

Our Knowledge of the World

What kind of world do we live in? Physicists today generally describe it as a flux of energy that exists in different forms at different levels. Due to the limitations of our sense organs, our brains cannot know directly about all of the world's energy. Indeed, a relatively small part of the electromagnetic spectrum—that is, of the entire range of radiation—can stimulate our eyes. In other words, although we can hear or feel parts of it, we can't see a large portion of the spectrum. Electromagnetic energy covers a wide range of wavelengths, from extremely short gamma rays, having wavelengths of about a billionth of an inch, to the extremely long radio waves, which have wavelengths that are miles long. In fact, we can see very little of the electromagnetic spectrum.

Our ears also sense a limited range of the mechanical vibrations transmitted through the air. Similarly, although we can smell and taste certain chemical substances and feel the presence of some objects in contact with our skin surface, most of what occurs in our environment cannot be perceived by these senses either. In effect, the great flux of energy that physicists say exists is largely lost to our senses. We know about it only indirectly, through specially devised instruments that can detect radio waves, X-rays, infrared rays, and other energy forms that we can't directly experience.

What implications do these facts hold for our view of reality? If nothing else, they should make us wonder just how complete a picture of reality we have and how accurate our interpretation of it is. In *New Pathways in Science*, Sir Arthur Eddington addresses this issue:

As a conscious being I am involved in a story. The perceiving part of my mind tells me a story of a world around me. The story tells of familiar objects.

It tells of colors, sounds, scents belonging to these objects; of boundless space in which they have their existence, and of an ever-rolling stream of time bringing change and incident. It tells of other life than mine busy about its own purposes.

As a scientist I have become mistrustful of this story. In many instances it has become clear that things are not what they seem to be. According to the storyteller I have now in front of me a substantial desk; but I have learned from physics that the desk is not at all the continuous substance that it is supposed to be in the story. It is a host of tiny electric charges darting hither and thither with inconceivable velocity. Instead of being solid substance my desk is more like a swarm of gnats.

So I have come to realize that I must not put overmuch confidence in the storyteller who lives in my mind.

QUESTIONS

1. Undoubtedly, things are often not what they appear to be. But to say that is to imply another experience of things. Can we be sure that alternative experiences are any closer to how things are?
2. If a desk is indeed more like "a swarm of gnats" than a solid substance, what practical difference does that make in the way you live? Or is such a question irrelevant?

Source: Sir Arthur Eddington, *New Pathways in Science* (Ann Arbor: University of Michigan Press, 1959), 11. Reprinted by permission.