Stories, Dice, and Rocks That Think

How Humans Learned to See the Future—and Shape It

What makes the human mind so unique? And how did we get this way?

This fascinating tale explores the three leaps in our history that made us what we are—and will change how you think about our future.

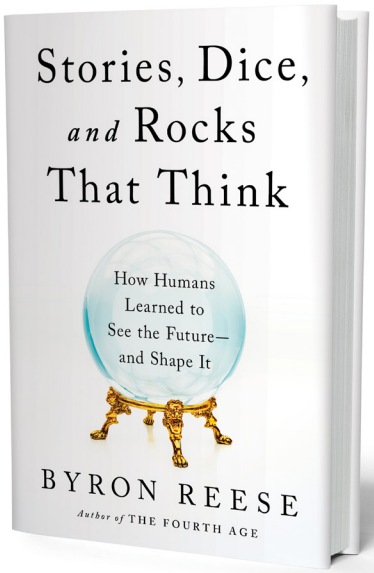
Look around. Clearly, we humans are radically different from the other creatures on this planet. But why? Where are the Bronze Age beavers? The Iron Age iguanas? In *Stories, Dice, and Rocks That Think*, Byron Reese argues that we owe our special status to our ability to imagine the future and recall the past, escaping the perpetual present that all other living creatures are trapped in.

Envisioning human history as the development of a societal superorganism he names Agora, Reese shows us how this escape enabled us to share knowledge on an unprecedented scale, and predict—and eventually master—the future.

Thoughtful, witty, and compulsively readable, Reese unravels our history as an intelligent species in three acts:

- **Act I:** Ancient humans undergo "the awakening," developing the cognitive ability to mentally time-travel using language
- **Act II:** In 17th century France, the mathematical framework known as 'probability theory' is born—a science for seeing into the future that we used to build the modern world
- **Act III:** Beginning with the invention of the computer chip, humanity creates machines to gaze into the future with even more precision, overcoming the limits of our brains

A fresh new look at the history and destiny of humanity, readers will come away from *Stories, Dice, and Rocks that Think* with a new understanding of what they are—not just another animal, but a creature with a mastery of time itself.



BOOK DETAILS

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FOR INTERVIEW & REVIEW COPY REQUESTS:

Tanya Wardell • Senior Marketing Associate
Tanya@BenBellaBooks.com • (214) 750-3600, ext 105
BenBellaBooks.com

About the Author

Entrepreneur • Futurist • Author • Speaker

BYRON REESE is an Austin-based entrepreneur with a quarter-century of experience building and running technology companies. He is a recognized authority on AI and holds a number of technology patents. In addition, he is a futurist with a strong conviction that technology will help bring about a new golden age of humanity. He gives talks around the world about how technology is changing work, education, and culture. He is the author of four books on technology, his most recent was described by *The New York Times* as "entertaining and engaging."

Bloomberg Businessweek credits Byron with having "quietly pioneered a new breed of media company." *The Financial Times of London* reported that he "is typical of the new wave of internet entrepreneurs out to turn the economics of the media industry on its head." Byron and his work have been featured in hundreds of news outlets, including *New York Times*, *Washington Post*, *Entrepreneur Magazine*, *USA Today*, *Reader's Digest*, NPR, and the *LA Times Magazine*.

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- @ByronReese
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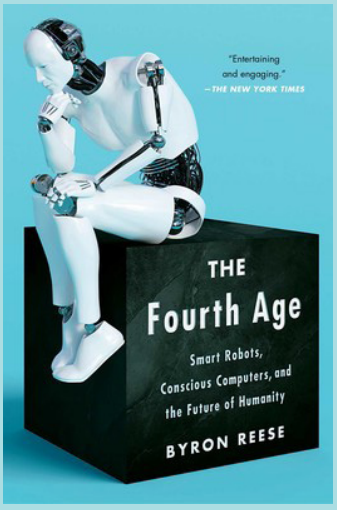
Also by Byron



"Entertaining and engaging."
—The New York Times

"Timely, highly informative, and certainly optimistic."
—Booklist

As Featured In

The New York Times · WIRED · Entrepreneur · Bloomberg Businessweek · The Washington Post · WSJ

"As an astrophysicist and a data scientist, I often think about the future, but I was struck about Byron's precise dissection of how our future is and will be determined by the data that is already starting to shape our lives."

—Dr. Alberto Conti, Archive Scientist at STSI, former Hubble Chief Engineer

Byron In Action

Demo Reel

TEDxAustin: Achieving Greatness Is A Choice

Sample Interview Questions

1. What is this book about?
2. How are people and animals different? Why does it matter?
3. Why do you say that only animals are immortal?
4. Why are our lives so full of technology compared to say the dolphins, who are also supposed to be smart?
5. Why do you say paper is the most important invention of all time?
6. What is Agora?
7. What does it mean that Agora knows how to make a smartphone, but we don't?
8. Is Agora a real creature or just an idea?
9. All of your books have been optimistic about the future. Is this one?
10. You say that we are at the dawn of Act III. What do you think the biggest economic, social and political challenges of Act III for humans might be?
11. What might be the biggest social, economic and political possibilities / opportunities of Act III?
12. What are your thoughts on some of the biggest implications of stories invented by humans versus reality in Acts I, II and III?
13. How does the concept of agora support / explain changes that happened distinctly and yet unilaterally across the globe? (Please describe these developments as well.)

Speaking Topics

- **Reasoned Optimism**

  With a gift for storytelling, Byron captivates audiences around the world with the message that technology is empowering us to build a better world, and he invites his listeners to imagine this better world, and build it.

- **Automation, AI, and the Future of Work**

  How will automation reshape the workplace? Will robots take all the jobs? Will artificial intelligence displace human intelligence? Are we destined to a future where we work harder and harder for less and less? Byron dispels the fearful myths around these topics and describes a world where workers of all skill levels use new technology to increase their own productivity.

- **The Jobs of Tomorrow**

  Everyone agrees that technology is changing the world. The question is how should we change in response to it? Byron tells the story of technology's advancement from the invention of language until today. He explores what's to come in the next decade, and examines what we as individuals can do to make the most of changing times.

- **How to Innovate in a Rapidly Changing World**

  Byron explores how businesses operating in industries undergoing dramatic changes can prosper and be successful. While traditional futurists seldom bridge the gap between "here is what is going to happen" and "here is how you capitalize on it," He explores how it is that radical technology advancement creates new multi-billion dollar companies, and destroys old ones.

- **Education in the 21st Century**

  How should education change? How will it? What skills will ensure that a person can economically contribute in a world of radical technological change? Byron answers these questions and explains that the University system is a 12th Century French invention that remains to this day largely unchanged from it origins in the Middle Ages.

FOR SPEAKING INQUIRIES, CONTACT:
bookbyron@seeagency.com

An Excerpt

For the past couple of centuries, our species has been playing an existential game of Mad Libs, trying to fill in the blank on what seems like a pretty straightforward sentence: "Humans are the only creatures that_____ _____ ." We've tried "makes tools," "uses language," "is conscious," "controls fire," "has culture," "reasons," and (per Mark Twain) "blushes, or needs to." But each time a new answer to the question of what makes us unique is offered, it is immediately pounced on by naysayers eager to disprove it and to show that there really isn't anything that special about us at all—that we are just another animal.

But common sense tells us that simply isn't true. Clearly, we are radically different from the other creatures on this planet. Who can deny this? We are Earth's preeminent life-form by such a wide margin that there isn't even a distant second. Look around. Where are the Bronze Age beavers? The Iron Age iguanas? Or the preindustrial prairie dogs? Have you ever met a penguin poet? Pheasant philosopher? Or platypus playwright? No, because they don't exist. Our planet is populated by just two types of creatures: us and a giant menagerie of beings so unlike us that the tiniest overlap is cause for curious wonder.

I'm not down on animals. Without a doubt, they feel pain as we do; their suffering is as real as ours, and because they can suffer, they should be given legal protections. Further, I'm not arguing that they don't have emotions or even that they are not conscious. Perhaps they are. I'm solely interested in *animal cognition*, which I do believe is entirely different from human cognition. In that difference lies the answer to the perplexing question posed above: If humans and animals are the same *sort* of thing, differing only by degrees, why is our outcome so dramatically different from theirs?

Obviously, it's not our bodies that give us preeminence. We have animal bodies. Good ones, to be sure, with unusually long lifespans and an amazing ability to repair themselves, but that isn't what distinguishes us. It's our minds. Something about them makes us so different from animals that we are almost aliens by comparison. I think it's this: We are endowed with a temporal mental plasticity that enables our minds to roam freely through time, untethered from the here and now. Our thoughts flow effortlessly from the present to the past to the future. We can remember what happened yesterday and use it to speculate on what might happen tomorrow; we can recall our childhood and contemplate our old age. We can imagine many different futures, predict what will likely happen, and try to exercise control over it. We are the architects of our tomorrows, the shapers of our destinies. No other creature on Earth even knows that there is a future, or a past for that matter; instinctual behavior aside, animals live outside of time. But this knowledge of ours comes at a price, for it reveals our mortality. As essayist Jorge Luis Borges put it, "Except for man, all creatures are immortal, for they are ignorant of death."

There was a time when creatures that looked like us *were* animals, and they, too, didn't know there was a future or a past. How did we get from there to a point where we could think about the future; influence it; and, finally, perhaps master it? This book tells the story, in three acts, of how our species learned to escape the perpetual present. Act I is how we developed the cognitive ability to mentally time travel. It starts far in the distant past, millennia ago, and explores how we acquired language as a *mental construct*, which gave us the capacity for thought, which we only later began externalizing in a spoken form in order to communicate with others. That mental language became the voice in our head, one that we used to imagine stories about possible immediate futures—running different scenarios in our minds of the ways that events could unfold. Later, we started externalizing those as well, telling stories to each other. We were story*thinkers* before we became storytellers.

The thing that transformed us—the radioactive spider that bit us—was something so rare and so serendipitous that it evidently has never happened to any other creature. That's why there are no Bronze Age beavers. When we got our mental superpowers, fifty thousand or so years ago, we became fully "us," with our language, art, music, and all the rest. With this range of new abilities, we were able to draw upon the past to imagine multiple futures and predict which of them would happen. This gave us mastery of the planet in an evolutionary blink of an eye. With it, we invented agriculture, created cities, devised writing systems, divided into nations, and explored the world.

But we wanted more. We wanted to *systematize* prediction, turning it from an art to a science. We accomplished this. But doing so required a new understanding of the nature of reality, of why the future unfolds the way it does. That's the story told in Act II, which begins in 1654 in France, when two mathematicians trading correspondence invented what we now call probability theory. With it, we had a science for seeing into the future, and we used it to build the modern world. It became the cornerstone of a dozen sciences, from mundane meteorology to exotic quantum physics. Sociologists used it to create demography, while biologists used it to pioneer medical research. It became the basis of our financial system, the insurance industry, the capital markets, and, well, the entire world economy. All commerce was based on it, on using probability to predict everything from inventory levels to consumer demand. Virtually all of the modern world, in all its complexity, sits atop that science of seeing the future.

Three centuries passed between creating the science of probability and hitting a biological limit of what our intellects, as amazing as they are, could accomplish with it. So we began building machines that could employ the science far better than we could. The curtain closes on Act II in 1954, as we booted up the first all-transistor computer.

Act III opens on that world, where events transpired quickly. Transistor-based computers rapidly grew in capability, and we invented a science called artificial intelligence, whose explicit goal was to teach the new machines how to think as we did. The hope was that with their lightning speed, they could solve probability problems that were beyond our capabilities, allowing us to predict the future ever more accurately. At the same time, we began attaching electronic sensors to the computers, allowing them to see and hear the world on their own and to interact with it. They would gather near-infinite amounts of data, and the belief was—and still is—that all that data, combined with near-unlimited processing power, will give us the ability to see the future as accurately as we see the present. If we can do this, we will become true masters of fate.

We are living at the dawn of Act III, but perhaps we can already see into the future well enough to confidently predict how this act will turn out. But I don't want to spoil the ending in the introduction, so let's take Lewis Carroll's advice and begin at the beginning. Pour yourself a drink, sit back, and get comfortable, because I have quite a story to tell you.