Out of the Blue

Why is the sky blue and why are sunsets red? When can I see a rainbow? Why is the Moon sometimes visible in daylight? In *Out of the Blue*, skywatcher John Naylor offers practical advice about where and when you can expect to see natural phenomena, what you will see and how to improve your chances of seeing it. He takes in both the night sky and the day sky, and deals only with what can be seen with the naked eye. Drawing on science, history, literature and mythology, and written in a popular style that assumes only basic scientific know-how, *Out of the Blue* is for everyone who enjoys being outdoors and who feels curious or puzzled about things optical and astronomical.

JOHN NAYLOR has been fascinated by the night sky since he was a child growing up in Peru, and by the daytime sky as an adult. He went to London University to study engineering and philosophy, and now teaches physics at a secondary school in London.

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A 24-hour Skywatcher's Guide

JOHN NAYLOR

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Contents

Preface

This book is about things that can be seen in the sky. We all look at the sky from time to time, though usually it is to check the weather. By and large we don't look at it for enjoyment, in part because we don't know what to look for. Very few people who are unfamiliar with the many wonderful sights to be seen in the sky accidentally notice halos or sundogs, two of the most common optical phenomena. To be sure of seeing these and other sights, you must know what to look for and when to look. This is where I hope this book will come in useful. It has been written to help you find your way around the sky, and see for yourself the many wonderful things that it has to offer.

My earliest memory of looking at the sky is of having the three stars that make up Orion's Belt pointed out to me. I can't recall what I made of them; I remember being told that they are distant suns, though that didn't mean much to me at the time. I was, I think, six or seven years old.

It was, nevertheless, a defining moment, the start of a lifelong fascination with the sky. But for many years that interest was overwhelmingly bookish. I read about the stars, but I didn't look at them; or, at any rate, not often. And when I did, it was invariably a brief, careless, unreflective glance. I looked, but I didn't see. And I didn't see because I didn't really know what to look for.

The turning point was a book by Marcel Minnaert, a Dutch astronomer. The book was *The Nature of Light and Colour in the Open Air*, and it made me look afresh at things that I had all but ignored, and look out for things which I had never seen.

For the first time in my life, I saw one of the most common sights in the sky, an ice halo around the Sun; I noticed a mirage of a distant island; I spotted a *heiligenschein*, the faint glow sometimes visible around the shadow of your head; I counted the colours in a rainbow. I began to take notice of the atmosphere itself, and of how it alters and transforms the way things appear to us. I was amazed at how much there was to see. All I had to do was keep my eyes peeled, something I could do while looking out of the window, pottering about in the garden, or walking to work.

It wasn't long before I found myself searching the night sky for similar sights. I began to realise that the night sky is about much more than stars

and planets. It is a dynamic entity. Gradually I fell in step with its rhythms: the nightly procession of stars, the monthly race around the heavens between the Sun and Moon, the yearly coming and going of planets, and much else.

As I learned more about the sky, the idea of this book took shape. I have called it *Out of the Blue* because its deals with phenomena that most of us have only seen by accident in the sky. It is a guide to a vast range of optical and astronomical phenomena, many of which occur daily, and which can be seen and understood without instruments or specialised knowledge. It has been written for anyone who is curious about, puzzled by, or just downright ignorant of the many optical phenomena that can be seen in the course of daily life. It offers practical advice about where and when you can expect to see these things, what you will see, and how to improve your chances of seeing them. It gives equal weight to the night sky and the day sky, and deals only with phenomena that can be seen with the naked eye. This is, after all, how most of us see things: we don't usually have telescopes or binoculars to hand.

I also hope that the book will help you make sense of what you see. I have assumed that you are a casual observer, and don't have a single focus of interest. You enjoy nature but are not, for example, a dedicated amateur astronomer or meteorologist. The text is thus a mixture of description and explanation, and draws on science, history, literature, mythology and anecdote. Explanations assume little or no scientific knowledge. Technical terms are kept to a minimum, are explained in the main text, and again in a glossary at the end of the book. Should you want to look into a particular phenomenon in greater detail, there is a comprehensive reference section in the sources and notes.

I could not have written this book without a great deal of help from a good many people. I should like to thank Jos Widdershoven, a one-time student of Marcel Minnaert, for introducing me to the sky; Gerald King for asking a lot of awkward questions; Alastair McBeith for reading an early draft, and setting me right on astronomical matters; Pekka Parviainen for his generosity and patience, not to mention his stunning photographs; Claudia Hinz and Francisco Diego similarly; several anonymous reviewers who spotted mistakes and made helpful suggestions; Mairi Sutherland for her hard work knocking my prose into shape and helping me to express myself more clearly; Faith Evans, my agent for dealing with the business side of things; and, most importantly, Sue, my wife, who never doubted that this book would see the light of day, for her encouragement, constructive criticism and much, much more.