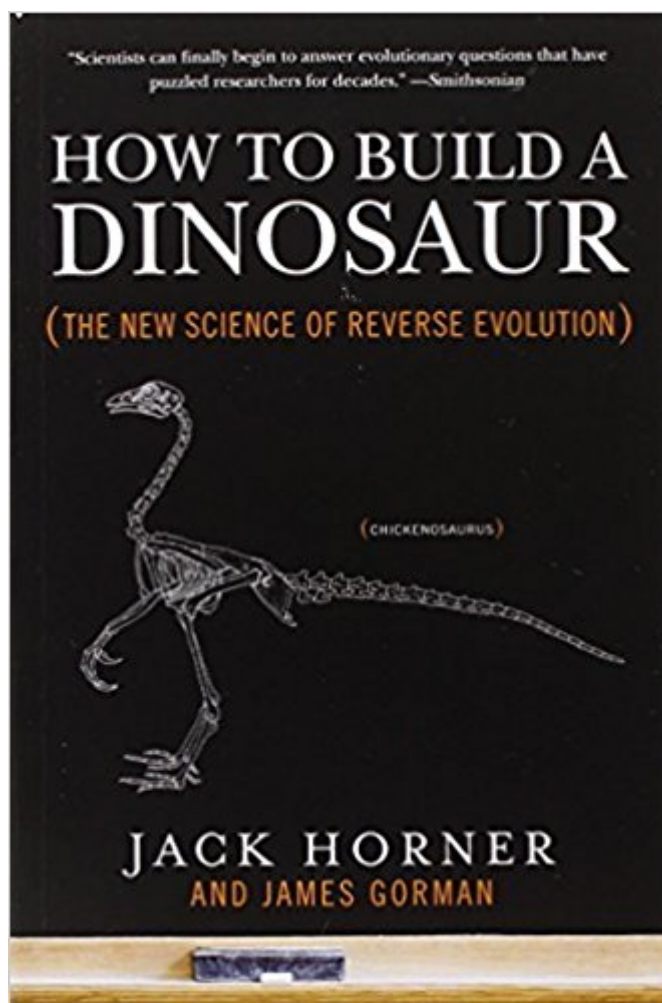


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# How To Build A Dinosaur: The New Science Of Reverse Evolution



## Synopsis

A world-renowned paleontologist reveals groundbreaking science that trumps science fiction: how to grow a living dinosaur. Over a decade after Jurassic Park, Jack Horner and his colleagues in molecular biology labs are in the process of building the technology to create a real dinosaur. Based on new research in evolutionary developmental biology on how a few select cells grow to create arms, legs, eyes, and brains that function together, Jack Horner takes the science a step further in a plan to "reverse evolution" and reveals the awesome, even frightening, power being acquired to recreate the prehistoric past. The key is the dinosaur's genetic code that lives on in modern birds- even chickens. From cutting-edge biology labs to field digs underneath the Montana sun, *How to Build a Dinosaur* explains and enlightens an awesome new science.

## Book Information

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## Customer Reviews

A Library Journal Best Science and Technology Book of the Year "Horner is at his best: provocative yet firmly grounded in science. His goal is to make people think about how evolution works, and by extension, about our own origins." *New Scientist* "Straight from the scientific frontier, Horner's work should excite anyone who's dreamed of walking with dinosaurs." *Booklist* "Scientists can finally begin to answer evolutionary questions that have puzzled researchers for decades." *Smithsonian*

John "Jack" Horner is one of the world's foremost paleontologists, credited with finding the first dinosaur eggs in the Western Hemisphere, the first evidence of dinosaur colonial nesting, the first evidence of parental care among dinosaurs, and the first dinosaur embryos. He served as the inspiration for Paleontologist Dr. Alan Grant in Michael Crichton's *Jurassic Park* and as the technical advisor on all of the *Jurassic Park* films. Horner is Curator of Paleontology at the Museum of the Rockies in Bozeman, Montana, and Regents Professor of Paleontology at Montana State University. James Gorman is deputy science editor of the New York Times and editor of its Science Times section.

When reading the first half of this book, this reviewer found it difficult at first to connect its subject matter with the title of the book. The expectation was that the book was going to be devoted to genetic and metabolic engineering as applied to embryology. Instead the authors devote the first half to matters of paleontology and the art of fossil hunting. Readers eager to learn how to "build a dinosaur" may therefore get impatient with the authors, and may be tempted to put the book down and not go further. This would be a mistake, since in the latter half of the book the authors get down to explaining what kind of techniques or knowledge may be necessary to produce a creature that for all practical purposes, i.e. in terms of its skeletal structure and general appearance would be a living dinosaur. Studying these pages is fascinating, and indeed gives one more reason for believing that if the authors or other biologists succeed in bringing this about, then this would be the most awesome feat in scientific and technological history. What is most important about the author's proposals is that they are not dependent on having the genomes of long extinct dinosaurs. Instead, they seek to adjust the timing of the growth patterns that led to the evolution of birds from nonavian dinosaurs. This is to be done via the embryo of a domestic chicken. But changing the timing of metabolic and growth processes, this timing being regulated by genes, must respect what actually occurred in the evolutionary development of the bird from the dinosaur. Otherwise what results is a kind of "freak" that may be of interest in general but will not represent a genuine dinosaur of the kind that roamed the earth millions of years ago. A small amount of space is devoted in the book to the ethics and dangers of this kind of effort. These discussions are important but did not convince this reviewer that the author's proposals should not be carried out. On the contrary, they should be done immediately without any mental reservation. Right now. Today.

The book is an easy read, taking you through portions of Horner's life and describing what has led him to believe that researchers will be able to hatch a dinosaur by reversing embryological

development that has led to dinosaurs' avian descendants.

This is a new and refreshing look at paleontology. While the book is nominally about turning a bird into a dinosaur, it is really about exciting new developments in paleontology. Horner shows how paleontology is expanding beyond digging for dinosaurs and moving into molecular biology and evolutionary development (evo-devo). Horner weaves several different fields of biology and shows how inter-disciplinary studies have revolutionized the field. He chronicles the work of Mary Schweitzer, who discovered red blood cells and (perhaps) cartilage in a 68-million year old T-rex, and Hans Larson, who is investigating ancestral genes in chicken embryos. I had followed news from paleontology relatively closely for a lay observer, but even I was shocked at some of the evo-devo research currently being done. Hopefully, this book will inspire more students to go into biology. Turning a chicken into a dinosaur might be just the right hook to stimulate interest in these exciting new developments in evo-devo. My one suggestion for the book is that because it covers so many fields, Horner ends up summarizing or quoting the works of others. He tells their stories effectively. But at some point, I wonder if perhaps it would have been better to produce a joint book, with articles from several of the contributors in the field. However, it is also useful to have one voice to guide the reader through the science. Since Horner is not a native to molecular sciences (his expertise is traditional paleontology), he is perhaps better suited to explaining the complexities of genetics to lay readers. P.S. - Be sure to check out the Discovery Channel's documentary (Dinosaurs: Return To Life?) on this topic. It is a nice complement to the book.

this book represents an intriguing look into the future of genetic manipulation. Indeed, the creation of a dinochiken may only be the first in a series of genetic recreations of past species. the genetic code hides many ancient genes that, if turned on, can shed light on the long process of evolution, perhaps all the way into deep time. This is the real "Jurassic Park", as the author describes it. This book is clear in its presentation, and is written for the layman, although a sound education in the fundamentals of Biology will surely help. Jack Horner is a masterful storyteller. I read the entire book in a few days, as I couldn't put it down once I started reading. ----Enjoy!

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