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PART ONE

Significant Ideas

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Conscious and Unconscious



A shadow on a wall, of the kind Plato described in his parable of people in a cave who see such shadows rather than reality.

Though the mind is usually thought of as conscious, there are three kinds of unconscious knowledge. One, proposed by Plato, is that in this world, we are unconscious of eternal truths. Another, proposed by Sigmund Freud, is that aspects of ourselves that are unacceptable have become unconscious but can still affect our perceptions of others and our actions toward them. A third, proposed by Hermann Helmholtz, is probably the most important. It is the principle of unconscious inference: we project

inner understandings, implicit theories, to infer what goes on in the physical world, and in the social world of our interactions with others.

Plato's Cave

It is tempting to think that what we see is real. But what if the mind doesn't work by taking in reality? What if our minds depend in part on movements of which we are not conscious? What if some of these movements are not entirely about what's out there, but come from inner processes, in a way that affects what we see and know?

To invite us to think about this, Plato asked us to imagine that we are prisoners chained to a bench in a cave where we have been since childhood. Our necks are fastened so that we can look only straight ahead. In front of us, on a wall, we see people passing back and forth. This, said Plato, is the human condition. We can't turn around to see that behind us is a large fire that is casting shadows of people onto the wall. We think the shadows are reality.

Now suppose that we are freed. We turn around and look at the fire. Now we see actual people as they walk past, and see other prisoners still shackled. Imagine being taken up a steep ascent, out of the cave and into the light. At first we are dazzled, unable to distinguish much, but then we start to see the world as it is.

The Republic, published nearly 2,400 years ago, in which Plato wrote about the cave, was a significant moment in the history of psychology. Are shadows in a cave what we experience of the world?

With his metaphor of the cave, Plato reached a turning point.¹ He suggested that although, in the world, we seem to experience truth in what we see, and seem to know what we are doing, other processes are at work. Plato was suggesting that we don't know some of the most profound things about the world. They can't be seen in the ordinary way.

Plato thought that before we were born we lived on another plane, as souls in the realm of ideals. Although—as Plato

thought—in our souls we once knew unchanging truths, in our embodied lives we have forgotten them. Now we see only appearances, shadows onto which we project our beliefs, which are sometimes false. Ideals can, however, be drawn out from us by insightful teachers: the word “education” means to “bring out” or “lead forth.” In the history of education, the path out of the cave has come to include philosophy and mathematics, and the acquisition of skills of constructing theories and drawing inferences.

Other questions are not about the physical world but, because we humans are social beings, about our understanding of the social world. How do we know what other people are thinking and feeling? We can wonder to what extent other people are similar to us, to what extent they are different. What if we ask them what they think and feel? Might our impression of them derive in part from what they say, and in part from passing shadows on their faces as they make emotional expressions and speak in certain tones of voice? And what about ourselves? We think we know our own thoughts and memories. But do we really know ourselves?

Plato thought the question of how one can know one’s own self was even more difficult than ascending from the cave into the light of the physical world. In his time, an injunction was written at the shrine of the Oracle in Delphi: “Know yourself.”² Plato offers a thought about this in a story of how Socrates was one day walking by a river with his friend, Protagoras, discussing the myths that had been told about the beautiful place where they were. Socrates said it would take a lot of work to understand myths, and that he didn’t have time for it, because, he said: “I’ve not yet succeeded in obeying the Delphic injunction to ‘know myself.’”

Alfred Whitehead wrote that Western philosophy is “a series of footnotes to Plato.”³ But not everyone agrees. The innovative philosopher Karl Popper rejected some of Plato’s main arguments, saying Plato was an enemy of open society. In *The Republic*, Plato’s account of the ideal society, he has organized people into three classes: guardians (rulers), auxiliaries (warriors), and artisans (producers). Only the guardians are free.

Although the form in which Plato wrote his philosophy was the dialogue—a fictional mode in which he imagines the long-dead Socrates discussing issues with acquaintances—he wants to ban writers of fiction from society entirely. Is it an oversight that he didn't point out that his idea of shadows in a cave is neither philosophy nor mathematics? It's a story based on a metaphor, the kind of story a fiction writer might offer. In chapter 17 we come to modern findings of how fiction can enable us to deepen our understandings.

How can we know other people? How can we know ourselves? The modern approach to understanding the mind is cognitive science: understanding mind as the making of meaning. "Cognitive" means having to do with knowledge. The mind makes meaning by organizing and working with knowledge, by making inferences, conscious and unconscious, to see, to remember, to converse, to know others and ourselves. In this quest, cognitive psychology and cognitive neuroscience come together with linguistics, cultural anthropology, philosophy, and other areas of research (see Ulric Neisser's *Cognition and Reality*, Howard Gardner's *The Mind's New Science*, Michael Eysenck's *Dictionary of Cognitive Psychology*, Robert Wilson and Frank Keil's *Encyclopedia of the Cognitive Sciences*, and Morton Hunt's *The Story of Psychology*).

Not all our knowledge can be accessed consciously; some of it is unconscious. It's of three kinds, and three methods are involved in reaching it. For Plato, the methods were philosophy and education. In the next section, the means are those of psychotherapy. In the sections following that, they are of psychological research and theory.

The Freudian Unconscious

The most famous kind of unconscious is psychoanalytic, as proposed by Sigmund Freud. The method he chose now seems obvious, but before his time it was not. Then, most often, doctors

would observe people who were mentally ill, see that they would often seem strange, and infer that this signified their insanity. The way Freud worked was different. He listened to what people said as they talked about themselves. He called this listening with “evenly suspended attention.”

Freud was not the only one in his time to be thinking about the unconscious in relation to mental illness, but he was a detective of the mind who asked: Who are we? At the center of his ideas is the suggestion that we humans are not always conscious of our reasons for doing what we do. His research affected the very texture of thinking about the self. It became, as W. H. Auden said in a poem to commemorate Freud, “a whole climate of opinion.” Concepts such as the unconscious, neurosis, inner conflicts, anxiety states, and psychotherapy acquired the meanings they now have largely through his influence.⁴

Sigmund Freud was born in 1856 in a small town called Příbor, which is now in the Czech Republic.⁵ A few years later his family moved to Vienna, where Freud spent most of his life. He attended the University of Vienna and qualified as a doctor in 1881. Soon after this he met Martha Bernays, with whom he fell deeply in love. The frustration of the couple’s four-year engagement may have contributed to Freud’s emphasis on sexuality as a central aspect of mental life. Sigmund and Martha had six children, the youngest of whom, Anna, also became a famous psychoanalyst. In May 1938, Freud, with his family, fled from the Nazis to London, where he lived until his death in September 1939.

Dora’s Case

Freud made the case study central to our understanding of human emotional disorders. In his hands it took the form of a detective story; the culprit being sought was a set of intentions that had gone missing from the patients’ conscious experience.⁶ The most important of Freud’s cases was that of Dora. Her real name was Ida Bauer.⁷

It's 1899. Dora is aged eighteen. She is depressed, and has other nervous complaints. Her parents have found a suicide note in her writing desk. Freud describes her as: "in the first bloom of youth, a girl of intelligent and engaging looks." Freud is aged forty-four, hoping at last to make a name for himself. He sees Dora for an hour every weekday.

Freud says that he began treatment by asking Dora "to give [him] the whole story of [her] life and illness." Then he writes, "As a matter of fact the patients are incapable of giving such reports about themselves . . . their communications run dry, leaving gaps unfilled, riddles unanswered." What is left out—the very matters that the psychological detective is seeking—are the patients' desires and intentions. Some of them are unknown to the patients. They are unconscious. It would be their discovery, to fill gaps in their stories, which would free the patients from disabling disorders.

Freud points out that although Dora is vague about herself, she gives a detailed account of an affair her father was having with a family friend, Frau K. At the same time Dora said that her father had encouraged Herr K to take an interest in herself, when she was only fourteen. This enabled Dora's father to pursue his affair with Frau K. Without denying anything she says, Freud asks Dora whether she may also be reproaching herself in the same way that she is reproaching her father. What is her involvement?

This is a psychoanalytic interpretation, a tentative filling-in of a gap left by the patient. For Dora, Freud's interpretation introduces a new development. She admits that Herr K had sent her flowers every day for a year, spent much of his spare time in her company, and that she felt enlivened by the relationship. She had looked after the Ks' children so that her father and Frau K could carry on their affair. She says Herr K even made her a proposal of marriage. Dora utters a crescendo of reproaches against her father. She has ended things with Herr K, and she tells Freud that she had demanded that her father end his affair with Frau K. Nothing enrages her more than her father's insistence that Herr K's proposal was just her imagination.

Then, one day, after three months of therapy, Dora tells Freud that this would be the last time she would see him. Freud asks her how long ago she had decided this. She tells him that it was two weeks. “That sounds just like a maidservant or governess—a fortnight’s notice,” says Freud.⁸ In this leap of intuition, Freud the mind-detective had found the right clue. This interpretation—for that is what it is—would clear up the case.

In response to this interpretation, Dora tells Freud that, on a holiday with the K family, the Ks had a governess who gave a fortnight’s notice of leaving. She had confided in Dora that Herr K had made advances and had sex with her. He’d said to the governess that he got nothing out of his wife. Freud says: “These are the very words he used afterwards when he made his proposal to you.” He suggests to Dora that the reason she was so incensed was that Herr K was treating her as he had treated the governess, as someone with whom he could have casual sex.

Freud explains to Dora that she had been hoping that Herr K would divorce his wife and marry her. At the same time, her father would be able to marry Frau K. That is why Dora had been outraged at her father thinking the proposal from Herr K had been just her imagination. She had been caught up in her idea of marriage to Herr K. But when the proposal came it was horribly transformed by what the governess had told her.

Freud added that, as he explained this, Dora had “listened to [him] without her usual contradictions.”⁹ She seemed to be moved.” We might reflect that for Dora what had been at issue was not just her sexual desire, but her whole life. Dora felt moved, perhaps because for the first time she felt understood by another person.

With the two weeks’ notice that Dora gave to Freud, he inferred that she was both treating him like a governess or maidservant and dumping him in the way she had dumped Herr K. He called this process, of patients feeling and acting toward him in ways they had felt and acted toward people in their day-to-day lives, “transference,” attention to which is another distinctive feature of psychoanalytic therapy.

Controversy and Advance

When Freud's theories were mentioned at a congress on neurology and psychiatry in 1910, one professor who was attending it banged "his fist on the table" and said: "This is not a topic for discussion at a scientific meeting; it is a matter for the police."¹⁰ A minor industry has grown up to show how wrong Freud was. Although Freud said that Dora's problems arose from driving her sexuality underground because it was unacceptable to her, Adolf Grünbaum has argued that Freud was never able to show that patients became psychologically ill because they had buried painful events in their unconscious. Some painful events may be lost to us, said Grünbaum, but others stay for decades sharply in our memories, and Freud was never able to say which would be which.

Why is there such antipathy toward Freud? Is it because Freud was merely wrong about certain things?¹¹ Or is it because he became famous, and even popular? Or is it because his proposals about our inner selves are unacceptable?

Freud had his own anxieties about his approach, and wrote: "it still strikes me myself as strange that the case histories I write should read like short stories and that, as one might say, they lack the serious stamp of science."¹² Freud is teasing us. "No," we're supposed to say. "It really is science, but because we are human beings it has to be different from chemistry or physics."

It's usually easier to see what is wrong with a piece of research or a line of thinking, such as Freud's, than to do it better. Among those who made new advances from Freud's beginnings were Carl Jung with his idea of archetypes and the collective unconscious, which affect everybody and underlie mythologies, and Melanie Klein, who was among the first to observe and analyze young children. Important, too, was Karen Horney. In 1930, she and her three daughters emigrated from Berlin to the United States, and lived in Brooklyn. Rather than accepting Freud's views of the critical function of the sex drive, Horney proposed

that among our most pressing aspirations are the need to feel loved and to feel approved of. She developed the idea, too, of reaching understandings that enable us to practice therapy on ourselves.

In *Self-Analysis*, she invites us to imagine we work for a boss, a woman who is attractive and complacently self-admiring, who is arbitrary, who favors others unfairly, who becomes hostile when she senses any critical attitude toward her. Imagine we need the job. More or less consciously we are careful never to criticize, we make sure any good ideas we have are put in a way that enables her to think they're her own. Privately we would resent having to bootlick. With a different boss, we would be different.

Now imagine this person is our mother. Horney describes a patient, Clare, whose mother was like this boss. Clare had a brother who was treated far more affectionately than she was.¹³ Her father was no help to her because he admired his wife and focused his attention on her although she openly despised him. Clare was unable to develop self-confidence. She felt she was unlikable, and that everything that went wrong was her fault. It was safer to join the ranks of admirers. She hoped in this way to receive at least a little affection. Because she started this when she was young, unlike what one might do with a boss, she did so more or less unconsciously. In *Self-analysis*, Horney focuses on how Clare dealt with her mother. She takes up the idea of the case history, but appeals to us to develop our own self-awareness and ask whether anything of this kind is recognizable to us. What do we know of the personalities of our parents, and how have we dealt with them? Do we need to feel loved and approved of?

Here, in a modern translation by Daniel Ladinsky, is how the Persian Sufi poet Hafiz put it some 650 years ago, in a poem called "With that moon language."¹⁴

Admit something:

Everyone you see, you say to them,

"Love me."

Of course you do not do this out loud,
otherwise someone would call the cops.
Still, though, think about this,
this great pull in us to connect.

Psychological Experiments

The case history remains at the center of research on psychotherapy, but when Freud started to write up his cases toward the end of the nineteenth century, other pioneers had been doing psychological research of a different kind, and these would lead to a different kind of understanding of the unconscious: an understanding that our minds depend on many millions of processes, which enable us to be who we are, but of which in our day-to-day lives we are unaware.

The new kind of psychology is said to have begun in Leipzig where, in 1879, an experiment was conducted in the first psychological laboratory by Wilhelm Wundt. It was to measure reaction time, the interval between an event and a person's response to it. Wundt wrote that, "by varying . . . external influences we arrive at the laws to which the psychic life is subject."¹⁵ Experimental psychology came to be founded on two principles: that any psychological measurement must have validity (it must be of something real), and that it must have reliability (it must be observable, and replicable, in a range of people). Comparisons were critical, for instance between people given one kind of external influence (in an experimental group), and others of a different influence (in a control group). Wundt insisted that in this way psychology was a science, like chemistry.

At least from the time of René Descartes, nearly four hundred years ago, the body has been thought of as a kind of machine, of which the brain is a part. Descartes knew the brain had chambers called ventricles that contain fluid. The way the nervous system works, said Descartes, is that when one's foot is burned by a fire,



Figure 1. René Descartes's illustration of reflex withdrawal from a painful stimulus. Source: Redrawn from Descartes' *Traité de l'homme* and uploaded to Wikimedia Commons: <https://commons.wikimedia.org/wiki/File:Descartes-reflex.JPG>.

as you may see in figure 1, the nerve cells in the foot pull invisible strings inside the nerves. The other ends of these strings are in the brain, where they open valves to let vital fluids into the nerves that run to the muscles, and inflate these muscles in such a way as to withdraw the foot. This is a reflex. It's still the mechanism that neurophysiologists accept today: a stimulus is picked up by receptors that send a message to the brain where, by a series of switches which are composed of neurons, an appropriate response is selected and produced: stimulus and response. The difference is that we now know the system works not by strings and hydraulics, but by electricity and chemical transmitter substances.

So how fast does a nerve impulse travel? Being electrical, does it travel at something near the speed of light? The answer, discovered by Hermann Helmholtz, was "No." It travels at about 30 meters

per second, slower than the speed of sound. Wundt had worked as an assistant to Helmholtz and under the influence of Helmholtz's measurement of the speed of nerve signals, it seems likely that Wundt conceived his experiment on measuring how long it takes to react to an event.

Hermann Helmholtz was born in 1821, in Potsdam, near Berlin.¹⁶ As a child he was sickly and spent a lot of time playing with a large set of children's building blocks, an activity that perhaps helped him develop his imagination. At the age of seventeen, he wanted to study physics. But his father was a high school teacher and not well-off. The young Hermann won a scholarship that paid for him to train at a medical-surgical institute in Berlin in return for working in the army. He went on to serve as an army surgeon for seven years. Somehow during this time he contrived to enjoy a vigorous academic life in Berlin, meeting and working with some of the foremost physicists and physiologists of his day. He published his medical thesis on how nerve cells are connected, and the conceptions he outlined are still those of our modern understanding of brain and mind.¹⁷

In the late 1850s, Helmholtz underwent a period of personal distress when his father died and not long afterward his wife, Olga, passed as well. This left him with two small children to look after. In 1861, he married Anna von Mohl, who did much to contribute to his life, and with whom he had three more children. Although Helmholtz's contributions to physics, physiology, and psychology were large and far-reaching, he was a modest person. In photographs he looks a bit formal, but people found him kind and trustworthy. His death may have been hastened by injuries to his brain, sustained when he fell down a ship's stairway. The accident happened in 1893, on his return from a visit to the Chicago World's Fair held on the 400th anniversary of Columbus's arrival in the New World. He complained of a lack of energy, and his mind would wander. In the following year he died of a cerebral hemorrhage.

Unconscious Inference

In the third volume of his *Handbook of Physiological Optics*, Helmholtz lays out his proposal of how we see the world. The eyes don't just pick up reality and relay it up the optic nerve into the mind. Helmholtz showed that input to the visual system occurs via an array of receptors in the two-dimensional sheets that are the retinae of our eyes. The task of the mind-brain is to take these two-dimensional arrays of neural excitations, and from them infer three-dimensional visual scenes of people to meet, objects to use, places to go.

Here is one of Helmholtz's verbal images:

A person in a familiar room which is brightly lighted by the sun gets [a perception] that is abundantly accompanied by very vivid sensations. In the same room in the evening twilight he will not be able to recognize any objects except the brighter ones, especially the windows. But what he does actually recognize will be so intermingled with his recollections of the furniture that he can still move about in the room with safety and locate articles he is trying to find, even when they are dimly visible. These images would be utterly insufficient to enable him to recognize the objects without some previous acquaintance with them.¹⁸

The mind's way of creating visual experience depends on what we now call cues—images or patterns on the retinae—which connect with conscious and unconscious knowledge and expectations, which we then project onto the world.¹⁹ The patterns on our retinae have been focused by the lenses of our eyes onto arrays of receptors that are specialized for being activated by changes of light. They transmit neural impulses to the brain.

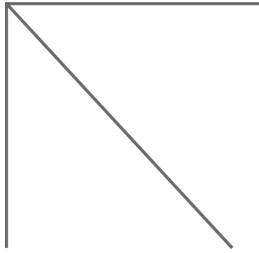


Figure 2. Three lines in a two-dimensional pattern that are a cue to a three-dimensional interpretation of a corner of a boxlike structure. *Source:* Drawn by Keith Oatley.

Look at the two-dimensional pattern shown in figure 2. The pattern of this figure on the retina can be thought of as a cue that connects with what we know innately or from learning. From this inner knowledge, we draw a conclusion from it about a boxlike structure that might be there, and project this conclusion onto the world.

A modern version of Plato's shadows in the cave is film.²⁰ *The Great Train Robbery*, first shown in 1903, is regarded as the earliest film to use modern editing techniques. Its first scene shows two masked robbers with guns forcing a telegrapher to send a message to stop a train. The second scene shows the robbers hiding behind a water tower as the train stops. In the third scene, the robbers kill the train's mail messenger. The scenes were shot separately, in a studio and on location. We see a sequence of enacted scenes edited together and onto them we project events of a story. When we watch the film, there are no robbers and no train: all that happens is that light flickers on a screen. Films and videos depend on the same kinds of processes by which patterns on the retinae enable us to see the world, because some of these processes in life and in movies are the same.

Hippolyte Taine, a French sociologist and art critic, wrote in 1882: "So our ordinary perception is an inward dream, which happens to correspond to things outside; and, instead of saying

that a hallucination is a perception that is false, we must say that perception is *a hallucination that is of the truth*.²¹ Had Taine written this forty years later, he might have added, “*and in film a hallucination that is of the story*.”

One kind of cue, in the ordinary world and in a movie, occurs when, at a spot on the retina, a sudden change of light intensity is registered by the receptors. This change is a cue that there’s been a movement. It also draws attention, and directs our eyes toward that place. The eyes move to fixate on it so that the image of the moving object is at the center of our vision.

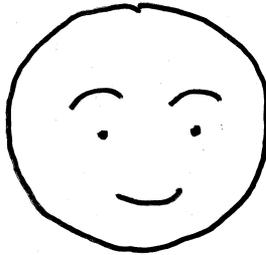


Figure 3. A cartoon which, despite its simplicity, is recognizable as a human face. *Source:* Drawn by Keith Oatley.

For a different kind of cue, consider an image of the kind you see in figure 3, which contains two dots that are not too far apart, with small semi-circles above each, and below them another small semi-circle, with this pattern surrounded by a circular line. It’s a cue to a human face: eyes, mouth, shape of a head. The fact that a cartoon can be so simple implies this pattern is significant for us. We project on to the pattern our knowledge of human faces.

Have a look, too, at figure 4, the Fraser Spiral, to see the effect of cues other than those that suggest a box or a human face. In each case a two-dimensional pattern, or cue, is picked up. In the mind-brain, each cue selects some inner knowledge of what might have given rise to it in the world: something significant, perhaps important.

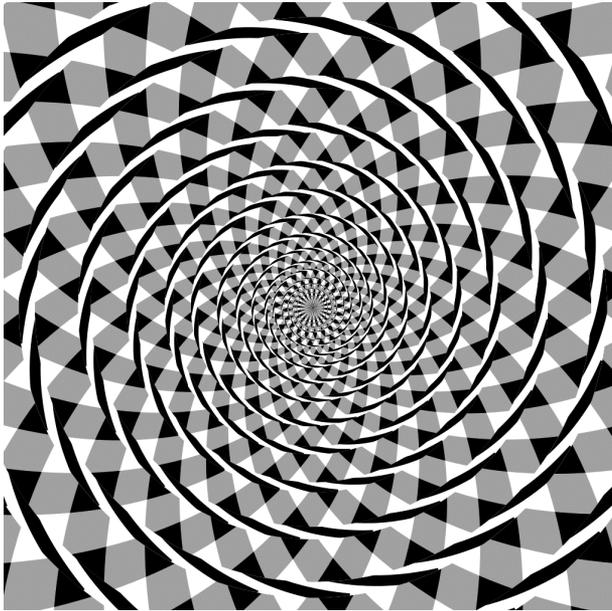


Figure 4. Frazser Spiral. Hermann Helmholtz proposed that a visual illusion shows us that the way in which we see the ordinary world and the way in which we see an illusion must share a common mechanism, and the illusion points us toward it. In this illusion, invented by James Fraser in 1908, we see a set of spirals. But if you trace each one around with the tip of a pencil, you discover the curved lines are not spirals but circles. The reason we see spirals is that the cues are line segments at an angle to the circumference of the circles. It is these line segments that invite us to project onto the image an understanding of spirals. *Source:* Fraser, J. (1908). A new visual illusion of direction. *British Journal of Psychology*, 2, 307–320. Image author, Mysid https://commons.wikimedia.org/wiki/File:Fraser_spiral.svg.

From Patterns and Cues to Perception

The brain uses visual cues to select mental structures that are then adjusted for size and orientation and manipulated in other ways, and then projected onto the world as conclusions: spatial layouts of things that we see. One could even say that Plato had it almost right with his metaphor of shadows in the cave. It's not quite shadows that we receive on the receptors of our reti-

nae, but it's something like shadows, flickering two-dimensional patterns.

Here's how the whole process works. If you hold a coin the size of an American quarter or a euro at arm's length, the size of that coin is about the area of the visual scene that can be seen in any detail. About 50 percent of the optic nerve and 50 percent of the visual cortex (the part of the brain that is devoted to analyzing visual input) is devoted to information from that small two-dimensional patch. The whole of the rest of the visual field is available only very vaguely. What happens is that we move our eyes to fixate on a patch of this size in the visual field, and during the fraction of a second when the eyes are steady—a fixation—a neural pattern from receptors in the retinae at the fixation point travels up the optic nerve: a small sample. Then the eyes move to pick up another small sample. If you look carefully you can see other people's eyes flicking from place to place. These movements occur two to four times a second; in each waking day we make some 200,000 of them.²² If, during an eye movement, a new event happens a bit off to one side, we can't notice it. Our eyes don't receive input during eye movements.

How different, then, is this detailed process of picking up visual information in these tiny samples from the seamless and steady sense of the world out there that we experience. If Plato's image of the people in the cave seemed far-fetched, what actually happens is even more remarkable.

We don't consciously experience our eye movements. We don't consciously experience the eye-brain's sampling of the visual field. We make constructions, by what Helmholtz called "unconscious inferences." We are conscious only of the conclusions of such inferences. The brain-mind takes small samples, is sensitive to patterns we call *cues*, and connects them with our inner knowledge, to construct three-dimensional visual scenes that we see.

The psychological principle is that we don't see directly, but rather by picking up cues that guide our understandings, which

we then project onto the world. We see our world in terms of how we can act in it. It's useful to us to see it as laid out in space so that we can move in it, and to see it as containing objects we can use, and people to meet. Our species is very social, and we are particularly good at seeing and recognizing other people. So it's in these terms that our visual conclusions are presented to us in our minds: the world as we find it.

Not everyone has been convinced of Helmholtz's theory of unconscious inference. For some, perception involves a more or less direct mapping of the kind Descartes described. A pattern in the world, a stimulus, elicits a pattern of motor action, a response. For instance, in 1960, Eleanor Gibson and Richard Walk found that human infants crawling toward a visual cliff—a visually salient drop in the ground in front of them, as occurs for instance at the top of a set of stairs—would stop and draw back from it. The pattern of the cliff was what Eleanor's husband, James, called an “affordance”: a visual stimulus for a response of a certain kind.²³ In chapter 5 we explore whether the mind-brain may work by this kind of direct stimulus-to-response mapping.

The kind of explanation of how we see, offered by Helmholtz and by Gibson, can be thought of in terms of process, of how visual perception derives from ongoing activities in our minds and brains. Another kind of explanation, that we come to in chapter 3 on evolution, is principally in terms of structure; in this case of how genes derived from our evolution give structure to our brains. As we go along in this book, you will see that process and structure interact. Often for a particular issue the one is taken as primary and the other as secondary.

In general, the path out of the cave isn't by way of philosophy and mathematics. The path of psychology suggests that the important kind of unconscious is less about unchanging truths of the physical world, more about truths we can discover, and reflect upon, of the worlds we know as human beings.

Since we humans are so social, one of our most fundamental kinds of knowledge is that of others, and of ourselves with oth-

ers. To know what another person is feeling and intending, we may have intuitions. To sense the effect we may have on another person, again we may have intuitions. If we follow Helmholtz, our intuitions derive from unconscious inferences and, of course, we may also make inferences consciously: “She said this, which implies that.” Inferences can be uncertain. One way forward is to discuss things with the other person, in conversation, which we address in chapters 6 and 14.