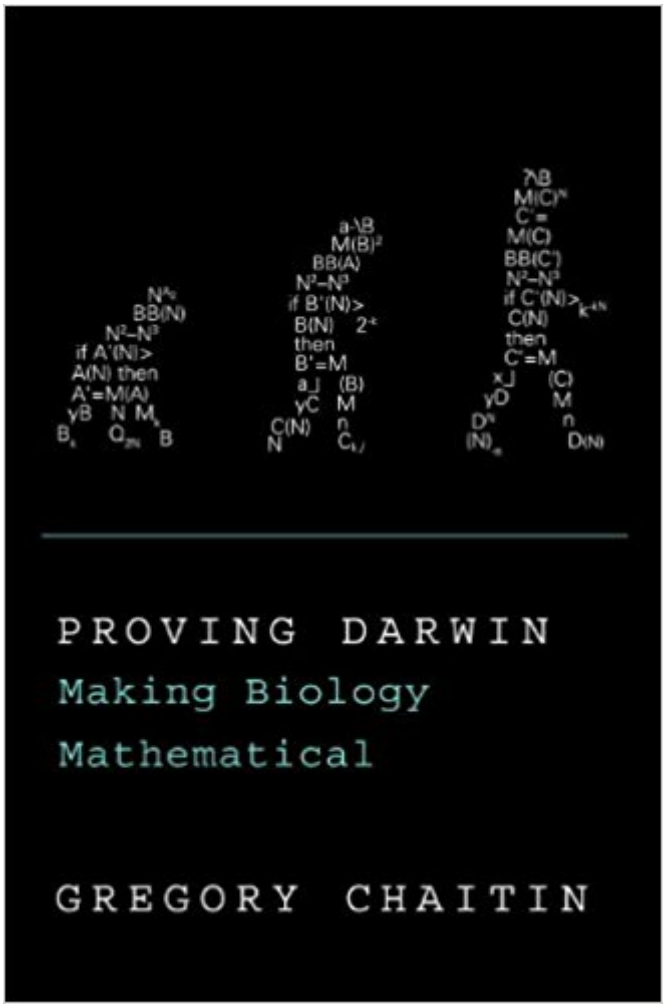
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# Proving Darwin: Making Biology Mathematical




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## Synopsis

Groundbreaking mathematician Gregory Chaitin gives us the first book to posit that we can prove how DarwinÃ¢â ¬â„¢s theory of evolution works on a mathematical level.Ã Â For years it has been received wisdom among most scientists that, just as Darwin claimed, all of the EarthÃ¢â ¬â„¢s life-forms evolved by blind chance. But does DarwinÃ¢â ¬â„¢s theory function on a purely mathematical level? Has there been enough time for evolution to produce the remarkable biological diversity we see around us? ItÃ¢â ¬â„¢s a question no one has yet answeredÃ¢â ¬â• in fact, no one has even attempted to answer it until now.Ã Â In this illuminating and provocative book, Gregory Chaitin argues that we canÃ¢â ¬â„¢t be sure evolution makes sense without a mathematical theory. He elucidates the mathematical scheme heÃ¢â ¬â„¢s developed that can explain life itself, and examines the works of mathematical pioneers John von Neumann and Alan Turing through the lens of biology. Chaitin presents an accessible introduction to metabiology, a new way of thinking about biological science that highlights the mathematical structures underpinning the biological world. Fascinating and thought-provoking, Proving Darwin makes clear how biology may have found its greatest ally in mathematics.

## Book Information

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## Customer Reviews

I should have given more attention to the reviews. Poorly constructed argument for using computer software to simulate creative design. Advances the idea of using mathematics to model evolution, but falls way short in developing a model of how this could be accomplished.

This is a book in which Gregory Chaitin explores the fascinating topic of artificial life. Most scientists venturing outside their normal realm take pains to show that they have studied the new area - with name-dropping and citations. Chaitin doesn't bother with that. Indeed, he shows no sign of being aware of other workers in the field. He refers to the field as "metabiology" - and acts as though this is a new subject area which he has invented. While reading the book I kept wondering if he was going to cite the work of Chris Langton, John Holland, John Koza, Tom Ray, Moshe Sipper - or any of the other artificial life pioneers. John von Neumann did get referenced - but that was about it.Does Chaitin say much of interest - despite apparently not having read any of the literature in the field? Unfortunately, not knowing the literature seems to lead to a distorted idea about what the open problems in the field are. Instead, Chaitin says he was inspired by David Berlinski's critique of Darwinism. Hang on, though. David Berlinski is a senior fellow of the Discovery Institute. He clearly doesn't have a clue what he is talking about. A scientist should not choose their research program based on what David Berlinski says. Chaitin just decreases his own credibility by taking Berlinski seriously.Overall, this book won't be worth reading for most readers. If you want to learn about artificial life, I recommend looking to sources which have more thoroughly researched the topic.

I have enjoyed books by Chaitin and this one was designed to be both amusing and informative. He is unusually good at making the math understandable and interesting. I can't say I buy his theory of evolution but he put it out to be question and tried not as a final effort. You get most of the idea without following the proof in detail. Is the toy problem good enough to explain Darwin? Time will tell.

This is a different view about evolution, not by explaining real biology (neither attempting to do it), but showing how it is possible for a math model to evolve, how a process with evolutionary characteristics can be reached efficiently by a scheme of mutator and mutant algorithms driven by chance, gaining complexity and fitness fighting against uncomputable problems.The key for this is

to introduce creativity in the math process, and showing how this leads to an efficient model. This is done by using computability notions, those topics are briefly introduced in the book so if you are not used with that language you could add bibliography material.Evolution is a complex subject and also a controversial one and also popular one, then it's difficult (or impossible) to write a book about it without drawbacks nor critics, please don't let you intimidate, read it for yourself, and you will get a lot more than what you put.

Chaitin proceeds too quickly through his proof. I suspect if I knew more of the maths behind Chaitin's Omega and the Halting Problem then I'd have found it easier. Given that the Omega is "source" of creativity I hoped it would've had greater treatment. I guess I'll just have to read his publications: which I hoped to avoid by buying this book.Following the proof are chapters that read more as manifesto, but I'm okay with that, even if I don't agree with it all.

This is a very interesting book, with a new approach to Darwin's theory of evolution. Its main goal is to provide a mathematical ground for that theory. The concept of DNA as a string of bits of information is not new, but Chaitin turn it very appealing, But one caveat: strings of information doesn't imply necessarily in conscious life.

brilliant!

Gregory Chaitin is the author of algorithmic information theory,and in this short volume he shows that conventional deterministmath cannot capture biological and--I would insist--economicsubjects. For them we need post-Godel and Turing mathematics,open mathematics that accommodates creativity and surprise.

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