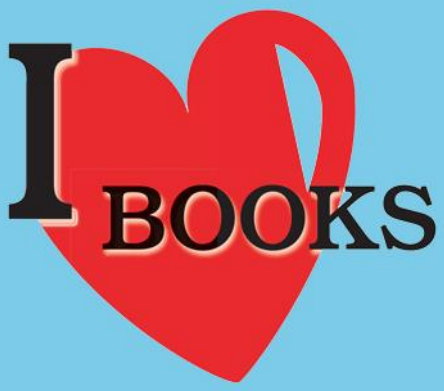


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Opening extract from

The Earth Book

Written by

Jonathan Litton

Illustrated by

Thomas Hegbrook

Published by

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For Lara, Leon, and Sophie,
you mean the world to me.
~J.L.

For Sally.
~T.H.

A WORLD OF CHANGE?
The world is an ever-changing place, as you will discover. Our understanding of it is evolving, too.
New discoveries are there to be made and new records may replace old ones.
We will be happy to revise and update information in future editions.

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The EARTH *Book*

BY JONATHAN LITTON

Illustrated by
THOMAS HEGBROOK





Welcome

In the vastness of space lies a tiny sphere that orbits an ordinary, middle-aged star in a quiet backwater of the Milky Way. It's one of billions of trillions of worlds, yet it is the only place we know of that supports life. It's an ever-changing environment, filled with fleeting beauty – 99% of species that have ever existed are now extinct for one reason or another. But what remains is a truly astonishing spectacle – a carnival of natural wonders, from lemurs to lemmings and giant sequoias to Antarctic mosses. In recent times, Earth's story has become intertwined with the human story, as we have created new urban and rural habitats and have harnessed energy and resources to meet our needs. To better understand and nurture our fragile little home, let's go on a voyage of discovery to the four corners of the globe....

EARTH
at a glance

There's so much to explore, so where to start? At the beginning, of course! First we investigate Earth's origins, its composition, and its dynamic processes. Then we move on to the fascinating array of life, from the earliest beings to emerge from the primordial soup to a cacophony of present-day wonders from a variety of families and habitats. Next it's a globetrotting tour of ecosystems and environments, encompassing both the expected and the unusual... such as penguins in a rainforest! Our final chapter is a look at the human world, and considers questions such as where people came from, how we divided the planet into countries and continents, and who are some of the most influential Earthlings in our history. We hope you enjoy this grand pictorial tour of our humble home.



Physical Earth

Explore the inner workings of the Earth, from earthquakes and volcanoes to thunderstorms and tsunamis.



Life on Earth

Learn about many of the billions of Earth's inhabitants, from the miniature to the mighty, and from the past to the present.



Earth Regions

Investigate a rich variety of ecosystems from all corners of the globe, including deserts, rainforests, oceans, and islands.



Human Planet

Ponder the human impact on the planet, from migration and population growth to cities and sustainability.



Physical EARTH

"Look again at that dot.
That's here. That's home. That's us."

~ Carl Sagan

Our planet is insignificant in the vastness of space, but hugely significant for the plants and animals that call it home. It's a middle-aged space rock, about halfway through its natural life, containing multiple layers of intrigue, from its super-heated core to its outermost atmosphere. It's the only planet we know of that experiences plate tectonics, and it's also unique in supporting a water-based weather system. Sometimes we surface-dwellers get a hint of the planet's raw power through earthquakes, volcanoes, tornadoes, and tsunamis. At other times we can sit back and marvel at Earth's natural beauty.

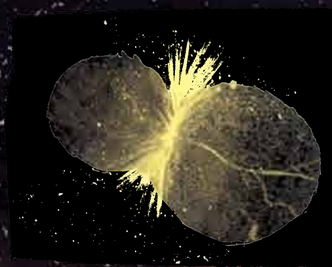


How the Earth *was* FORMED

For about 9 billion years, the universe was Earthless. Then, about 4.6 billion years ago, a giant dust cloud (made of dust from exploded stars) experienced a remarkable transformation. Matter was sucked into a solid centre because of gravity and a hot, dense star was born: the Sun.

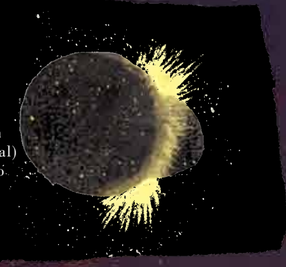
Although most of the dust cloud formed the Sun, a tiny amount was left swirling around the centre, in what is called a protoplanetary disc. About 100 million years after the formation of the Sun, gravity moulded that disc into the planets, moons and comets of the solar system, including Earth.

So there you have it: Earth is made from ancient stardust, as are all Earthlings.



THE EARTH'S TWIN
Many scientists believe that Earth once had a twin planet named Theia. One day, their paths crossed and there was a huge collision. Earth absorbed most of Theia, but some material was ejected, which formed the Moon. This is sometimes called the Big Splat Theory.

WHY THIS 'BIG SPLAT THEORY' SEEMS CORRECT
This Theia collision theory explains why the Earth's core is unusually big for a planet of its size (Theia's material is here too), why the composition of the Moon is so similar to Earth (the Moon is mainly made from Earth's material) and why the spinning of the Moon is so in step with Earth (we never see the far side of the Moon because of its precise spin cycle).



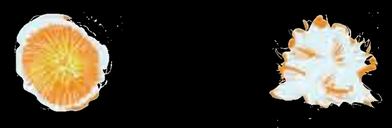
LAW OF ATTRACTION
Gravity acts to pull things together. The heavier something is, the stronger the force of attraction, so the Sun has a huge gravitational pull.

CENTRE OF ATTENTION
The Sun contains 99.86% of the matter in the solar system, condensed into a super-heated sphere.

SPACE ROCKS
Most of the remaining rocky matter formed planets and moons, but some became 'dwarf planets' and asteroids.

Stages of creation

Our knowledge of the formation of the solar system is evolving, but most scientists have settled upon a standard theory.



SUPERNOVA EXPLOSION

SOLAR NEBULA

PROTOPLANETARY DISC

We believe that our solar system underwent the beautiful and spectacular sequence of events below, spread across hundreds of millions of years.



GRAVITATIONAL SCULPTING OF THE SOLAR SYSTEM

PLANET FORMATION AND STABILIZATION OF SYSTEM