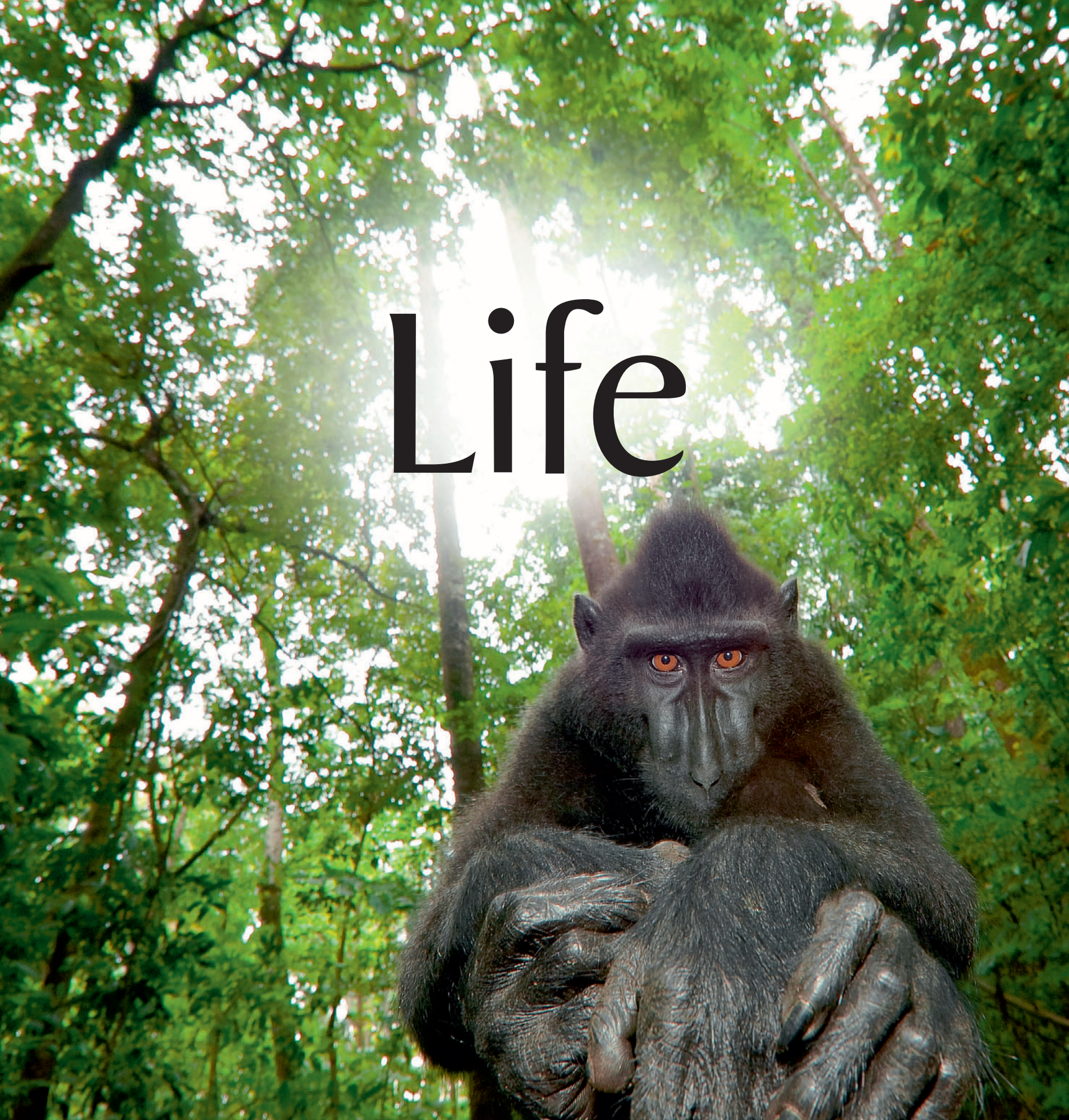
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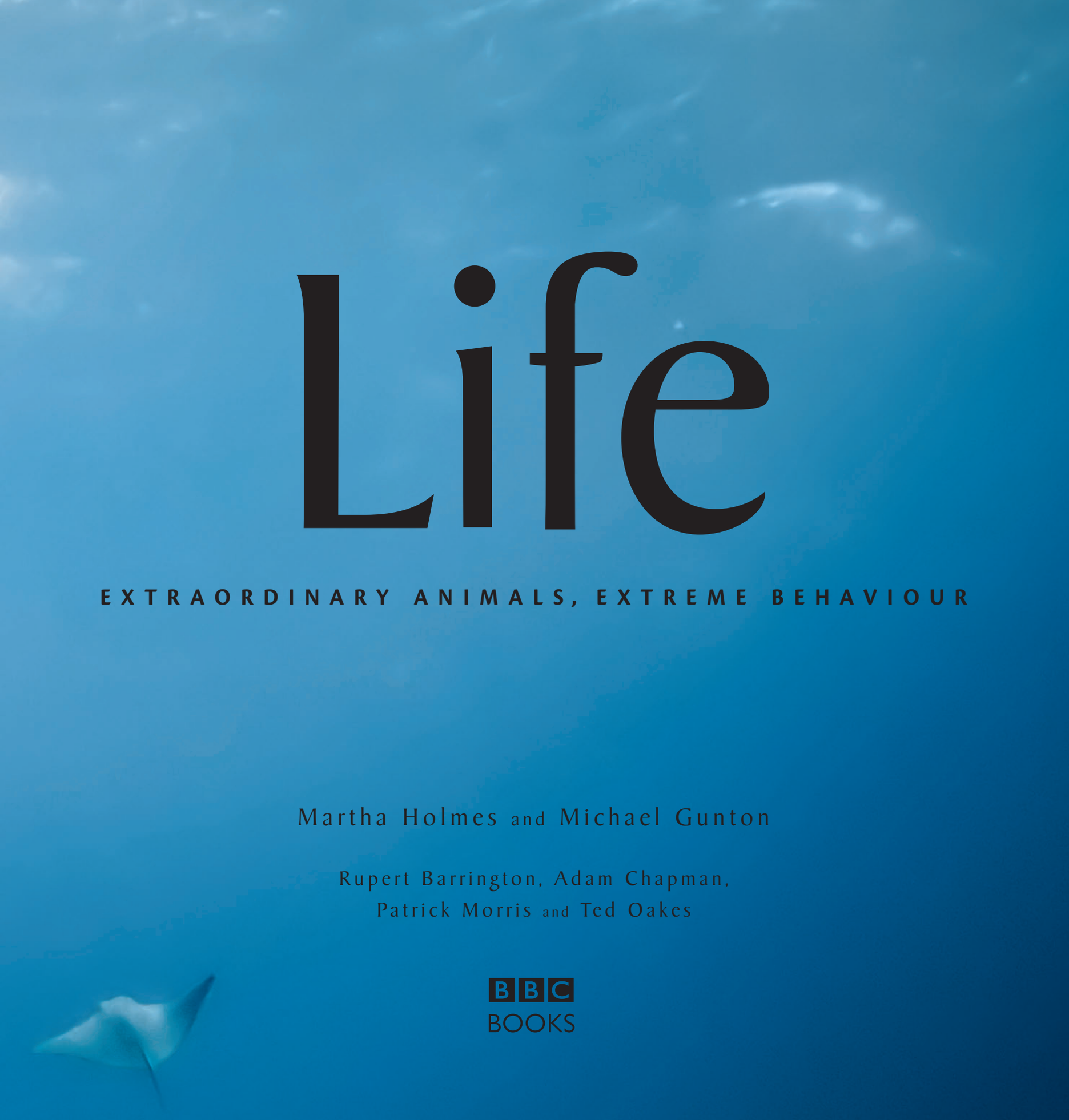

Life

EXTRAORDINARY ANIMALS, EXTREME BEHAVIOUR

Martha Holmes and Michael Gunton

Rupert Barrington, Adam Chapman,
Patrick Morris and Ted Oakes

BBC BOOKS

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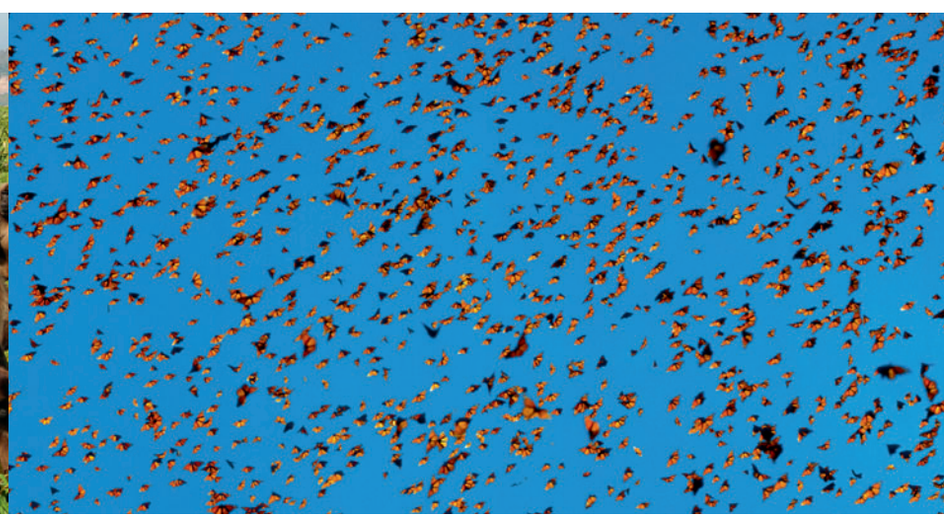

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Introduction

Right *Chinstrap penguins resting on blue ice off the South Sandwich Islands, Antarctica – an example of a bird that has adapted both its body and its behaviour to meet the challenges of polar conditions.*

Previous page *North American red-winged blackbirds on migration to their breeding sites – a feat made possible by their skills of flight and navigation.*

Page one *A crested black macaque, Sulawesi, Indonesia, as fascinated by the behaviour of the person photographing him as the human primate is by him.*

Page two *A school of migrating cownose rays, Ogasawara, Japan – just one of the 28,000 or so known species of fish.*

Life, both the BBC series and this book that accompanies it, is about behaviour – the extraordinary ends animals and plants go to in order to survive and to pass their genes through a new generation.

Every day, animals and plants face enormous challenges thrown at them by predators, competitors and the environment they live in. For most animals, it is a huge achievement just to survive, to see another dawn. But at some point, they also have to reproduce. To do so, they are likely to face serious competition and must either fight rivals to win a mate or invest in elaborate displays to attract one. *Life* is a collection of some of the most exciting examples we could find to illustrate how different groups of living things endeavour to overcome these universal challenges.

There are, of course, many millions of different creatures living on our planet, and the selection for *Life* represents a minuscule fraction of them. The demands of television have meant that we couldn't represent the entire living world, and so we've chosen a cast of characters that we feel best illustrates the diversity and complexity of life. We had to miss out many creatures that are too small to be seen or whose behaviour is less interesting, and then grouped our selection in the simplest way, into programmes – and chapters – about insects, birds, reptiles and so on. And in some cases, we had to combine groups of animals, such as the marine invertebrates. This selection took years to research and then film, with the help of scientists and field-workers worldwide. And whether it's a capuchin monkey using a stone that it can barely lift to smash open palm nuts, a komodo dragon stalking its prey for weeks, two giant beetles wrestling in the treetops or half a million spider crabs massing together to moult, we have been continually astounded by the extraordinary behaviours we've been lucky enough to film for the series.

The diversity of life on Earth, the only planet known to support life, is astonishing. It is the result of more

Opposite *Horseshoe crabs emerging from the sea to spawn in Delaware Bay. These marine creatures are little changed from ones that existed in the ocean more than 400 million years ago, proving that ancient lifestyles are sometimes the best.*

Left *A high-ranking young Japanese macaque warming up in a hot pool in Japan – a smart way to weather extreme cold.*

than 3 billion years of evolution. The millions upon millions of organisms alive today all have a common ancestry in the simplest forms of life – mere carbon compounds swirling around in a cocktail of chemicals. Those first primordial compounds had the ability to replicate themselves, and the basis of life was born.

Throughout the ensuing eons, the complexity of those early organic compounds increased and turned into protein-making compounds, and eventually into the simplest cellular organisms. Teamwork was the next step, when different kinds of simple cells got together to create complex groupings. But throughout this long, drawn-out process, only the cells that were most suited to the environment thrived. The less perfectly adapted cells perished, and the process of natural selection began.

Life forms became increasingly complicated. They developed simple guts, muscle fibres and nervous systems. And when the momentous breakthrough of sexual reproduction occurred, and replication was not simply a matter of cloning but of creating a mix of attributes from different individuals, the potential for diversification vastly increased. So did the potential for the development of new species.

More and more new species evolved, exploited new habitats and niches and continued to adapt. Natural selection meant many species died out along the way, unable to compete or survive the rigours of a changing environment. But those that survived kept developing a little for the better with each generation. And today we have the result – so far: a planet with a breathtaking variety of life.

No one really knows how many species there are today – estimates range widely from 4 million to 100 million – but all have one thing in common: the drive to survive and reproduce. It's this perpetual battle that *Life* is all about.

Martha Holmes and Michael Gunton