The famous geneticist and co-founder of the modern theory of evolution, Theodosius Dobzhansky, published an article in this journal in 1973 with the title “Nothing in Biology Makes Sense Except in the Light of Evolution” (Dobzhansky, 1973). In that article he responded to religious attacks on the theory and defended its importance by noting how evolution explains the enormous diversity of life, its unity, and the myriad empirical facts of biology.

What does Dobzhansky’s dictum mean today? Most biologists would say that Dobzhansky had it correct: The theory of evolution is the central organizing theory of the life sciences. The theory explains the facts of biology, i.e., the theory tells us why the living world appears as it does. It gives us the answer to a number of interesting questions: Why do we observe so much diversity of life (750,000 named insects, 170,000 dicots, 12,000 nematodes, and 18,000 bony fish, for example)? Given the vast amount of biodiversity, why are so many chemical pathways (e.g., the Krebs Cycle) the same in otherwise greatly different organisms? Why is DNA found so widely as the genetic material? Evolution provides for us an understanding. It also addresses questions like, Why do organisms have highly specialized functions that permit them to live in hostile environments (hot springs), or in extraordinarily limited environments (like the nematode Panagrellus redivivus which lives in German beer coasters)? Biology is a truly amazing subject, and evolution helps explain why.

The theory of evolution similarly explains biological relationships. Why do we observe complex patterns of distribution among plants and animals? Why do some birds have limited ranges while others are cosmopolitan? The theory also relates bodies of scientific information. Subjects of study that utilize different methods, focus on different orders of magnitude, conceive of nature in different time frames, or in different spatial categories are unified by the theory of evolution. Paleontology, biogeography, physiology, ecology, systematics, embryology, genetics, and cytology are vastly different disciplines. Unlike the physical sciences, which are still searching for a plausible unifying theory, the life sciences have a single unifying theory that synthesizes...