



## Elemental: How Five Elements Changed Earth's Past and Will Shape Our Future

**Stephen Porder**

Princeton University Press (Sep 12, 2023)

Hardcover \$26.95 (240pp)

978-0-691-17729-8

Stephen Porder's science book *Elemental* examines the impact of five elements on Earth and its changing climate.

Chronicling billions of years of history through the framework of carbon, nitrogen, hydrogen, oxygen, and phosphorous, this is a unique view of how the climate crisis arrived. These elements, Porder shows, fueled single-celled cyanobacteria, proliferating across the globe and ending up causing environmental harm, putting the planet on the brink.

Covering the science of carbon cycles and showing how even small changes in temperature produce sweeping effects, Porder takes the time to explain considerable data to skeptics. He discusses how computer modeling works, why natural variations do not explain dramatic temperature rises, and how weather differs from climate. And this scientific information is made even more accessible because of Porder's engaging storytelling and views of different milieus like farms to illustrate what more sustainable alternatives could look like.

While noting the economic benefits that fossil fuels brought the world in the twentieth century, Porder also suggests less harmful and finite alternatives, including nitrogen. He explains the mechanics and impacts of past innovations, including nitrogen fertilizer, which changed the world by making it possible to feed billions of people, showing future possibilities. And a call to action concludes this work: Porder notes that human beings are a long way from mimicking trees and cacti in harnessing endless supplies of renewable energy. While acknowledging the lack of a perfect solution, he cautions that there is a race against time to avert catastrophe; he also observes that human beings know how to get to a better solution once they work through some of the technical logistics.

Porder's insightful and informative book *Elemental* approaches the climate change crisis via five elements, revealing a path to sustainability.

JOSEPH S. PETE (September / October 2023)

*Disclosure: This article is not an endorsement, but a review. The publisher of this book provided free copies of the book to have their book reviewed by a professional reviewer. No fee was paid by the publisher for this review. Foreword Reviews only recommends books that we love. Foreword Magazine, Inc. is disclosing this in accordance with the Federal Trade Commission's 16 CFR, Part 255.*