

Charles Darwin's

On the

ORIGIN
of
SPECIES

Retold and illustrated by
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A long, long time ago, before humans even existed, the living world looked very different from how it looks today. Since life on Earth began, tiny organisms, plants and animals have been changing slowly, over millions of years, because of a process we call evolution.





For most of human history, many people believed that everything in the world was created all at once. They thought that plants, animals and people were always the same as they are now.

But there were a few clever and curious scientists around who challenged this idea.



Georges-Louis Leclerc de Buffon

Animals change over time,
and they often look different
in different parts of the world.



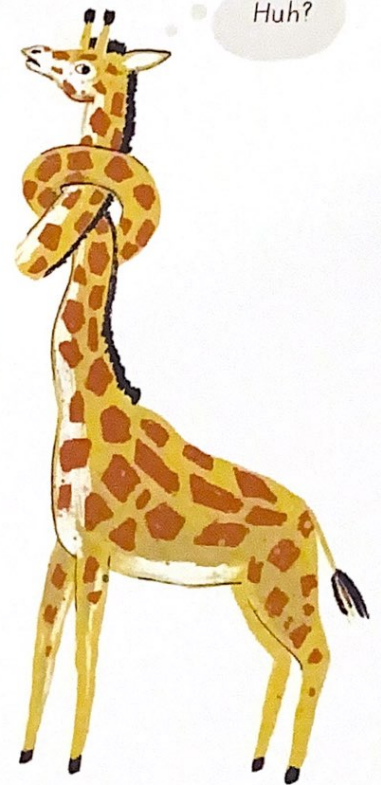
ancestor
with short
neck



Jean-Baptiste Lamarck

Hmm, perhaps giraffes who give
their necks a good stretch to
reach the higher leaves will go on
to have baby giraffes with
extra-stretched necks?

Huh?



French biologist Jean-Baptiste Lamarck liked the idea that some animals evolved by using certain body parts more than others. It turned out he was a little off the mark with that theory, but it certainly did get people thinking!

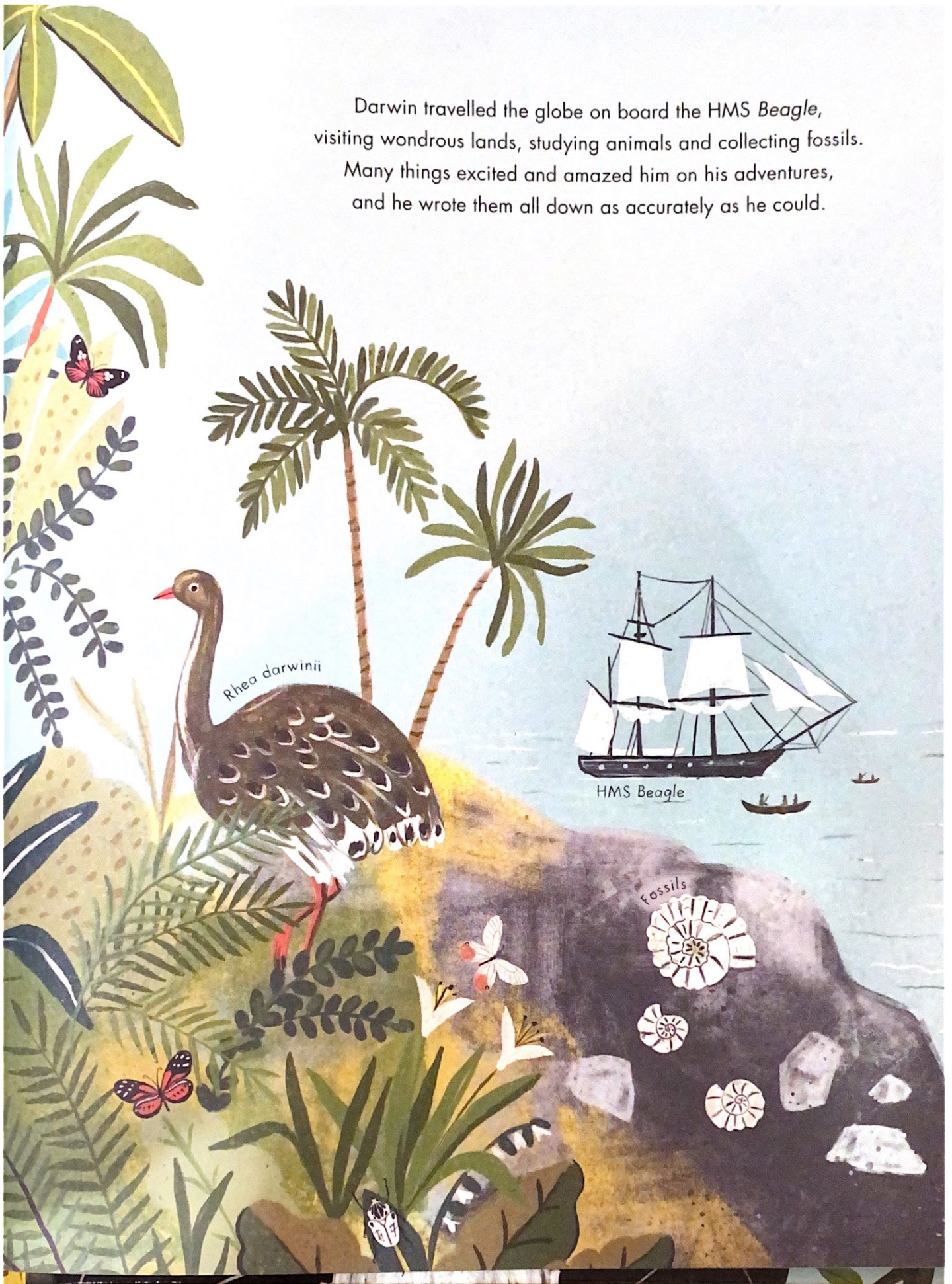
✱ See Appendix VI

It was right to notice that living things changed – or evolved – over time, but nobody was quite sure *how* this happened.



Soon though, the world came to know Charles Darwin, an English naturalist who would change people's understanding of how different species came to be.

Darwin travelled the globe on board the HMS *Beagle*,
visiting wondrous lands, studying animals and collecting fossils.
Many things excited and amazed him on his adventures,
and he wrote them all down as accurately as he could.





Down House

The Darwin Family



Charles Robert Darwin



Emma Wedgwood



William Erasmus



Anne Elizabeth



Henrietta Emma



George Howard



Elizabeth



Francis



Leonard



Horace



Charles Waring



Polly



Mary Eleanor

When Darwin returned from his expedition, he worked from his English country house, where he lived with his wife, children, and his dog Polly!



But Darwin had another long and difficult journey ahead. He had a new, big idea he wanted to share with everyone but, to explain it, he would have to do a lot of writing, studying and discussing with other scientists.



Darwin liked to study the orangutan Jenny at London Zoo.



The greenhouse was one of Darwin's favourite spots. He conducted many intriguing experiments there.

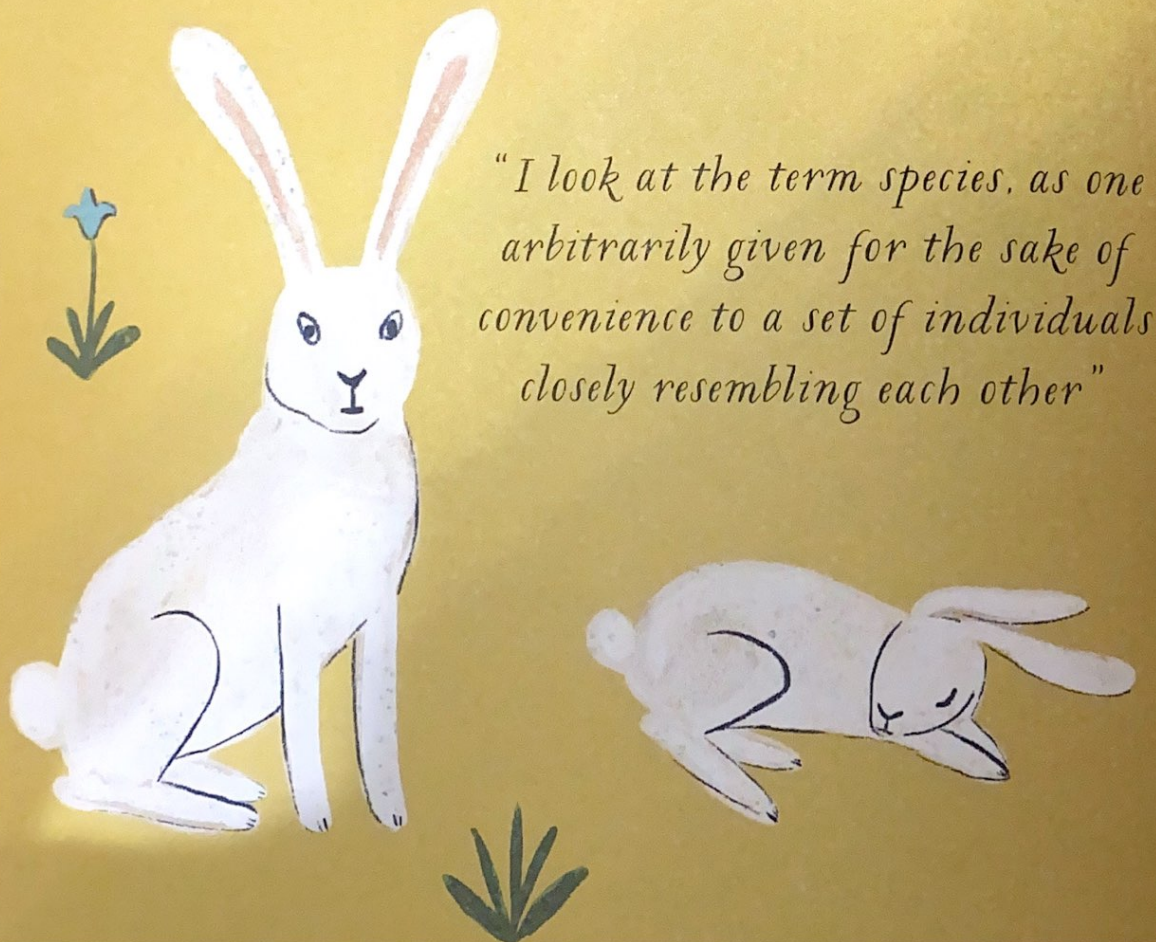


* See Appendix I

In 1859, after 20 years of hard work, Darwin was finally able to publish his book, *On the Origin of Species*, which explained all of his ideas.

In his book, Darwin explains that **species** are groups of living things that look alike and can have babies together. But even if they belong to the same species, no two animals are *exactly* the same.

Look closer and you will see some are:

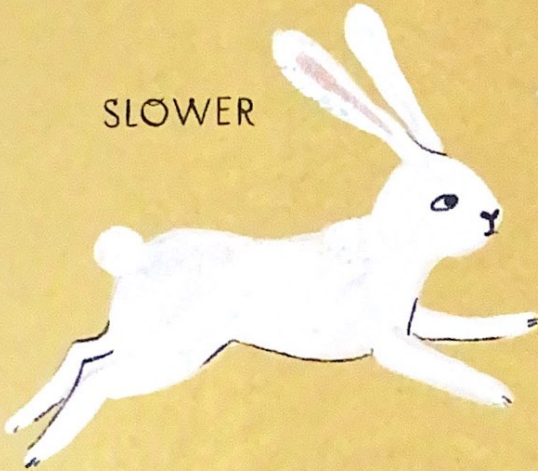




FASTER



SLOWER



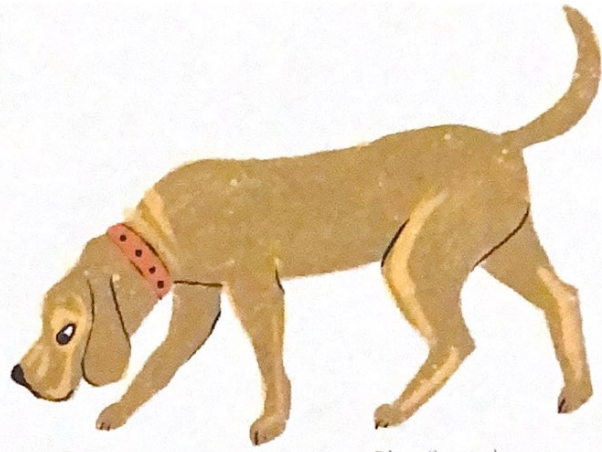
or different in
COLOUR!



These differences are known as variations.



Poodle



Bloodhound



Pug



English Pointer

*Variation under
Domestication*




Bulldog



Italian Greyhound

Animals that people have tamed and domesticated, like pets and farm animals, look very different from their wild ancestors. Take man's best friend for example – we now have over 340 breeds of dog! People have raised them for their different sizes, shapes, colours and even talents. Yet all of these breeds came from one kind of wild wolf, many howling moons ago!



*"Great as the differences are
between the breeds of pigeons, I am
fully convinced that the common
opinion of naturalists is correct,
namely, that all have descended
from the rock pigeon."*

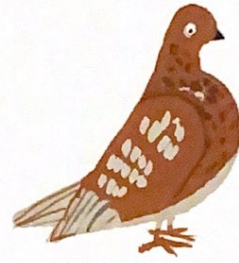
Columba Livia or Rock Pigeon



Fantail



English Pouter



Short-Faced Tumbler



English Carrier



Scandaroon



English Barb



Trumpeter



Jacobin



Frillback

Darwin studied pigeons too. Just like dogs, Darwin knew that all pigeons belong to the same species, although you certainly wouldn't think so to look at them!



Gardeners may encourage the growth of plants with large and beautiful flowers while they might weed out those that don't quite make the grade.



Like pets, farm animals and even garden flowers can look very different from their wild ancestors. This is mostly because people make choices. Farmers may choose to breed the cows that produce the most milk, the chickens that lay the best eggs, and the sheep with the warmest and most knittable wool.

Variation under Nature



Species change in the wild too. Even without human influence of any kind, plants sprout and young animals in the wild are born, all with slight differences. Some differences don't matter, some are not helpful at all . . .



... but some differences are very useful.

Darwin noted that Galapagos finches have developed beaks in all sorts of shapes and sizes. These differences help them to pick up their favourite snacks. Different beaks are good for different nibbles.



Large beak for crushing tough seeds



Small beak for feeding on soft seeds



Long and sharp beak helps to tear cactus flowers

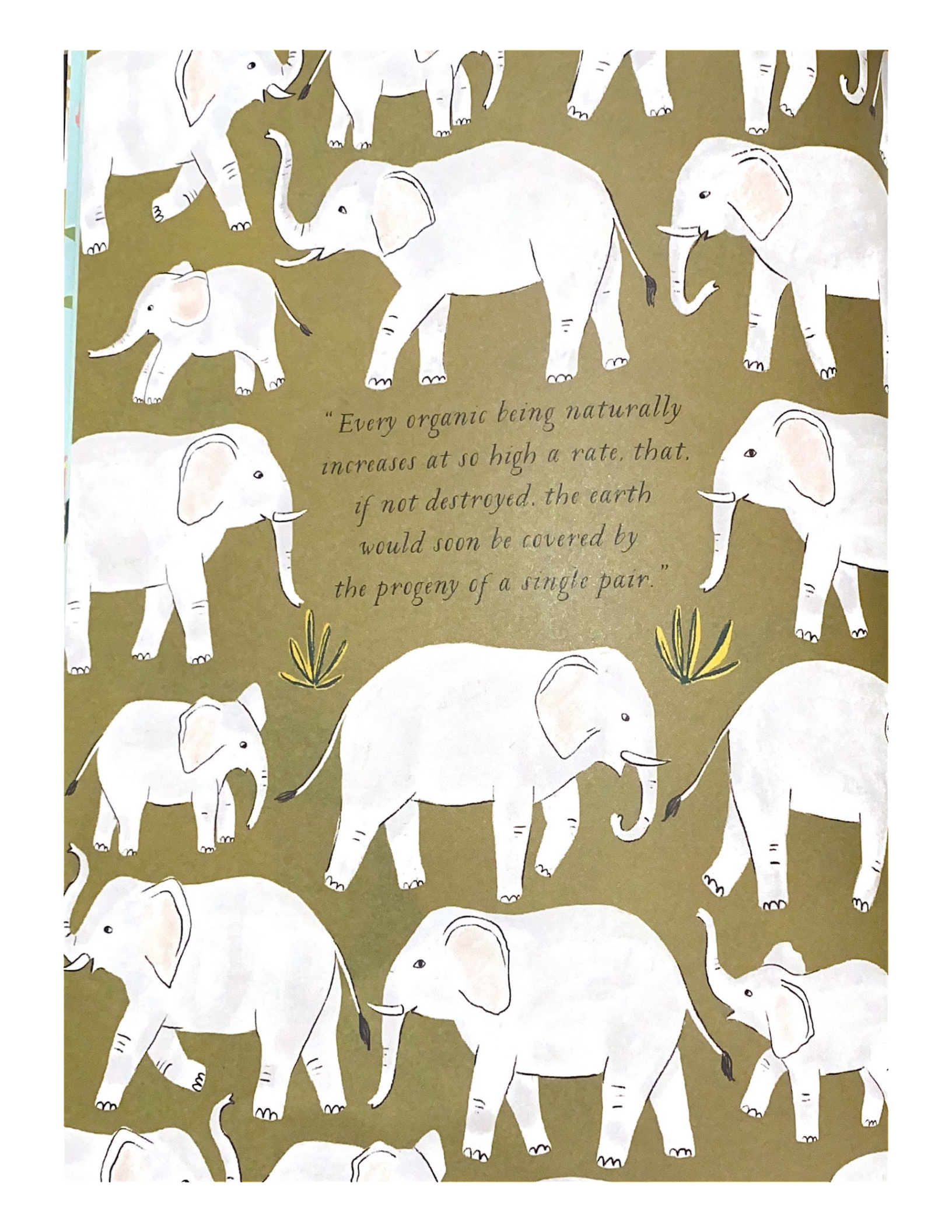
Beak that can hold tools to probe and find insects



Struggle for Existence

Nature may be beautiful and abundant, but living
in the wilderness is not easy for any species.
Many can't escape their predators or
find the right conditions to survive.





"Every organic being naturally increases at so high a rate, that, if not destroyed, the earth would soon be covered by the progeny of a single pair."



Animals compete for food and shelter – things they must have if they are to survive and have babies. It's a struggle to live in the wild and only the best adapted will succeed.

"I estimated that the winter of 1854-55 destroyed four-fifths of the birds in my own grounds."



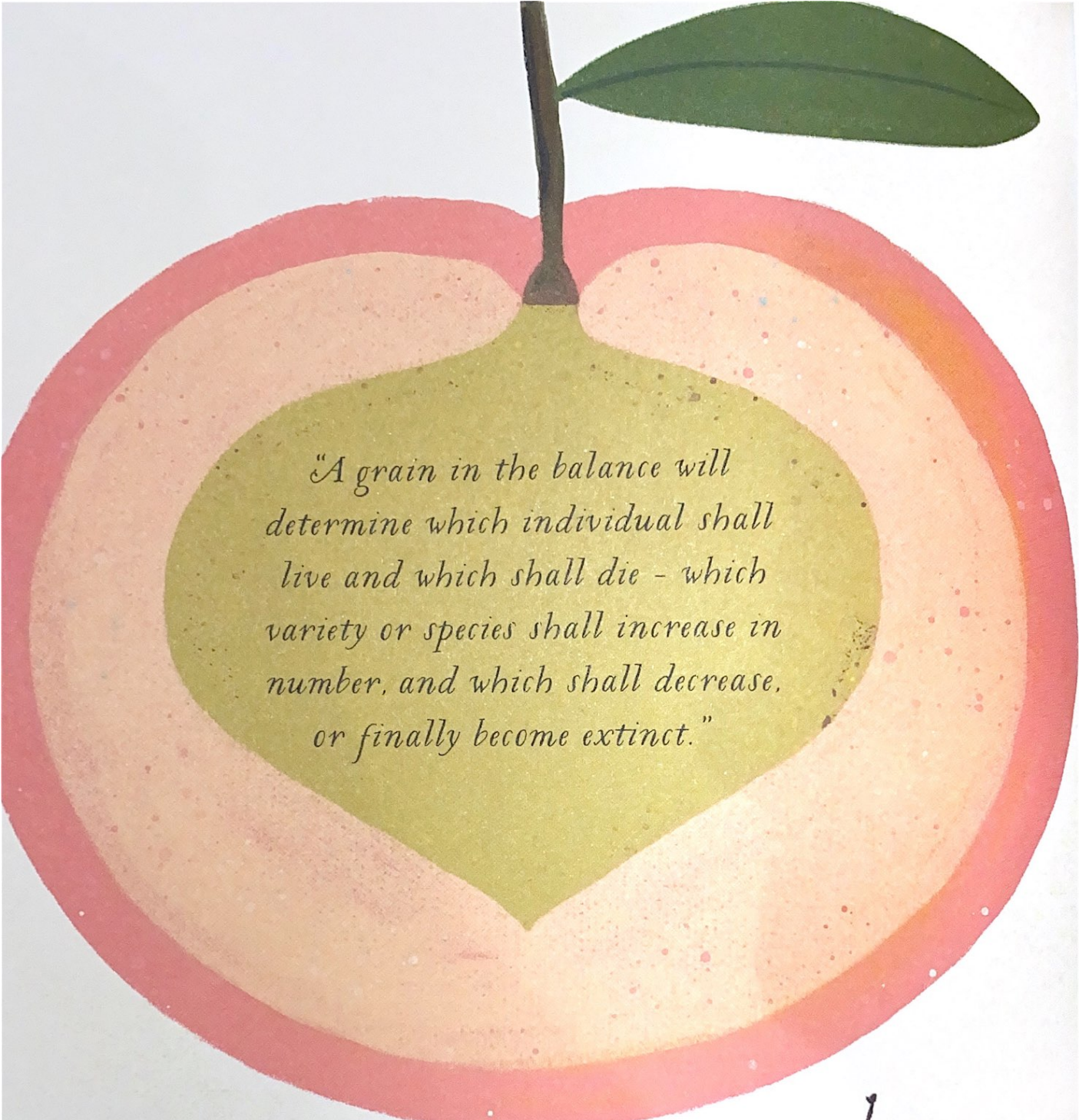
*"We see beautiful adaptations
everywhere and in every part of
the organic world."*



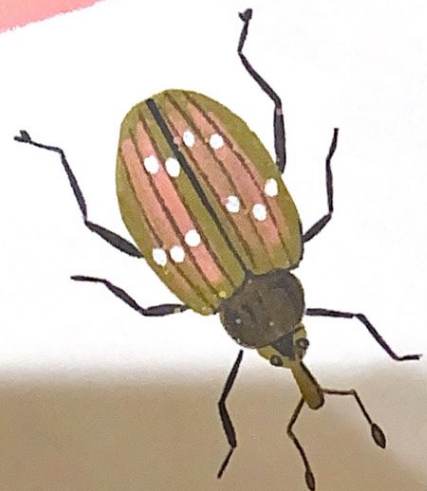


Natural Selection

Some differences help animals survive in the wild. Some help them to hide, to hunt, to live longer or have lots of babies. Those babies will then grow to benefit from the helpful differences that have been passed down from their parents. The species is adapting to the world around it.



"A grain in the balance will determine which individual shall live and which shall die - which variety or species shall increase in number, and which shall decrease, or finally become extinct."



Even small differences in colour or design can help an animal or plant to live, survive and reproduce better. Darwin called this **Natural Selection**.



Pink-downed peach

Yellow smooth peach

The Curculio beetle loves to feed on yellow, smooth peaches. Trees with pink-downed peaches are pestered less often by this beetle, so they reproduce better and increase in number.

