5.0

A BIG HISTORY OF EVERYTHING

0:00–2:23

THE FIFTH THRESHOLD

And now, deep in the ocean waters carried to Earth by comets and asteroids…we are about to witness the fifth and most mysterious of the Big History thresholds…life. How exactly does life emerge? It's one of our most profound questions. Some believe that life may have crash-landed on Earth in meteors or comets. But most believe that life on Earth starts with a chemical reaction…down in the deepest depths of the ocean…where heat rising from the planet's molten core tears apart the sea floor. Superheated gas and lava vent through the cracks and ignite a revolution. In this broiling soup, a new kind of chemistry emerges, a biological blueprint for every living thing that will ever exist…a secret code called DNA. Just four chemicals will combine in millions of ways to instruct every cell on how to do everything…beginning with bacteria, the simplest and oldest form of life.

Here's where early forms of bacteria appeared, feeding off the energy and the heat that was coming out of these volcanic eruptions. Here, we think the first life on Earth appeared beside these great undersea mountain ranges.

2:23–5:00

LIFE EVOLVES

Life is the only thing in the Universe that can store and pass along information, reproduce itself, and evolve. But how does a simple microscopic organism evolve into something as complex as a human? The path from bacteria to man is a mysterious series of transformations with an infinite number of possible outcomes, but only one that leads to us. The seeds of everything that will happen on the future Earth are all descended from these simple beginnings. Earth, 542 million years ago, 3 billion years after life first appears. In a geological instant, the seas explode with complex plants and animals. All the basic body types that will ever exist — heads, mouths, eyes, fins that will evolve into limbs, jaws, and teeth — all of them suddenly appear. 475 million years ago, plants begin to spread across the land, transforming the Earth into a world of lush forests with abundant food and shelter. Some plants evolve into trees that, along with metals brought by meteors…will become key building blocks of civilization.

To escape the carnage in the seas, some creatures crawl onto land as well. At first, they're forced to return to the salty seas to reproduce...but then they discover a way to bring a bit of the ocean with them — the egg.

5:00–6:48

EGGS

When we started crawling onto the land, certain creatures figured out — birds, reptiles — that they could lay eggs that have a nice, hard shell that kind of keeps the saltwater contained in a small space for them.

The egg is a critical development. It allows animals to move permanently onto land — animals that will continue to evolve and grow more complex. But now, Big History reveals a fundamental secret that governs all life on the planet. The more complex you are, the more fragile you become. Some simple bacteria can survive being frozen, boiled, crushed, or dried out. Complicated animals like us cannot. So when the Earth is shaken by a drastic change in climate or volcanoes poison the air or a giant meteor strikes, life faces the ultimate threat — extinction. Five times since complex animals appear, more than 50% of all life is wiped away. But these catastrophes clean the slate for new creatures to evolve and fill the void. Without them, Big History's future thresholds could never occur.

6:48–8:29

EXTINCTIONS RESHUFFLE THE DECK

A good way to put it is that every extinction does reshuffle the deck. You just take all of the playing cards, put 'em back, mix it up, and deal yourself a new hand.

One catastrophic reshuffling ends the 165-million-year reign of the dinosaurs...when a huge asteroid plunges into Earth 65 million years ago.

Temperatures plunge. Plants don't grow.

A great era in Earth's history has come to a fiery end...clearing the way for the age of mammals...the age of us. But what most people don't know...is that it almost didn't happen.

8:29–9:53

MAMMALS ARRIVE

Big History reveals how a series of rare and unlikely connections across 3 billion years...make Earth a thriving planet. But what does it take for the planet to make us? And what exactly does it mean to be human? It all starts with a lucky break that kills the dinosaurs...and clears the way for the ultimate rise of mankind. With the dinosaurs gone, tiny mammals begin to take their place.

Humans are ultimately evolved, descended from these mammals. If there had been no asteroid collision 65 million years ago, would the human species even exist? Probably not.

But as we've seen with so much Big History, things could have been very different.

9:53–11:31

MAMMALS EVOLVE

If that asteroid had been on a trajectory five minutes earlier or five minutes later, it would have missed the Earth. And the dinosaurs would probably still rule the Earth.

Instead, life begins a new chapter. 50 million years ago, the spread of a new plant, grass, draws mammals out of the forest. Over the next 45 million years, the ancestors of horses grow larger, stronger, and faster. Sheep, goats, and aurochs — the ancestors of cows — evolve. Mankind will use them for food and power to build civilizations. But first, on the savannahs of Africa more than 4 million years ago...some primates take the first steps toward becoming human.

We left the trees, and the grass was really tall. We had to see over it. And walking on our hind feet allowed us to hold babies and tools and hunt and free up our hands and our opposable thumbs.

11:31–12:23

THE ARMS RACE

Since we no longer need to walk using our knuckles or swing from trees, our shoulders and wrists evolved to do something unique in nature — throw accurately...making it easier to hunt and kill for meat.

Look at the natural world. How do you kill something? Almost always, you kill something by getting up close and personal. You do it with your claws. You do it with your teeth. Now, look at your claws. Look at your teeth. Do you really want to get up close and personal and try to kill something with these pathetic teeth, these pathetic claws? I don't think so.