Cover illustration
Fossilized limbs based on illustrations by K. Monoyios (Univ. Chicago, Illinois). Artwork by N. Spencer

Darwin200

EVOLUTION

The articles in this Insight testify to the success of Charles Darwin's theory of descent with modification by means of natural selection, carefully detailed in his book *On the Origin of Species* almost 150 years ago. The most striking aspect of the theory is its simplicity. Given heritable variation, a superabundance of offspring, and environmental change, natural selection must happen, and evolution will follow. The natural world can be explained without invoking pre-existing germs, essential life forces, the great chain of being, Ptolemaic epicycles or a prime mover.

This simplicity has meant that the theory has always accommodated new discoveries — the general theme of this Insight. In Darwin's day, nothing was known about genetics or the mathematical basis of natural selection. But such discoveries have only made the theory stronger.

Simplicity also makes for longevity. The theory of natural selection has had its ups and downs, but today we are not celebrating, for example, the 280th anniversary of the birth of the great experimental scientist Lazzaro Spallanzani. Why not? He saw in his results confirmation of the theory of preformation: that the essence of organisms is stamped in the egg, and all that is needed is for the pre-existing germ to unfold. This theory died with Spallanzani, overcome by better observation — and by a theory with no preconditions. No one subscribes to the theory of preformation now, whereas natural selection continues to evolve.

To be sure, Darwin's first ideas now seem dated, but he winnowed them over decades, stripping them of any archaic clutter to reveal a modern clarity of purpose on which biologists have continued to build.

So, as we toast the bicentenary of Darwin's birth today, we can be sure that Darwin's name will be familiar to our descendants (however modified) for centuries to come, whereas those of Spallanzani and many others — so great in their day — will succumb to the inevitable flip side of evolution: extinction.

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OVERVIEW

REVIEWS

nature insight