

## What Goes into the Mind and What Comes out of It

Earlier chapters have dealt with thinking and with knowing but not with the mind that thinks and knows.

In Part II, we considered productive thinking—the kind of thinking that is involved in the making of things. There we also considered the kind of knowledge needed for making—the kind we called skill or know-how.

In Part III, we examined practical thinking and practical knowledge—thinking about the means and ends of human action and knowledge of what is good and bad for us to seek, or right and wrong for us to do in the conduct of our lives.

Now, in Part IV, we will be concerned with theoretical thinking, thinking for the sake of knowing, not just for the sake of production or action. And we will be concerned with knowledge itself—with knowledge of the way things are as well as with knowledge of what we ought or ought not to do. Here for the first time we will consider what we know about the mind that thinks and knows.

Language plays a large part in human thinking and knowing. The words we use, according to Aristotle, express the ideas we think with. The declarative sentences we utter or the statements we make express opinions that we affirm or deny—opinions that may be either true or false.

When a statement we make happens to be true, it expresses knowledge. If it happens to be false, we have made an error. We cannot be in error about something and have knowledge about it at the same time. Opinions may be either true or false, correct or erroneous, but incorrect, erroneous, or false knowledge is as impossible as a round square.

Where do the ideas with which we think come from? It seemed obvious to Aristotle that we are not born with them in our minds—that they are somehow the products of our experience. That is why his account of human thinking and knowing turns first to the senses and to the experience that results from the functioning of our senses.

The senses are the windows or doorways of the mind. Whatever comes into the mind from the outside world comes into it through the senses. What comes into it may be words or sentences that other human beings utter. As everyone knows, we learn a great deal that way, certainly from the moment that our schooling begins. But learning does not begin with schooling. Nor does all our learning, even after schooling, involve statements made by others. Taking the human race as a whole, as well as human infants in every generation, learning begins with sense experience before the learners use words to express what they have learned.

In Aristotle's day, it was generally thought that we have five external senses—sight, hearing, touch, smell, and taste. The reason Aristotle called them external senses is that each involves

a sense organ on the surface of our bodies, there to be acted on by the outside world: sight results from the action on our eyes of things outside us, hearing from what outside acts on our ears, touch from what outside acts on our skin, smell from what outside acts on our nose, and taste from what outside acts on our tongue and mouth.

Modern scientific research has discovered that we have more than five senses and sense organs; for example, the sense organs by which we sense hunger and thirst within our own bodies and the sense organs by which we sense the motion of our limbs or the position of our bodies. But the exact number of senses and sense organs does not affect the account that Aristotle gives of the contribution that the senses and sense experience make to our thinking and knowing.

Each of the senses produces sensations only when its sense organ is acted on physically by something in the outside world. The senses are passive receivers that must be activated from the outside. Each of our sense organs is a highly specialized receiver. We cannot taste or smell things with our eyes; we cannot hear or see them with our tongues and noses. We are aware of colors through our eyes, of sounds through our ears, of odors through our nose, and so on.

Certain aspects of the world around us we can be aware of in more than one way. The size and shape of bodies we can see as well as feel by touch. We can see and hear the motion of bodies from one place to another, and we can even tell whether that motion is slow or fast.

Sensations of the various kinds just mentioned are the raw materials out of which our sense experience is formed. Though these raw materials come in separately from outside, through the channels of different sense organs, they do not remain separate, or isolated from one another, in our sense experience. The

world we experience through our senses is a world of bodies of various sizes and shapes, in motion or at rest, and related to one another in space in a variety of ways. Our experience of this world of bodies also includes a wide variety of qualities—the colors bodies have, the sounds they make, the roughness or the smoothness of their surfaces, and so on.

According to Aristotle, our sense experience is the product of perception on our part. The sensations we receive passively through our sense organs are merely the raw materials that we somehow put together to constitute the seamless fabric of our sense experience. In that putting together, we are more active than passive.

Sensation is input from the outside. But the sense experience that arises from our perception of that outside world involves memory and imagination on our part. It is composed of many elements, all having their origin in what our various senses take in, but transformed by the way they are put together to make up the whole that is the world we perceive.

If we describe any typical perceptual experience in words, we see at once that there is much more to it than the raw materials of sensation. For example, you perceive a big, black, barking dog chasing a tiger-striped, yellow cat down the street, and the cat runs in front of a blue automobile that screeches to a sudden halt. In that description of a sense experience, only a few words name visible or audible qualities sensed by the eye and the ear—the colors and the sounds. A dog and a cat, an automobile and a street, chasing, running, and suddenly slowing down to a halt—all these things that you perceive involve more than sensations received from outside.

When you perceive an object that you call a dog or a cat, or when you perceive actions that you call chasing or running,



your memory and your imagination are involved, especially if the dog you perceive is a stranger to you, while the cat is a familiar animal that you have seen around before. In addition, your understanding is involved. You have some understanding of the kind of animal that a cat is, different in kind from dogs. You have some understanding of what tigers are like, as indicated by your perception of the cat as tiger striped. You understand the difference between walking and running, between going fast and slowing down. If you did not understand all these things, you could not have had the perceptual experience that was described.

According to Aristotle, these various understandings that we have result from the activity of our mind, not from the activity of our senses. Our mind forms ideas of cats and dogs, of running and chasing. Ideas are based on the information that our senses receive from the outside world, but the ideas themselves are not received from the outside world. They are, according to Aristotle, the product of the mind's activity in its effort to understand the world we experience through our senses.

Just as we can sense things because they are capable of being sensed, so we can understand things because they are understandable. If the barking dog and the screeching car were not visible and audible, we could not see and hear them. Similarly, if the dog and the cat were not understandable as different kinds of things, we could not understand them as having different natures. In Aristotle's view, we apprehend the natures of cats or dogs by our idea or understanding of what a cat is or what a dog is, just as we apprehend the blackness of the dog or the blueness of the automobile by the visual sensations received by our eyes.

When a carpenter sets out to make a chair, he must have in mind an idea of the chair he wants to make. He must not only have an idea of chairs in general but also the more definite idea

of the particular chair he wishes to make. Working with these ideas and with pieces of wood as his raw material, the carpenter shapes those pieces of wood and puts them together so that they take on the form of a chair. The idea in the mind of the productive worker has become the form of the material he works on.

Living matter having a certain form is a cat. Living matter having a different form is a dog. When children learn to distinguish between cats and dogs and to recognize each when they see it, their perception of cats and dogs involves some understanding of the special nature of each of these two kinds of animals. That understanding consists in their having an idea of what a cat is and an idea of what a dog is.

In Aristotle's view, having the idea of a cat amounts to having in one's mind the form that is common to all cats and makes each cat the kind of animal it is. This leads him to say that, just as the hand is the tool of tools (the instrument by which we use other instruments), so the mind is the form of forms. Another way of saying the same thing describes the mind as the place where the forms that are in things become our ideas of them.

The mind forms ideas by taking the forms of things and separating them from the matter of things. Producing ideas is the very opposite of producing things. In producing things, we put the ideas that we have in our minds into things by transforming matter in accordance with our ideas. In producing ideas, our minds take the forms out of things and turn them into ideas whereby we understand the nature of the things that have this or that form.

Getting or producing ideas should also be contrasted with eating things. When we eat an apple, we take both its form and its matter into our bodies. The form without the matter would not

nourish us. The matter without the form would not be an apple. But when we get the idea of an apple, we take the form away from the matter of the apple. The action of our mind in doing so turns the form of an apple into an idea of the kind of fruit an apple is.

The ideas or understandings so far mentioned are ideas or understandings of objects that we perceive. They are the kind of objects that are present in our sense experience. They are also the kind of objects we can remember when they are absent. They are even the kind of objects that we can imagine, as we might imagine a cat or dog that we have never perceived, or dream of one that is strangely shaped or colored.

But when the mind starts producing ideas on the basis of sense experience, it does not stop with ideas that enable us to understand objects we can perceive, remember, and imagine. We can understand many objects of thought that we cannot perceive, such as good and bad, right and wrong, freedom and justice. We could not have discussed these objects in earlier chapters of this book if we did not understand them—if we had not formed ideas of them.

Thinking begins with the formation of ideas on the basis of the information received by our senses. Sensations are the input the mind receives from the outside world. Ideas are the output the mind produces as a result of what it receives.

Thinking goes further. It relates the ideas it produces. It joins them together, separates them, and sets one idea against another. By these further activities of thinking, the mind produces knowledge, not only knowledge about objects we can perceive, remember, or imagine, but also knowledge of objects that do not fall within our sense experience. Arithmetic, algebra, and geometry are good examples of such knowledge.

A sensation is neither true nor false. You simply have it, as when you sense the blackness of a dog or the blueness of an automobile. Even when your senses deceive you, as they often do, the sensation itself is neither true nor false. The dog, for example, may have been in shadows. In bright sunlight, it would have been seen by you as gray, not black. Your sensing it as black when it is in shadows is not false; but if, on the basis of that information alone, you *think* that it is black, you may be in error. The error is in your thinking, not in your sensing.

Every common noun and almost every adjective and verb in our language names an object of thought—an object we can think about because we have formed an idea of it. Not all the objects we can think about are objects we can also perceive, remember, or imagine. Dogs and cats, for example, are objects that we can perceive, but we can also think about them when there are no dogs and cats around for us to perceive through our senses. In addition, we can think about the very small particles of matter inside the atom although our senses are unable to perceive anything so small, even with the help of the most powerful microscope.

Like sensations, ideas are neither true nor false. If you and I were talking to one another, and I spoke the single word “dog” or the single word “cat,” you would not be able to respond by saying either yes or no. Let us assume for the moment that you and I had the same understanding of these words. What they meant for me, they also meant for you, because for each of us they expressed the same ideas. When I said “dog,” you and I thought about the same object. So, too, when I said “cat.”

Now suppose that when I said “cat,” I nodded or pointed in the direction of an animal in the room that started to bark at that very moment. You would immediately say, “No, that is not a cat, that’s a dog.” My uttering the word “cat” while nodding



or pointing to an animal that both of us were perceiving could have been spelled out in a sentence: "That animal over there is a cat." Your saying no could also have been spelled out by saying, "If you think that animal is a cat, you are in error. That statement you have just made is false."

We cannot be in error just thinking of cats or dogs any more than we can be in error when we see the dog standing in the shadows as black rather than gray. Only when we make some assertion, such as "That dog is black," does the question arise whether what we say or think is true or false. That word "is" must enter into our thinking, and along with it goes another word, "not." When "is" and "is not" enter into our thinking, we have passed from the level of just having ideas to the level of combining and separating them. Then we have reached the level where we are forming opinions that can be either true or false.

There are other words, such as "and," "if" and "then," "since" and "therefore," "either, or," "not both," that enter our thinking at a still higher level of thought. This is the level at which making one statement leads us to affirm another or to reject another as false.

Aristotle distinguishes among these three levels of thought in his account of how the mind operates to produce knowledge. From the raw materials of sense experience, the mind forms ideas. Ideas in turn are the raw materials out of which the mind forms judgments in which something is affirmed or denied. As single ideas are expressed in speech by single words or phrases, so judgments are expressed by sentences—declarative sentences in which the words "is" or "is not" occur.

The third level Aristotle calls reasoning or inference. Only when one statement becomes the basis for asserting or denying

another statement does the mind move up to the third level of thought. At this level, thinking involves giving reasons for what we think. At this level, what we think may not only be either true or false, it may also be either logical or illogical.

Aristotle was a great logician. He founded the science of logic. He wrote the first book on the subject, a book that was the standard textbook for many centuries and that still exerts considerable influence. In the next chapter, we shall consider some of his basic rules for conducting our thinking in a logical manner.

Although logical thinking is better than illogical thinking, it does not always reach conclusions that are true. Aristotle pointed out that it is possible for the mind to hold opinions that are true without reaching them in a logical manner, even as it is possible for logical thinking to result in false conclusions. Hence after we pay some attention to what makes thinking logical or illogical, we shall have to consider what makes thinking true or false.