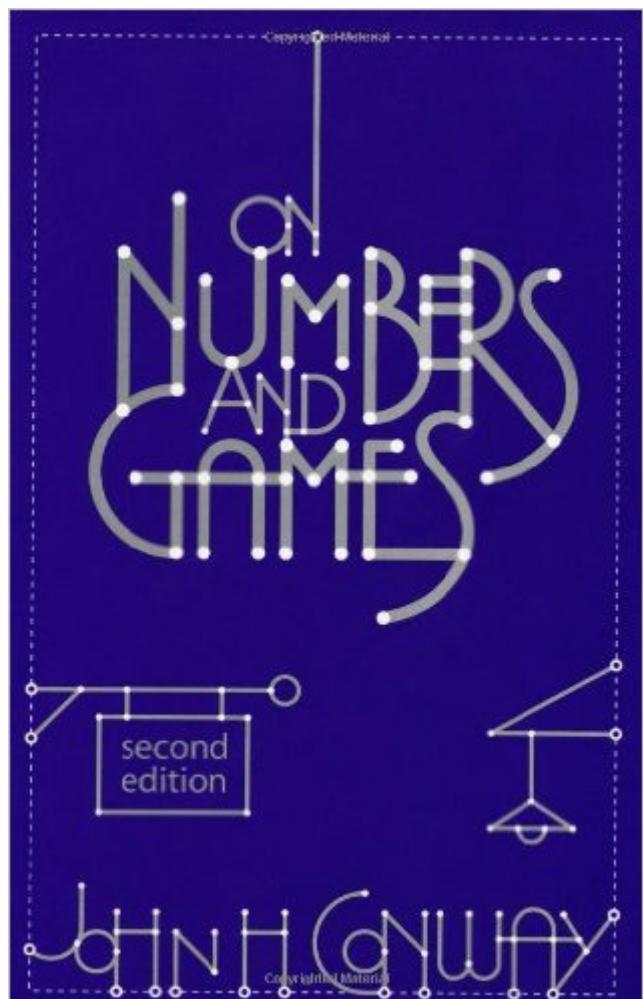


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# On Numbers And Games



## Synopsis

ONAG, as the book is commonly known, is one of those rare publications that sprang to life in a moment of creative energy and has remained influential for over a quarter of a century. Originally written to define the relation between the theories of transfinite numbers and mathematical games, the resulting work is a mathematically sophisticated but eminently enjoyable guide to game theory. By defining numbers as the strengths of positions in certain games, the author arrives at a new class, the surreal numbers, that includes both real numbers and ordinal numbers. These surreal numbers are applied in the author's mathematical analysis of game strategies. The additions to the Second Edition present recent developments in the area of mathematical game theory, with a concentration on surreal numbers and the additive theory of partizan games.

## Book Information

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## Customer Reviews

Boy, you wanna talk about your \_cool\_ books. I read this one twenty years ago and never quite got over it. Georg Cantor sure opened a can of worms with all that infinity stuff. John Horton Conway is probably best known as the creator/discoverer of the computer game called "Life," with which he re-founded the entire field of cellular automata. What he does in this book is the \_other\_ thing he's best known for: he shows how to construct the "surreal numbers" (they were actually named by Donald Knuth). Conway's method employs something like Dedekind cuts (the objects Richard Dedekind used to construct the real numbers from the rationals), but more general and much more powerful. Conway starts with the empty set and proceeds to construct the entire system of surreals, conjuring them forth from the void using a handful of recursive rules. The idea is that we imagine

numbers created on successive "days". On the first day, there's 0; on the next, -1 and +1; on the next, 2, 1/2, -1/2, and -2; on the next, 3, 3/4, 1/4, -1/4, -3/4, and -3; and so on. In the first countably-infinite round, we get all the numbers that can be written as a fraction whose denominator is a power of two (including, obviously, all the whole numbers). We can get as close to any other real number as we like, but they haven't actually been created yet at this point. But we're just getting started. Once we get out past the first infinity, things really get weird. By the time we're through, which technically is "never," Conway's method has generated not only all the real numbers but way, way, way more besides (including more infinities than you've ever dreamed of).

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