

# Why Dinosaurs Matter

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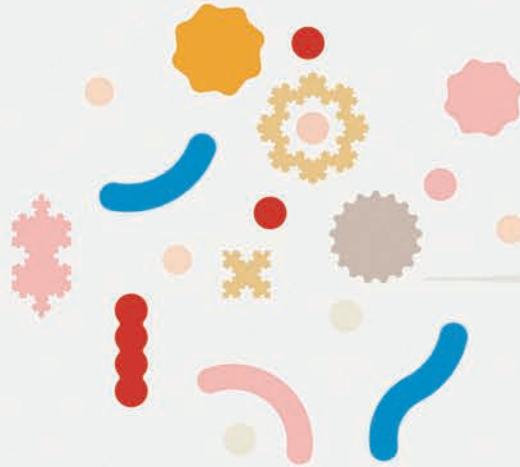
ILLUSTRATIONS BY MIKE LEMANSKI

Until now, you might have seen dinosaurs as cool comic-book characters, all gnashing teeth and thundering limbs, celebrated in children's fantasies and blockbuster movies but otherwise quaintly obsolete. The truth is far different.

Dinosaurs were finely tuned marvels of evolutionary adaptation. Old as they are, they are supremely relevant today. To study them is to be astounded by their physical virtuosity—and to gain valuable insights about endeavors as varied as flight, industrial design, and locomotion.



Evolution happens so incrementally that the beginnings of momentous transformations appear mundane. The events from which massive, history-shaping changes emerge often begin as tweaks so tiny that they're barely perceptible.



Imagine a world in which one side failed, or in which the split never occurred. Earth history is an endless collection of contingencies just like this.

Take us, for example. As different as we humans are from dinosaurs, we share a common origin. Some 320 million years ago, in the humid forests of the Carboniferous Period, a group of reptiles wandered away from their kin and started breeding separately.

At first, the two groups of evolving reptiles barely looked different. But given time—mind-bending amounts of geological time—one group would spawn the sauropsids and eventually dinosaurs. Much later, the other group would cleave again into the synapsids, which eventually led to you.





All of Earth's past comes to us in the form of rocks and the fossils they bear. For millennia we were blind to the vast histories contained in stone, blind to the fantastic creatures trapped in rock, just beneath our feet. The discoveries of deep time and the biological origin of fossils opened our eyes to billions of years of events that preceded us.

The world that we see today is only the latest version of our planet. Many past worlds have been our Earth. Each one leaves behind layers and clues for us to discover: a fossilized dinosaur femur here, the rocks of an ancient seafloor exposed on a mountaintop there. Each one fits within a story more grand than the mind can fathom, a story that stretches back beyond humans, beyond dinosaurs, beyond continents, even beyond life itself.



Only when we grasp the astonishing scale of deep time, revealed to us in the vestiges of countless antecedent worlds, do the clues reveal their meaning.

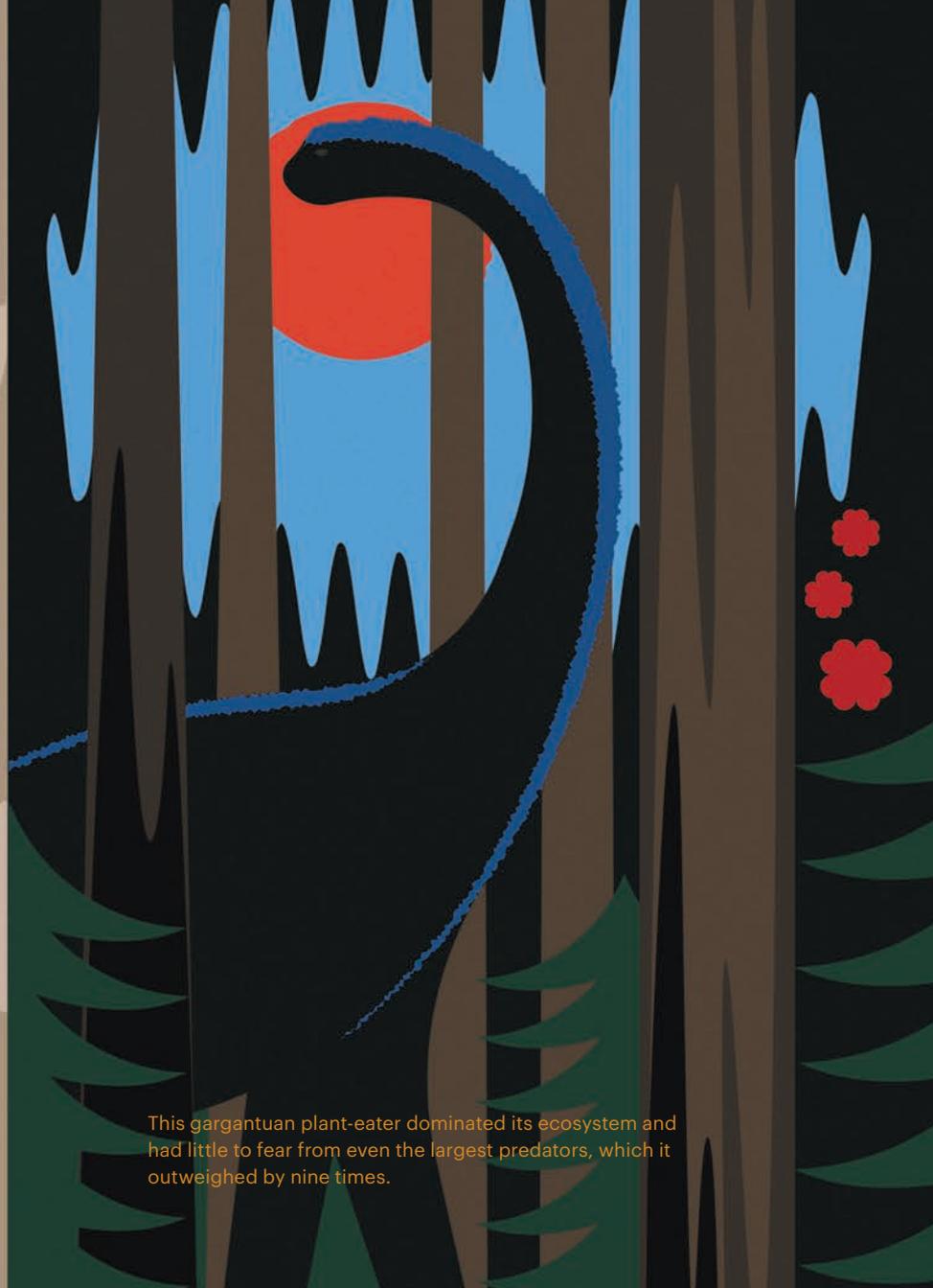


A stylized illustration of a Tyrannosaurus rex's right arm and hand. The arm is covered in dark brown, layered feathers that create a sense of texture and depth. The hand is shown in profile, with three distinct, dark, curved claws. The background is a light, neutral color, making the dark feathers stand out.

Tyrannosaurus rex, the most iconic of all dinosaurs, possessed the most powerful bite of any land animal in history. Counterintuitively, the key to its power hinges on those tiny, much ridiculed arms. Arm muscles, it turns out, compete with neck muscles for attachment space in the shoulder. A powerful bite requires a big head, which requires big neck muscles for support. It's a zero-sum situation—too much arm, not enough bite.

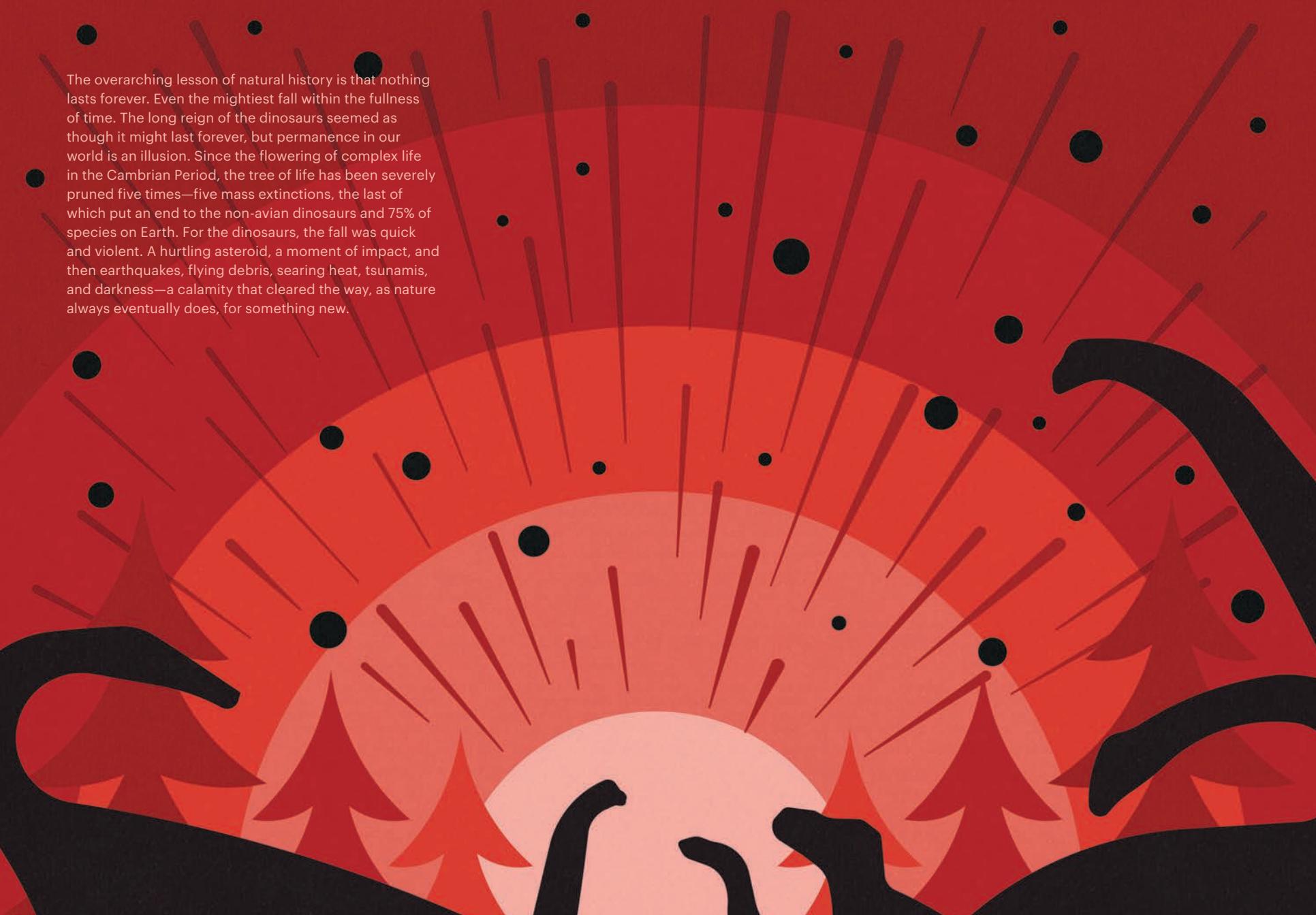


It took four austral summers in the whipping, frigid winds of Patagonia to free *Dreadnoughtus schrani* from the rocks. One hundred forty-five bones were recovered, which paint a picture of a beast eighty-five feet long, two-and-a-half stories at the shoulder, weighing an astounding sixty-five tons.



This gargantuan plant-eater dominated its ecosystem and had little to fear from even the largest predators, which it outweighed by nine times.

The overarching lesson of natural history is that nothing lasts forever. Even the mightiest fall within the fullness of time. The long reign of the dinosaurs seemed as though it might last forever, but permanence in our world is an illusion. Since the flowering of complex life in the Cambrian Period, the tree of life has been severely pruned five times—five mass extinctions, the last of which put an end to the non-avian dinosaurs and 75% of species on Earth. For the dinosaurs, the fall was quick and violent. A hurtling asteroid, a moment of impact, and then earthquakes, flying debris, searing heat, tsunamis, and darkness—a calamity that cleared the way, as nature always eventually does, for something new.



Dinosaurs matter, because the future matters. Among extinct creatures, they are not special in this regard. Every rock and every fossil has a tale to tell. Combined, they tell the story of our planet and are our guideposts into the future. Today, a sixth extinction is unfolding before our eyes. We are in the midst of it, but worse, we are the cause of it. We have become the asteroid of our age. The dinosaurs had no choice and played no part beyond dying in the unraveling of their world. This time, it's different. We can see it coming and we do have a choice. Armed with our knowledge of the past, can we rise to the challenge and secure our future?

