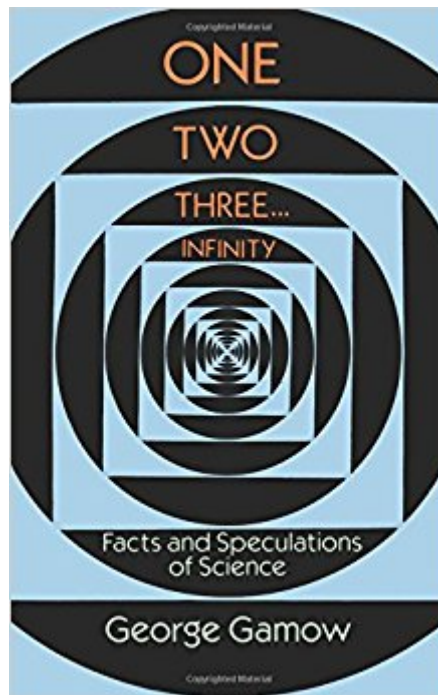


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# One Two Three . . . Infinity: Facts And Speculations Of Science (Dover Books On Mathematics)



## Synopsis

"... full of intellectual treats and tricks, of whimsy and deep scientific philosophy. It is highbrow entertainment at its best, a teasing challenge to all who aspire to think about the universe." — New York Herald Tribune

One of the world's foremost nuclear physicists (celebrated for his theory of radioactive decay, among other accomplishments), George Gamow possessed the unique ability of making the world of science accessible to the general reader. He brings that ability to bear in this delightful expedition through the problems, pleasures, and puzzles of modern science. Among the topics scrutinized with the author's celebrated good humor and pedagogical prowess are the macrocosm and the microcosm, theory of numbers, relativity of space and time, entropy, genes, atomic structure, nuclear fission, and the origin of the solar system. In the pages of this book readers grapple with such crucial matters as whether it is possible to bend space, why a rocket shrinks, the "end of the world problem," excursions into the fourth dimension, and a host of other tantalizing topics for the scientifically curious. Brimming with amusing anecdotes and provocative problems, *One Two Three . . . Infinity* also includes over 120 delightful pen-and-ink illustrations by the author, adding another dimension of good-natured charm to these wide-ranging explorations. Whatever your level of scientific expertise, chances are you'll derive a great deal of pleasure, stimulation, and information from this unusual and imaginative book. It belongs in the library of anyone curious about the wonders of the scientific universe. "In *One Two Three . . . Infinity*, as in his other books, George Gamow succeeds where others fail because of his remarkable ability to combine technical accuracy, choice of material, dignity of expression, and readability." — *Saturday Review of Literature*

## Book Information

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## Customer Reviews

Then give her this book! It seems that almost all the reviewers had the same experience: we read this book at an early age, and it was so fascinating, so inspiring, and so magical that it directed us into math and science for the rest of our lives. In my case the book was loaned to me when I was about 12, by my best friend's father. As a result, when I wrote MY first math book (which cannot begin to compare with Gamow's!) thirty-five years later, I dedicated it to my friend's father in gratitude. The book explains how mathematics and science really works, in language which a young person with an eighth grade education can understand. Everyone thinks it takes a genius to understand relativity, but there are lots of fifteen-year-olds walking around with a decent understanding of Special Relativity simply because they read this book. But don't be misled into thinking this book is just for young people. It's for anyone who thirsts for knowledge and understanding, anyone who realizes that it doesn't require an alien life form to understand physics and math. Gamow discusses some of the great unsolved problems in mathematics (at least two of which - the four-color problem and Fermat's Last Theorem - have been solved since the book was written), the theory of relativity, the usefulness of imaginary numbers (square roots of negatives), geometry of more than three dimensions, and many other topics which most people think are accessible only to those anointed with stratospheric IQ's. But Gamow's writing is so clear and entertaining that you'll come away wondering why EVERYBODY doesn't understand those topics. A particularly vivid memory I have of the book is Gamow's demonstration that there are different sizes of infinity. He didn't originate the idea, of course; it was first thought of by a mathematician named Georg Cantor. But once again Gamow makes the mathematics so clear and accessible that I was enthralled. You will be too.

George Gamow tends to get forgotten these days. He died some time ago, and his books are now over forty years old. Some, like his history of 20th century physics, may seem a bit dated in light of the discoveries since then. Yet there's still magic in these pages. Gamow was one of the greatest of 20th century physicists, and at the same time, a great teacher whose passion for the sheer fun of math and science was communicated in his books, whether explaining the wonders of infinite series, or how to locate a hidden pirate's treasure chest using imaginary numbers. Unlike a lot of modern popular science writers, Gamow didn't shy away from showing you the math- but he could

explain in a way that even an elementary school child could understand. A wonderful book for the child or adult who isn't afraid to think.

The sweep and vision of the book are truly breath-taking. I suspect this marvelous book has launched more scientific careers than any other. The author, George Gamow (d. 1968), was an award-winning physicist cum biologist with a flair for making the complicated seem simple. (A gift shared by the late Richard Feynman.) Gamow's book introduces the reader to complicated subjects in a clear and non-threatening way. In some respects this book may be considered a precursor of the popular "For Idiots" series, but with much more dignity and poetry. It is of course inevitable, and no fault of the author, that portions have been overcome by events. For example, Fermat's Last Theorem has -- at long last -- been proven. So it is no longer true that (page 31) "no general proof ...has ever been achieved." Also, some of the material on elementary particles and genetics is dated. To paraphrase Aristotle, nature abhors perfection, and so there are some errors as well. (I find this a bit surprising, since the book was revised in 1961, and I would expect these to have been caught.) For example, the discussion on complex numbers (page 37) contains a number of elementary errors - which however cancel, so the final result is correct! The periodic chart (page 136) shows gallium, indium and thallium as transition elements, whereas they are "main sequence" elements, of the boron-aluminum family. Also, the symbol for gallium is shown as Fa instead of Ga. Gamow's discussion of the drunkard's walk (page 200) has been over-simplified to the point where it is misleading. I mention these details because I think young and inexperienced readers may be unduly confused. Looking through it again after many years, I see that my interest in prime numbers, platonic solids, chemical elements, and elementary particles can all be traced back to this fountain. Another enchanting book by the same author is, "The New World of Mr. Tompkins."

I'm happy to join the list of reviewers who owe something personal to this marvelous book. As a liberal arts undergraduate in 1955, I borrowed "1,2,3..." from my physics-major roommate. I liked it so much that he kindly gave me his copy. Its influence contributed to my later decision to become an engineer, and marked the beginning of my lifelong interest in science. On recently re-reading the 1961 edition, I was impressed all over again by Gamow's friendly, conversational, agenda-free style. Since he never talks down, never hand-waves, and always goes straight to the essence of a topic, this decades-old book still seems fresh and contemporary. And yes, the dry, slightly pixilated humor still works. I once met a man who had taken a course from Gamow at the University of Colorado. He said he would never forget the sight of the professor careening around campus in an open

convertible -- in the middle of January!

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