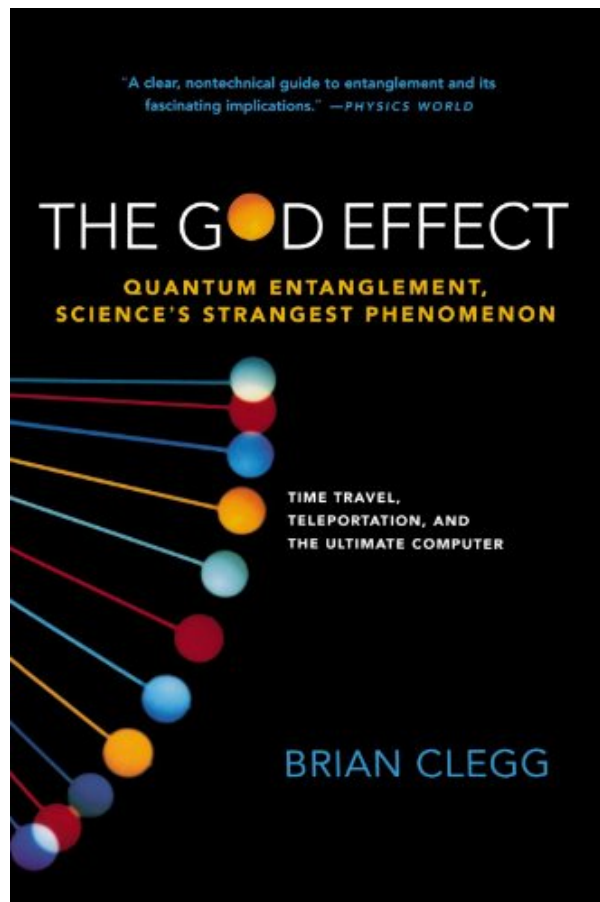


THE GOD EFFECT: QUANTUM ENTANGLEMENT, SCIENCE'S STRANGEST PHENOMENON BY BRIAN CLEGG



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"A clear, nontechnical guide to entanglement and its
fascinating implications." —*PHYSICS WORLD*

THE GOD EFFECT

QUANTUM ENTANGLEMENT,
SCIENCE'S STRANGEST PHENOMENON



TIME TRAVEL,
TELEPORTATION, AND
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From School Library Journal

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The phenomenon that Einstein thought too spooky and strange to be true

What is entanglement? It's a connection between quantum particles, the building blocks of the universe. Once two particles are entangled, a change to one of them is reflected---instantly---in the other, be they in the same lab or light-years apart. So counterintuitive is this phenomenon and its implications that Einstein himself called it "spooky" and thought that it would lead to the downfall of quantum theory. Yet scientists have since discovered that quantum entanglement, the "God Effect," was one of Einstein's few---and perhaps one of his greatest---mistakes.

What does it mean? The possibilities offered by a fuller understanding of the nature of entanglement read like something out of science fiction: communications devices that could span the stars, codes that cannot be broken, computers that dwarf today's machines in speed and power, teleportation, and more.

In *The God Effect*, veteran science writer Brian Clegg has written an exceptionally readable and fascinating (and equation-free) account of entanglement, its history, and its application. Fans of Brian Greene and Amir Aczel and those interested in the marvelous possibilities coming down the quantum physics road will find much to marvel, illuminate, and delight.

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54 of 58 people found the following review helpful.

Great Read

By Homie G

If you are a physics major or well versed and well read on the subject this might not be the best book for you.

If you are someone interested in the subject but don't have a lot of time or brain power to get really deep into physics this is a great book for you.

Accessible, with deep yet clear examples, Clegg's book takes the reader on an interesting ride into physics, quantum entanglement and the possibilities.

I found this book to be a fun read and his explanations were direct and easily comprehensible. Most books on this subject can be dry and down right boring. This book is different in that it keeps the reader interested, educates and elucidates possibilities and ideas, and I learned a little bit about the social world of physics and the characters of that stage.

The only thing that did distract me was the title. Having nothing, or maybe everything, to do with "God", nor mentioning the phenomenon, I thought it a little off the mark. But it is a catchy title and if you let you mind wander the possibilities are definitely there.

Fun read!

44 of 48 people found the following review helpful.

A peek inside the engines of creation...

By Steve Reina

Although this book has been justly criticized it remains nonetheless a serviceable examination of one of nature's most interesting phenomenon: quantum entanglement.

Momentarily, the book's shortcomings, but first, it's strength.

Quantum entanglement is sort of the platypus of physics...so unlike the phenomenon around it that it forces us to ask essential questions about the nature of physics itself. As has been commonly discussed in other popular physics works, there are four fundamental forces of nature. Two of them operate at the macroscopic level being gravity and electromagnetism and the other two operate microscopically at the nuclear level being the strong and weak nuclear forces.

Significantly, each force has some type of distance limitation attached to it. So, to move a ball I have to somehow come into contact with it. Or likewise to move an electron I have to somehow sub atomically come in to contact with it.

However, such is not the case with quantum entanglement where as Albert Einstein observed we see a "spooky action at a distance." In other words, when two particles have been mated they immediately assume like properties (in the case of sub atomic particles for example, a like spin or orientation). Once entangled, one has merely to effect the orientation of one partner to the mating to effect the other.

That's exactly the aspect of entanglement that made Einstein an ardent opponent of entanglement because ostensibly it seemed to violate his notions that light speed was the ultimate speed limit. Remember: in quantum entanglement effecting the orientation of one partner immediately effects the other partner. Einstein also saw as noxious the idea that this seemed to violate his notions of local action like me effecting a ball by somehow making contact with it.

While quantum entanglement is great stuff for science fiction plots, it has some basic limitations that seriously curtail its applications...all of which are discussed by Clegg. Most significantly, it's properly called a quantum effect because it is just that...something uniquely naturally peculiar to the sub atomic world. The reason is that when the mated particles are set free, their orientations can be changed by ANY examination...including those typically done by nature.

So, let's we were to recall Shroedinger's cat for another experiment (hopefully he's still alive!), and we were to want to entangle the entire cat. Our first biggest problem would be the natural interactions occurring between the cat and his environment between our attempt at entangling him and our attempt to unentangle him at the end of the process.

Significantly, this most important potential application of entanglement -- teleportation -- is touched upon by Clegg.

Also significantly, Clegg manages to cover the main entanglement issues as they exist at the time of his writing.

However, and this where his limitations show themselves. Though his book clearly has some very lucid moments and helpful discussion, it also contains some distracting segeways and inclusions of material put there perhaps most likely to pad the length of the manuscript. Also, the titling of the work as "The God

Effect" seems nothing more than an attempt to create a provocative title to encourage book sales.

Even despite these limitations, the book is still on the whole well written and highly serviceable and undeniably discusses one of the most interesting phenomenon in nature. So, while this may be a good first book to read on the topic, by all means do not make it your last.

138 of 169 people found the following review helpful.

the mediocre effect

By Dr. Fred J. Mbogo

Wow. I'm not a conspiracy theorist, but somehow my negative review just disappeared from this page. Perhaps the book was not selling enough. What's up with that, Amazon? I really didn't like the book and the review didn't contain anything inappropriate. In an attempt to reconstruct the review...I thought that the book lacked an audience. There was not remotely enough detail for a regular reader of popular science books. The single chapter on entanglement in Brian Greene's "Fabric of the Cosmos" was much more enlightening than this entire book. I also don't see how a beginner would get anything out of this book. Too many things were just glossed over. Despite the dearth of detail about the main topic, the author saw fit to pad it with descriptions of Cantor's work, which is covered in many other books, including one of Mr. Clegg's. When referring to the uncountability of irrationals, he refers to them as "decimal fractions" and at one point, misleadingly, as simply "fractions", which are of course rational and countable. The book is a perfect example of the trend toward small, rapidly and inexpensively produced 250-page popular science books. Mr. Clegg is not a practicing scientist. He appears to be more of an entrepreneur and this shows in the quality of the book. I think my original review might have been pulled because I mentioned that I felt cheated because I bought the book on the 5-star recommendation of a particular UK popular science website, which appears to be an objective book review site. I found out that this site, which heavily pushes Mr. Clegg's books (he is always the featured author), appears to be controlled by him. He gives all of his books very high ratings of course. This seems incredibly deceptive to me. He has recently changed "featured author" to featured author/editor", though, perhaps in response to my original review. The web site is mentioned at the front of this book. So Amazon, in pulling the one bad review for this book (I've read about 100 popular science books in the past few years) left only the good reviews, including the first few 5-star reviews which are quite obviously planted by concerned parties. This seems deceptive also. Put your money into books that are a bit more substantial and took a bit more effort to write. BTW, the title is an unoriginal ripoff of Leon Lederman's wonderful "The God Particle". Mr. Clegg's book is a mediocre book about one of the most interesting (possibly the most interesting) phenomena in science. If this book had been written by Simon Singh, it would have been a winner.

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