In 1600, Giordano Bruno, an Italian priest and mathematician, was burned at the stake in Campo dei Fiori in Rome after the Inquisition found him guilty of heresy, a charge that included his belief that there were infinitely many worlds like our own. Four centuries later, at a time when a popular television show is called The Big Bang Theory, science has infiltrated popular culture to such a degree that a scientist can forcefully argue that, indeed, infinitely many universes may exist and that we live in but one of the many distinct parts of what is now known as the "multiverse." Brian Greene is no stranger to controversial science. His first book, the Pulitzer Prize-nominated The Elegant Universe (1999), was an eloquent exposition of what was then still an obscure theory in physics: string theory. Greene's book helped make string theory a household phrase. In The Hidden Reality, while admitting that string theory has in the meantime come under attack from many physicists as a theory that may be extremely hard to prove experimentally, Greene forges forward to explain an equally controversial theory – or rather, set of theories – about the plurality of universes. Having done so well in his exposition of string theory , Greene apparently feels safe from being figuratively burned at the stake. But this is not to say that the theories he writes about are easy to believe, feel natural in any way, or have any significant experimental evidence to support them.

The belief that many universes – perhaps infinitely many – co-exist along with the universe we perceive around us and explore with our telescopes and satellites has grown rapidly in its influence within the physics and cosmology community in the last decade. And theoretical evidence for how this can be the case has come from many sources: A number of distinct theories in physics can be seen to lead to the conclusion that our universe is not the only one.

Greene assiduously surveys and discusses a number of physical theories leading to the multiverse hypothesis. There is a natural unevenness in these theories: Some seem likely to be true; others are more remote. One likely theory Greene doesn't mention is the idea that an anti-universe exists somewhere as the antimatter reflection of our own.

Other than string theory, which in its proposed hidden dimensions of space-time can harbour other universes, Greene spends considerable effort on explaining a field called inflationary cosmology. The theory of cosmic inflation, which says that soon after the Big Bang our universe experienced an explosive period of exponential growth, was proposed by Alan Guth, now at MIT, in 1980. Most physicists, astronomers and cosmologists are convinced that cosmic inflation did take place in the early universe, and satellite observations of the cosmic microwave background radiation in space seem in agreement with this theory.

But purely theoretical advances in this area by other scientists now imply that inflation doesn't stop and instead goes on to expand other universes – perhaps infinitely many. Greene carefully explores other avenues to the multiverse as well, including an oft-disputed quantum theory called "Many Worlds," which holds that every time a quantum measurement is made, the outcome an experimenter sees is only one of many. The other possible outcomes occur in universes parallel to our own. This is perhaps the hardest theory to swallow, but in his usual passionate style, Greene argues that it has something to recommend it.

Greene's forte is his amazing ability to give clear, everyday examples to illustrate complicated physical situations. There are the usual descriptions of a baseball in its flight and fall under the pull of gravity; a description of a space that looks like a Pringle potato chip; our cosmic "horizon" as an actual horizon beyond which a ship will disappear. There is even an imagined discussion between the author and a fly about the infinite possible locations on the wall the fly can land on.

These examples make a hard topic easier to understand. That is not to say that the reader has to believe every theory Greene presents. But perhaps the greatest value of The Hidden Reality, in addition to making science accessible, is the hope of immortality it inspires. For even when we are long gone, somewhere in the great expanses of the multiverse, a civilization just like ours (or infinitely many of them) may still thrive. Some may consider this good news.

Amir D. Aczel’s many books include the bestselling Fermat's Last Theorem: Unlocking the Secret of an Ancient Mathematical Problem.

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