



# The God Effect: Quantum Entanglement, Science's Strangest Phenomenon

By Brian Clegg

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## The God Effect: Quantum Entanglement, Science's Strangest Phenomenon

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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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### Editorial Review

From Publishers Weekly

Science writer Clegg (*A Brief History of Infinity*), discussing the field of quantum mechanics, asserts that "[e]very experiment takes us a step closer to realizing just how strange the world is at the quantum level." Quantum entanglement is the oddest of them all. As Clegg explains it, entanglement occurs when two particles (photons, atoms, electrons, etc.) become so intensely linked together that for all intents and purposes they become part of one unit. The mystifying thing is that this link continues even if the two particles are in different parts of the universe: "Make a change to one particle, and that change is instantly reflected in the other(s)—however far apart they may be." Clegg does an excellent job of explaining this complex situation in nontechnical terms; he details the many experiments that have consistently suggested that entanglement is real. The implications for future technological advances are huge, and Clegg is at his finest as he embeds potential advances in a broad historical context. Data could be encrypted in unbreakable codes; computers could become thousands of times more powerful than today; objects, and maybe even living organisms, could be instantaneously transported. While highly speculative, these possibilities could change our notion of reality. 27 b&w illus. (July 6)

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From School Library Journal

Adult/High School—While written in laypersons' terms, this book requires some understanding of physics. The opening chapters set up the discovery of quantum entanglement, which occurred during the professional debate between Max Bohr and Albert Einstein as they discussed the nature of quantum physics. Clegg then provides historical understanding and the potential applications of entanglement to advance current technologies. Those chapters read like a science-fiction novel—an unbreakable secure communications system, teleportation, and supercomputers that think all become possibilities. The author's writing is well organized and succinct. Later chapters can be read independently. While the foundation for quantum entanglement may be difficult for some students to grasp, its potential will fascinate them.—Brigeen Radoicich, Fresno County Office of Education, CA

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Review

Clegg does an excellent job of explaining this complex situation in nontechnical terms... implications for technological advances are huge, and Clegg is at his finest as he embeds potential advances in a broad historical context. --Publishers Weekly

A delightful book. The author does a superb job of presenting the story of a remarkable concept - quantum entanglement - in a relaxed and entertaining style. --Professor Artur Ekert, Leigh Trapnell Professor of Quantum Physics, Cambridge University

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**Ann Birdsell:**

Now a day folks who Living in the era everywhere everything reachable by connect with the internet and the

resources in it can be true or not call for people to be aware of each data they get. How people have to be smart in receiving any information nowadays? Of course the solution is reading a book. Reading a book can help people out of this uncertainty Information especially this The God Effect: Quantum Entanglement, Science's Strangest Phenomenon book because book offers you rich info and knowledge. Of course the knowledge in this book hundred % guarantees there is no doubt in it everybody knows.

**Todd James:**

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**Ricardo Hayward:**

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**Ella Norman:**

A lot of people always spent all their free time to vacation or maybe go to the outside with them loved ones or their friend. Are you aware? Many a lot of people spent that they free time just watching TV, or playing video games all day long. In order to try to find a new activity here is look different you can read a new book. It is really fun to suit your needs. If you enjoy the book that you simply read you can spent all day long to reading a e-book. The book The God Effect: Quantum Entanglement, Science's Strangest Phenomenon it is very good to read. There are a lot of individuals who recommended this book. These were enjoying reading this book. Should you did not have enough space to bring this book you can buy typically the e-book. You can m0ore very easily to read this book through your smart phone. The price is not too costly but this book features high quality.

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