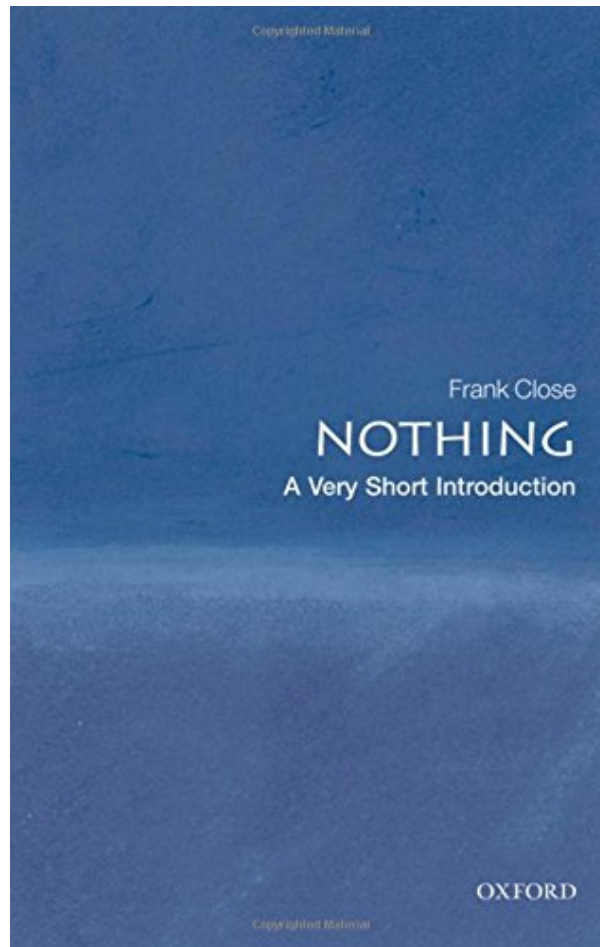
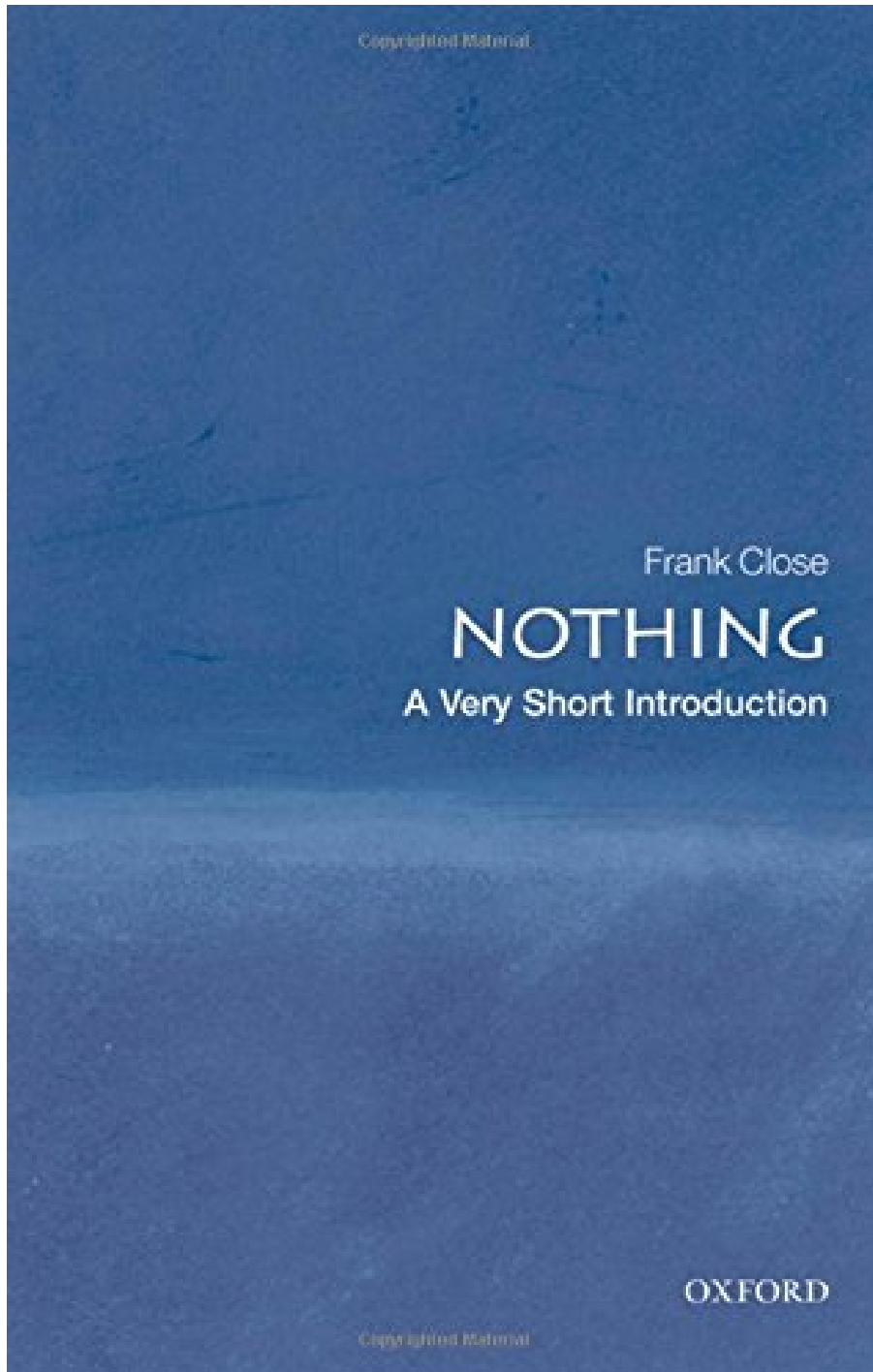


NOTHING: A VERY SHORT INTRODUCTION BY FRANK CLOSE



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Review

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About the Author

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This short, smart book tells you everything you need to know about "nothing." What remains when you take all the matter away? Can empty space--"nothing"--exist? To answer these questions, eminent scientist Frank Close takes us on a lively and accessible journey that ranges from ancient ideas and cultural superstitions to the frontiers of current research, illuminating the story of how scientists have explored the void and the rich discoveries they have made there. Readers will find an enlightening history of the vacuum: how the efforts to make a better vacuum led to the discovery of the electron; the ideas of Newton, Mach, and Einstein on the nature of space and time; the mysterious aether and how Einstein did away with it; and the latest ideas that the vacuum is filled with the Higgs field. The story ranges from the absolute zero of temperature and the seething vacuum of virtual particles and anti-particles that fills space, to the extreme heat and energy of the early universe.

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82 of 87 people found the following review helpful.

Nothing to read about here...

By ewomack

"Why are there beings rather than nothing?" This seemingly futile question has plagued everyone from philosophers, scientists and anyone who has stopped to reflect on our bizarre existence. Such reflection usually leads to a thought about the state of "nothing." And then the inevitable contradictory questions flow, such as "what would exist if there were nothing?" or "would something need to exist to verify that nothing exists?" And the neurons flap on and on until exhaustion or insanity set in. Apparently, the void sits on the edge of human cognition. Our moist brains have problems going there without falling into slippery logical contradictions. But why rely on logic for such questions? Why keep banging our heads against empty formalism? Frank Close's little dense book "Nothing: A Very Short Introduction" takes off with this very idea. After discussing his own personal confrontation with the void, the book shifts drastically from the philosophical to the scientific. A short history of the void/vacuum science follows, including Toricelli's 1643 experiment that created a vacuum, the Magdeburg Hemispheres that demonstrated the power of atmospheric pressure, and Pascal's trials with water and wine. People were finally creating and experimenting with, seemingly, "nothing." Scientific method, in contrast to pure reason, was able to make something of the void. But was the void really nothing?

To explore this question, the book embarks on a breakneck tour of the history of science. Though it seems to veer from the void in many places, it always returns to nothing. Those familiar with the basic history of Newtonian Mechanics, Relativity and Quantum physics will likely tread familiar territory. But those who don't know about the innards of an atom, the architecture of magnetic and electromagnetic fields, the inverse square law, the historic controversy over the ether, curved space time, the expanding universe, quantum uncertainty, pair creation, the Higgs vacuum, or just what that Large Hadron Collider in Switzerland is supposed to discover, will learn enough to say that a new conceptual world has opened. One of the more interesting ideas discussed involves the self-sustaining universe, in that the majority of the universe may only need a speck of energy (a gigantic quantum fluctuation) to exist nearly forever. The book's final chapter "the new void" once again waxes philosophic, but this time with 300 some years of science supporting the speculations. He begins: "Everything came from nothing" and "Modern physics suggests that it is possible that the universe could have emerged out of the vacuum." We may originate solely from an eruption from inflation. But what if more universes exist? Or more dimensions? Such questions may remain mere interrogatives until a marriage of quantum mechanics and relativity occurs. Or perhaps our human sensibilities weren't fashioned to contemplate the essence of creation? A final paragraph asks a deeper question, one asked of many religions: what brought the universe into existence? Or, to avoid latent anthropomorphism, why did it emerge? Or, as Close puts it, "I am still confronted with the enigma of what encoded the quantum possibility into the void." The book ends with an appropriate quote from the Rig Veda. Though we seem to know more than the toga-clad sky stargazers of previous millennia, each discovery seems to open new questions.

"Nothing" provides an introduction to far more than nothing. It aims some 2,000 years of speculation at the void. Some of the narrative will more than challenge the scientifically nescient, so perhaps the "introduction" in the subtitle slightly misleads. Nonetheless, those seeking to initiate or expand upon scientific knowledge will find that "Nothing" provides a fascinating background on which to explore such brain wrinkling concepts. This book may look flimsy and may even fly away in a strong breeze, but this belies the density of information it contains. Perhaps it goes a bit too deep in places, and this may prove frustrating to readers seduced by the word "introduction." In any case, persistence will pay off as the history of science unfolds from the void as we are simultaneously revealed through it. This book provides a weighty read that

bequeaths substance onto nothing.

40 of 41 people found the following review helpful.

Close observations of nothing will make you think

By Jay C. Smith

Nothing: A Very Short Introduction (Very Short Introductions)

If you are at all scientifically curious this little volume should be a pleasure to read, especially if you know you are not going to be tested on it. Frank Close presents complex subject matter in a manner that is understandable even if you don't have a physics degree. But "Very Short Introduction" does not mean superficial -- the concepts it deals with are quite dense after all.

It is mostly about particle physics and cosmology. Close constructs accessible explanations of, for example, the composition and behavior of atoms and sub-atomic particles, relativity, quantum theory, the Big Bang, and the theory of Higgs bosons.

His unifying theme involves the Aristotelian idea that nature abhors a vacuum, a notion that was not overturned (seemingly) until the seventeenth century. But it turns out that something is there after all, that all space is filled with energy.

Close renders the material (and energy) comprehensible through clear prose, reconstruction of helpful "thought experiments," enlightening metaphors, and a limited number of pictorial illustrations. For instance, he offers a graphic "mental model" of the uncertainty principle, one which I found very helpful. Yet he never lets the reader off the hook -- you will be required to think throughout.

This is publication number 205 in the Oxford "Very Short Introductions" series, which covers all manner of subjects. It is small and conveniently portable, but not unduly skimpy (I estimate about 43,000 words). An index makes it potentially useful as a reference book.

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