholy, and by which all holy things are holy. Do you remember that?

EUTHYPHRO: I do.



SOCRATES
470?–399 B.C.

SOCRATES: Well then, tell me what, precisely, this ideal is, so that, with my eye on it, and using it as a standard, I can say that any action done by you or anybody else is holy if it resembles this ideal, or, if it does not, can deny that it is holy.

EUTHYPHRO: Well, Socrates, if that is what you want, I certainly can tell you.

SOCRATES: It is precisely what I want.

EUTHYPHRO: Well then, what is pleasing to the gods is holy, and what is not pleasing to them is unholy.

SOCRATES: Perfect Euthyphro! Now you give me just the answer that I asked for. Meanwhile, whether it is right I do not know, but obviously you will go on to prove your statement true.

EUTHYPHRO: Indeed I will.⁹

Socrates has now received an answer to his question. Euthyphro has finally proposed necessary and sufficient conditions for something's being holy. Socrates proceeds to test this proposal by trying to determine whether the conditions identified really are necessary and sufficient.

SOCRATES: Come now, let us scrutinize what we are saying. What is pleasing to the gods, and the man that pleases them, are holy; what is hateful to the gods, and the man they hate, unholy. But the holy and unholy are not the same; the holy is directly opposite to the unholy. Isn't it so?

EUTHYPHRO: It is. . . .

SOCRATES: Accordingly, my noble Euthyphro, by your account some gods take one thing to be right, and others take another and similarly with the honorable and the base, and good and bad. They would hardly be at variance with each other, if they did not differ on these questions. Would they?

EUTHYPHRO: You are right.

SOCRATES: And what each one of them thinks noble, good and just, is what he loves and the opposite is what he hates?

EUTHYPHRO: Yes, certainly.

SOCRATES: But it is the same things, so you say, that some of them think right, and others wrong, and through disputing about these they are at variance, and make war on one another. Isn't it so?

EUTHYPHRO: Yes it is.

SOCRATES: Accordingly, so it would seem the same things will be hated by the gods and loved by them; the same things would alike displease and please them.

EUTHYPHRO: It would seem so.

SOCRATES: And so, according to this argument, the same things, Euthyphro, will be holy and unholy.

EUTHYPHRO: That may be.

SOCRATES: In that case, admirable friend, you have not answered what I asked you. I did not ask you to tell me what at once is holy and unholy, but it seems that what is pleasing to the gods is also hateful to them.

Thus, Euthyphro, it would not be strange at all if what you now are doing in punishing your father were pleasing to Zeus, but hateful to Cronus and Uranus, and welcome to Hephaestus, but odious to Hera, and if any other of the gods disagree about the matter, satisfactory to some of them and odious to others.¹⁰

Euthyphro suggests that holiness is what is pleasing to the gods. Socrates puts this suggestion to the test by exploring its implications. He points out that what is pleasing to one of the gods may not be pleasing to the others—for example, what is pleasing to Zeus may not be pleasing to Hera. So if being pleasing to the gods is what makes something holy, something could be holy and unholy at the same time. But that’s impossible. Nothing can have a property and lack it at the same time. Consequently, the conditions proposed can’t be correct. Being pleasing to the gods can be neither a necessary nor a sufficient condition for being holy.

The Socratic Method for analyzing a concept, then, involves the following steps:

1. *Identify a problem or pose a question.* Ask, “How is it possible for concept X to apply?” “What makes X apply?” “What is the logical relationship between X and Y?”
2. *Propose a hypothesis.* Specify the necessary or sufficient conditions for applying the concept in question. Try to identify the features shared by all and only those things to which the concept applies.
3. *Derive a test implication.* Ask, “What if the hypothesis were true?” “What does it imply?” “What does it commit us to?” Test implications have the following form: If hypothesis H is true, then concept X should apply in this situation.
4. *Perform the test.* Determine whether the concept applies in the situation envisioned.
5. *Accept or reject the hypothesis.* If the concept applies in the situation envisioned, there is reason to believe that it is true. If it doesn’t apply, there is reason to believe that it is false. In that case, you should either reject the hypothesis or go back to step 2 and revise it.

Science and the Scientific Method

While philosophers are in the business of trying to identify the necessary or sufficient conditions for the application of concepts, scientists are in the business of trying to identify the necessary or sufficient conditions for the occurrence of events. Consider, for example, the problem of Uranus’s orbit. By 1844, it was known that there was a wobble in Uranus’s orbit that couldn’t be explained by Newton’s theories of gravity and motion. The observed orbit differed from the predicted orbit by two minutes of arc, a discrepancy much

greater than that of any other known planet. If astronomers couldn't explain how this was possible, Newton's theory would be in trouble because it would be inconsistent with the data. In 1845, astronomer Urbain Leverrier explained how the wobble was possible by postulating the existence of an unknown planet. Using Newton's theories of gravity and motion, he calculated the mass and trajectory a planet would need to have in order to affect Uranus's orbit in the way observed. On the basis of those calculations, he requested astronomer Johann Galle to search a particular region of the sky for such a planet. Less than an hour after Galle began his search, he noticed something that was not on his charts. When he checked again the next night, the object had moved a considerable distance. Galle had discovered Neptune.

Uranus's orbit seemed impossible because it conflicted with Newton's laws of gravity and motion. Leverrier explained how it was possible by identifying sufficient conditions for Uranus having the orbit it did that were consistent with Newton's laws of gravity and motion. Because Leverrier's claim turned out to be true, Newton's laws did not have to be revised or abandoned.

The scientific method, then, involves the following steps:

1. *Identify a problem or pose a question.* Ask, "How is it possible for event X to occur?" "What makes X occur?" "What is the causal relationship between X and Y?"
2. *Propose a hypothesis.* Specify the necessary or sufficient conditions for the event's occurring. Try to identify the features shared by all and only those things that cause X.
3. *Derive a test implication.* Ask, "What if the hypothesis were true?" "What does it imply?" "To what does it commit us?" Test implications have the following form: If hypothesis H is true, then event X should occur in this situation.
4. *Perform the test.* Produce the situation in the laboratory or look for it in the field.
5. *Accept or reject the hypothesis.* If the event occurs in the situation specified, there is reason to believe that the hypothesis is true. If it doesn't apply, there is reason to believe that it is false. In that case, you should either reject the hypothesis or go back to step 2 and revise it.

Philosophy, like science, aims at solving problems and getting at the truth. Unlike science, however, philosophy explains how it's possible for concepts to apply rather than how it's possible for events to occur. Jerry Fodor illuminates the difference between these two types of inquiry with the following example:

Consider the question: 'What makes Wheaties the breakfast of champions?' (Wheaties, in case anyone hasn't heard, is, or are, a sort of packaged cereal. The details are very inessential.) There are, it will be noticed, at least two kinds of answers that one might give. A sketch of one answer, which belongs to what I shall call the 'causal story' might be: 'What make Wheaties the breakfast of champions are the health-giving vitamins and minerals that it contains'; or 'It's the carbohydrates in Wheaties, which give the energy one needs for hard days on the high

hurdle'; or 'It's the special springiness of all the molecules in Wheaties, which gives Wheaties eaters their unusually high coefficient of restitution', etc.

. . . I suggested that there is another kind of answer that 'What makes Wheaties the breakfast of champions?' may appropriately receive. I will say that answers of this second kind belong to the 'conceptual story'. In the present case, we can tell the conceptual story with some precision: What makes Wheaties the breakfast of champions is the fact that it is eaten (for breakfast) by nonnegligible numbers of champions. This is, I take it, a conceptually necessary and sufficient condition for anything to be the breakfast of champions; as such, it pretty much exhausts the conceptual story about Wheaties.

The point to notice is that answers that belong to the conceptual story typically do not belong to the causal story and vice versa.¹¹

Scientists explain how it's possible for an event to occur by specifying the *causally* necessary or sufficient conditions for its occurrence. Philosophers, on the other hand, explain how it's possible for a concept to apply by identifying the *logically* necessary or sufficient conditions for its application. In other words, scientists try to explain the causal relations among events while philosophers try to explain the logical relations among concepts. To understand the difference between philosophy and science, then, it's important to understand the difference between logical and causal (or physical) possibility.

Logical versus Causal Possibility

Something is **logically impossible** if and only if it violates a law of logic known as the **law of noncontradiction**, which says that nothing can have a property and lack it at the same time. For example, a round square is logically impossible because nothing can be both round and square at the same time. Anything that is logically impossible cannot exist. We know, for example, that there are no round squares, no married bachelors, and no largest number because these notions involve a contradiction. The laws of logic, then, not only determine the bounds of the rational, they also determine the bounds of the real. That is why the great German logician Gottlob Frege called logic "the study of the laws of the laws of science."

The laws of science must obey the laws of logic. But the laws of logic need not obey the laws of science. In other words, something can be logically possible even though it's causally impossible. Something is **causally impossible** if and only if it violates a law of nature. A cow's jumping over the moon, for example, is causally impossible because it violates natural laws concerning mass, force, acceleration, and gravity, among others. But such a feat isn't logically impossible, for the notion of a moon-jumping cow doesn't involve a logical contradiction, so the notion of logical possibility is more inclusive than that of causal possibility.

Because scientific theories try to explain how it's causally possible for an event to occur, they can often be tested by means of physical experiments in the laboratory. If a scientific theory is true, then certain events should occur under certain conditions. Scientists test their theories by constructing artificial

logical impossibility
Something is logically impossible if and only if it violates the law of noncontradiction.

law of noncontradiction
The principle that nothing can both have and lack a property at the same time and in the same respect.

causal impossibility
Something is causally impossible if and only if it violates a law of nature.

The Laws of Thought

The laws of logic are often called the laws of thought because, just as social laws make society possible, so logical laws make thought possible. Aristotle (384–322 B.C.) was the first to codify these laws. They include

The law of noncontradiction: Nothing can both have a property and lack it at the same time. (No statement can be both true and false at the same time.)

The law of identity: Everything is identical to itself. (Everything is what it is and not another thing.)

The law of excluded middle: For any property, everything either has it or lacks it. (Every statement is either true or false.)

In order to think or communicate, our thoughts and sentences must have a specific content; they must assert one thing rather than another. In other words, they must be either true or false but not both. But if the laws of thought didn't hold, this wouldn't be the case. No thought or sentence could be considered to be any more true than any other because they would all be equally true and false. In such a situation, as Aristotle notes, thinking would be impossible:

. . . if all are alike both wrong and right, one who is in this condition will not be able either to speak or to say anything intelligible; for he says at the same time both “yes” and “no.” And if he makes no judgment but “thinks” and “does not think” indifferently, what difference will there be between him and a vegetable?¹²

What difference, indeed? Without the law of non-contradiction, we can't believe things to be one way rather than another. But if we can't believe things to be one way rather than another, we can't think at all.

Because the laws of thought are the basis for all logical proofs, they can't be directly proven by means of a logical demonstration. But they can be indirectly proven by showing that you cannot deny them without assuming them! Aristotle puts the point this way:

The starting point for all such proofs is that our opponent shall say something which is significant both for himself and for another; for this is necessary if he really is to say anything. For if he means nothing, such a man will not be capable of reasoning, either with himself or with another. But if any one says something that is significant, demonstration will be possible; for we shall already have something definite. The person responsible for the proof, however, is not he who demonstrates but he who listens; for while disowning reason he listens to reason. And again he who admits this has admitted that something is true apart from demonstration.¹³

The law of noncontradiction can't be demonstrated to someone who won't say something definite, for demonstration requires that our words mean one thing rather than another. On the other hand, the law of noncontradiction need not be demonstrated to someone who will say something definite, for in saying something definite, the speaker has already assumed its truth.

situations in which those conditions are met. If the events occur as predicted, the test is successful. If not, it's unsuccessful. Suppose, for example, that you wanted to test the effectiveness of a new antibacterial drug. You could grow some bacteria in a culture and then apply the drug to them. If most of the bacteria died, you would have reason to believe that the drug was effective.

Because philosophical theories explain how it's logically possible for a concept to apply, they cannot be tested by physical experiments in a scientist's laboratory. But they can be tested by thought experiments in the laboratory of the mind. If a philosophical theory is true, then certain concepts should apply under certain conditions. Philosophers test their theories by constructing

imaginary situations in which those conditions are met. If the concepts apply as predicted, the test is successful. If not, it's unsuccessful. So even though philosophy deals with abstract concepts rather than concrete events, its theories can be tested, and the results of these tests can be used to judge the plausibility of these theories.

Thought Probe

Possibilities

Are the following situations causally possible? Are they logically possible? A human with feathers. Traveling faster than the speed of light. A cat speaking English. A bowling ball speaking English. A rabbit laying multicolored eggs. A soft-shelled prime number. A thinking machine. A computer with a soul.

Summary

We all have a philosophy, for we all have beliefs about what is real, what is valuable, and how we come to know what is real and valuable. The quality of our lives is determined by the nature of our philosophy, for every decision we make is influenced by our views of reality, value, and knowledge. The goal of philosophical inquiry is to determine whether these views are viable.

Philosophical problems arise from the realization that some of our most fundamental beliefs seem to be inconsistent with one another. Apparent inconsistencies among some of our central beliefs give rise to the mind-body problem, the problem of personal identity, the problem of free will, the problem of evil, the problem of moral relativism, and the problem of skepticism. Philosophical theories try to resolve such conflicts by explaining how it is possible (or why it is impossible) for a concept to apply to something.

Philosophy differs from science in that it tries to explain how it's possible for a concept to apply rather than how it's possible for an event to occur. Philosophical theories provide the logically necessary and sufficient conditions for a concept's applying whereas scientific theories provide the physically necessary and sufficient conditions for an event's occurring. Because scientific theories explain the causal relations between events, they can be tested by means of physical experiments in the laboratory. Because philosophical theories explain the logical relations between concepts, they can be tested by means of thought experiments in the laboratory of the mind.

Study Questions

1. What are the four main branches of philosophy?
2. How do philosophical problems arise?
3. How can philosophical problems be solved?

4. What is a necessary condition?
5. What is a sufficient condition?
6. What do philosophical theories try to explain?
7. What do scientific theories try to explain?
8. What makes something logically impossible?
9. What makes something causally impossible?
10. How can scientific theories be tested?
11. How can philosophical theories be tested?

Discussion Questions

1. How does your philosophy affect your decisions? Give specific examples.
2. Are philosophical beliefs the only beliefs worth dying for? Illustrate your answer by means of examples.
3. What if Crick were able to demonstrate convincingly that we are “nothing but a pack of neurons”? What effect, if any, should this have on our legal system? On our religious beliefs?
4. What if it were convincingly demonstrated that we do not have free will? What effect, if any, should this have on our legal system? On our religious beliefs?
5. What if it were convincingly demonstrated that knowledge is impossible? What effect, if any, should this have on our educational system? On government support for research?
6. Is being a resident of Iowa a necessary or a sufficient condition for being a resident of the United States?
7. Is being a citizen of the United States a necessary or a sufficient condition for being president of the United States?
8. Is it logically possible for a human to grow feathers instead of hair? Is such a thing causally possible?
9. Is it logically possible for a cow to jump over the moon? Is such a thing causally possible?

Section 1.2

Evidence and Inference

Proving Your Point

To arrive at the truth, we have to reason correctly. Philosophers have always appreciated that fact and have made the study of correct reasoning—logic—one of their central concerns. Logic doesn't attempt to determine how people in fact reason. Rather, it attempts to determine how people should reason if they want to avoid error and falsehood. Logical thinking is rational thinking, and rational thinking is that which is most likely to lead us to the truth.

To make an inference is to draw a conclusion on the basis of certain evidence. We are justified in making an inference, however, only if the evidence is related to the conclusion in the right way. To help us distinguish legitimate from illegitimate inferences, logic identifies the ways in which evidence and conclusion must be related in order for the evidence to justify the conclusion. To present your reasons for believing something is to make an **argument**. From a logical point of view, then, an argument is a group of statements that attempts to justify a claim. The claim that the statements attempt to justify is known as the **conclusion** of the argument, and the statements that supposedly justify it are known as **premises**. For example, consider the classic argument:

1. All men are mortal.
2. Socrates is a man.
3. Therefore, Socrates is mortal.

In this argument, statements 1 and 2 are premises, and statement 3 is the conclusion.

The premises and conclusion of an argument are not always easy to identify. Often, however, they are preceded by certain indicator words. For example, words such as “thus,” “therefore,” “and hence,” “so,” “then,” “consequently,” “as a result,” “shows that,” “means that,” and “implies that” serve as conclusion indicators, while words such as “because,” “for,” “if,” “as,” “follows from,”

Our reason must be considered as a kind of cause, of which truth is the natural effect.

—DAVID HUME

argument A group of statements consisting of one or more premises and a conclusion that purportedly follows from the premises.

conclusion The claim that an argument is trying to establish.

premise A reason given for accepting the conclusion of an argument.

“given that,” “provided that,” and “assuming that” serve as premise indicators. Writers and speakers do not always explicitly state their premises or their conclusions, however. Learning to identify arguments with unstated premises or conclusions (known as “enthymemes”) is a skill that can be acquired only through practice.

Arguments come in two basic varieties: deductive and inductive. Good deductive arguments differ from good inductive ones in that they are valid. In a **valid argument**, the conclusion logically follows from its premises. In other words, in a valid argument, it’s logically impossible for the premises to be true and the conclusion false because the conclusion expresses what is implied by the combination of premises. Consider, for example, this argument:

1. If all that exists is matter in motion, then there are no disembodied spirits.
2. All that exists is matter in motion.
3. Therefore, there are no immaterial spirits.

This argument is valid because if the premises are true, the conclusion must be true. There’s no way that the premises can be true and the conclusion false. So deductive arguments are said to be “truth preserving” because the truth of their premises guarantees the truth of their conclusions.

Inductive arguments, on the other hand, are not truth preserving because the truth of their premises doesn’t guarantee the truth of their conclusions. Consider, for example, this argument:

1. Every raven that has ever been observed has been black.
2. Therefore, every raven that ever will be observed will be black.

It’s possible for the premise of this argument to be true and the conclusion false. Because we haven’t observed every raven, we can’t be sure that there isn’t a nonblack raven somewhere. And because we can’t observe the future, we can’t be sure that the future will resemble the past. So, unlike deductive arguments, which can establish their conclusions with certainty, inductive arguments can establish their conclusion with only a high degree of probability. A strong inductive argument is one in which it’s improbable (but not logically impossible) for the premises to be true and the conclusion false.

Deductive Arguments

Whether a deductive argument is valid depends on the form or structure of the argument. The form of an argument can be represented in many different ways, but one of the most effective is to substitute letters for the statements contained in the argument. Some statements are compound in that they contain other statements as constituents. To accurately represent the form of these statements, each constituent statement should be assigned a letter. For example, a conditional or if-then statement is compound because it contains at least two statements. To accurately represent the form of these statements, assign one letter to the statement following the “if” (known as the “antecedent”), and another to the statement following the “then” (known as the

Logic is the armory of reason, furnished with all offensive and defensive weapons.

—THOMAS FULLER

“consequent”). Using this method, two of the most common valid argument forms can be represented as follows.

Some Valid Argument Forms

Affirming the Antecedent (Modus Ponens)

If p then q.
p.
Therefore, q.

For example:

1. If the soul is immortal (p), then thinking doesn't depend on brain activity (q).
2. The soul is immortal (p).
3. Therefore, thinking doesn't depend on brain activity (q).

Denying the Consequent (Modus Tollens)

If p then q.
Not q.
Therefore, not p.

For example:

1. If the soul is immortal (p), then thinking doesn't depend on brain activity (q).
2. Thinking does depend on brain activity (not q).
3. Therefore, the soul is not immortal (not p).

Hypothetical Syllogism

If p then q.
If q then r.
Therefore, if p then r.

For example:

1. If the Federal Reserve Board raises interest rates, it will be more difficult to borrow money.
2. If it's more difficult to borrow money, home sales will fall.
3. Therefore, if the Federal Reserve Board raises interest rates, home sales will fall.

Disjunctive Syllogism

Either p or q.
Not p.
Therefore q.

Logic is the art of convincing us of some truth.

—JEAN DE LA BRUYERE

Believe nothing, no matter where you read it, or who said it, no matter if I said it, unless it agrees with your own reason and your own common sense.

—BUDDHA

valid argument A deductive argument in which it's logically impossible for the premises to be true and the conclusion false.

For example:

1. Sally either walked or rode the bus.
2. She didn't walk.
3. So, she rode the bus.

Because validity is a matter of form, any argument that exhibits any of these forms is valid, regardless of whether the statements it contains are true. So, to determine an argument's validity, it's not necessary to ascertain the truth of its premises.

To see this, consider this argument:

1. If one human is made of tin, then every human is made of tin.
2. One human is made of tin.
3. Therefore, every human is made of tin.

The premises and conclusion of this argument are false. Nevertheless, this argument is valid because *if* the premises were true, *then* the conclusion would be true. A valid argument can have false premises and a false conclusion, false premises and a true conclusion, or true premises and a true conclusion. The one thing it cannot have is true premises and a false conclusion.

Since the purpose of logic is to help us discover the truth, there must be more to being a good deductive argument than being valid. In addition, the premises must be true. When both conditions are met — when an argument is valid and its premises are true — the argument is said to be **sound**.

Only a sound argument provides a good reason for believing its conclusion. To determine whether you are justified in believing the conclusion of a deductive argument, then, you have to determine whether it's sound. This involves three steps: (1) identifying the premises and conclusion, (2) determining whether the argument is valid, and (3) determining whether the premises are true. If the argument is not valid, there is no reason to proceed to step 3, for in that case, the conclusion doesn't follow from the premises.

There are many valid argument forms, and it is not feasible to memorize them all. But once you have ascertained the form of an argument, you can test it for validity by determining whether there is another argument with the same form that would allow the premises to be true and the conclusion false. If so, the argument is invalid. Such an interpretation serves as a counterexample to the claim that the argument is valid.

Some Invalid Argument Forms

Affirming the Consequent

If p, then q.

q.

Therefore, p.

Let's test this argument form for validity by substituting the sentence "Chicago is the capital of Illinois" for p and "Chicago is in Illinois" for q. Then we have:

1. If Chicago is the capital of Illinois (p), then Chicago is in Illinois (q).
2. Chicago is in Illinois (q).
3. Therefore, Chicago is the capital of Illinois (p).

Clearly, this argument is invalid. In a valid argument, you will recall, it's impossible for the premises to be true and the conclusion false. But in this case, both of the premises are true and the conclusion is false. So any argument with this form does not provide a good reason for accepting its conclusion.

Here's another type of argument you may come across:

Denying the Antecedent

If p, then q.

Not p.

Therefore, not q.

Can you imagine any situation in which the premises are true and the conclusion false? Suppose we substitute "Joe is a bachelor" for p, and "Joe is a male" for q. Then we get:

1. If Joe is a bachelor (p), then Joe is a male (q).
2. Joe is not a bachelor (not p).
3. Therefore, Joe is not a male (not q).

This argument is also invalid because it's possible for the premises to be true and the conclusion false. So anyone who uses this form of reasoning—no matter what statements they use in the place of p or q—has not proven their point.

Affirming a Disjunct

Either p or q.

p.

Therefore, not q.

In logic, the word "or" is usually understood inclusively. In the inclusive sense, a statement of the form p or q is true whenever p or q *or both* are true. The word "or" can also be understood exclusively, however. In the exclusive sense, a statement of the form p or q is true whenever p or q *but not both* are true. The fallacy of affirming a disjunct occurs when an inclusive or is interpreted exclusively. For example:

1. Either the car battery is dead or the car is out of gas.
2. The car battery is dead.
3. Therefore, the car is not out of gas.

*In the spider-web of facts,
many a truth is strangled.*

—PAUL ELDRIDGE

*Truth is what stands the
test of experience.*

—ALBERT EINSTEIN

sound argument A valid deductive argument that contains only true premises.

This argument is invalid because it's possible for both disjuncts to be true: the car could have a dead battery and be out of gas at the same time. Consequently, from the fact that one is true, we cannot validly conclude that the other is not true.

Inductive Arguments

Even though inductive arguments are not valid, they can still give us good reasons for believing their conclusions provided that certain conditions are met. An inductive argument that would establish its conclusion with a high degree of probability if its premises were true is known as a **strong argument**. A strong inductive argument with true premises is known as a **cogent argument**. To get a better idea of what constitutes a strong inductive argument, let's examine some common forms of induction.

Enumerative Induction

Enumerative induction is the sort of reasoning we use when we arrive at a generalization about a group of things after observing only some members of that group. The premise of a typical enumerative induction is a statement reporting what percentage of the observed members of a group have a particular property. The conclusion is a statement claiming that a certain percentage of the members of the whole group have that property. Enumerative induction, then, has the following form:

1. X percent of the observed members of A are B.
2. Therefore, X percent of the entire group of A are B.

For example, suppose you use enumerative induction to argue from the observation that 54 percent of the students in your college are female to the conclusion that 54 percent of all college students are female. This would be a strong argument only if your sample is sufficiently large and sufficiently representative of the entire group of college students. A sample is considered to be representative of a group when every member of the group has an equal chance to be part of the sample. If your sample consists of those students attending a small select engineering school, then your argument would not be very strong because your sample is too limited and unrepresentative. But if your sample consists of those students attending a large state university with a national reputation, your argument would be stronger because your sample would be larger and more representative.

Analogical Induction

When we show how one thing is similar to another, we draw an analogy between them. When we claim that two things that are similar in some respects are similar in some further respect, we make an analogical induction. For ex-

ample, prior to the various missions to Mars, NASA scientists may have argued as follows: The earth has air, water, and life. Mars is like the earth in that it has air and water. Therefore, it's probable that Mars has life. The form of such analogical inductions can be represented as follows:

1. Object A has properties F, G, H, etc., as well as the property Z.
2. Object B has properties F, G, H, etc.
3. Therefore, object B probably has property Z.

Like all inductive arguments, analogical inductions can only establish their conclusions with a certain degree of probability. The more similarities between the two objects, the more probable the conclusion. The fewer similarities, the less probable the conclusion.

The dissimilarities between the earth and Mars are significant. The Martian atmosphere is very thin and contains very little oxygen, and the water on Mars is trapped in ice caps at the poles. So the probability of finding life on Mars is not very high. Mars was more like the earth in the past, however. So the probability of finding evidence of past life on Mars is greater.

NASA scientists are not the only ones who make analogical inductions. This kind of reasoning is used in many other fields, including medical research and law. Whenever medical researchers test a new drug on laboratory animals, they are making an analogical induction. Essentially, they are arguing that if this drug has a certain effect on the animals, then it's probable that it will have the same sort of effect on human beings. The strength of such arguments depends on the biological similarities between the animals and humans. Rats, rabbits, and guinea pigs are often used in these kinds of experiments. Although they are all mammals, their biology is by no means identical to ours. So we cannot be certain that any particular drug will affect us in the same way that it affects them.

The American legal system is based on precedents. A precedent is a case that has already been decided. Lawyers often try to convince judges of the merits of their case by citing precedents. They argue that the case before the court is similar to one that has been decided in the past, and since the court decided one way in that case, it should decide the same way in this case. The opposing attorney will try to undermine that reasoning by highlighting the differences between the case cited and the current case. The person who wins such court cases is often determined by the strength of the analogical arguments presented.

Hypothetical Induction (*Abduction, Inference to the Best Explanation*)

We attempt to understand the world by constructing explanations of it. Not all explanations are equally good, however. So even though we may have arrived at an explanation of something, it doesn't mean that we're justified in believing it. If other explanations are better, then we're not justified in believing it.

strong argument An inductive argument that would establish its conclusion with a high degree of probability if its premises were true.

cogent argument A strong inductive argument that contains only true premises.

Inference to the best explanation has the following form:

1. Phenomena p.
2. If hypothesis h were true, it would provide the best explanation of p.
3. Therefore, it's probable that h is true.

The American philosopher Charles Sanders Pierce was the first to codify this kind of inference, and he dubbed it “abduction” to distinguish it from other forms of induction.

All truths are easy to understand once they are discovered; the point is to discover them.

—GALILEO GALILEI

Inference to the best explanation may be the most widely used form of inference. Doctors, auto mechanics, and detectives as well as you and I use it almost daily. Anyone who tries to figure out why something happened uses inference to the best explanation. Sherlock Holmes was a master of inference to the best explanation. Here's Holmes at work in *A Study in Scarlet*:

I knew you came from Afghanistan. From long habit the train of thoughts ran so swiftly through my mind that I arrived at the conclusion without being conscious of intermediate steps. There were such steps, however. The train of reasoning ran, 'Here is a gentleman of a medical type, but with the air of a military man. Clearly an army doctor, then. He has just come from the tropics, for his face is dark, and that is not the natural tint of his skin, for his wrists are fair. He has undergone hardship and sickness, as his haggard face says clearly. His left arm has been injured. He holds it in a stiff and unnatural manner. Where in the tropics would an English army doctor have seen much hardship and got his arm wounded? Clearly in Afghanistan.' The whole train of thought did not occupy a second. I then remarked that you came from Afghanistan, and you were astonished.¹⁴

Although this passage appears in a chapter entitled “The Science of Deduction,” Holmes is not using deduction here, because the truth of the premises does not guarantee the truth of the conclusion. From the fact that Watson has a deep tan and a wounded arm, it doesn't necessarily follow that he has been in Afghanistan. He could have been in California and cut himself surfing. Properly speaking, Holmes is using abduction or inference to the best explanation because he arrives at his conclusion by citing a number of facts and coming up with the hypothesis that best explains them.

Reason is man's instrument for arriving at the truth, intelligence is man's instrument for manipulating the world more successfully; the former is essentially human, the latter belongs to the animal part of man.

—ERICH FROMM

Often what makes inference to the best explanation difficult is not that no explanation can be found, but that too many can be found. The trick is to identify which among all the possible explanations is the best. The goodness of an explanation is determined by the amount of understanding it produces, and the amount of understanding produced by an explanation is determined by how well it systematizes and unifies our knowledge. We begin to understand something when we see it as part of a pattern, and the more that pattern encompasses, the more understanding it produces. The extent to which a hypothesis systematizes and unifies our knowledge can be measured by various **criteria of adequacy**, such as consistency, both internal and external; simplicity, the number of assumptions made by a hypothesis; scope, the amount of diverse phenomena explained by the hypothesis; conservatism, how well

the hypothesis fits with what we already know; and fruitfulness, the ability of a hypothesis to successfully predict novel phenomena. Let's take a closer look at how these criteria are used to evaluate hypotheses.

The first requirement of any adequate hypothesis is *consistency*. Not only must an adequate hypothesis be internally consistent—consistent with itself—but it must also be externally consistent—consistent with the data it is supposed to explain. If a hypothesis is internally inconsistent—if it's self-contradictory—it can't possibly be true. Thus one of the most effective ways to refute a theory is to show that it harbors a contradiction. (This technique, you will recall, is the one that Socrates used against Euthyphro.) If a hypothesis is externally inconsistent—if it's inconsistent with the data it's supposed to explain—there's reason to believe that it's false. The data, of course, could be mistaken, but until we know that, we shouldn't accept the theory.

Other things being equal, the *simpler* a hypothesis is—the fewer assumptions it makes—the better it is. If phenomena can be explained without making certain assumptions, there's no reason to make them. So a theory that makes unnecessary assumptions is unreasonable. Medieval philosopher William of Occam put the point this way: "Entities should not be multiplied beyond necessity." In other words, you shouldn't assume the existence of anything that's not needed to explain the phenomena. This principle has come to be known as "Occam's razor" because it's used to shave off unneeded entities from theories. (This principle is also known as "the principle of parsimony" and looms large in Carl Sagan's book and movie titled *Contact*.)

Scope—the amount of diverse phenomena explained by a theory—is also an important consideration in theory evaluation. If two theories do equally well with respect to the other criteria of adequacy but one has more scope, it's clearly the better theory, for it has greater explanatory power.

Conservatism—the quality of fitting well with existing theories—is a mark of a good theory because if accepting a theory requires rejecting a good deal of what we've already established, then it may diminish our understanding. Instead of systematizing and unifying our knowledge, it may fragment it. A theory can make up in scope and simplicity what it lacks in conservatism, however. In that case, it may be worthy of acceptance.

In science, *fruitfulness* is determined by the number of successful, novel predictions a theory makes. In philosophy, it's determined by the number of problems it solves. In both cases, it's an indication of the truth of the hypothesis because the best explanation of the fact that a theory makes a successful, novel prediction or solves problems is that it's true.

Unfortunately, there is no formula for applying the criteria of adequacy. We can't quantify how well a hypothesis does with respect to any particular criterion, nor can we rank the criteria in order of importance. At times, we may rate conservatism more highly than scope, especially if the hypothesis in question is lacking in fruitfulness. At other times, we may rate simplicity higher than conservatism, especially if the hypothesis has at least as much scope as any other hypothesis. Choosing among theories isn't the purely logical process it is often made out to be. Like judicial decision making, it relies on factors of human judgment that resist formalization.

The ground aim of all science is to cover the greatest number of empirical facts by logical deductions from the smallest possible number of hypotheses.

—ALBERT EINSTEIN

criteria of adequacy

The features that distinguish a good theory from a bad one: *consistency* (lack of contradictions), *simplicity* (quality of relying on only a small number of assumptions), *scope* (the amount of diverse phenomena explained), *conservatism* (quality of fitting well with existing theories), and *fruitfulness* (the number of new facts predicted or problems solved).

This doesn't mean that the process of theory selection is subjective, however. There are many distinctions we can't quantify that are nevertheless perfectly objective. The point at which day turns into night or a hirsute person becomes bald can't be precisely specified. But the distinctions between night and day or baldness and hirsuteness are as objective as they come. There are certainly borderline cases about which reasonable people can disagree, but there are also clear-cut cases where disagreement would be irrational. It would simply be wrong to believe that a person with a full head of (living) hair is bald. It would be equally wrong to believe that a theory that does not meet the criteria of adequacy as well as its competitors is the better theory.

Informal Fallacies

When we give reasons for accepting a claim, we are making an argument. 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: provide a good reason for accepting a claim. Unfortunately, logically fallacious arguments can be psychologically compelling. Because 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 ways in which an argument can fail.

An argument is fallacious if it contains (1) unacceptable premises, (2) irrelevant premises, or (3) insufficient premises.¹⁵ Premises are unacceptable if they are at least as dubious as the claim they are supposed to support. In a good argument, 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, “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. 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.

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; in the second, it means male. As a result, the conclusion doesn’t follow from the premises.

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.

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.

Appeal to the Person When someone tries to rebut an argument by criticizing or denigrating its presenter rather than by dealing with the issues it raises, 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 Ouiji 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.

Appeal to Unqualified 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 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.

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. 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 that 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 on 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 may 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.

Summary

Arguments come in two basic varieties: deductive and inductive. In a valid deductive argument, it’s impossible for the premises to be true and the conclusion false. A deductive argument is sound if it’s valid and its premises are true. In a strong inductive argument, it’s improbable for the premises to be true and the conclusion false. An inductive argument is cogent if it’s strong and its premises are true.

Hypothetical induction or inference to the best explanation is one of the most common inductive arguments. The goodness of an explanation is determined by how much understanding it produces, and the amount of understanding produced by an explanation is determined by how well it systematizes and unifies our knowledge. The extent to which a hypothesis accomplishes this goal can be measured by various criteria of adequacy such as consistency, simplicity, scope, conservatism, and fruitfulness.

Study Questions

1. What is the difference between deductive and inductive arguments?
2. What is a valid deductive argument?
3. What is a sound deductive argument?
4. What is a strong inductive argument?
5. What is a cogent inductive argument?
6. What is the logical form of affirming the antecedent, denying the consequent, hypothetical syllogism, disjunctive syllogism, affirming the consequent, denying the antecedent?
7. What is the logical form of enumerative induction, analogical induction, hypothetical induction?
8. What are the criteria of adequacy for good explanations?
9. What are informal fallacies?

Discussion Questions

Determine whether the following deductive arguments are valid or invalid, and if valid, whether they are sound or unsound.

1. If it rained, the streets are wet. The streets are wet. So it must have rained.
2. If Richard Roe is willing to testify, then he's innocent. But he's not willing to testify. Therefore he's not innocent.
3. If Bogotá is north of New Orleans, and New Orleans is north of Mexico City, then Bogotá is north of Mexico City.
4. If the president doesn't act forcefully, he'll lose points in the polls. The president is incapable of acting forcefully. Therefore the president will lose points in the polls.
5. If you want high taxes, excessive unemployment, and corruption in government, then you should vote for my opponent. I know that you don't want any of those things. So you should vote for me.

Determine whether the following inductive arguments are strong or weak, and if strong, whether they are cogent or uncogent.

6. Every day you've lived has been followed by another day in which you have been alive. Therefore every day you ever will live will be followed by another day in which you are alive. (You will live forever.)

7. Every day you've lived has been a day before tomorrow. Therefore every day you ever will live will be a day before tomorrow. (You will die tonight.)
8. Almost every Mummers Parade has been held in freezing weather. Therefore, probably, this year's Mummers Parade will be held in freezing weather.
9. Building the great pyramids required cutting huge stones with remarkable precision and transporting them great distances. So the great pyramids must have been built by extraterrestrials.
10. A recent Roper poll found that a significant number of Americans have woken up paralyzed, have experienced a period of time in which they couldn't remember what they were doing, have seen inexplicable lights, have found puzzling scars on their bodies, and have felt as if they were flying. So a significant number of Americans must have been abducted by aliens.

Identify the informal fallacy committed in the following arguments.

11. Nobel Prize winner Linus Pauling says we should take massive doses of vitamin C every day. Therefore massive doses of vitamin C must be good for you.
12. You should believe in God because if you don't, you'll go to hell.
13. Quartz crystals cure colds because after wearing a quartz crystal around my neck, my cold went away.
14. Society's interest in the occult is growing. Therefore Joe's interest in the occult is growing.
15. I believe in God because the Bible says that God exists, and I believe in the Bible because God wrote it.

Section 1.3

The Laboratory of the Mind

Thought Experiments

Philosophy is the microscope of thought.

—VICTOR HUGO

Philosophical theories explain how it's possible (or why it's impossible) for a concept to apply by identifying the conditions for applying it. **Thought experiments** test such theories by determining whether these conditions are necessary or sufficient for the application of the concept. If it's conceivable that there's a situation in which the concept applies but the conditions aren't met, then the conditions are not necessary for the application of the concept. Conversely, if it's conceivable that there's a situation in which the conditions are met and the concept doesn't apply, the conditions aren't sufficient for the application of the concept. Consider, for example, Aristotle's theory that humans are rational animals. To assess this theory, we have to determine whether being a rational animal is both a necessary and a sufficient condition for being a human being. Let's apply the Socratic Method to this problem.

The first two steps have already been completed: a problem has been identified—What is a human being?—and a hypothesis has been proposed—Human beings are rational animals. The next step is to derive a test implication. We have to ask, What if this theory were true? What does it imply? What does it commit us to? In answer to these questions, we might derive this test implication: If human beings are rational animals, then human infants are rational animals.

Notice that test implications are in the form of conditional or “if-then” statements. The antecedent—the statement following the “if”—identifies a sufficient condition, and the consequent—the statement following the “then”—identifies a necessary condition. So our test implication says two things: (1) that Aristotle's theory being true is a sufficient condition for human infants being rational animals, and (2) that human infants being rational animals is a necessary condition for Aristotle's theory being true.

The next step is to perform the test—examine the situation in our mind, and see whether the implication holds. If it doesn't, then the situation serves

as a **counterexample** to the hypothesis. A counterexample is an example that runs counter to or conflicts with the theory. It suggests that the theory is mistaken and should be rejected or revised. Does the implication hold? It wouldn't seem so. Human infants are not rational animals because they do not know how to reason. Thus human infants are a counterexample to Aristotle's theory. So we need to either reject Aristotle's theory or go back to step 2 and revise it. In this case, it looks like Aristotle's theory can be saved with only a minor correction. We could revise it to read that human beings are animals with the capacity to reason. This would take care of the infant counterexample because although infants can't reason, they have the capacity to reason (given time). To assess this new theory, we need to go through the process of deriving a **test implication** and performing a test.

Every thought experiment is part of an argument that usually has the form of denying the consequent or affirming the antecedent. In this case, the form of the argument is denying the consequent. It goes like this:

1. If human beings are rational animals, then human infants must be rational animals.
2. But human infants aren't rational animals.
3. Therefore it's not necessarily true that human beings are rational animals.

This is a deductively valid argument—if the premises are true, the conclusion must be true.

Of course, we could cite a number of positive instances to support the theory. For example:

1. If human beings are rational animals, then Aristotle is a rational animal.
2. Aristotle is a rational animal.
3. Therefore it's probable that human beings are rational animals.

This argument, unlike the former, is not valid—the truth of the premises does not guarantee the truth of the conclusion—because it commits the fallacy of affirming the consequent. It could be a strong inductive argument of the enumerative variety, however, if there were sufficient positive inferences. But because inductive arguments do not guarantee the truth of their conclusions, they can be refuted by one counterexample. All it takes to refute the claim that all ravens are black is one nonblack raven.

The most difficult part of performing a thought experiment is deriving the test implication, because there is no formula for deriving one. Inventing a thought experiment involves a creative leap of the imagination that cannot be dictated by a set of formal rules. German philosopher Edmund Husserl called thought experiments “free fancies” because the situations involved are often produced by the free play of the imagination. But even though thought experiments can be fanciful, they are not frivolous, for as Husserl recognized, “fiction is the source from which the knowledge of ‘eternal truths’ draws its sustenance.”¹⁶ To determine whether a conceptual claim is true, we have to determine whether it holds in all conceivable situations. And to determine that, we have to go beyond the actual to the possible.

thought experiment

An imaginary situation designed to determine whether a claim is necessarily true.

counterexample

An example that runs counter to or conflicts with a theory.

test implication

A statement to the effect that if a theory is true, then a certain concept (event) should apply (occur) in a certain situation.

Thought Probe

Platonic Humans

Plato once claimed that humans are featherless bipeds (two-legged creatures without feathers). Is this a good hypothesis concerning the nature of human beings? Put Plato's theory to the test by using the Socratic Method.

The true method of discovery is like the flight of an aeroplane. It starts from the ground of particular observation; it makes a flight in the thin air of imaginative generalization; and it again lands for renewed observation rendered acute by rational interpretation.

— ALFRED NORTH
WHITEHEAD

Philosophical inquiry is not just idle, abstract speculation. Sometimes it has concrete, practical applications. It can even be a matter of life and death. To see this, let's consider a variant of the problem Aristotle was addressing: namely, "What makes something a person?" Understanding the concept of a person will be important to solving a number of philosophical problems we will encounter later in the text.

Case Study: Explaining How Moral Abortions Are Possible

Many people believe that, in certain circumstances, abortion is morally permissible. But abortion seems to involve the intentional killing of an innocent human being, and such an act is usually considered murder. So those who believe that abortion is morally permissible need to explain how it is possible for abortion not to be murder.

Murder is wrong because it violates our rights, specifically our right to life. But what is it about us that gives us a right to life? Why is it murder to intentionally kill an innocent human being but not a cow, a pig, or a chicken? What do we have that gives us our special moral status? Is it something about our physiology? Are we morally superior to these animals because we have an opposable thumb? Because we lack fur or feathers or hoofs? Because we have 46 chromosomes? This was the issue that Mary Anne Warren set out to investigate in her article "On the Moral and Legal Status of Abortion."¹⁷

In ethics, a being with full moral status—and thus full moral rights—is called a person. The question is, Are all and only human beings persons? In other words, is being a biological human being a necessary and sufficient condition for being a person? To determine whether it is, Warren proposed the following thought experiment.

Thought Experiment

Warren's Moral Space Traveler

What characteristics entitle an entity to be considered a person? . . . In searching for such criteria, it is useful to look beyond the set of people with whom we are acquainted, and ask how we would decide whether a totally alien being was

a person or not. . . . Imagine a space traveler who lands on an unknown planet and encounters a race of beings utterly unlike any he has ever seen or heard of. If he wants to be sure of behaving morally toward these beings, he has to somehow decide whether they are people, and hence have full moral rights, or whether they are the sort of thing which he need not feel guilty about treating as, for example, a source of food. How should he go about making this decision? . . .

I suggest that the traits which are most central to the concept of personhood, or humanity in the moral sense, are, very roughly, the following:

1. consciousness (of objects and events external and/or internal to the being, and in particular the capacity to feel pain);
2. reasoning (the developed capacity to solve new and relatively complex problems);
3. self-motivated activity (activity which is relatively independent of either genetic or direct external control);
4. the capacity to communicate, by whatever means, messages of an indefinite variety of types, that is, not just with an indefinite number of possible contents, but on indefinitely many possible topics;
5. the presence of self-concepts, and self-awareness, either individual or racial, or both. . . .

We needn't suppose that an entity must have all of these attributes to be properly considered a person. (1) and (2) alone may well be sufficient for personhood, and quite probably (1)–(3) are sufficient. Neither do we need to insist that any one of these criteria is necessary for personhood, although once again (1) and (2) look like fairly good candidates for necessary conditions, as does (3), if "activity" is construed so as to include the activity of reasoning.¹⁸

If being a human were a necessary condition for being a person, it would be impossible for a nonhuman to be a person. But as Warren's thought experiment shows, it's not impossible for a nonhuman to be a person, for the notion of a nonhuman person doesn't involve a logical contradiction. According to Warren, what gives us our special moral status isn't the stuff out of which we are made, but rather what we can do with that stuff. So being a human being is neither a necessary nor a sufficient condition for being a person.

Remember, a logically necessary condition is one that something cannot possibly do without. So even if every person who ever has or ever will exist is human, it doesn't follow that being a human is a logically necessary condition for being a person. A possibility may be real even if it is never realized. To show that a condition isn't logically necessary for something, you only have to show that it's logically possible for the thing to exist without it.

Mary Anne Warren wasn't the first person to recognize that the concept of a person and the concept of a human being aren't the same. English philosopher John Locke realized this more than three hundred years ago. He writes, ". . . we must consider what Person stands for; which I think, is a thinking intelligent Being, that has reason and reflection, and can consider it self as it self. . . ." ¹⁹ Locke also uses a thought experiment to demonstrate that persons

*Everything that is possible
to be believed is an image
of the truth.*

— WILLIAM BLAKE

*Knowing others is intelli-
gence; knowing yourself is
true wisdom.*

— LAO TZU

In religion and politics people's beliefs and convictions are in almost every case gotten at second-hand, and without examination, from authorities who have not themselves examined the questions at issue but have taken them at second-hand from other nonexaminers, whose opinions about them were not worth a brass farthing.

—MARK TWAIN

need not be humans. Instead of appealing to the possibility of intelligent aliens, however, Locke appeals to the possibility of an intelligent parrot. It seems that a certain Sir William Temple wrote in his memoirs of a parrot in Brazil that “spoke, and asked, and answered common Questions like a reasonable Creature. . . .”²⁰ If there really were such a parrot, Locke argued, and if it really did possess reason and reflection, then it would be a person even though it wasn’t a human being.

The notion that not all persons are human beings is one that is widely held but little recognized. Most Christians, for example, take God to be a person. But few would claim that he is a biological human being. As English philosopher Richard Swinburne puts it, “That God is a person, yet one without a body, seems the most elementary claim of theism.”²¹ So the distinction between persons and human beings is by no means a novel one.

From her analysis of the concept of a person, Warren draws the following conclusion about the moral status of the fetus:

All we need to claim, to demonstrate that a fetus isn’t a person, is that any being which satisfies none of (1)–(5) is certainly not a person. I consider this claim to be so obvious that I think anyone who denied it and claimed that a being which satisfied none of (1)–(5) was a person all the same, would thereby demonstrate that he had no notion at all of what a person is—perhaps because he had confused the concept of a person with that of genetic humanity. . . .

Furthermore, I think that on reflection even the antiabortionists ought to agree not only that (1)–(5) are central to the concept of personhood, but also that it is part of this concept that all and only people have full moral rights. . . .²²

The question we began with was, How is it possible for abortion not to be murder? Warren provides the following answer: It is possible for abortion not to be murder because only persons can be murdered and fetuses are not persons. In Warren’s view, abortion doesn’t violate a fetus’s right to life because a fetus isn’t the sort of thing that can have a right to life.

The realization that persons need not be humans and that humans need not be persons has important implications for our beliefs in other areas, as Warren notes:

Now if (1)–(5) are indeed the primary criteria of personhood, then it is clear that genetic humanity is neither necessary nor sufficient for establishing that an entity is a person. Some human beings are not people, and there may well be people who are not human beings. A man or woman whose consciousness has been permanently obliterated but who remains alive is a human being which is no longer a person; defective human beings, with no appreciable mental capacity, are not and presumably never will be people; and a fetus is a human being which isn’t yet a person, and which therefore can’t coherently be said to have full moral rights. Citizens of the next century should be prepared to recognize highly advanced, self-aware robots or computers, should such be developed, and intelligent inhabitants of other worlds, should such be found, as people in the fullest sense, and to respect their moral rights. But to ascribe full moral rights to an entity which is

not a person is as absurd as to ascribe moral obligations and responsibilities to such an entity.²³

The concept of a person is closely tied to our concepts of rights and responsibilities. In order to ensure that we give others their due, then, we have to be clear about what makes something a person.

Thought Probe

The Terri Schiavo Case

In January 2005, the United States Supreme Court let stand a Florida Supreme Court decision to strike down “Terri’s law,” a statute passed by the Florida state legislature giving Governor Jeb Bush (President George W. Bush’s brother) the authority to prevent a feeding tube from being removed, against the wishes of the patient, Terri Schiavo, and her husband, Michael Schiavo. Terri Schiavo’s parents, Bob and Mary Schindler, did not want the feeding tube removed, and Governor Bush sided with them.

Terri Schiavo had been in a persistent vegetative state (PVS) since 1990 when a heart attack allegedly deprived her brain of oxygen for over five minutes. The National Institute of Neurological Disorders and Stroke describes PVS this way:

A persistent vegetative state (commonly, but incorrectly, referred to as “brain-death”) sometimes follows a coma. Individuals in such a state have lost their thinking abilities and awareness of their surroundings, but retain non-cognitive function and normal sleep patterns. Even though those in a persistent vegetative state lose their higher brain functions, other key functions such as breathing and circulation remain relatively intact. Spontaneous movements may occur, and the eyes may open in response to external stimuli. They may even occasionally grimace, cry, or laugh. Although individuals in a persistent vegetative state may appear somewhat normal, they do not speak and they are unable to respond to commands.²⁴

On March 18, 2005, doctors removed the feeding tube. On March 21, President George Bush signed into law a bill (S. 686) allowing the United States District Court for the Middle District of Florida to hear the parent’s case for removing the tube. After hearing the case, the district court refused to order reinsertion of the tube. The case was then appealed to the Eleventh Circuit Court of Appeals, which also voted against reinsertion. It was finally appealed to the United States Supreme Court, which refused to hear the case. Terri Schiavo died on March 31, 2005.

If Terri Schiavo was in a persistent vegetative state, and if people in PVS have permanently lost the ability to think, was Terri Schiavo still a person? Remember, a person, according to Locke and Warren, is conscious, self-aware, and capable of reasoning, communicating, and engaging in self-motivated activity. If Terri Schiavo was not a person, was removing the feeding tube an act of murder?

How Are Thought Experiments Possible?

Once you have eliminated the impossible, whatever remains, however improbable, must be the truth.

—SIR ARTHUR
CONAN DOYLE

Thought experiments test claims about the logical relations between concepts by helping us determine whether the claims are necessarily true. But how can such flights of fancy prove anything? Why should we trust our imaginations to reveal anything about the way things are? The answer to these questions lies in our conceptual competence. Having a concept gives us the ability to make accurate judgments about its applicability, even in imaginary situations.

We acquire a concept by being given a definition of it or by being shown examples of it. In either case, once we have a concept, we have the ability to apply it to things we have never before encountered. If we have the concept of the letter A, for example, we can apply it to typefaces we have never seen before. A thought experiment is like a newly encountered typeface. Just as we can trust our judgment to determine whether the concept of the letter A applies to a letter in a new typeface, so we can trust our judgment to determine whether a particular concept applies to the situation described in a thought experiment.

Of course, the more flourishes the letters in a typeface have, the more difficult it will be to determine whether a letter is an A. Similarly, the more outlandish the thought experiment, the more difficult it will be to determine whether the concept in question applies. So not all thought experiments have equal evidentiary value. Some are more persuasive than others.

To have a concept is to be able to apply it correctly. But we may be able to apply a concept without being able to state the criteria we use in applying it. For example, we may be able to identify a grammatical sentence without being able to state the rules of grammar. In such a case, we have an intuitive understanding of grammar even though we do not have a theoretical understanding of it. In attempting to identify the conditions for applying a concept, we are trying to transform our intuitive understanding into a theoretical one. That is, we are trying to make explicit what is implicit in our understanding of a concept. Because having the ability to apply a concept correctly doesn't necessarily give us the ability to state the conditions for applying it, different people may have different theories about what those conditions are. But because we have an intuitive understanding of the concept, there is a body of data—our “intuitions”—that can be used to adjudicate various theories of it.

Criticizing Thought Experiments

Truth, like gold, is to be obtained not by its growth, but by washing away from it all that is not gold.

—LEO TOLSTOY

The value of any experiment is determined by the amount of control with which it is executed. The more controlled the experiment, the less chance that its results will be misleading. It is not possible to control all the variables in an experiment, however. No one, for example, can control the position of the earth relative to the sun and the other planets. Nevertheless, it is sometimes possible to control all the *relevant* variables—that is, all the variables that could reasonably be expected to affect the outcome of the experiment. Criticiz-

ing an experiment usually involves explaining how it's possible that something other than the variable under investigation could have produced the result.

Some thought experiments describe situations that are physically impossible. That is not necessarily a strike against them, however, for their more fantastic aspects may not be relevant to their outcome. Thought experiments examine the logical relations between concepts, and abstracting from physical reality is sometimes necessary to throw those relations into proper relief. Of course, the more outlandish a thought experiment, the more likely it is to alter a variable that is relevant to its outcome. If you doubt the results of an experiment, however, the burden of proof is on you to show where it went wrong by providing an alternative explanation of the results.

There is usually widespread agreement about the outcome of a thought experiment.²⁵ Thus thought experiments serve as an objective check on philosophical theorizing. When there is disagreement, it usually focuses on the interpretation of the results rather than on the results themselves. In the case of Warren's moral space traveler, for example, there is widespread agreement that persons need not be human beings and vice versa. There is much less agreement, however, about what implications this has for the abortion controversy.

Even if fetuses aren't persons, many claim that fetuses are nonetheless valuable forms of life and thus should be destroyed only if there are good reasons for doing so. For example, Daniel Callahan, director of the Hastings Center, an institute devoted to studying biomedical ethical issues, claims, "[Abortion] is not the destruction of a human person—for at no stage of its development does the conceptus fulfill the definition of a person, which implies a developed capacity for reasoning, willing, desiring and relating to others—but it is the destruction of an important and valuable form of human life."²⁶ As a result, Callahan maintains, taking such a life "demands of oneself serious reasons for doing so."²⁷ Just what those reasons are, he doesn't say. Nevertheless, it's clear that Callahan doesn't believe that the nonpersonhood of the fetus justifies abortion on demand. So Warren's moral space traveler thought experiment has not settled the abortion controversy. By clarifying the concept of a person, however, it has raised the level of discussion.

Even if the situation envisioned in a thought experiment is well defined, we may still reject the results of the thought experiment on the grounds that its assumptions are unreasonable. No theory—whether about concepts or physical objects—can be tested in isolation. Theories of any sort have testable consequences only in the context of certain background assumptions. Assumptions about the nature of human cognition and the nature of the external world, for example, lie behind every experiment. Thus if an experiment yields an incredible result, the problem may lie with the background assumptions rather than the theory being tested.

Conceivability and Possibility

To show that a condition is not necessary for the application of a concept, one needs to show only that it's possible for the concept to apply without the

*Logical consequences are
the scarecrows of fools
and the beacons of wise
men.*

—THOMAS H. HUXLEY

condition being met. The best evidence that a situation is possible is that it's conceivable, that is, coherently imaginable. A situation is coherently imaginable when its details can be filled in and its implications drawn out without running into a contradiction. If, on examination, a situation is found to harbor an inconsistency, then it is not conceivable.

Consider, for example, time travel. At first glance, traveling backward in time seems perfectly conceivable. It may be technically impossible to build a time machine, but the many science-fiction stories that make use of this notion seem to suggest that it is not logically impossible. This suggestion is mistaken, however, because an event that has already happened cannot also not have happened. Suppose you travel back in time to a town at the turn of the century whose population was exactly 10,000 on January 1, 2000. After you arrive, the town would then have a population of 10,001. But it is logically impossible for a town to have a population of both 10,000 and 10,001 on January 1, 2000. So, appearances to the contrary, traveling backward in time to the same universe is neither conceivable nor possible.²⁸

What this shows is that apparent conceivability doesn't guarantee possibility. From the fact that a situation seems coherently imaginable, it doesn't follow that it is, for it may contain a hidden contradiction. Apparent conceivability does provide good evidence for possibility, however, because if, after careful reflection, we haven't found a contradiction in a situation, we're justified in believing that it's possible.

Our conceptual ability can be compared to our perceptual ability. We can seem to perceive something that isn't real, but we can't actually perceive something that isn't real. Similarly, we can seem to conceive something that isn't possible, but we can't actually conceive something that isn't possible. To distinguish apparent from actual perception, we often perform physical experiments. Similarly, to distinguish apparent from actual conception, we often perform thought experiments. If we doubt the results of a physical experiment, we can check them by means of another physical experiment. Similarly, if we doubt the results of a thought experiment, we can check them by means of another thought experiment.

Because our conceptual scheme is an interconnected web of beliefs, every philosophical problem has a bearing on every other. Whatever solution is proposed to one problem must be judged in terms of the sorts of solutions it suggests to others. Deciding among various solutions to philosophical problems, then, requires appealing to considerations of scope, simplicity, conservatism, and fruitfulness. The theory that does best with regard to the criteria of adequacy will produce the most understanding.

Thought experiments are just one tool among many that philosophers use to evaluate their theories. But they are an important tool, for not only can they strengthen or weaken existing theories, they can also generate data that any future theory must take into account. Theories at the forefront of philosophical research are generally superior to their predecessors because the thought experiments of the past have broadened the evidence base on which future theories must rest.

Scientific Thought Experiments

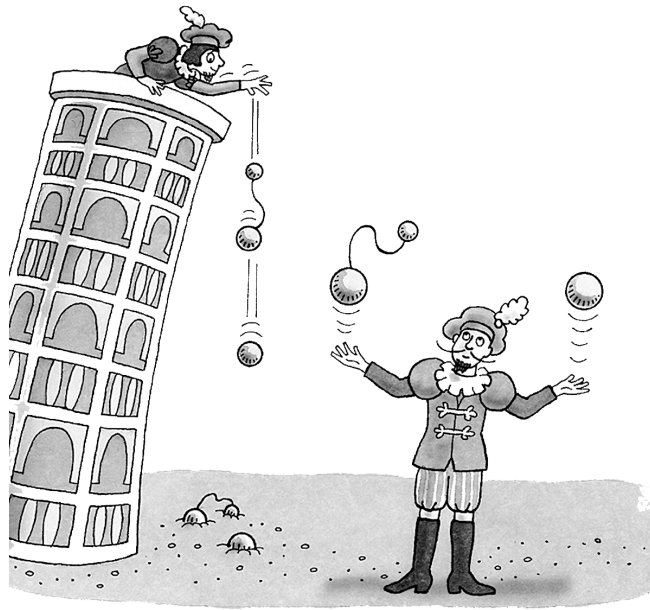
Thought experiments aren't unique to philosophy. They can also be found in the sciences, where they have helped produce a number of scientific advances. Their use in the sciences is instructive.

One of the hallmarks of a good theory is that it is free from contradiction. Any theory that implies that something both is and is not the case is unacceptable, for not only is it uninformative, it cannot possibly be true. Thought experiments are particularly useful in testing for contradictions. Galileo used a thought experiment to demonstrate that Aristotle's theory of motion was self-contradictory and thereby paved the way for the modern science of mechanics.

Aristotle held that heavier bodies fall faster than lighter ones. Galileo, on the other hand, maintained that all bodies, regardless of their weight, fall at the same rate. To show that his view was superior to Aristotle's, Galileo proposed the following thought experiment.

Thought Experiment

Impossibility of Aristotle's Theory of Motion



Imagine that a heavy cannonball is attached to a light musket ball by means of a rope. Now imagine that both this combined system and an ordinary cannonball are dropped from a height at the same time. What should happen? According to Aristotle, because lighter objects fall more slowly than heavier ones, the

Every great advance in science has issued from a new audacity of imagination.

—JOHN DEWEY

Imagination rules the world.

—NAPOLEON

Good reasons must, of force, give place to better.

—WILLIAM SHAKESPEARE

musket ball attached to the cannonball should act as a drag on it. So the combined system should fall more slowly than the cannonball alone. But because the combined system is heavier than the cannonball alone and because heavier objects fall faster than lighter ones, the combined system should also fall faster than the cannonball alone. But it is logically impossible for one object to fall both faster and more slowly than another. So Aristotle's theory cannot be correct. Galileo's theory, however, avoids the contradiction by maintaining that all bodies fall at the same rate. It follows, then, that Galileo's view is more credible than Aristotle's.

By showing that Aristotle's theory harbored an inconsistency, Galileo made the modern science of mechanics possible. The value of thought experiments, then, lies not only in their immediate results but also in their long-term consequences.

Summary

Philosophical theories explain how it is possible or why it is impossible for a concept to apply by identifying the conditions for applying it. Thought experiments test these theories by determining whether they hold in all possible situations. If they do not—that is, if there are counterexamples to the theory—there is reason to believe that the theory is mistaken.

Like scientific experiments, thought experiments can go wrong and can be criticized for it. If they are not sufficiently spelled out or if they rest on unreasonable assumptions, their value is questionable. If you believe that a thought experiment is problematic, however, the burden of proof is on you to provide an alternative explanation of the results.

The adequacy of a theory is determined by how much understanding it produces, and the amount of understanding produced by a theory is determined by how well it systematizes and unifies our knowledge. Criteria such as conservatism, scope, fruitfulness, and simplicity can be used to gauge the adequacy of a theory.

Thought experiments not only help us evaluate theories, but they generate data that any future theory must take into account. Theories at the cutting edge of philosophical research are usually superior to their predecessors because previous thought experiments have added important considerations that any future theory must incorporate.

Study Questions

1. What is a thought experiment?
2. How are thought experiments possible?
3. On what grounds can thought experiments be criticized?
4. What is Warren's moral space traveler thought experiment? How does it attempt to undermine the claim that all human beings are persons?

5. On what grounds can philosophical theories be criticized?
6. What are the criteria of adequacy that good theories should meet?

Discussion Questions

1. According to Mary Anne Warren, fetuses aren't persons. But they are potential persons. Does being a potential person give something a right to life? Michael Tooley believes not. To make his point, he offers the following thought experiment.

Thought Experiment

Tooley's Cat

My argument against the potentiality principle can now be stated. Suppose at some future time a chemical were to be discovered which when injected into the brain of a kitten would cause the kitten to develop into a cat possessing a brain of the sort possessed by humans, and consequently into a cat having all the psychological capabilities characteristic of adult humans. Such cats would be able to think, to use language, and so on. Now it would surely be morally indefensible in such a situation to ascribe a serious right to life to members of the species *Homo sapiens* without also ascribing it to cats that have undergone such a process of development: there would be no morally significant differences. . . .

Suppose a kitten is accidentally injected with the chemical. As long as it has not yet developed those properties that in themselves endow something with a right to life, there cannot be anything wrong with interfering with the causal process and preventing the development of the properties in question. . . .

But if it is not seriously wrong to destroy an injected kitten which will naturally develop the properties that bestow a right to life, neither can it be seriously wrong to destroy a member of *Homo sapiens* which lacks such properties. . . .²⁹

According to Tooley, being a potential person is not a sufficient condition for having a right to life. Is Tooley right about this? If not, where is the flaw in his experiment?

2. Judith Jarvis Thomson believes that the question of whether a fetus is a person or even a potential person is irrelevant to the abortion controversy, for even if the fetus is a person, the woman may be under no obligation to care for it. In defense of her view, she offers the following thought experiment.

Thought Experiment

Thomson's Diseased Musician

I propose, then, that the fetus is a person from the moment of conception. . . . But now let me ask you to imagine this. You wake up in the morning and find yourself back to back in bed with an unconscious violinist. A famous unconscious violinist. He has been found to have a fatal kidney ailment, and the So-

ciety of Music Lovers has canvassed all the available medical records and found that you alone have the right blood type to help. They have therefore kidnapped you, and last night the violinist's circulatory system was plugged into yours, so that your kidneys can be used to extract poisons from his blood as well as your own. The director of the hospital now tells you, "Look, we're sorry the Society of Music Lovers did this to you — we would never have permitted it if we had known. But still, they did it, and the violinist now is plugged into you. To unplug you would be to kill him. But never mind, it's only for nine months. By then he will have recovered from his ailment, and can safely be unplugged from you." Is it morally incumbent on you to accede to this situation? No doubt it would be very nice of you if you did, a great kindness. But do you have to accede to it?³⁰

Are you morally obligated to share your bloodstream with the diseased musician? If not, are you morally obligated to share your bloodstream with a developing fetus? Is this thought experiment flawed in a significant way?

3. Consider this theory of the function of lightbulbs:

For years it was believed that electric bulbs emitted light. However, recent information has proven otherwise. Electric bulbs don't emit light, they suck dark. Thus we will now call these bulbs "dark suckers." The dark sucker theory, according to a spokesperson, proves the existence of dark, that dark has mass heavier than that of light, and that dark is faster than light.

The basis of the dark sucker theory is that electric bulbs suck dark. Take, for example, the dark suckers in the room where you are. There is less dark right next to them than there is elsewhere. The larger the dark sucker, the greater its capacity to suck dark. Dark suckers in a parking lot have a much greater capacity than ones in this room. . . .

Dark has mass. When dark goes into a dark sucker, friction from this mass generates heat. Thus it is not wise to touch an operating dark sucker. . . .

Finally, we must prove that dark is faster than light. If you were to stand in an illuminated room in front of a closed, dark closet, then slowly open the closet door, you would see the light slowly enter the closet, but since dark is so fast, you would not be able to see the dark leave the closet.

In conclusion, it has been stated that dark suckers make all our lives much easier, so the next time you look at an electric bulb remember that it is indeed a dark sucker.³¹

Are we justified in believing this theory to be true? Explain your answer with reference to the criteria of adequacy.

The Value of Philosophy

Bertrand Russell (1872–1970) is one of the greatest philosophers of the twentieth century, making significant contributions in all of the major branches of philosophy. Perhaps his greatest contribution was in the field of logic where his *Principia Mathematica* (co-authored with Alfred North Whitehead) tried to demonstrate that all of mathematics could be derived from logic. Although Russell did not write much fiction, the Nobel Committee decided to recognize his importance as a man of letters by awarding him the Nobel Prize for Literature in 1950. The following selection is the concluding chapter of his text *The Problems of Philosophy*. In it, he describes the importance of philosophy for the life of the mind.

Having now come to the end of our brief and very incomplete review of the problems of philosophy, it will be well to consider, in conclusion, what is the value of philosophy and why it ought to be studied. It is the more necessary to consider this question, in view of the fact that many men, under the influence of science or of practical affairs, are inclined to doubt whether philosophy is anything better than innocent but useless trifling, hair-splitting distinctions, and controversies on matters concerning which knowledge is impossible.

This view of philosophy appears to result, partly from a wrong conception of the ends of life, partly from a wrong conception of the kind of goods which philosophy strives to achieve. Physical science, through the medium of inventions, is useful to innumerable people who are wholly ignorant of it; thus the study of physical science is to be recommended, not only, or primarily, because of the effect on the student, but rather because of the effect on mankind in general. This utility does not belong to philosophy. If the study of philosophy has any value at all for others than students of philosophy, it must be only indirectly, through its effects upon the lives of those who study it. It is in these effects, therefore, if anywhere, that the value of philosophy must be primarily sought.

But further, if we are not to fail in our endeavour to determine the value of philosophy, we must first free our minds from the prejudices of what are wrongly called “practical” men. The “practical” man, as this word is often used, is one who recognises only material needs, who realises that men must have food for the body, but is oblivious of the necessity of providing food for the mind. If all men were well off, if poverty and disease had been reduced to their lowest possible point, there would still remain much to be done to produce a

valuable society; and even in the existing world the goods of the mind are at least as important as the goods of the body. It is exclusively among the goods of the mind that the value of philosophy is to be found; and only those who are not indifferent to these goods can be persuaded that the study of philosophy is not a waste of time.

Philosophy, like all other studies, aims primarily at knowledge. The knowledge it aims at is the kind of knowledge which gives unity and system to the body of the sciences, and the kind which results from a critical examination of the grounds of our convictions, prejudices, and beliefs. But it cannot be maintained that philosophy has had any very great measure of success in its attempts to provide definite answers to its questions. If you ask a mathematician, a mineralogist, a historian, or any other man of learning, what definite body of truths has been ascertained by his science, his answer will last as long as you are willing to listen. But if you put the same question to a philosopher, he will, if he is candid, have to confess that his study has not achieved positive results such as have been achieved by other sciences. It is true that this is partly accounted for by the fact that, as soon as definite knowledge concerning any subject becomes possible, this subject ceases to be called philosophy, and becomes a separate science. The whole study of the heavens, which now belongs to astronomy, was once included in philosophy; Newton’s great work was called “the mathematical principles of natural philosophy.” Similarly, the study of the human mind, which was, until very lately, a part of philosophy, has now been

From: Bertrand Russell, *The Problems of Philosophy* (New York: Henry Holt and Company, 1912) 237–250.

separated from philosophy and has become the science of psychology. Thus, to a great extent, the uncertainty of philosophy is more apparent than real: those questions which are already capable of definite answers are placed in the sciences, while those only to which, at present, no definite answer can be given, remain to form the residue which is called philosophy.

This is, however, only a part of the truth concerning the uncertainty of philosophy. There are many questions—and among them those that are of the profoundest interest to our spiritual life—which, so far as we can see, must remain insoluble to the human intellect unless its powers become of quite a different order from what they are now. Has the universe any unity of plan or purpose, or is it a fortuitous concourse of atoms? Is consciousness a permanent part of the universe, giving hope of indefinite growth in wisdom, or is it a transitory accident on a small planet on which life must ultimately become impossible? Are good and evil of importance to the universe or only to man? Such questions are asked by philosophy, and variously answered by various philosophers. But it would seem that, whether answers be otherwise discoverable or not, the answers suggested by philosophy are none of them demonstrably true. Yet, however slight may be the hope of discovering an answer, it is part of the business of philosophy to continue the consideration of such questions, to make us aware of their importance, to examine all the approaches to them, and to keep alive that speculative interest in the universe which is apt to be killed by confining ourselves to definitely ascertainable knowledge.

Many philosophers, it is true, have held that philosophy could establish the truth of certain answers to such fundamental questions. They have supposed that what is of most importance in religious beliefs could be proved by strict demonstration to be true. In order to judge of such attempts, it is necessary to take a survey of human knowledge, and to form an opinion as to its methods and its limitations. On such a subject it would be unwise to pronounce dogmatically; but if the investigations of our previous chapters have not led us astray, we shall be compelled to renounce the hope of finding philosophical proofs of religious beliefs. We cannot, therefore, include as part of the value of philosophy any definite set of answers to such questions. Hence, once more, the value of philosophy must not depend upon any supposed body of definitely ascertainable knowledge to be acquired by those who study it.

The value of philosophy is, in fact, to be sought largely in its very uncertainty. The man who has no tincture of philosophy goes through life imprisoned in the prejudices derived from common sense, from the

habitual beliefs of his age or his nation, and from convictions which have grown up in his mind without the co-operation or consent of his deliberate reason. To such a man the world tends to become definite, finite, obvious; common objects rouse no questions, and unfamiliar possibilities are contemptuously rejected. As soon as we begin to philosophise, on the contrary, we find, as we saw in our opening chapters, that even the most everyday things lead to problems to which only very incomplete answers can be given. Philosophy, though unable to tell us with certainty what is the true answer to the doubts which it raises, is able to suggest many possibilities which enlarge our thoughts and free them from the tyranny of custom. Thus, while diminishing our feeling of certainty as to what things are, it greatly increases our knowledge as to what they may be; it removes the somewhat arrogant dogmatism of those who have never travelled into the region of liberating doubt, and it keeps alive our sense of wonder by showing familiar things in an unfamiliar aspect.

Apart from its utility in showing unsuspected possibilities, philosophy has a value—perhaps its chief value—through the greatness of the objects which it contemplates, and the freedom from narrow and personal aims resulting from this contemplation. The life of the instinctive man is shut up within the circle of his private interests: family and friends may be included, but the outer world is not regarded except as it may help or hinder what comes within the circle of instinctive wishes. In such a life there is something feverish and confined, in comparison with which the philosophic life is calm and free. The private world of instinctive interests is a small one, set in the midst of a great and powerful world which must, sooner or later, lay our private world in ruins. Unless we can so enlarge our interests as to include the whole outer world, we remain like a garrison in a beleaguered fortress, knowing that the enemy prevents escape and that ultimate surrender is inevitable. In such a life there is no peace, but a constant strife between the insistence of desire and the powerlessness of will. In one way or another, if our life is to be great and free, we must escape this prison and this strife.

One way of escape is by philosophic contemplation. Philosophic contemplation does not, in its widest survey, divide the universe into two hostile camps—friends and foes, helpful and hostile, good and bad—it views the whole impartially. Philosophic contemplation, when it is unalloyed, does not aim at proving that the rest of the universe is akin to man. All acquisition of knowledge is an enlargement of the Self, but this enlargement is best attained when it is not directly sought.

It is obtained when the desire for knowledge is alone operative, by a study which does not wish in advance that its objects should have this or that character, but adapts the Self to the characters which it finds in its objects. This enlargement of Self is not obtained when, taking the Self as it is, we try to show that the world is so similar to this Self that knowledge of it is possible without any admission of what seems alien. The desire to prove this is a form of self-assertion and, like all self-assertion, it is an obstacle to the growth of Self which it desires, and of which the Self knows that it is capable. Self-assertion, in philosophic speculation as elsewhere, views the world as a means to its own ends; thus it makes the world of less account than Self, and the Self sets bounds to the greatness of its goods. In contemplation, on the contrary, we start from the not-Self, and through its greatness the boundaries of Self are enlarged; through the infinity of the universe the mind which contemplates it achieves some share in infinity.

For this reason greatness of soul is not fostered by those philosophies which assimilate the universe to Man. Knowledge is a form of union of Self and not-Self; like all union, it is impaired by dominion, and therefore by any attempt to force the universe into conformity with what we find in ourselves. There is a widespread philosophical tendency towards the view which tells us that Man is the measure of all things, that truth is man-made, that space and time and the world of universals are properties of the mind, and that, if there be anything not created by the mind, it is unknowable and of no account for us. This view, if our previous discussions were correct, is untrue; but in addition to being untrue, it has the effect of robbing philosophic contemplation of all that gives it value, since it fetters contemplation to Self. What it calls knowledge is not a union with the not-Self, but a set of prejudices, habits, and desires, making an impenetrable veil between us and the world beyond. The man who finds pleasure in such a theory of knowledge is like the man who never leaves the domestic circle for fear his word might not be law.

The true philosophic contemplation, on the contrary, finds its satisfaction in every enlargement of the not-Self, in everything that magnifies the objects contemplated, and thereby the subject contemplating. Everything, in contemplation, that is personal or private, everything that depends upon habit, self-interest, or desire, distorts the object, and hence impairs the

union which the intellect seeks. By thus making a barrier between subject and object, such personal and private things become a prison to the intellect. The free intellect will see as God might see, without a *here* and *now*, without hopes and fears, without the trammels of customary beliefs and traditional prejudices, calmly, dispassionately, in the sole and exclusive desire of knowledge—knowledge as impersonal, as purely contemplative, as it is possible for man to attain. Hence also the free intellect will value more the abstract and universal knowledge into which the accidents of private history do not enter, than the knowledge brought by the senses, and dependent, as such knowledge must be, upon an exclusive and personal point of view and a body whose sense-organs distort as much as they reveal.

The mind which has become accustomed to the freedom and impartiality of philosophic contemplation will preserve something of the same freedom and impartiality in the world of action and emotion. It will view its purposes and desires as parts of the whole, with the absence of insistence that results from seeing them as infinitesimal fragments in a world of which all the rest is unaffected by any one man's deeds. The impartiality which, in contemplation, is the unalloyed desire for truth, is the very same quality of mind which, in action, is justice, and in emotion is that universal love which can be given to all, and not only to those who are judged useful or admirable. Thus contemplation enlarges not only the objects of our thoughts, but also the objects of our actions and our affections: it makes us citizens of the universe, not only of one walled city at war with all the rest. In this citizenship of the universe consists man's true freedom, and his liberation from the thralldom of narrow hopes and fears.

Thus, to sum up our discussion of the value of philosophy: Philosophy is to be studied, not for the sake of any definite answers to its questions, since no definite answers can, as a rule, be known to be true, but rather for the sake of the questions themselves; because these questions enlarge our conception of what is possible, enrich our intellectual imagination, and diminish the dogmatic assurance which closes the mind against speculation; but above all because, through the greatness of the universe which philosophy contemplates, the mind also is rendered great, and becomes capable of that union with the universe which constitutes its highest good.

The Philosophic Enterprise

Brand Blanshard (1892–1989), eminent American philosopher and Rhodes scholar, received his A.B. from Michigan University and his Ph.D. from Harvard University. He taught at Swarthmore College for two decades and chaired the Yale philosophy department from 1945 until his retirement in 1961. His major works include *The Nature of Thought, Reason and Goodness*, and *Reason and Analysis*. In this selection, he presents his view of the relationship between philosophy and science.

Philosophy is best understood, I think, as part of an older and wider enterprise, the enterprise of understanding the world. We may well look first at this understanding in the large. I shall ask, to begin with, what is its goal, then what are its chief stages, then what are the ways in which philosophy enters into it.

The enterprise, we have just said, is that of understanding the world. What do we mean by understanding—understanding anything at all? We mean, I suppose, explaining it to ourselves. Very well; what does explaining anything mean? We stumble upon some fact or event that is unintelligible to us; what would make it intelligible? The first step in the answer is, seeing it as an instance of some rule. You suffer some evening from an excruciating headache and despondently wonder why. You remember that you just ate two large pieces of chocolate cake and that you are allergic to chocolate; the headache seems then to be explained. It is no longer a mere demonic visitor intruding on you from nowhere; you have domesticated it, assimilated it to your knowledge, by bringing it under a known rule.

What sort of rules are these that serve to render facts intelligible? They are always rules of connection, rules relating the fact to be explained to something else. You explain the headache by bringing it under a law relating it *causally* to something else. In like manner, you explain the fact that a figure on the board has angles equal to two right angles by relating it *logically* to something else; by pointing out that it is a triangle, and that it belongs to the triangles as such to have this property. . . .

[Philosophers] have tried to supplement the work of science in at least two respects. In both of these respects science has to be extended if our thirst for understanding is to be satisfied, but in neither of them do scientists take much interest. The fact is that, logically speaking, philosophy begins before science does, and

goes on after science has completed its work. In the broad spectrum of knowledge, science occupies the central band. But we know that there is more to the spectrum than this conspicuous part. On one side, beyond the red end of the spectrum, there is a broad band of infrared rays; and on the other side, beyond the violet end, are the ultraviolet rays. Philosophy deals with the infrareds and the ultraviolet rays of science, continuous with the central band but more delicate and difficult of discernment.

Take the red end first. Consider the sense in which philosophy comes before science. Many of the concepts the scientist uses and many of his working assumptions he prefers to take for granted. He can examine them if he wishes, and some scientists do. Most do not, because if they waited till they were clear on these difficult basic ideas, they might never get to what most interests them at all. But it would be absurd to leave these basic ideas unexamined altogether. This somewhat thankless preliminary work is the task of the philosopher.

We referred to these unexamined ideas as concepts and assumptions. Let us illustrate the concepts first.

Common sense and science are constantly using certain little words of one syllable that seem too familiar and perhaps unimportant to call for definition. We say, "What time is it?" "There is less space in a compact car," "There was no cause for his taking offense," "He must be out of his mind," "I think these strikes are unjust to the public." Consider the words we have used: 'time', 'space', 'cause', 'good', 'truth', 'mind', 'just', 'I'. If someone said to us, "What do you mean, *I*?" or, when we asked what time it was, "What do you mean by

From: Brand Blanshard, "The Philosophic Enterprise," *The Owl of Minerva: Philosophers on Philosophy*, ed. Charles J. Bontempo and S. Jack Odell (New York: McGraw-Hill, 1975) 163–177.

'time?'" we should probably say, "Oh, don't be an idiot," or perhaps with St. Augustine, "I know perfectly well what time means until you ask me, and then I don't know." I suspect this last is the sound answer regarding all these words. We know what they mean well enough for everyday purposes, but to think about them is to reveal depth after depth of unsuspected meaning. This fact suggests both the strength and the weakness of present-day linguistic philosophy. It is surely true, as this school contends, that a main business of philosophy is to define words. The first great outburst of philosophy in the talk of Socrates was largely an attempt at defining certain key words of the practical life — 'justice', 'piety', 'temperance', 'courage'. But their meanings proved bafflingly elusive; he chased the ghost of justice through ten books of the *Republic* and barely got his hands on it in the end. Socrates saw that to grasp the meaning even of these simple and common terms would solve many of the deepest problems in ethics and metaphysics. But we must add that Socrates was no ordinary language philosopher. He was not an Athenian Noah Webster, collecting the shopworn coins that were current in the marketplace; on the contrary, he took special pleasure in showing that at the level of ordinary usage our meanings were muddled and incoherent. Only by refining and revising them could we arrive at meanings that would stand.

Now the scientist who is trying to find the truth about the cause of flu cannot discontinue his experiments till he has reached clearness on the nature of truth or the concept of causality. The political scientist who holds that democracy is in certain respects better than communism cannot remain dumb till all his colleagues have agreed as to the definition of 'good'. These people must get on with their work, and they are right not to stop and moon about ultimates. But these ideas are ultimates after all; we must use them hourly in our thinking; and it would be absurd if, while researchers were trying to be clear about relatively unimportant matters, no one tried to get clear about the most important things of all. And the right persons to make that effort are surely the philosophers. A philosopher friend of mine sat down in a railway car beside a salesman who, recognizing a kindred spirit, poured out a stream of talk about his line. "And what's your line?" he concluded. "Notions," replied the philosopher. That seemed all right to the salesman, and it should be so to us. Notions are the line of the philosopher, such key notions as truth, validity, value, knowledge, without which scientific thought could not get under way, but which the scientist himself has neither the time nor the inclination to examine.

We suggested that it is not only his ultimate concepts but also his ultimate assumptions that the scientist prefers to turn over to others for inspection. Let me list a few and ask whether there is any natural scientist who does not take them for granted. That we can learn the facts of the physical order through perception. That the laws of our logic are valid of this physical order. That there is a public space and a public time in which things happen and to which we all have access. That every event has a cause. That under like conditions the same sort of thing has always happened, and always will. That we ought to adjust the degree of our assent to any proposition to the strength of the evidence for it. These are all propositions of vast importance, which the scientist makes use of every day of his life. If any one of them were false, his entire program would be jeopardized. But they are not scientific propositions. They are assumed by all sciences equally; they are continuous with the thought of all; yet they are the property of none. It would be absurd to leave these unexamined, for some or all of them may be untrue. But the scientist would be aghast if, before he used a microscope or a telescope, he had to settle the question whether knowledge was possible through perception, or whether there could be a logic without ontology. Scientists have at times discussed these matters, and their views are always welcome, but they generally and sensibly prefer to turn them over to specialists. And the specialists in these problems are philosophers.

I have now, I hope, made clear what was meant by saying that philosophy comes before science. It comes before it in the sense of taking for examination the main concepts and assumptions with which scientists begin their work. Science is logically dependent on philosophy. If philosophy succeeded in showing, as Hume and Carnap thought it had, that any reference to a nonsensical existent was meaningless, the physics that talks of electrons and photons would either have to go out of business or revise its meanings radically. If philosophy succeeded, as James, Schiller, and Freud thought it had, in showing that our thinking is inescapably chained to our impulses and emotions, then the scientific enterprise, as an attempt at impartial and objective truth, would be defeated before it started. Philosophy does not merely put a bit of filigree on the mansion of science; it provides its foundation stones.

If philosophy begins before science does, it also continues after the scientist has finished his work. Each science may be conceived as a prolonged effort to answer one large question. Physics asks, "What are the laws of matter in motion?" Biology asks, "What kinds of

structure and behavior are exhibited by living things.” Each science takes a field of nature for its own and tries to keep within its own fences. But nature has no fences; the movement of electrons is somehow continuous with the writing of *Hamlet* and the rise of Lenin. Who is to study this continuity? Who is to reflect on whether the physicist, burrowing industriously in his hole, can break a tunnel through to the theologian, mining anxiously in his? Surely here again is a task that only the philosopher can perform. One way of performing it, which I do not say is the right way, is suggested by the definition of philosophy as the search by a blind man in a dark room for a black hat that isn’t there, with the addendum that if he finds it, that is theology. It may be thought that since no two true propositions can contradict each other, the results of independent scientific search could not conflict, and that there is no problem in harmonizing them. On the contrary, when we examine even the most general results of the several sciences, we see that they clash scandalously and that the task of harmonizing them is gigantic. Indeed the most acute and fascinating of metaphysical problems arise in the attempt to reconcile the results of major disciplines with each other.

How are you to reconcile physics with psychology, for example? The physicist holds that every physical event has a physical cause, which seems innocent enough. To say that a material thing could start moving, or, once started, could have its motion accelerated or changed in direction without any physical cause, would seem absurd. If you say that a motion occurs with no cause at all, that is to the physicist irresponsible; if you say that it represents interference from outside the spatial order, it is superstitious. Now is not the psychologist committed to saying that this interference in fact occurs daily? If my lips and vocal cords now move as they do, it is because I am thinking certain thoughts and want to communicate them to you. And the only way in which a thought or desire can produce such results is through affecting the physical motions of waves or particles in my head. It will not do to say that only the nervous correlates of my thought are involved in producing these results, for those physical changes are not my thoughts, and if my thoughts themselves can make no difference to what I do, then rational living becomes a mummy. My action is never in fact guided by conscious choice, nor anything I say determined by what I think or feel. Common sense would not accept that, nor can a sane psychology afford to; the evidence against it is too massive. And what this evidence shows is that conscious choice, which is not a physical event at all, does make a difference to the behavior of tongue

and lips, of arms and legs. Behavior may be consciously guided. But how are you to put that together with the physicist’s conviction that all such behavior is caused physically? That is the lively philosophical problem of body and mind.

Conflicts of this kind may occur not only between natural sciences but between a natural and a normative science. Take physics and ethics. For the physicist all events—at least all macroscopic events—are caused; that is, they follow in accordance with some law from events immediately preceding them. This too seems innocent enough. But now apply the principle in ethics. A choice of yours is an event, even if not a physical event, and thus falls under the rule that all events are caused. That means that every choice you make follows in accordance with law from some event or events just preceding it. But if so, given the events that just preceded any of my choices, I had to do what I did do; I could not have done otherwise. But if that is true, does it not make nonsense to say in any case that I ought to have done otherwise, since I did the only thing that I could have done? But then what becomes of ethics as ordinarily conceived? If the scientific principle is true, one will have to rethink the ethical ground for remorse and reward and punishment and praise and blame. This is the ancient problem of free will, which was discussed with fascination by Milton’s angels while off duty from their trumpets, and is discussed with equal fascination by undergraduates today. . . .

There are many other conflicts like the two we have mentioned. They fall in no one of the disciplines, but between them, and they must be arbitrated by an agency committed to nonpartisanship. The only plausible nominee for this post is philosophy. Philosophy is the interdepartmental conciliation agency, the National Labor Relations Board, or if you prefer, the World Court, of the intellectual community. Like these other agencies, it has no means of enforcing its verdicts. Its reliance is on the reasonableness of its decisions.

We are now in a position to see the place of philosophy in the intellectual enterprise as a whole. Intelligence has shown from the beginning a drive to understand. To understand anything means to grasp it in the light of other things or events that make it intelligible. The first great breakthrough of this drive was the system of common sense, which was molded into form by millennia of trial and error. This system is being superseded by science, whose network of explanation is far more precise and comprehensive. Philosophy is the continuation of this enterprise into regions that science leaves unexplored. It is an attempt to carry understanding to its furthest possible limits. It brings

into the picture the foundations on which science builds and the arches and vaultings that hold its structures together. Philosophy is at once the criticism and the completion of science. That, as I understand it, is what all the great philosophers have been engaged upon, from Plato to Whitehead.

They may never wholly succeed. It is quite possible that men will use such understanding as they have achieved to blow themselves and their enterprise off the planet. But while they do allow themselves further life, the enterprise is bound to go on. For the effort to understand is not a passing whim or foible; it is no game for a leisure hour or "lyric cry in the midst of busi-

ness." It is central to the very nature and existence of man; it is what has carried him from somewhere in the slime to the lofty but precarious perch where he now rests. The drive of his intelligence has constructed his world for him and slowly modified it into conformity with the mysterious world without. To anyone who sees this, philosophy needs no defense. It may help in practical ways, and of course it does. But that is not the prime reason why men philosophize. They philosophize because they cannot help it, because the enterprise of understanding, ancient as man himself, has made him what he is, and alone can make him what he might be.

Philosophy as an Art Form

Robert Nozick (1938–2002) was the Arthur Kingsley Porter Professor of Philosophy at Harvard University. He is the author of *Anarchy, State, and Utopia*, which won a National Book award in 1975, and *Philosophical Explanations*, which won the Ralph Waldo Emerson Award from Phi Beta Kappa in 1982. In this selection, from *Philosophical Explanations*, Nozick explores the nature of philosophical inquiry.

We have seen that philosophy can be carried on (there are other legitimate ways, too) as part of the humanities, responsive to value and meaning as value and meaning. Although responsive thus, not every part of the humanities is itself a form of art. Can philosophy be not just humanistic but also an art form? It would not be enough, I think, for a philosophy to exhibit and exemplify value and meaning as well as to respond to these, not enough even for it to be intended to be an object to which, as well as through which, others respond. A scientific theory also could fit that, and so be part of the humanities without being an art form.

The key, I think, lies in the degree of shaping and molding that takes place, the self-conscious choice about the nature and details of the work produced, the degree to which the work is created. As the composer works with musical themes, harmonic structures, and meter, the painter with forms, colors, represented things, and perimeters, the novelist with plot themes, characters, actions, and words, so the material of the philosopher is ideas, questions, tensions, concepts. He molds and shapes these, develops, revises, and reformulates them, and places them in various relations and juxtapositions. In the medium of ideas, he sculpts a view.

This molding also involves shaping parts, somewhat against their natural grain sometimes, so as better to fit the overall pattern, one designed in part to fit them. This purposeful molding and shaping, conscious of not being determined solely by the preexisting contours of a reality already out there, is part of the artistic activity. Can the scientist take a similar view of his theorizing, viewing it as a controlled artistic shaping? Einstein spoke of theories as being “free inventions of the human intellect” by which he meant at least that the data did not dictate the theory, that getting to the theory required a leap of intuition and insight—the theory could not simply be “read off” the data. But did he think that only one (adequate, correct, true)

theory could be leaped to, or did he think several quite different theories, equally good, might be leaped to and developed, each of which would equally well fit all the observational data? (Still, once a particular leap is made successfully, it carries the rest of science along in its wake, at least for a time.) Did it feel to Einstein as if he were discovering preexisting theoretical truths, or creating a theory? It would be fruitful to consider what scope the underdetermination of scientific theory by all possible observational data, a central theme in the writings of W. V. Quine, leaves for science as an art form.

Others have aimed at artistic intellectual synthesis: from Dante through Joyce’s *Ulysses*, and most recently Pynchon’s *Gravity’s Rainbow*, some novelists and poets have tried to incorporate everything their time held worth knowing into their encyclopedic works. Some have imagined distinctively new types of intellectual syntheses, new intellectual forms; in *Magister Ludi*, Hesse portrays the Glass Bead game as a synthesis of music, theology, science, and philosophy, and describes also the social institution which serves it. Is philosophy as an artistic activity to be like these, an imaginative encyclopedic synthesis—leavened by a delight in the free play of ideas?

Where into this can we fit the philosopher’s concern with the truth? The artist cannot make up just anything, though, either. The artistic activity works within its own constraints, depending upon the medium, and it deals with material having their own degree of obduracy. Novelists often tell us of their surprise at what their characters do, sometimes at what it turns out those characters have to do. The fact that words have meaning, and are not simply sounds, imposes constraints on the poet to which the composer is not sub-

From: Robert Nozick, *Philosophical Explanations* (Cambridge, MA: Harvard University Press, 1981) 645–647.

ject (although some literary experiments try to avoid even these). So, too, the different materials of the philosopher—ideas and their relationships, possibilities to be explained and understood—impose their own different constraints. (On this view, should we say that the philosopher's activity is of the same type as that of (other) artists, but is done with different material and so involves different constraints and possibilities; or rather that the different material with its accompanying different constraints and possibilities requires a different activity—a nonartistic one?)

An artistic philosophy would welcome (and appreciate) other shapings, other philosophical visions as part of the basketful, while striving itself for a prominent position in the ranking. Such a philosophy might present more than one vision at a time, or contemplate presenting others later. Is this attitude too playful? Think of a painter who spends his life working on one canvas, repainting and altering, building it up, perfecting it. We ask him what he's doing and hear him reply, "I am engaged in making my painting."

The philosopher aimed at truth states a theory that presents a possible truth and so a way of understanding the actual world (including its value) in its matrix of possible neighbors. In his artistic reshaping, he also may lift the mind from being totally filled with the actual world in which it happens to find itself. There is a tension between the philosopher's desire that his philosophy track the world—as a tight unity, tracking is of value—and his desire that it depict a world worth tracking, if not transcend the world altogether. Still, the philosophy must be true enough to the world, presenting a possible (though shaped) view, to be transcending it.

We can envision a humanistic philosophy, a self-consciously artistic one, sculpting ideas, value, and meaning into new constellations, reverberative with mythic power, lifting and ennobling us by its content and by its creation, leading us to understand and to respond to value and meaning—to experience them and attain them anew.

Suggestions for Further Reading

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