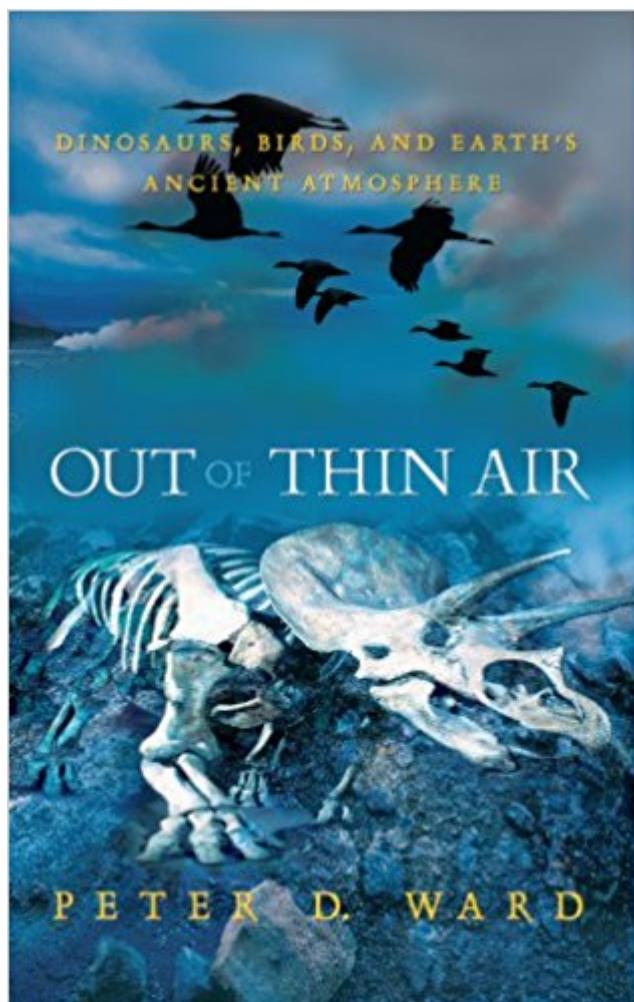


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# Out Of Thin Air: Dinosaurs, Birds, And Earth's Ancient Atmosphere



## Synopsis

For 65 million years dinosaurs ruled the Earth--until a deadly asteroid forced their extinction. But what accounts for the incredible longevity of dinosaurs? A renowned scientist now provides a startling explanation that is rewriting the history of the Age of Dinosaurs. Dinosaurs were pretty amazing creatures--real-life monsters that have the power to fascinate us. And their fiery Hollywood ending only serves to make the story that much more dramatic. But fossil evidence demonstrates that dinosaurs survived several mass extinctions, and were seemingly unaffected by catastrophes that decimated most other life on Earth. What could explain their uncanny ability to endure through the ages? Biologist and earth scientist Peter Ward now accounts for the remarkable indestructibility of dinosaurs by connecting their unusual respiration system with their ability to adapt to Earth's changing environment--a system that was ultimately bequeathed to their descendants, birds. By tracing the evolutionary path back through time and carefully connecting the dots from birds to dinosaurs, Ward describes the unique form of breathing shared by these two distant relatives and demonstrates how this simple but remarkable characteristic provides the elusive explanation to a question that has thus far stumped scientists. Nothing short of revolutionary in its bold presentation of an astonishing theory, *Out of Thin Air* is a story of science at the edge of discovery. Ward is an outstanding guide to the process of scientific detection. Audacious and innovative in his thinking, meticulous and thoroughly detailed in his research, only a scientist of his caliber is capable of telling this surprising story.

## Book Information

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## Customer Reviews

Mountain climbers struggling to breathe astride the 29,029 foot (8,848 meter) summit of Mt. Everest routinely see birds gracefully flying above them, engaging in nonchalant aerial acrobatics at altitudes where humans risk hypoxia (oxygen starvation) while standing still. The avian respiratory system is at least 33% more efficient than any mammalian lung. Birds combine lungs with an extensive system of air sacs - permitting a unidirectional airflow of 'fresh' air with a higher oxygen content. Mammals are saddled with bidirectional lungs that mix 'fresh' and 'stale' (carbon dioxide-laden) air. Since birds descended from dinosaurs - they are avian dinosaurs - what does this say about dinosaurian respiration, the world in which they evolved, and more specifically the atmospheric chemistry of the planet they came to dominate? "Out of Thin Air: Dinosaurs, Birds, and Earth's Ancient Atmosphere" by Peter Ward hypothesizes that the history of atmospheric and oceanic oxygen levels throughout geologic time has profoundly impacted the nature of animal life on Earth - everything from morphology (body plans) and physiology to evolutionary history and diversity - was contingent on oxygen levels which have varied radically over time. Ward, a paleontology professor at the University of Washington, and a NASA staff astrobiologist, is an expert in paleo-atmospheric chemistry and supports his claims with ample and compelling evidence. Earth's atmosphere presently consists of 78% nitrogen and 21% oxygen, the final 1% composed of various gases; carbon dioxide being the most notable and problematic. 4.54 billion years ago Earth's atmosphere was a hothouse dominated by carbon dioxide. Oxygen was so scarce that Iron could not rust.

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