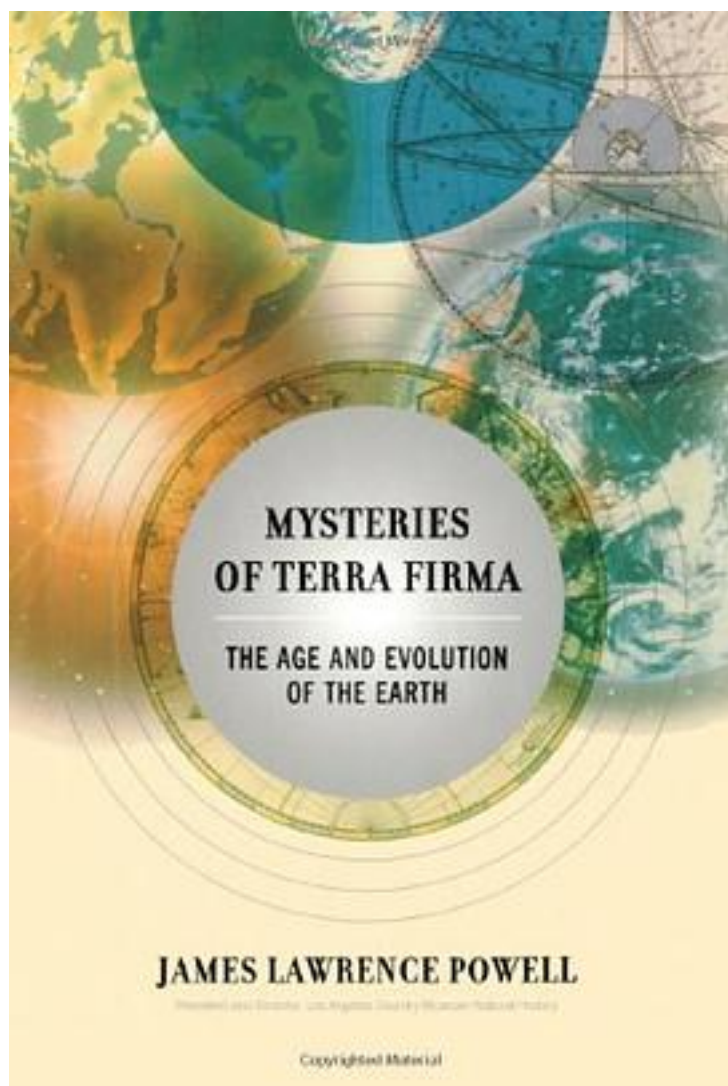


Mysteries of Terra Firma



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In *Mysteries of Terra Firma*, James Lawrence Powell tells an engrossing three-part tale of how we came to understand the ground on which we walk, and how that ground holds the key to the greatest secrets of deep space and time. Naming his profound stories Time, Drift, and Chance, he tells of the three twentieth-century revolutions in thought that created the amazing science of Earth -- and of all planets to the edge of the universe. The riddle that drove the first revolution is obvious and yet in 1904 remained impenetrable: how old is Earth? An encounter between the imperious Lord Kelvin and a New Zealand farm-boy-turned-physicist, Ernest Rutherford, set the stage for the solution and launched a golden century of geology. As a result, scientists learned that if the 4.5 billion years of geologic time were compressed into a single twenty-four-hour period, *Homo sapiens* would have arrived only in the last second. The geological Revolution of Time reveals how long the ground on which we walk has existed, and how briefly we have trod that ground. In the early twentieth century, German meteorologist and polar explorer Alfred Wegener proposed a counterintuitive, heretical theory: that terra firma is not so firm; instead of being fixed in place, continents drift. In 1926, petroleum geologists convened in New York City to discuss Wegener's radical idea, where it was met with outrage and skepticism: "If we are to believe Wegener's hypothesis we must forget everything which has been learned in the last seventy years and start all over again," one attendee said. Forty years later, a new generation did exactly that. The Revolution of Drift, the second part of Powell's narrative, showed us how the ground on which we walk moves. Throughout geologic time, meteorites have incessantly bombarded everything in the solar system. Far from serene and predictable, the planets are ruled by random violence on an unimaginable scale. Once a mountain-sized meteorite flew through space, struck the Earth, killed the dinosaurs and two-thirds of all species, and spared the small hamster-sized creature that happened to be our ancestor. The chance of that happening again is essentially zero. So, the final revolution in Powell's history of a golden century of geology is the Revolution of Chance. Simply put, this revolution in thought has transformed our understanding of how lucky we really are. If we can learn so much from considering no more than the rocks beneath our feet, what will we learn when we begin walking on other planets? *Mysteries of Terra Firma* is both charming in its storytelling and staggering in its implications. Discovering the ground on which we stand is a fascinating journey into our past -- and our future.

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