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What does it mean to be *living*? Humans, plants, and birds *are* alive; stones, sand, and clouds *are not*. But what are the fundamental properties that characterize living things and distinguish them from nonliving matter?

The answer begins with a basic fact that is taken for granted now but marked a revolution in thinking when first—*indeed!*—170 years ago. All living things (or organisms) are built from cells. Small, membrane-enclosed units filled with a clear or colorless liquid solution of chemicals and endowed with the extraordinary ability to create copies of themselves by growing and then dividing in two. The simplest forms of life are solitary cells. Higher organisms, including ourselves, are communities of cells derived by growth and division from a single founder cell. Every animal or plant is a vast colony of individual cells, each of which performs a specialized function that is essential to the overall system of cell-to-cell communication.

Cells, therefore, are the building blocks of life. Just as it is to study biology—the study of cells and their structure, function, and behavior—we must look for an answer to the question of what life is and how it works. With a deeper understanding of cells, we can begin to tackle the grand historical problems of life on Earth: its mysterious origins, its stunning diversity produced by billions of years of evolution, and its persistence in every conceivable habitat. At the same time, cell biology can provide us with answers to the questions we have about ourselves: Where do we come from? How do we develop from a single fertilized egg cell? How is each of us similar to—and different from—everyone else on Earth? Why do we get sick, grow old, and die?