

## CHAPTER 2

# Touchstones: The Origins of Psychological Thought



### Questions to Consider

- Do you think that we know certain things innately? If so, where does “innate” knowledge come from? If not, where does what we know come from?
- Have you ever tried to tell your own or someone else’s fortune by using a tool such as tarot cards? Have you ever used a method of divination such as the *I Ching*? Are you at all curious about your horoscope? Is psychology similar to such devices in any way? How is it different?
- Should all beings be organized in a hierarchy? What might such a hierarchy look like?

### Introduction

This chapter will examine the origins of psychological thought. People have been asking psychological questions for thousands of years. The questions they have asked are often quite sophisticated, even to the modern mind. Western psychology has its roots among the ancient Greeks, whose speculations about the nature of mathematics and its apparent ability to represent reality have been supremely important in the history of Western science. The Greeks also conjectured about such enduring issues as the relation between mind and body, and between experience and reality and the nature of memory. Of course, psychology is not purely a Western invention. For example, the psychological descriptions by the Chinese sage Lao-tzu were extremely acute and are still relevant to us today. To understand properly the history of psychology, we need to guard against our own cultural biases while examining the development of psychological thought in the English-speaking world.

## Touchstones

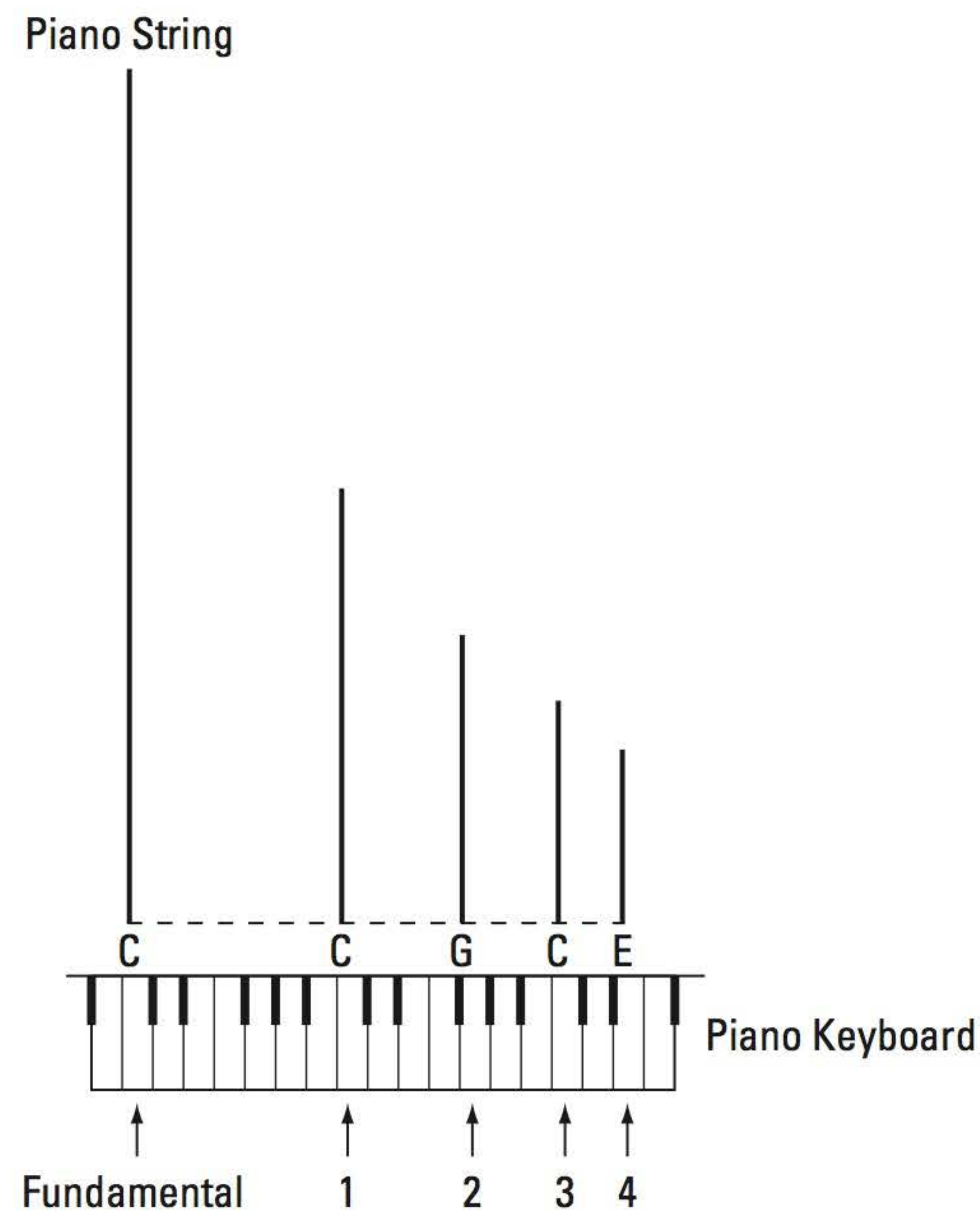
The word “touchstone” originally referred to a stone used to test the quality of gold or silver because of the mark it left upon them. Subsequently, “touchstone” came to mean any criterion by which the value of something is measured. In both this chapter and the next, we will examine some famous thinkers who have left their mark. Their works are touchstones for evaluating the theories that have descended from them. The ideas we will examine in this chapter and the next have stood the test of time, and, as the saying goes, time is the only true touchstone of merit.

Important ideas in psychology or any other discipline do not come out of nowhere. The present generation of psychologists draws on a rich store of ideas from previous generations. Throughout history, the contributions of each generation would have been impossible without the foundation laid by its predecessors. It is commonplace for the most profound thinkers to confess their indebtedness to those who have preceded them. A recurring phrase that expresses this indebtedness is that “we stand on the shoulders of giants” (Manuel, 1965: 69). In these two chapters we will consider the work of some of the giants.

### Pythagoras (570–495 BC)

**Pythagoras**, one of the most famous figures in the Western intellectual tradition, has often been characterized as having had a peerless influence on the course of Western thought (e.g., Russell, 1945: 29). However, very little can be said with certainty about his life, and so in dealing with Pythagoras we are dealing as much with a mythic as with a real person (e.g., Burnyeat, 2007; Gorman, 1979). He was often described as having miraculous powers and was even referred to as the incarnation of Apollo, the Greek god most associated with otherworldly wisdom. He was thought to have studied in Egypt and to have been initiated into the mathematical and religious secrets of the priesthood there. The mythic aura surrounding Pythagoras is annoying because it prevents us from seeing the person clearly. Historically, however, the myth has captured the thought of many real people. It is the *myth* of Pythagoras that has had such a great influence on the way many people in the West think about the world.

One of the central features of the Pythagorean myth is that he founded a semi-secret society in Italy. The members of this society were supposed to have been able to attune themselves to the *harmony* that ordered the universe. The concept of harmony is a central one in Pythagorean thought. It is closely linked to the notion, which has been so influential in the history of science, that the structure of mathematics is the structure of reality. The story has often been told of how Pythagoras first understood that reality has an underlying mathematical order. It is said that upon hearing the sounds from a blacksmith’s hammers he realized that pitch and the hammer’s weight were correlated—high sounds with light hammers, low sounds with heavy hammers. The same sort of correlation obtains between the length of plucked strings, such as those on a musical instrument, and the sound they produce. An example of this kind of relation is shown in Figure 2.1. As one goes up the scale on a piano, the piano strings get progressively shorter. These relations are not arbitrary. Rather, the notes one hears and the lengths of the corresponding



**Figure 2.1** The relation between different pitches on a piano and the length of the corresponding strings.

Source: Reprinted by permission of the publisher from *The Unanswered Question: Six Talks at Harvard* by Leonard Bernstein. Figure 49, p. 23, Cambridge, Mass.: Harvard University Press, Copyright © 1976 by Leonard Bernstein.

strings bear exact relations to one another. There is nothing mythic about the relations between mathematics and music. A provocative modern account of this relationship, and its importance for psychology, is given by Leonard Bernstein (1976).

It is said that Pythagoras was astounded by his discovery of mathematical relationships in everyday experiences such as listening to music. He felt that he had an insight into the unity of the cosmos. While our experiences are many and varied, they are not chaotic. Rather, the phenomena of our experience are united mathematically.

According to Cornford ([1950] 1967, [1922] 1974), the view that phenomena are ordered mathematically is one way of resolving the puzzles of everyday experience. The Pythagoreans were convinced of the virtue of *unity* and all that this concept implies. Unity implies *wholeness* and *oneness*, a simplicity that is perfect. The opposite of unity is undesirable, leading to *chaos*. It is clear to all of us that everyday life is not a series of purely positive experiences. Rather, we can find all manner of opposing tendencies in our experience: *light* and *dark*; *good* and *evil*; *strong* and *weak*. Although unity and wholeness are what we value, our experience can be only described in terms of contradictory tendencies. A problem felt by every person is how to reconcile the discordant state of affairs we normally experience with the one that we value.

## Pythagorean Cosmology

The Pythagoreans responded to this puzzle in a way that is both similar to and different from answers given by thinkers in other cultures (Cornford, 1974: 150). As we shall see,

there are surprising similarities in ancient world views, ranging from the Pythagorean **cosmology** to the yin/yang philosophy of Chinese Taoism (Osgood and Richards, 1973). Many see the universe as initially a unity that becomes differentiated into pairs of opposites. These opposites are then reunited, or *harmonized*, to generate the various forms of life we witness. This conception of the process of creation—from unity to differentiation to integration—is by no means an ancient relic with no relevance to modern thought. In contemporary psychology, the process of *ontogeny* (individual development) is sometimes understood in a similar way, as we will discover in Chapter 13, on developmental psychology. While there are, of course, important differences between the ancient and modern conceptions, it is still correct to say that the basic frames of reference are similar. There are, however, several features of the Pythagorean world view that are elaborated in a distinctive way. The most important of these are their ideas concerning (a) the nature of *opposites*; and (b) the importance of *number* in regulating phenomena.

### The Pythagorean Opposites

The Pythagoreans believed that some pairs of opposites were particularly useful for describing our experience (Cornford, 1939: 6; Philip, 1966). The most important is *limit* versus *unlimited*. This distinction is regarded as crucial to the process of creation. Opposites arise out of an original unity. The integration of opposites produces the *limited*. We do not experience things that are *unlimited*. Everything we experience has a *limit*. The union of the unlimited and limited produces the world we experience. Although this all sounds mysterious, the phenomena the Pythagoreans had in mind are quite obvious. Consider a mundane phenomenon like snow. I know from my own experience that while I am shovelling it, snow seems to be limitless. However, as **Johannes Kepler** (1571–1630) observed, if you carefully examine particles of snow under a magnifying glass, you will see that all snowflakes have “six corners” (Kepler, [1611] 1966: 7). Each snow crystal demonstrates that snow, while appearing to be an unlimited substance, in fact, has a precise mathematical structure. Similarly, if we examine *any* of our experiences, we will see that each one involves something that is potentially unlimited, like snow, but that has a precise mathematical structure, or *limit*. Echoes of the Pythagorean view of phenomena may easily be found in contemporary thought. Thus, a book on natural forms by Stevens is full of examples of the ways in which natural phenomena take on definite configurations (1974: 3, emphasis added).

[T]he visual patterns and forms in the natural world . . . are peculiarly restricted . . . the immense variety that nature creates emerges from the working and reworking of only a few formal themes. Those *limitations* on nature bring harmony and beauty to the natural world.

From the Pythagorean conception that the union of limit and unlimited produces all sensible phenomena is but a short step to the idea that there should be a proper balance between opposites. When the mixture of opposite tendencies is just right, the result is a *harmony*. Central to Pythagorean doctrine is the concept of *proportion*. When opposites are mixed in the right proportion, there is a harmonious outcome, a **union of opposites** that achieves the unity and integrity we value. The **psyche**, or soul, seeks precisely such a harmony. Our goal is a state in which the opposing forces within us are properly

balanced. We shall see how Carl Jung elaborated such an approach when we consider his work in Chapter 7.

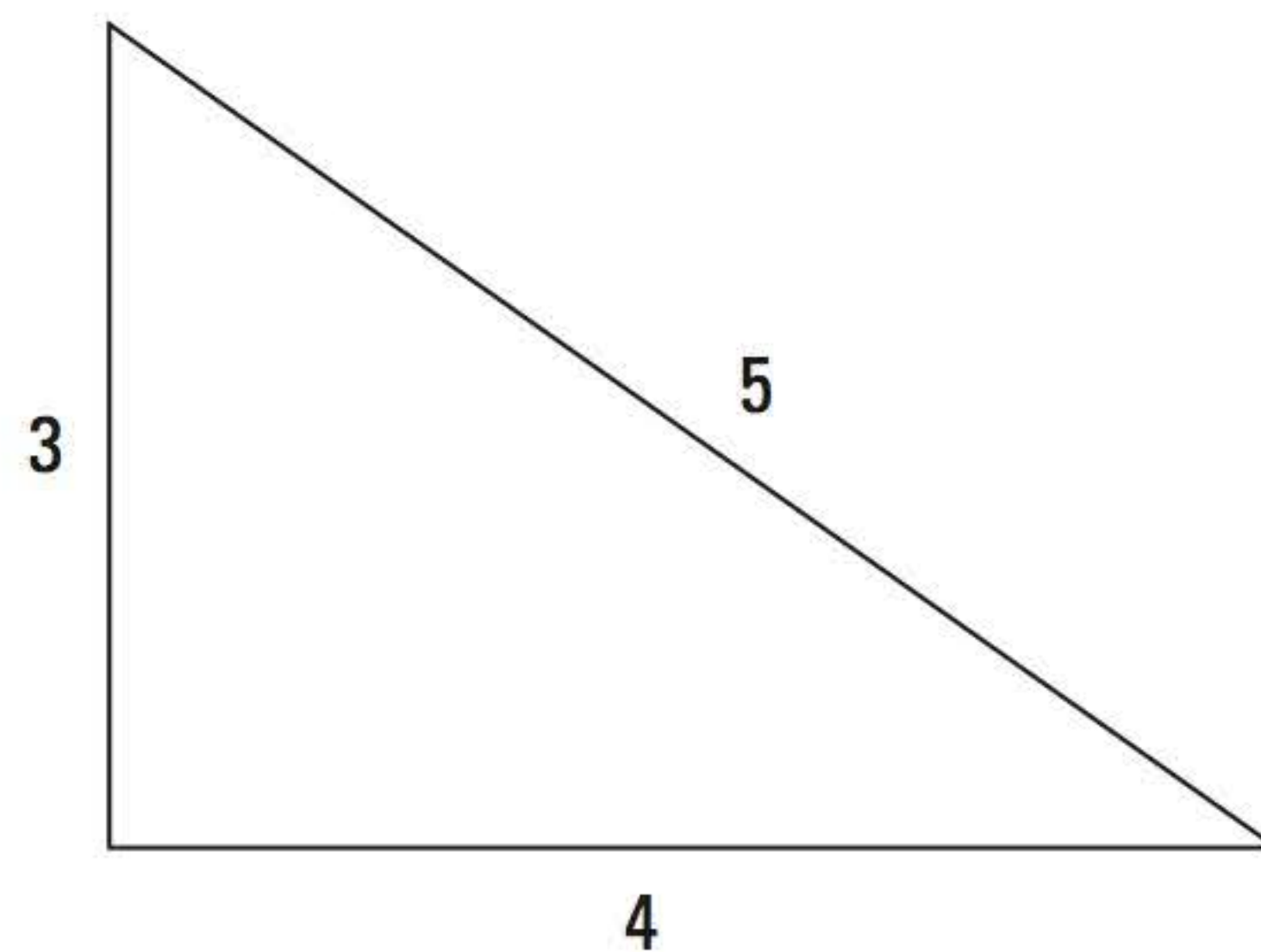
## Pythagorean Mathematics

The Pythagoreans viewed numbers as underlying all phenomena (Cornford, 1974: 152). Numbers are responsible for uniting the opposites in a harmonious manner. For example, in the sequence of positive integers, *odd* and *even* numbers alternate. This sequence is a *union of opposites*, brought together through number itself. The harmony to which numbers gave rise can be seen most clearly in the proportions that parts of geometrical constructions bear to one another. The famous *Theorem of Pythagoras* is a demonstration of invariant proportion. The square on the hypotenuse of a right-angled triangle *always* equals the sum of the squares on the other two sides. Thus, consider a right-angled triangle with sides of lengths 3 and 4 units and a hypotenuse of 5 units, as shown in Figure 2.2:  $3^2 + 4^2 = 5^2$ .

More than one young initiate into the truths of geometry has found the Pythagorean theorem, and others, both beautiful and profound. For example, H.E. Huntley (1970: 5) wrote a book on geometry in which he describes the enthusiasm of one of his teachers, who had drawn a figure on the blackboard to demonstrate an important geometric relation.

Striding rapidly up and down between the class and the blackboard, waving his arms about excitedly, with his tattered gown, green with age, billowing out behind him, he spoke in staccato phrases: “Och, a truly beautiful theorem! Beautiful! . . . Beautiful! Look at it! *Look at it!* What simplicity! What economy!” . . . His voice rises in a crescendo. “What elegance! . . . Its generality is *astonishing*.” Then, muttering to himself “Beautiful! . . . beautiful! . . .,” he stopped, slightly embarrassed . . . , and returned to earth.

If you are fortunate enough to have had such a teacher, you may have gained an enthusiasm for mathematics yourself. Even if you do not have much feeling for mathematics, you should still appreciate how important such a feeling is in the history of all sciences, including psychology. As we will see, the mathematical analysis of phenomena is a central feature of many branches of psychology. However, the application of mathematics in psychology is sometimes controversial, and at several points we will consider debates about when and if its use is appropriate.



**Figure 2.2** The theorem of Pythagoras.

## Plato (427–347 BC)

### Pythagoras, Plato, and the Problem of the Irrational

We have already discussed the way that the Pythagorean theorem followed from a mathematical view of reality. Ironically, this theorem itself eventually led to a serious difficulty for the Pythagorean world view. For triangles of the right proportions, such as the triangle we considered above, the numbers describing the lengths of the sides were *rational*. For others, however, no rational solution was possible, in the sense that no *integers* could be found to express the lengths (Thompson, 1929). For example, consider a right-angled triangle with sides of 1 unit each, as shown in Figure 2.3; in this case, the sum of squares of the sides  $1^2 + 1^2$  equals 2. This means that the square on the hypotenuse must equal 2 and that the length of the hypotenuse is the square root of 2, or  $\sqrt{2}$ . The square root of 2 cannot be expressed as a single number; it is an irrational number. Thus, the Pythagoreans came upon the *irrational* as an unavoidable aspect of reality (Chakerian, 1972). The way the Greeks and subsequent thinkers tried to comprehend things that were irrational is an important part of our story.

The **problem of the irrational** became a preoccupation for Greek mathematicians. “It was the irrational number . . . which was a constant object of search, whose nature as a number was continually in question, and whose genesis as a number cried aloud for explanation or justification” (Thompson, 1929: 44). Many attempts were made to solve the problem of the irrational. Thompson shows how this was done for the **golden section**, a famous proportion in the history of Western thought (Herz-Fischler, 1998). Rightly or wrongly, it has often been claimed to be a more beautiful proportion than any other and has been used frequently by artists in their work (Benjafield, 1985; 2010; Green, 1995). Moreover, the golden section has intrigued many of the psychologists we will study later on (e.g., Fechner, 1871; Hilgard, 1987: 165; Thorndike, 1917; Witmer, 1894; Woodworth, 1938: 384–91).

The golden section is the proportion that obtains between two quantities  $a$  and  $b$  such that the smaller ( $a$ ) is to the larger ( $b$ ) as the larger ( $b$ ) is to the sum of the two

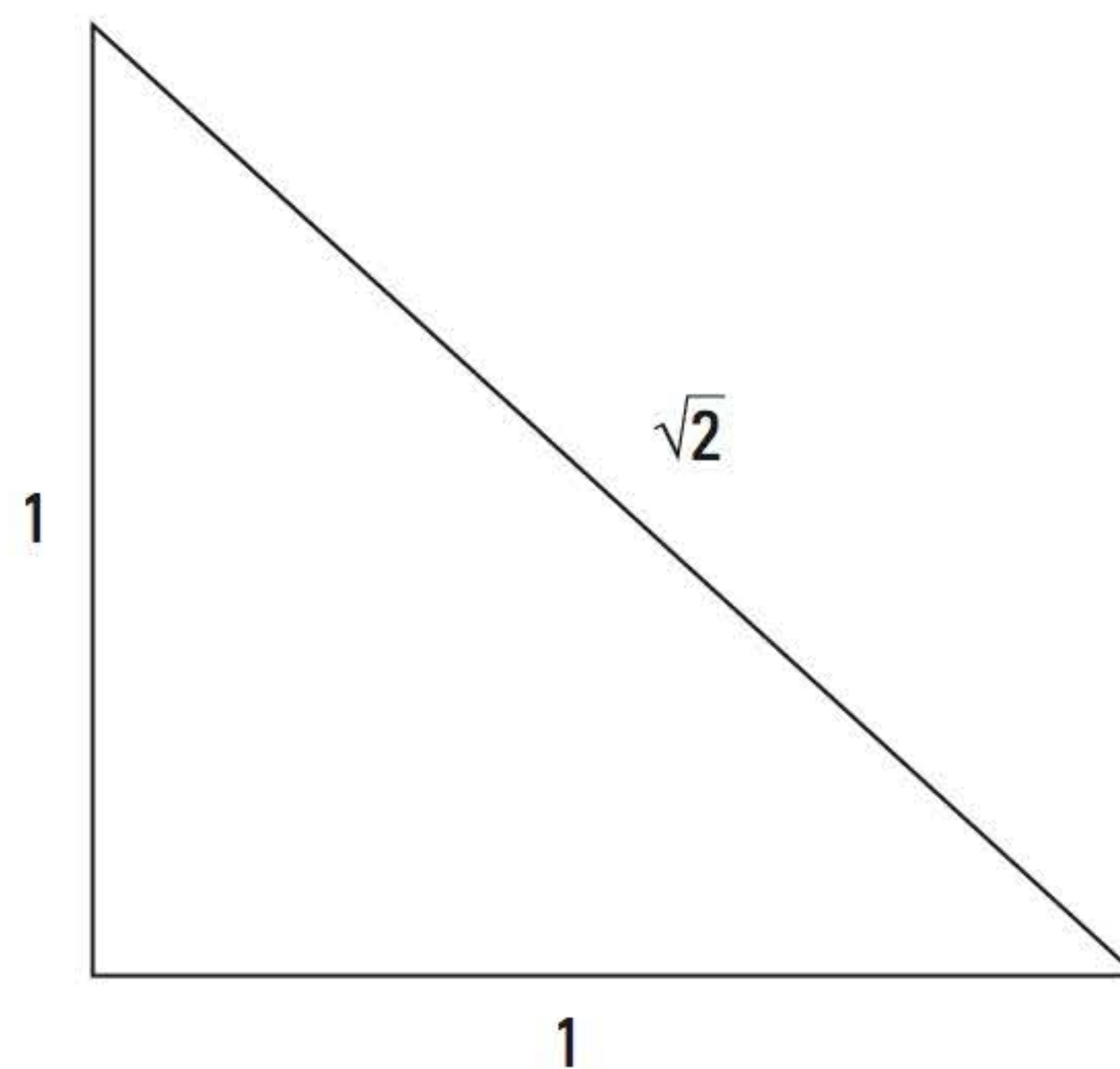
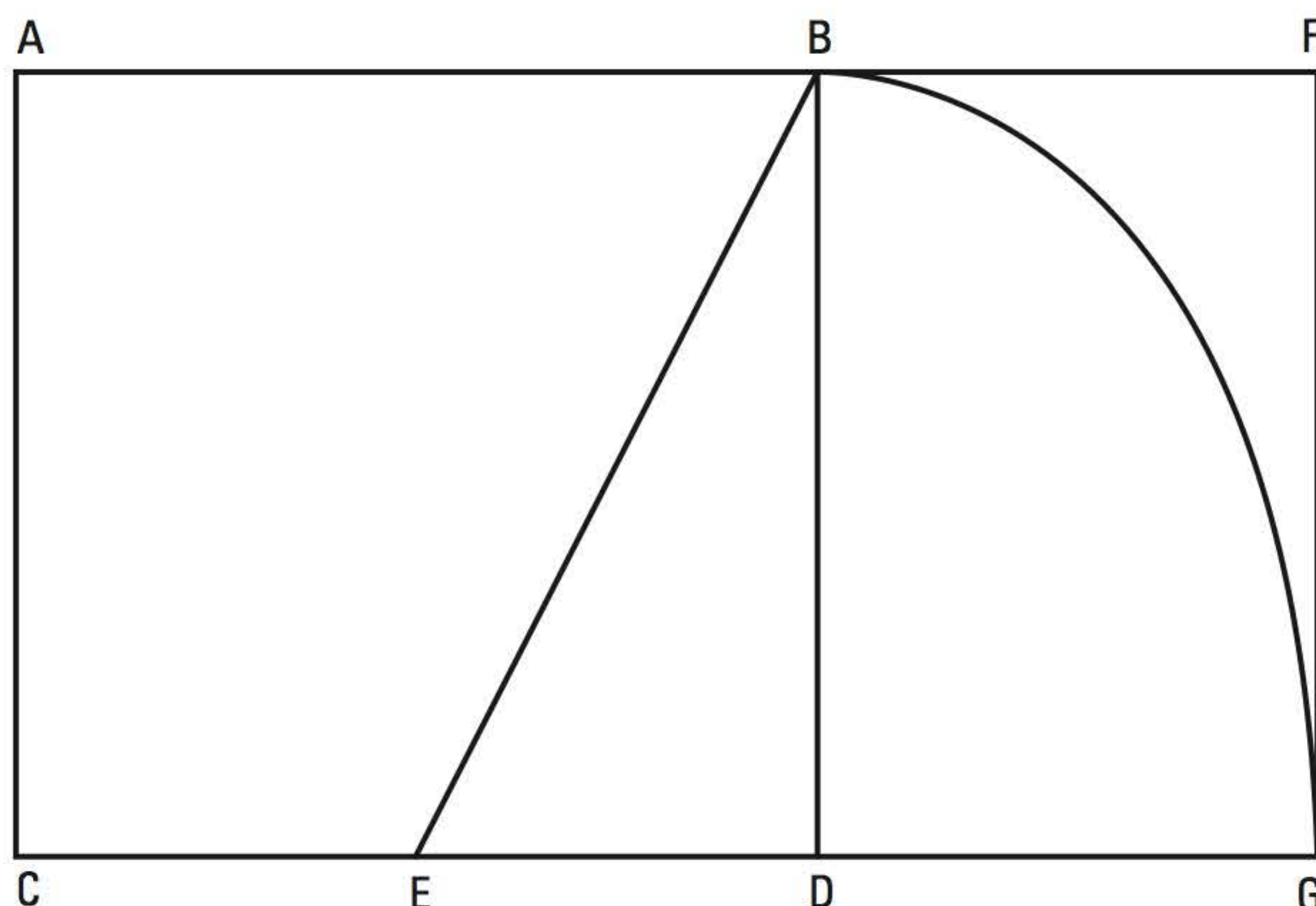


Figure 2.3 A root-two right-angle triangle.



**Figure 2.4** How to construct the golden section.

$(a + b)$  [i.e.,  $a/b = b/(a + b)$ ]. The golden section is an irrational number with a value of approximately 0.618. Figure 2.4 shows how to construct the golden section. Begin with the square ABCD. Divide the line CD at its midpoint E. With radius EB, draw an arc that cuts the extension of CD at G. D is now the golden section of CG (i.e.,  $DG/CD = CD/CG$ ). AFCD is a *golden rectangle*, meaning that its sides are in golden section proportion [i.e.,  $FG/CG = CG/(CG + FG)$ ]. Interestingly, the smaller rectangle BFGD is also a golden rectangle.

At least since the nineteenth century, a variety of extraordinary claims have been made for the golden section. These claims were clearly presented in Dan Brown's bestselling novel *The Da Vinci Code*. The hero, a Harvard lecturer in "symbolology," calls the golden section a "fundamental building block in nature. Plants, animals, and even human beings all possessed dimensional properties that adhered with eerie exactitude to [the golden section]. [Its] ubiquity in nature . . . clearly exceeds coincidence, and so the ancients assumed that the [golden section] must have been preordained by the Creator of the universe. Early scientists heralded [it] as the *Divine Proportion*" (2003: 94).

You would be right to be sceptical of such claims. However, the golden section actually does have a remarkable number of intriguing properties. For example, its value can be approximated by using the following series of numbers. Suppose you begin with the numbers 0 and 1, and then generate additional numbers such that each one is the sum of the two preceding numbers. Thus the series would go:

$$0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, \dots$$

The series is called the Fibonacci numbers after the thirteenth-century mathematician who introduced the Arabic number system into Europe. There is a close relationship between the Fibonacci numbers and the golden section. As the successive numbers in the

Fibonacci series become larger and larger, the ratio of any two successive numbers gets closer and closer to the golden section, as shown below.

$$\begin{array}{ll} 1/2 = 0.50 & 8/13 = 0.615 \\ 2/3 = 0.67 & 13/21 = 0.619 \\ 3/5 = 0.60 & 21/34 = 0.6176 \\ 5/8 = 0.625 & 34/55 = 0.6182 \end{array}$$

There are two things to note about the preceding list. The first is that the series very rapidly generates good approximations to the golden section. The second is that the successive approximations are alternately greater than and less than the value of the golden section, which is 0.6180 to four decimal places.

Surprisingly, Fibonacci numbers actually do describe features of naturally occurring forms.

Consider the phenomenon of spiral phyllotaxis in plants. Many plants display a leaf arrangement that embodies the Fibonacci series of numbers (Adler et al., 1997). For example, if you count the number of spirals that catch the eye on a pine cone, you will find that their number is almost always a member of the Fibonacci sequence (Rehmer, 2007). The formidable classicist-cum-biologist D'Arcy Thompson [1929] . . . argued that the Fibonacci series was too simple and its properties too interesting for it not to have been known by ancient Greek mathematicians. (Benjafield, 2010: 55)

According to D'Arcy Thompson (1929: 52), the ancient Greeks used the properties of the Fibonacci numbers to understand the nature of the irrational. Thompson argued that the Greeks found the relationship between the Fibonacci numbers and the golden section full of meaning. The golden section is an ideal proportion that is said to be more aesthetically pleasing than any other. A series of numbers that alternately exceeds and falls short of such an ideal value can be used to represent the notion that each particular thing we experience is a more or less imperfect representation of something ideal. No matter how close we may come to our ideals, we always seem to fall a little bit short. Thompson (1929: 55) draws the analogy between the way we try to reach ideals and the process of discovery in science. For example, consider the attempts of biologists to describe a particular species:

Just as we study the rational forms of an irrational number, and through their narrowing vista draw nearer and nearer to the ideal thing, but always fail to reach it by the little more or the little less; so we may, as it were, survey the whole motley troop of feathered things, only to find each one of them falling short of perfection, deficient here, redundant there: all with their inevitable earthly faults and flaws. Then beyond them all we begin to see dimly a bird such as never was on sea or land, without blemish, whether of excess or defect: it is the ideal *Bird*. . . .

Thompson is asking us to consider the possibility that each bird we see is an imperfect example of some ideal Bird. The same would be true of any creature. Each individual dog or cat, for example, only illustrates imperfectly the perfect specimen that would

embody all the ideal features of the species. To generalize further, *any* event is only an imperfect illustration of some ideal event. Think of athletics here. Even though judges at the Olympics have occasionally given “perfect 10s” to a gymnast, or a figure skater, or a diver, are not all athletic performances imperfect, if only slightly? Perhaps it is the *judges* whose performance is the most imperfect of all!

## The Forms

The distinction between the way things *appear* and the way things *really are* is a very important distinction, not only in the history of Western thought generally, but in psychology in particular. **Plato** advanced the notion that there are perfect **forms** on the one hand and imperfect appearances on the other. The perfect forms are in an important sense more *real* than the imperfect appearances. Belief in an ideal world of perfect forms can arise as a result of confronting problems such as the nature of the irrational. Such problems can force us to give up seeking answers in the things we experience through our senses, because our senses give us imperfect information. Instead, imagine another world that underlies the one we experience, and that contains the perfect forms we seek. Our everyday world is flawed and incapable of satisfying us; perhaps there is another world that has what we are actually looking for. Such Platonic ideas have attracted thinkers for ages, and it is to a consideration of them we now turn.

It is a commonplace to refer to the history of Western thought as but a footnote to Plato. His philosophy has been the benchmark against which all other subsequent systems of thought have been measured. In large part, his significance is the result of his ability to articulate the implications of the thought of his predecessors. Much of Platonic thought was an extension of the Pythagorean doctrines we considered earlier (Sambursky, 1956: 43). We have already seen how one possible outcome of the search for the irrational is a belief in perfect “forms” that underlie the world of appearances. From a Platonic point of view, it is possible to gain knowledge of these forms, but we are usually not aware of them. The phenomena with which we interact are mere “shadows” of their forms, or essences.

Plato advanced his theories by means of dialogues in which the protagonist was **Socrates** (469–399), one of the great figures of ancient Greece. It is difficult to separate Plato’s ideas from those originating with Socrates. Much more was written about him than appeared in Plato’s dialogues (Ferguson, 1970), but it is largely through Plato’s dialogues that Socrates is familiar to us today. Following Weimer (1973), we will focus on one of these dialogues, the *Meno*.

The *Meno* developed a typical theme that runs through all the dialogues. Here is the beginning of the dialogue, spoken by Meno (Hamilton and Cairns, 1961: 354).

Can you tell me, Socrates—is virtue something that can be taught? Or does it come by practice? Or is it neither teaching nor practice that gives it to a man but natural aptitude or something else?

Psychology students will recognize this as a type of question that still arises in practically all areas of psychology. Whether we are considering the nature of virtue (or morality) or any other psychological concept such as *intelligence* or *personality*, we can always ask whether or not it is something we learn or something we have innately. Are people

innately virtuous (or immoral)? Is a person's intelligence innately determined, or is it acquired? Is temperament given innately, or is it learned?

Socrates makes the point that it is very difficult to define concepts such as *virtue*. Any definition that is proposed includes either too much or too little, is either too narrow or too broad. Although Meno can give examples of virtuous behaviour, he cannot answer the question "What is virtue?" by specifying what it is that all virtuous behaviour has in common (Hamilton and Cairns, 1961: 355). Again, this is a recurrent problem with any psychological concept. As we shall see in Chapter 8, when psychologists in the twentieth century became fascinated with the concept of *intelligence*, they were able to come up with many different examples of intelligence, such as the ability to remember strings of numbers (digit span), the ability to give the meanings of words (vocabulary), and so on. Nevertheless, a great debate has raged over precisely what is meant by the term *intelligence* and whether or not intelligence is innate or acquired. It is just this kind of question Plato (through Socrates) was exploring in the *Meno*.

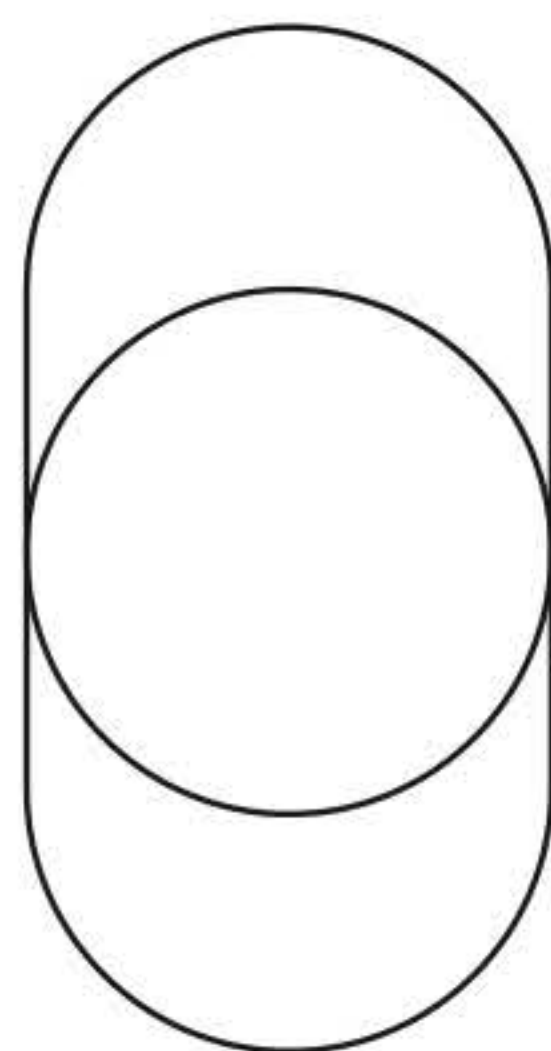
Socrates proposed to resolve the problem by suggesting that someone cannot "know what a part of virtue is, without knowing the whole" (Hamilton and Cairns, 1961: 362). That is, we would not be able to give examples of virtue unless we knew what virtue itself really was.

Thus the soul, since it is immortal and has been born many times, and has seen all things both here and in the other world, has learned everything that is. So we need not be surprised if it can recall the knowledge of virtue or anything else which, as we see, it once possessed. All nature is akin, and the soul has learned everything, so that when a man has recalled a single piece of knowledge—*learned* it in ordinary language—there is no reason why he should not find out all the rest, if he keeps a stout heart and does not grow weary of the search, for seeking and learning are in fact nothing but recollection. (Hamilton and Cairns, 1961: 364)

A famous example of the process of awakening **innate knowledge** is given by Plato in the *Meno*, when he describes the ability of Socrates to elicit from a slave boy the solution to Pythagoras's theorem. The point of his interrogation of the boy is to demonstrate that the solution is already "known" in the sense of being a deduction from what the boy knows innately. A more recent illustration of the same kind of point comes from the work of the German psychologist Max Wertheimer (1959). Wertheimer was a member of a group of psychologists called *Gestalt psychologists*. We will study them in detail in Chapter 10. For now all you need to know is that **gestalt** means "form" or "configuration," and that the Gestalt psychologists stressed the importance of innate tendencies towards "good form." Thus, for them, our experience is shaped by our innate tendencies towards "good form." An example of this notion is Wertheimer's so-called "altar window problem," which is illustrated in Figure 2.5. Read the description of the problem given in the caption to Figure 2.5, and see if you can solve it without reading any further.

It is easy to find the area of the window itself, since it is just a circle. Similarly, it is easy to find the area of the semi-circles at the top and the bottom of the figure. However, that leaves the problem of finding the area of "the four funny remainders."

Wertheimer gave this problem to a child with no mathematical training, whose first reaction to the problem was to say that, of course, he could not solve it. Immediately



**Figure 2.5** The altar window problem: Painters at work, painting and decorating a church. Above the altar there is a circular window. For decoration the painters have been asked to draw two vertical lines tangent to the circle, and of the same height as the circular window; they were then to add half circles above and below, closing the figure. This area between the lines and the window is to be covered with gold. For every square inch, so and so much gold is needed. How much gold will be needed to cover the space (given the diameter of the circle); or, what is the area between the circle and the lines?

Source: "The altar window problem" (p. 266) from *Productive Thinking* by Max Wertheimer and edited by Michael Wertheimer. Copyright © 1945, 1959 by Valentin Wertheimer; renewed © 1987 by Michael Wertheimer. Reprinted by permission of HarperCollins Publishers.

thereafter, however, he realized that the top and bottom semi-circles fit inside the window. Thus, the solution to the problem is simply to find the area of the square drawn with its sides tangent to the circle. If you cannot see this solution, ask a friend to help you with it.

Wertheimer's example is congruent with that of Socrates and the slave boy. In both cases, the solution to a problem *emerges* on the basis of what the child already knows. The child is capable of seeing certain necessary relationships, and this (apparently) innate ability is all that is required to enable him to derive the solution. The implication of both Plato's and Wertheimer's analysis is that we are all in possession of all we need to know to understand fully our experience. However, we must draw out the implications of what we already know.

From this point of view, then, the difficulties we experience in everyday life stem from an inability to perceive essential relationships. Since, from the Platonic viewpoint, the ability to perceive relationships is given innately, our difficulties are due to our inability to *remember* the basic ideas that allow us to organize our experiences in a meaningful way. Often we act as if we have forgotten what we most need to know, and behave as if we have lost touch with those ideas that could give our experience depth and meaning. "All so-called learning is actually remembering . . . there is no real 'learning' at all. This is the doctrine of *anamnesis* (recollections)" (Weimer, 1973: 16). A skilled "Socratic" teacher is one who can make the student aware of what she or he already knows but does not know that she or he knows.

If our deepest and most important ideas are innate, then what is the origin of these innate ideas? This is one of the most recurrent issues in psychology, and many different reasons for the existence of innate ideas have been given. From the Platonic viewpoint, innate ideas exist because "the human soul is immortal (divine) and is purified through a round of incarnations, from which, when completely purified, it may finally escape" (Cornford, [1935] 1960: 2). Recall the quotation from the *Meno* given earlier: "Thus the

soul, since it is immortal and has been born many times, and has seen all things both here and in the other world, has learned everything that is” (Hamilton and Cairns, 1961: 364). This is a religious view of the origin of innate knowledge, and it has had several defenders over the millennia. However, we will come across several other interpretations of the nature of innate knowledge as we go along, so keep an eye out for them.

## Lao-tzu (sixth century BC)

**Lao-tzu** is as much a mythical figure as Pythagoras, there being some debate about whether or not he actually existed (Kaltenmark, 1969; Lau, 1963). He was said to have lived a very long life, and one of the meanings of “Lao-tzu” is “old man.” At that time in China, old age and wisdom were thought to go together, an insight that seems to have been rediscovered (e.g., Baltes and Staudinger, 1993). Lao-tzu is an example of a *sage*. According to the *OED*, a *sage* is “A person of profound wisdom; especially one of those persons of ancient history or legend who were traditionally famous as the wisest of mankind.” The wisdom of Lao-tzu is called **Taoism**.

### The Tension between Confucianism and Taoism

Many people today are similar to people in ancient China in that they have the same desire for explicit guidelines for dealing with the problems that arise in everyday life. Just as there is no shortage today of advisers to tell us how to live (many of whom are psychologists), so it was in ancient China. We will come to Lao-tzu’s advice presently, but first we should briefly consider the contrasting advice given by another great Chinese sage, **Confucius**. The advice of Confucius affirmed the importance of developing one’s intelligence through education and of following traditional values, such as loyalty to one’s family and to one’s government (Kaltenmark, 1969: 9).

Bond and Hwang (1986: 216) summarize the recommendations of **Confucianism** as follows: People “exist through, and [are] defined by, [their] relationships to others; . . . these relationships are structured hierarchically; . . . social order is ensured through each party’s honoring the requirements in the role relationship.” Important role relationships, such as being a father, a son, or a friend, provide a framework within which social behaviour is regulated.

A famous incident in the story of Lao-tzu’s life is an encounter he had with Confucius. In descriptions of this meeting, it almost appears as if Lao-tzu is making fun of Confucian traditionalism. Here is a part of what Lao-tzu is supposed to have said to Confucius (from Kaltenmark, 1969: 8): ““The man who is intelligent and clear-sighted will soon die, for his criticisms of others are just; the man who is learned and discerning risks his life, for he exposes others’ faults. The man who is a son no longer belongs to himself; the man who is a subject no longer belongs to himself.”

Although Confucianism and Taoism have much in common, Taoism is usually regarded as less explicit and more mystical. Confucianism emphasized the social and moral order, to the exclusion of an interest in natural phenomena. By contrast, Taoism treated the natural and social orders as continuous (Ronan and Needham, 1978: 94). As the great scholar Joseph Needham (1962: 33) states, Confucianism “was masculine and managing: the Taoists condemned it and sought after a feminine and receptive knowledge

which could arise only as the fruit of a passive and yielding attitude in the observation of Nature.” For the Taoist, both nature and society worked the same way. Everything illustrated the Tao.

## What Is Tao?

The simplest translation of the word *Tao* is “the Way,” which referred to the “way in which the Universe worked; in other words, the order of Nature . . . which brought all things into existence and governs their every action, not so much by force as by . . . controlling the orderly processes of change” (Needham, 1962: 36).

The writings attributed to Lao-tzu are called the *Tao Te Ching*. Here is an oft quoted passage from the *Tao Te Ching* that illustrates the Taoist preoccupation with the nature of change (Lau, 1963: 139).

Is not the way of heaven like the stretching of a bow?  
The high it presses down,  
The low it lifts up;  
The excessive it takes from,  
The deficient it gives to.

This passage expresses the belief that any situation is always in the process of changing into its opposite. This means that it is fruitless to search for something that does not change. Many scholars (e.g., Wilhelm, 1975: 15) have compared the Taoist view of change to that of the Greek philosopher Heraclitus (c. 540–c. 470 BC). The following quotation from Heraclitus (Wheelwright, 1966: 71) illustrates this similarity to Taoism: “You cannot step into the same river twice, for other waters and yet others go ever flowing on.”

This emphasis on the pervasiveness of change should be contrasted with Plato’s views (Lau, 1963: 20). Whereas Plato believed that it was possible to discover a permanent world of forms behind the flow of everyday experience, for the Taoist such a hope is illusory. The Tao cannot be “discovered” or “named” (Lau, 91):

The way is forever nameless . . .  
Only when it is cut are there names  
As soon as there are names  
One ought to know that it is time to stop.

What we can describe are individual phenomena. However, we cannot give a general description of the Tao that “explains” all individual phenomena. The Tao resists description because any name that can be applied to it is misleading: “Dimly visible, it cannot be named” (Lau, 93).

As was mentioned above, Taoism emphasizes the virtue of a passive observation of nature (Needham, 1962: 57). Such passivity does not impose itself upon nature but is open to observing what is actually there. In a way, this aspect of Taoism anticipates what has become a very important aspect of scientific observation. When properly conducted, science makes no assumptions about what nature *must* be; it is not founded on dogmatic principles. Rather, it begins with observations of what *actually* happens, regardless of what anyone’s theory says *should* be happening.

The Taoist approach to observation has been important to several Western psychologists. As we shall see in Chapter 14, on humanistic psychology, Abraham Maslow (1966) and Carl Rogers (1961a, b: 164; Hermsen 1996) were influenced by Taoist ideas of receptivity and openness to experience.

### *The Book of Changes*

Many of you will have come across the *I Ching*, or *Book of Changes* (1967). As an expression of ancient Chinese culture, it has an affinity with both Confucian and Taoist ideas. The *I Ching* has fascinated many Western scholars, from **G.W. Leibniz** (1646–1716) to **C.G. Jung** (1875–1961).

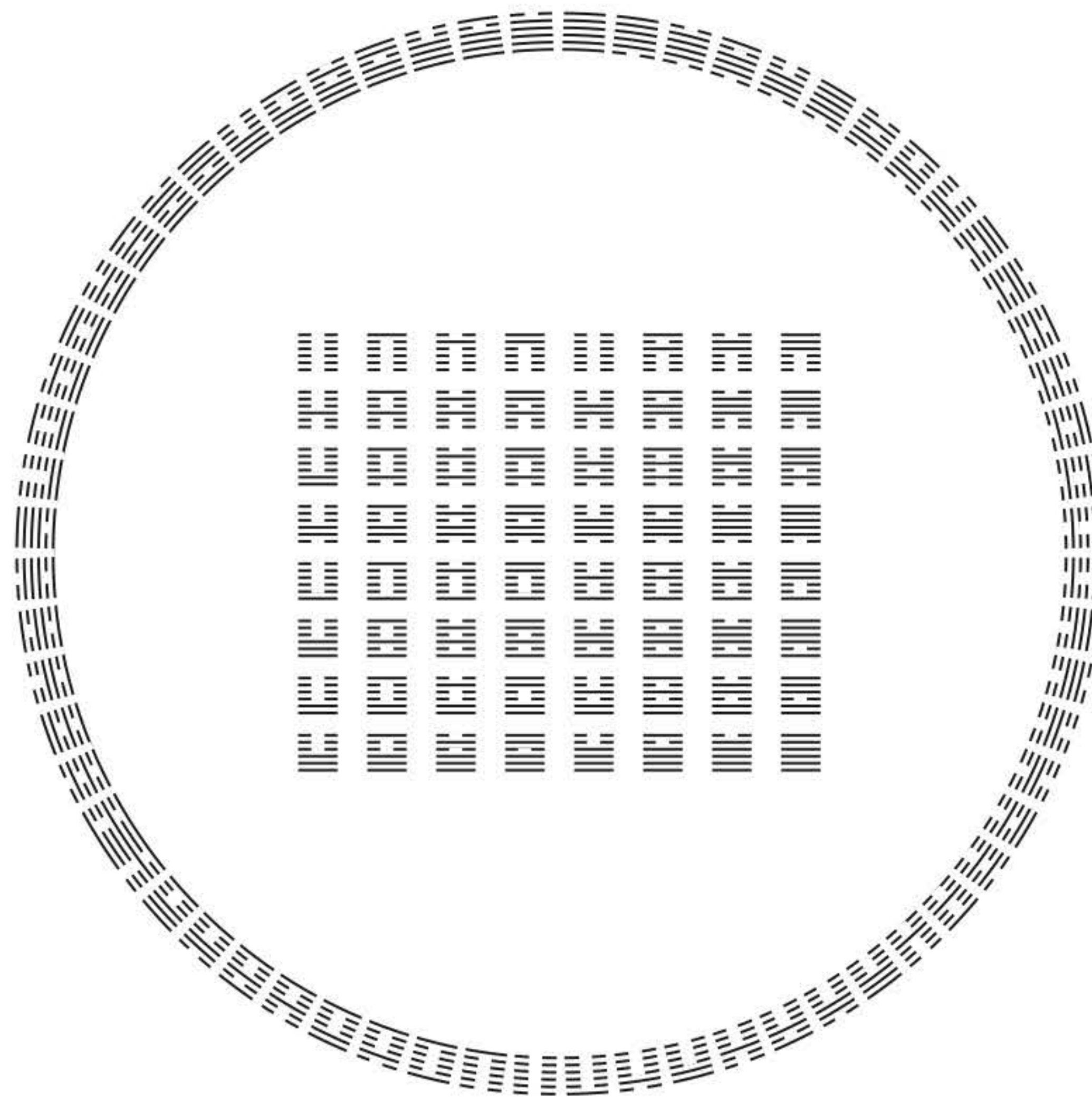
At its most superficial level, the *I Ching* is a fortune-telling device. Wanting to predict one's future is a pervasive wish today just as it was in ancient China. In order to make such predictions, one needs a system for codifying possible future outcomes. It is here that the *I Ching* is particularly prescient, because its codification scheme involves what later came to be known as a *binary* number system.

A binary system uses only two values, such as 1 and 0. In the *I Ching*, these two values are **yang and yin**, which represent the fundamental cosmic forces. Yang and yin may be characterized by opposing pairs of adjectives, yang representing that which is masculine, firm, and light, and Yin standing for that which is feminine, yielding, and dark (Osgood and Richards, 1973). In general, yang and yin are both equally important, although one or the other may predominate in a particular situation. As it says in the *I Ching* (1967: 297–8):

That which lets now the dark, now the light appear is tao . . . . The primal powers never come to a standstill; the cycle of becoming continues uninterrupted. The reason is that between the two primal powers there arises again and again a state of tension, a potential that keeps the powers in motion and causes them to unite, whereby they are constantly regenerated. Tao brings this about without ever becoming manifest. The power of tao to maintain the world by constant renewal of a state of tension between the polar forces, is designated as good.

Notice that change is conceptualized as cyclical. This sense of “a movement that returns to its starting point . . . may have been derived from the orbits of the heavenly bodies or the course of the seasons. . . . The notion of progress . . . is alien to the ancient concept of change” (Wilhelm, 1975: 19–20). This conception of historical change as cyclical is a possibility we will need to take seriously. As we go along we consider further the question of whether or not the history of psychology involves more repetition than progress.

A simple and easily understood way of representing **cyclical change** is by means of a circle. The *I Ching* does this by using a circular diagram like that in Figure 2.6. This circular diagram is generated by combining trigrams, each of which is composed of three lines. Each line is either solid (yang) or broken (yin). There are eight unique trigrams. For example, a trigram of three unbroken (yang) lines is called *Ch'ien* (the Creative), while its opposite is a trigram of three broken (yin) lines, called *K'un* (the Receptive). The entire set of trigrams is given in Figure 2.7. Notice that each row of Figure 2.7 contains four yang and four yin lines, and that the eight trigrams represent all possible combinations of three



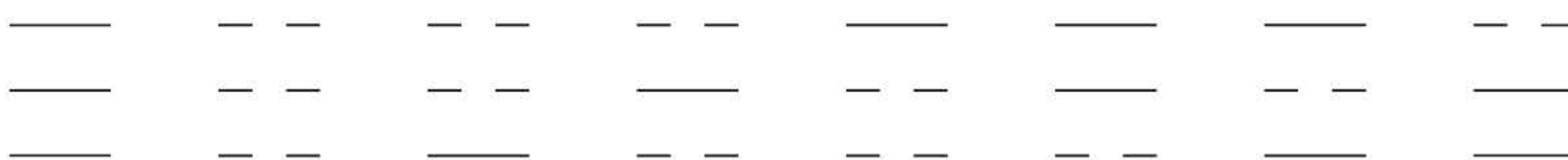
**Figure 2.6** The circular structure of the *I Ching*.

Source: H. Richard Wilhelm. *Change: Eight Lectures on the I Ching*. Translated by Cary F. Baynes. © 1960 Bollingen, 1988  
Princeton University Press. Reprinted by permission of Princeton University Press.

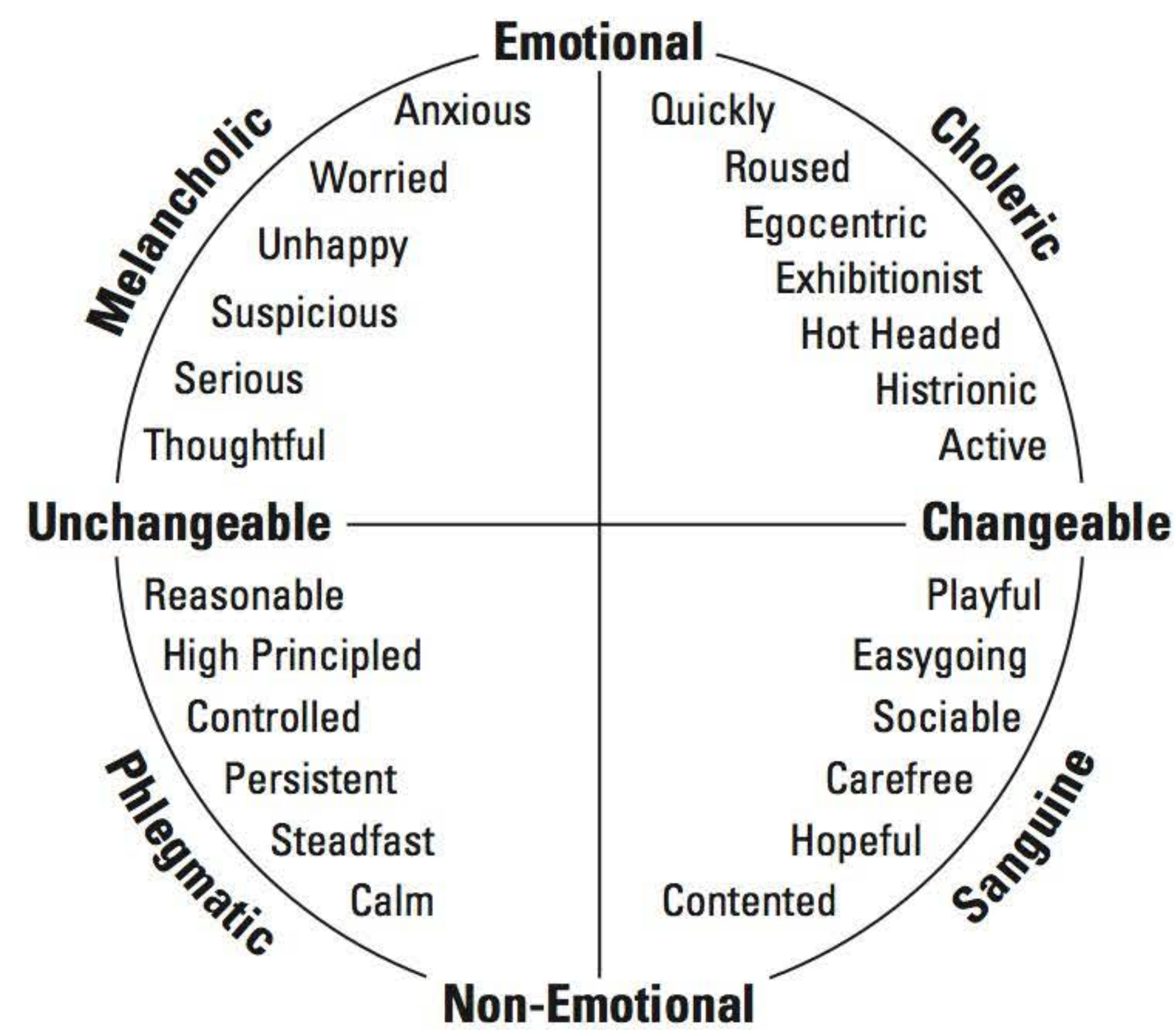
solid or broken lines. The 64 hexagrams of Figure 2.6 are obtained by combining the eight trigrams in all possible ways. Each hexagram has a different name and represents a different possible state of affairs. For example, at the bottom of Figure 2.6, the hexagram containing all broken lines is called *K'un* (the Receptive), mentioned above, and represents “the nature of the earth, strong in devotion; among the seasons it stands for late autumn, when all the forces of life are at rest” (Wilhelm, 1967: li). At the top of the circle is *Ch'ien* (the Creative), mentioned above, which has the opposite meaning to *K'un*. “Ch'ien . . . whose symbol is heaven . . . is associated with the Chinese fourth month, approximately our May—that is, the time when growth and flowering is at a peak” (Wilhelm, 1975: 50).

For our purposes, the fact that the *I Ching* has traditionally been used to tell fortunes is not its most important feature. What has intrigued scholars such as Leibniz is the fact that the *I Ching* begins with a simple binary arithmetic from which is constructed a model of all possible situations (Mungello, 1977; Wilhelm, 1975: 90–2). Moreover, the circular structure makes possible the representation of the way that phenomena may be transformed over time.

Circular models are quite common in the history of psychology, although they are usually models of much smaller scope than the *I Ching*. Such models, often called **circumplexes**, have been created for many domains in psychology. In Western psychology, the



**Figure 2.7** The eight trigrams underlying the *I Ching*.



**Figure 2.8** Galen's circumplex model of temperament.

Source: Eysenck & Eysenck (1985: 45).

most pervasive circumplex model has been **Galen's typology** of temperaments. Galen (c. 130–c. 200) identified four temperaments, called *melancholic* (or pessimistic), *sanguine* (or sociable), *choleric* (or proud), and *phlegmatic* (or controlled). These four temperaments can be arranged in a circle as in Figure 2.8. This model has influenced many subsequent psychologists (Martindale and Martindale, 1988; Miller, 1988). Other areas in which circumplex models have been applied in psychology include colour (e.g., Goethe, [1840] 1970: lvii), facial expression (e.g., Schlosberg, 1952), interpersonal characteristics (e.g., Kiesler, 1983), and emotion (e.g., Russell, 1980). We will examine some of these models later. Box 2.1 summarizes the major issues with which we have dealt thus far.

## Aristotle (384–323 BC)

### Aristotle's Differences with Plato

As a young man, **Aristotle** studied with Plato at the Academy in Athens. After Plato's death, Aristotle left Athens and subsequently became tutor to the young man who was to become Alexander the Great. Upon returning to Athens, he founded his own school, called the Lyceum. Aristotle's mature philosophy is one of the most influential in the history of Western culture, including on psychology. Let us begin by sketching the way in which his views differed from those of Plato.

Aristotle rejected Plato's theory of forms. Recall that Plato believed a world of ideal forms exists independent of the world of ordinary experience. Aristotle argued instead that form and matter were intertwined. Matter does not exist without form, nor does form exist without matter. Far from being arcane, Aristotle's point is an expression of what has become common sense in Western culture. In order to see how intuitively obvious Aristotle's point is, let us briefly consider an argument made by the linguist Benjamin Lee Whorf (1897–1941).

## Box 2.1 ∞ Where Are We Now?

### A Summary and Some Implications

So far we have considered the contrasting views of Pythagoras, Plato, and Lao-tzu. Now is a good time to take a breather, and try to spell out some of the major issues that emerge from a consideration of these three. The following issues can be traced back to the period we are considering, although they have been formulated in different ways at different times. Regardless of how they are stated, these issues are still capable of generating debate in psychology, and we will have an opportunity of seeing different generations of psychological theorists deal with them.

1. Nature versus culture. Taoism treats human behaviour as a part of the natural order, and not as something different from other natural phenomena. An alternative approach would be to regard human behaviour as determined by principles unique to it. For example, culture might have so powerful an effect on behaviour as to make it impossible to understand as a purely natural phenomenon. The issue here is this: can human behaviour be understood in the same way as we understand natural phenomena, or must it be understood in terms of its own culturally determined rules?
2. Process versus structure. Taoism treats change as the fundamental characteristic of experience. **Platonism** encourages us to seek a perfect world of unchanging forms. This issue can be phrased as follows: is psychology best seen as the study of processes in continuous change, or is it best seen as the study of the underlying structures that determine behaviour? What is the relation between process and structure? As we will see, the great American psychologist William James (1890) compared consciousness to a stream, just as Heraclitus compared life to a stream. If consciousness is like a stream, nothing recurs in it. If nothing recurs, can it have any permanent structure?
3. The individual case versus the general law. If it turned out to be true that our experience has no underlying structure, then there would appear to be nothing very general that can be said about human behaviour. Each person's life will be relatively unique, and it would be pointless to try to see his or her behaviour as the result of some general laws. If, however, as Pythagoras believed, everything has a mathematical structure, then everything will be an illustration of an underlying law.
4. Pure observation versus theory-driven observation. The Taoist approach to observation was to make no assumptions about what we will find in nature. Perhaps observation should be passive, and not determined by theoretical preconceptions. If our observations of behaviour are determined by a preconceived theory, we may not be open to observing what people actually do. However, is it always wise to approach the study of behaviour without a theory? Does not a good theory provide direction to one's exploration of nature?

Whorf (1956) suggested that all of us in the Western world unconsciously construct our experience in a particular way, and observed that we commonly “carve up” reality into units defined by the general formula *form-plus-substance*. Thus, we say “a *quart of milk*” and not just “a milk”; “a *kilogram of meat*” and not “a meat”; a “*snow crystal*” and not just “a snow.” This is close to Aristotle’s view: we ordinarily understand all substances as having particular forms, and we assume that forms cannot exist apart from the substances they shape.

Aristotle observed that substances had the *potential* to take on different forms. What a substance *actually* became depended on the form it took. Baumrin (1975: 487) uses the following example to illustrate how the distinction between **potentiality** and **actuality** worked in the case of living beings.

By way of illustration, consider the stillborn fetus. It is a body that is both material and has form but not soul. Its body is the sort of body that could potentially live; moreover it actually had to have been alive for some time to have the form it has at birth. The soul is both the form of a living body in the sense that it is the organization of that body and in the sense that it is the life of that body when it is alive.

The distinction between a living and a dead body is that the former has what Baumrin calls “a soul.” However, different living things have different powers, and Aristotle compared the powers possessed by plants, animals, and human beings. Plants fulfill minimal conditions for being alive in that “they grow up and down, and everything that grows increases its bulk alike in both directions or indeed in all, and continues to live so long as it can absorb nutriment” (McKeon, 1941: 557).

At the next level are creatures with “the power of sensation.” What distinguishes animals from plants is that the former have senses, such as touch: “The primary form of sense is touch, which belongs to all animals” (McKeon, 1941: 557). Aristotle argued that human beings have five senses: vision, the sense of sound (audition), the sense of smell (olfaction), the sense of taste, and of touch. This fivefold classification of the senses became “common sense,” and “has upon it the sanction of the centuries” (Geldard, 1972: 258).

In addition to the powers of “self-nutrition” and sensation, human beings also possess the power to think (McKeon, 1941: 559). To Aristotle, reasoning seemed like a peculiarly human attribute, and he delineated the forms of reasoning in great detail. Among these forms, Aristotle was particularly interested in the **syllogism**. A syllogism consists of two premises and a conclusion, and in a valid syllogism the conclusion follows necessarily from the premises. There are a great many forms of valid syllogism, but one of particular interest to Aristotle was the so-called *practical syllogism*. We use practical syllogisms when “the conclusion drawn from the two premises becomes an action” (Henle, [1962] 1968: 103). Here is an example of a practical syllogism.

*Premise 1:* It is necessary for me to understand psychology as a whole.

*Premise 2:* The only way to understand psychology as a whole is through the study of the history of psychology.

*Conclusion:* Therefore, it is necessary for me to study the history of psychology.

You may disagree with the premises, but if you accept them, the conclusion necessarily follows. Henle has provided examples showing that the practical syllogism is a very

common feature of everyday life. One of her examples is the following: “It is too far to walk to the public library; I must take the subway or bus. The Fifth Avenue bus passes the Public Library. I must take the Fifth Avenue bus.” Henle goes on to observe that “it is difficult to see how the individual could cope with the ordinary tasks of life if the practical syllogism embodied techniques which are not . . . the common property of the unsophisticated subject” ( Henle, [1962] 1968: 103). The practical syllogism is an illustration of the way our behaviour is regulated by our reason. Our ability to reason is what most distinguishes human beings from other forms of life.

Aristotle believed certain parts of the soul, particularly the power of reason, were indestructible. This meant that even though bodily functions decline throughout the process of normal aging, reason is left intact. However, it may *seem* as if reason declines, because the body declines and the body is the only vehicle through which reason can express itself. In the following quotation (McKeon 1941: 548), the word *impassible* means “to be incapable of suffering or pain.” Thus, to say the mind is impassible means that it is not prone to the diseases and degeneration that may afflict an aging person.

The case of mind is different; it seems to be an independent substance implanted within the soul and to be incapable of being destroyed. If it could be destroyed at all, it would be under the influence of old age. What really happens in respect of mind in old age is, however, exactly parallel to what happens in the case of the sense organs; if the old man could recover the proper kind of eye, he could see just as well as the young man. The incapacity of old age is due to an affection not of the soul but of its vehicle, as occurs in drunkenness or disease. Thus it is that in old age the activity of mind or intellectual apprehension declines only through the decay of some other inward part; mind itself is impassible.

The issue, then, is whether reason itself declines, or whether its full expression is prevented because of disease or decay in other parts of the body, such as the brain. Although this is an ancient question, its relevance has not diminished with the passage of time. Consider the cases depicted by the neurologist Oliver Sacks (1974). In his book *Awakenings*, which was subsequently made into a film, Sacks described patients with Parkinson’s disease. People who have severe cases of Parkinsonism may deteriorate into “a ‘frozen’ state of rigid immobility and unresponsiveness to external stimuli” (Flowers, 1987: 590) that may persist for several years. However, this does not mean that their mental life has irreversibly ceased. Sacks described several cases of people who, as a result of drug therapy, were “awakened” for at least a while, and showed signs of reason and other mental powers where there had appeared to be none before. Aristotle would surely have seen such “awakenings” as illustrations of his point that the mind is impassible and able to recover with the right therapy to the right parts of the body (in this case, the brain). Although contemporary neurologists would, no doubt, offer other, and vastly more detailed, accounts of such phenomena, the view that people have souls, and that the soul is indestructible, is still very widely held in many cultures.

## The Nature of Human Action

If we follow Aristotle and say that human behaviour can be regulated by reason, we will expect people to be able to give reasons for their actions. These reasons are usually

statements of what Aristotle called the *final cause*. Final causes are “the end, i.e., that for the sake of which a thing is, e.g., health is the cause of walking. For ‘Why does one walk?’ we say ‘that one may be healthy’; and in speaking thus we think we have given the cause” (McKeon, 1941: 752). Human behaviour appears to be *purposive*. We act with certain ends in mind, and those ends may explain our action. Thus, if you meet me when I am out walking and ask me what I am doing, I may explain myself by saying that I am walking for my health. My health is the goal that determines my behaviour.

Hamlyn ([1953] 1962: 63) has shown how Aristotle’s conception of human action requires us to distinguish **action versus motion**. Actions can be accomplished in a variety of ways. Thus, suppose I want to mail a letter. I may accomplish this through any number of bodily movements. For example, I may open the letter box with my right hand, or with my left hand. It is impossible to specify the particular movements required to accomplish an action. It follows that an explanation of bodily movements will not be a complete explanation of action. A complete explanation of actions will involve the actor’s reasons for behaving in a particular way.

If someone pushes me off the edge of the Grand Canyon, my fall is aptly described as motion. This simple motion can be given a completely mechanical explanation—someone applied a force to my back, and then gravity took over. Falling into the Grand Canyon is not something for which I can give an explanation in terms of my goals. However, if I am *walking* down a trail towards the floor of the Canyon, then it is reasonable to expect me to be able to give an explanation of my behaviour in terms of my goal. Thus, if I am asked why I am walking down the trail, I might answer that I want to be able to appreciate the canyon from that vantage point.

Psychology is often defined as the study of *behaviour*. As Hamlyn ([1953] 1962: 63) observed, the word “behaviour” is often used in an ambiguous way. Sometimes “behaviour” refers to the movements that organisms make; other times it refers to their actions. The explanation of behaviour may require more than an explanation of bodily movements; it may also require an explanation in terms of the person’s goals or purposes. Explanations in terms of goals are called teleological. The role of **teleological explanations** of behaviour has often been problematic in the history of psychology, and we will return to this issue often.

## Memory

Aristotle defined memory as the process by which a person revives a previous experience. **Memory** involves the “reinstatement in consciousness of something which was there before but had disappeared” (McKeon, 1941: 613). Aristotle is often called the originator of the notion that memory is governed by *associations* (e.g., Mandler and Mandler, 1964: 8). For an associationist, one idea will follow another in memory if the two ideas were previously experienced in relation to each other. The doctrine of associationism is very important in the history of psychology, and we will follow its development closely.

According to Aristotle, when we try to remember something we follow a chain of associated ideas until we succeed in recovering what it is we wanted to recall. We may not find what we want to remember right away. Rather, there may be a sequence of ideas that begins with “something either similar, or contrary, to what we seek, or else from that which is contiguous with it” (McKeon, 1941: 612). The hypothesis that associations

are produced by *similarity*, *contrast*, and *contiguity* is one of Aristotle's most important contributions.

1. *Association by similarity* means that we tend to be reminded of something to the extent that it resembles what we are currently experiencing. For example, upon thinking of Plato we may then think of Aristotle because they both share many common properties, such as being not only ancient and Greek, but also philosophers.
2. *Association by contrast* refers to the fact that we are sometimes reminded of something to the extent that it means the opposite of what we are currently experiencing. Thus, if I ask you to say the first thing that comes into your head when I say *black*, you are likely to respond with *white*.
3. *Association by contiguity* occurs whenever we are reminded of something because it had been previously experienced together with whatever we are currently experiencing. For example, if I ask you to say the first thing that comes into your head when I say *salt*, you are liable to respond with *pepper* because salt and pepper shakers tend to be side by side.

These three can be called the first **laws of association**. Over the years, there has been a great deal of debate about the relationships of these three laws and which of them is most important. We will develop the story of associationism in Chapter 3 when we come to the British empiricists. However, we should not leave Aristotle's account of memory without noting that it contained more than just the principles of association. For example, Aristotle noted that "recollection is, as it were, a mode of inference. For he who endeavors to recollect *infers* that he formerly saw, or heard, or had some such experience, and the process . . . is, as it were, a sort of investigation" (McKeon, 1941: 612). Here, Aristotle is suggesting that recollection can be more like imagination than like a literal rendition of the past.

### **Mnemonics**

The central role of imagination in memory was well known to the ancients. Imagination played a crucial part in their elaborate **mnemonic techniques**, which are ways of improving one's memory. We have probably all used mnemonic techniques at one time or another. For example, if I want to remember to buy eggs, cherries, lemons, and margarine at the supermarket, I may take the first letters of each item, rearrange them, and make a name out of them, such as CLEM. Then, all I have to do is remember the one word rather than the four items and decode the word when I am in the supermarket. Such simple mnemonics are feeble attempts when compared to the elaborate mnemonic techniques described by Aristotle and practised from ancient times throughout the Middle Ages and into the Renaissance (Carruthers, 1990).

Ancient memory systems were explored by Frances Yates (1966) in *The Art of Memory*. She begins by presenting an outline of mnemonics given in an anonymous document called the *Ad Herennium*, written in the first century BC. Written for students, it describes an **artificial memory** that would enable someone who was properly trained to recall accurately a great many items. The system is called an "artificial memory" to distinguish it from the memory we have naturally, without training. In order to develop an artificial memory, a student would have to invest a considerable amount of time and effort, as we shall see.

The artificial memory has two parts, places (*loci*) and images. “A *locus* is a place easily grasped by the memory, such as house, an intercolumnar space, a corner, an arch, or the like. Images are forms, marks . . . of what we wish to remember. For example, if we wish to recall the genus of a horse, of a lion, of an eagle, we must place their images on definite *loci*” (Yates, 1996: 6). The “art of memory” involves creating a memory that can be read like a book (*ibid.*, 6–7).

The art of memory is like an inner writing. Those who know the letters of the alphabet can write down what is dictated to them and read out what they have written. Likewise those who have learned mnemonics can set in places what they have heard and deliver it from memory. For the places are very much like wax tablets or papyrus, the images like the letters, the arrangement and disposition of the images like the script, and the delivery is like the reading.

Learning a set of *loci* was the would-be mnemonist’s first task. It was necessary to learn a great many *loci* by following these rules:

- The *loci* must be learned in a particular order, and overlearned so that the student could imagine going in either direction from any particular *locus*. Aristotle was apparently referring to this ability when he described people who “are supposed to recollect sometimes by starting from mnemonic *loci*” (McKeon, 1941: 614).
- *Loci* should be selected from “a deserted and solitary place” such as a building when no one is around (Yates, 1966: 7).
- The *loci* should be as much unlike one another as possible.
- The *loci* should be a fair distance apart, and bright. The *Ad Herennium* suggests a distance of about 30 feet.
- Every fifth *locus* should be marked in a distinctive way. For example, one could “mark the fifth locus with a golden hand” (*ibid.*, 7). The hand has five fingers and so is a good symbol for the fifth *locus*.

The *loci* could be reused again and again. Having constructed a series of *loci*, the student was ready to place the material to be remembered in them. This material was encoded in the form of *images*, a single image for each item to be remembered. Each image was stored in a *locus*. The student could then recall this material by mentally strolling through the *loci*, collecting the images stored there. The images should be as bizarre and distinctive as possible, “of exceptional beauty or singular ugliness; . . . ornament some of them, as with crowns or purple cloaks . . . or . . . disfigure them, as by introducing one stained with blood or soiled with mud” (*ibid.*, 10).

By using this method, the ancients are reputed to have been able to remember an astonishing numbers of items. For example, “the elder Seneca . . . could repeat two thousand names in the order in which they had been given; and when a class of two hundred students or more spoke each in turn a line of poetry, he could recite all the lines in reverse order, beginning from the last one said and going right back to the first” (*ibid.*, 16).

Aristotle discussed the artificial memory on several occasions. For example, he described people who dream that they are “mentally arranging a given list of subjects according to the mnemonic rule” (McKeon, 1941: 619). Yates (1966: 31) notes that this

is “rather a warning, one would think, against doing too much in artificial memory,” but goes on to show that the importance of imagination in Aristotle’s theory of memory was consistent with the way that ancient mnemonists approached their task. For example, Aristotle argued that “imagining lies within our own power whenever we wish (e.g., we can call up a picture, as in the practice of mnemonics by the use of mental images)” (ibid., 587). Not only did Aristotle believe that imagery was an important mnemonic tool, but he also held that thinking was impossible without images. After all, the mind requires something to think about, and what else do we think with other than images? This is a claim that has been controversial throughout the history of psychology, as we shall see.

The elaborate mnemonic techniques of the ancients faded away with the arrival of printing, which made it easy to store large amounts of information outside of one’s memory. However, after Yates wrote her book there was renewed interest in mnemonics. A particularly important paper in this revival was written by Bower (1970), who showed that many of the ancient techniques had a sound psychological basis and are still useful. Another example of the way in which Aristotle’s views are still relevant is given in Box 2.2.

### Box 2.2 ∞ Aristotle’s Theory of Intelligence

The present-day relevance of Aristotle’s theory of intelligence has been pointed out by Tigner and Tigner (2000). They observed that Aristotle recognized three kinds of intelligence. The first is “theoretical intelligence,” which corresponds to what most people now think of as “intelligence.” It is the ability to understand subjects such as mathematics and science. Aristotle’s second kind of intelligence is practical intelligence. Here the focus is on being able to choose a wise course of action. Finally, there is productive intelligence, which is concerned with being able to make things. It is perhaps best exemplified by the arts.

Why should we believe that Aristotle’s classification of the kinds of intelligence has merit? As Tigner and Tigner point out, Aristotle’s system has strong similarities to the highly respected triarchic theory of intelligence proposed by the modern psychologist Robert Sternberg (1988). Although Sternberg uses different labels (analytical, practical, and

creative), his three kinds of intelligence are essentially the same as Aristotle’s. Sternberg did not copy Aristotle’s system, but arrived at it by using the empirical methods of modern psychology. Thus, one reason for believing that Aristotle’s system has merit is that it has been independently verified by another investigator using different methods and in a very different era.

Sternberg (2000: 178) makes the sage observation that the similarity between his theory and Aristotle’s illustrates the importance of studying the history of psychology. “If both philosophical [analysis] and psychological analysis support an idea, the idea gains credibility by virtue of the overlap in substantive findings across methods of analysis. . . . Tigner and Tigner’s (2000) analysis shows how important it is to study the history and philosophy of psychology. There are many alternative paths to knowledge and understanding about the human mind.”

## Averroes (1126–98) and the Re-introduction of Aristotle into European Thought

Aristotle's works were not widely available to Christian European scholars in the period after the fall of the Roman Empire. However, many of Aristotle's writings remained accessible to Muslim scholars, who took a great interest in them. A notable example is **Averroes** (e.g., Arnzen, 2010), who was born in Córdoba, Spain. One of Averroes's concerns was to demonstrate that philosophical and religious thought were compatible. Averroes became famous for his commentaries on Aristotle, and he developed the reputation of being "the greatest Aristotelian of Islam" (Fakhry, 2004: 270).

Averroes did not simply take Aristotle's views and repeat them. Rather he gave some of them a distinctive twist. For example consider Aristotle's theory of the nature of the mind (Tornay, 1943) in terms of his distinction between *potentiality* and *actuality*, discussed earlier in this chapter. People are *potentially* able to do something before they *actually* achieve it. Thus, for example, we are potentially capable of an extraordinary variety of thoughts, only some of which we will actually have. Although Aristotle did not explicitly work out the relationship between potential and actual thoughts (Davidson, 1984: 176), Averroes tried to do so. Averroes argued that everyone has the same intellectual potential. This potential is shaped by one's *active intellect*, which can make "the potentially knowable . . . actually knowable" (Tornay, 1943: 281). Our active intellect can lead us to a greater understanding of ourselves and the world we live in.

When Christians conquered Spain, their scholars discovered a treasure trove of important works, including those of Averroes, whose work "was a fundamental part of the reintroduction and revitalization of [Aristotle] into European medieval thought" (Borrowman, 2008: 342). Among those who found food for thought in Averroes work was St Thomas Aquinas to whom we turn next.

## St Thomas Aquinas (1225–74) and the Medieval View of the Universe

During the Middle Ages, which lasted from about AD 500 until roughly the fifteenth century, Christianity became the dominant religion in Europe. One of Aristotle's most successful interpreters was the great Catholic theologian, **St Thomas Aquinas** (1225–74). Aquinas demonstrated that much of what Aristotle thought was consistent with a Christian world view.

### The *Scala Naturae*

Recall that Aristotle had differentiated between forms of life in terms of the powers that they possessed. Thus, plants had only the power of self-nutrition, animals had both self-nutrition and sensation, while humans were able to think in addition to the first two powers. Notice that this creates a *hierarchy* with humans at the top, followed by animals, and then plants. If all creatures "could be ranked on a unitary, graded, continuous dimension" (Hodos and Campbell, 1969: 338), one would have what has been called a **scala naturae**

(**scale of nature**). Aristotle conceived of this “natural scale” as a measure of the “degree of perfection” of each creature. “It is based on the ‘powers of the soul’ . . . from the nutritive, to which plants are limited, to the rational, characteristic of man . . . each higher order possessing all the powers of those below it in the scale, and an additional differentiating one of its own” (Lovejoy, [1936] 1971: 58).

The idea of a *scala naturae*, or **great chain of being** (Lovejoy, [1936] 1971: 73–7) was consistent with Catholic theology. According to Aquinas, “the universe is hierarchically arranged” with beings ordered “according to their internal perfection” (Wulf, [1922] 1959: 62). A representation of such a hierarchy is shown in Figure 2.9. In this



**Figure 2.9** The scale of being, beginning with plants, through trees, animals, to angels and finally God.

Source: Lull, R. 1512. *Liber de ascensu et descensu intellectus*. Reproduced in Yates (1996: 180).

system, “reality mounts step by step from one specific nature to another, following a certain definite order. . . . Things evolve . . . in a certain order, the investigation of which is the work of the particular sciences, and calls for patient observation. If there are any leaps in nature, they are never capricious” (Wulf, [1922] 1959: 72). The great chain of being illustrates God’s plan, as described in the following quotation from Aquinas (Pegis, 1948: 260–1):

Hence we must say that the distinction and multitude of things is from the intention of the first cause, who is God. For he brought things into being in order that His goodness might be communicated to creatures, and be represented by them. And because His goodness could not be adequately represented by one creature alone, He produced many and diverse creatures, so that what was wanting to one in the representation of the divine goodness might be supplied by another. For goodness, which in God is simple and uniform, in creatures is manifold and divided; and hence the whole universe together participates in the divine goodness more perfectly, and represents it better, than any given single creature. And because the divine wisdom is the cause of the distinction of things, therefore Moses said that things are made distinct by the Word of God, which is the conception of His wisdom; and this is what we read in *Genesis* (i. 3, 4): *God said: Be light made. . . . And he divided the light from the darkness.*

It is impossible to overestimate the importance to Western culture of this religious conception of the evolutionary process. Some of its main features and tenets include the following:

- Creatures are ordered hierarchically, reflecting God’s purpose.
- Nothing in this plan is “capricious” (that is, occurring merely by chance). Rather, everything and everyone has a place in a purposeful order that culminates in God.
- This view of nature is consistent with what we are told in the Bible, which is an irrefutable source of knowledge.

This view of the world as a hierarchically arranged and purposefully ordered system, with God at its apex and humans as the most God-like creatures, lasted in Western culture for hundreds of years. The stability of the medieval system was first shaken by the coming of the Renaissance in the fifteenth century. And when Darwin presented his theory of evolution in the nineteenth century, the religious world view faced its most serious challenge. We will examine the dispute between traditional theology and Darwinian evolutionary theory in Chapter 3.

In spite of challenges to its veracity, the great chain of being is still an influential model of morality that people continue to use in everyday life. Brandt and Reyna propose a “social-cognitive chain of being” consisting of “a vertical moral continuum that ranges from the most immoral and evil of social targets to the most virtuous and good” (2011: 429). Individuals vary a great deal in terms of the targets they place high or low on this scale. However, it may well be that most people still use such a scale in order to evaluate themselves and other people. If so, then versions of the great chain of being live on in the ways in which we make moral judgments.

---



---

## Questions for Reflection

- Outline the Pythagorean cosmology. In your answer consider the nature of harmony and the Pythagorean opposites.
  - Discuss the Platonic theory of innate knowledge, paying particular attention to the doctrine of anamnesis. How does Socrates' interaction with the boy in the *Meno* illustrate Plato's theory of knowledge?
  - Outline Aristotle's psychology, paying particular attention to his theory of memory and the laws of association.
  - Discuss the *I Ching* as an illustration of Taoist ideas.
  - Suggest a way in which Pythagoras and Plato are similar but different from Lao-tsu. Then, suggest a way in which Pythagoras and Lao-tsu are similar but different from Plato. Finally, suggest a way in which Plato and Lao-tsu are similar but different from Pythagoras.
- 
- 

## Important Names, Works, and Concepts

### Names and Works

Aristotle  
 Averroes  
 Confucius  
*I Ching*  
 Jung, Carl G.  
 Kepler, Johannes  
 Lao-tzu

Leibniz, Gottfried Wilhelm  
 Plato  
 Pythagoras  
 St Thomas Aquinas  
 Socrates  
*Tao Te Ching*

### Concepts

action versus motion  
 artificial memory  
 circumplexes  
 Confucianism  
 cosmology  
 cyclical change  
 forms  
 Galen's typology  
 gestalt  
 golden section  
 great chain of being  
 innate knowledge  
 laws of association

memory  
 mnemonic techniques  
 Platonism  
 potentiality and actuality  
 problem of the irrational  
 psyche  
 Pythagorean opposites  
*scala naturae*  
 syllogism  
 Taoism  
 teleological explanations  
 union of opposites  
 yang and yin

## Recommended Readings

### Pythagoreanism

A fascinating collection of writings pertaining to Pythagoreanism is K.S. Guthrie, *The Pythagorean Sourcebook and Library* (Grand Rapids, Mich.: Phanes Press, 1987 [1920]). D.J. O'Meara presents a thorough review of the influence of Pythagorean mathematical ideas in *Pythagoras Revived: Mathematics and Philosophy in Late Antiquity* (Oxford: Clarendon Press, 1987). If you wish to explore the cultural context and influence of Pythagorean ideas, consult P. Kingsley, *Ancient Philosophy, Mystery, and Magic: Empedocles and Pythagorean Tradition* (Oxford: Clarendon Press, 1995).

### Plato and Platonism

For additional examples of the ways in which Platonic ideas have been used by psychologists, see R.B. MacLeod, *The Persistent Problems of Psychology* (Pittsburgh: Duquesne University Press, 1975) and L. Stevenson, *Seven Theories of Human Nature* (New York: Oxford University Press, 1974), both of which contain accounts of Plato's psychology, as well as reviews of many of the other figures we will consider in this book. More on the implications of the doctrine of the golden mean may be found in T.J. Tracy, *Physiological Theory and the Doctrine of the Mean in Plato and Aristotle* (The Hague: Mouton, 1969).

### Taoism and Eastern Thinking

G. Murphy and L.B. Murphy, *Asian Psychology* (New York: Basic Books, 1968), is a compendium of sources on Asian psychology that provides a thorough introduction. An appreciation of Taoism is perhaps best gained through exposure to its art. A good beginning source is P. Rawson and L. Legeza, *Tao: The Chinese Philosophy of Time and Change* (London: Thames and Hudson, 1973), a copiously illustrated overview of Taoism. Taoism as

a contemporary religion is presented in J. Lagerwey, *Taoist Ritual in Chinese Society and History* (New York: Macmillan, 1987), and its centrality to Chinese culture is thoroughly considered in Z. Bokun, "Daoist patterns of thought and the tradition of Chinese metaphysics," *Contemporary Chinese Thought* 29 (1998): 13–71.

An investigation of the enormous range of Eastern psychology is beyond the scope of this book. In particular, the teachings of Buddha (566–480 BC) have intrigued many psychological thinkers. There are different varieties of Buddhism, and D.T. Suzuki, *Zen Buddhism: Selected Writings of D.T. Suzuki*, ed. W. Barrett (Garden City, NY: Doubleday, 1956), offers a good introduction to one strand. Good examples of the way Buddhism has influenced psychology are provided by E.H. Rosch, "Is wisdom in the brain?," *Psychological Science* 10 (1999): 222–4, and F.J. Varela, E. Thompson, and E. Rosch, *The Embodied Mind* (Cambridge, Mass.: MIT Press, 1991).

### Aristotle, Averroes, and St Thomas Aquinas

A thorough outline of Aristotle's approach to psychology is in D.N. Robinson, *Aristotle's Psychology* (New York: Columbia University Press, 1989). Aristotle's role as an early predecessor of contemporary psychology is explored by C.D. Green, "The thoroughly modern Aristotle: Was he really a functionalist?," *History of Psychology* 1 (1998): 8–20. A useful introduction to Averroes is by H.C. Hillier, "Ibn Rushd (Averroes) (1126–1198)," *Internet Encyclopedia of Philosophy*, 2010. Retrieved from <http://www.iep.utm.edu/ibnrushd/>. An interesting treatment of Aquinas's psychology is by M. Garcia-Valdecassas, "Psychology and mind in Aquinas," *History of Psychiatry* 16 (2005): 291–310. The development of Aquinas's thought in the late nineteenth and twentieth centuries is described by R. Kugelman, "Neoscholastic psychology revisited," *History of Psychology* 8 (2005): 131–75.