



In association with  
the Met Office

# THE CLOUD BOOK

HOW TO UNDERSTAND THE SKIES



RICHARD HAMBLYN

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D&C  
David and Charles

THE  
CLOUD  
BOOK

HOW TO UNDERSTAND THE SKIES

RICHARD HAMBLYN

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# FOREWORD

Clouds are one of nature's greatest art forms with their ever-changing shapes and colours dancing to the tune of the atmosphere's whims. They're also an important expression of the science of meteorology, reflecting the dynamics of the atmosphere from the smallest convective eddy to the broad-scale gradual ascent associated with an approaching frontal depression.

From my earliest memories, growing up in the Clyde Valley, in south-west Scotland, I have marvelled at the changing skyline, excited about what it all meant and what might happen next. What made cirrus clouds look so fibrous? Why was low stratus so depressing? And, oh, how excited I got with the fireworks display brought on by an approaching cumulonimbus cloud.

Of course, in those days I had no understanding of the names of clouds, but my first book on cloud observations brought structure to this private chaos and began to hone my ability in predicting what might happen next.

This ability in observing the weather through the behaviour of clouds and reading what it heralded provided me with a marvellous insight that I used to great effect when I eventually became a professional forecaster and later Chief Meteorologist at the Met Office.

My childhood ponderings on clouds had given me an intimate picture of atmospheric motion that I struggled to find when learning about the physical laws and mathematical equations required of a meteorologist. But by meshing my amateur

understanding into my formal studies, the art of forecasting became underpinned by the science of meteorology.

This book relives the thrill of my first sight of cloud pictures in all their breathtaking variety. These wonderful photographs, combined with expert commentary, will give both the amateur and the professional a feeling of order to the apparent chaos of the skies above.

Ewen McCallum  
Met Office Chief Meteorologist



# INTRODUCTION

## Clouds and their Classification

Clouds have been objects of delight and fascination throughout history, their fleeting magnificence and endless variability providing food for thought for scientists and daydreamers alike. 'The patron goddesses of idle men', as the playwright Aristophanes described them in 420 BCE, clouds and their ever-changing patterns have long stood as potent symbols of nature's restlessness and grandeur.

But in contrast to all other earthly phenomena, from microbes and minerals to the greatest plants and animals, every known species of which had been classified and reclassified many times over since early antiquity, clouds (at least in Western culture) remained uncatalogued and unnamed until the early nineteenth century, when the Latin terms that are now in international use – 'cirrus', 'stratus', 'cumulus', and their compounds – were bestowed

on them by Luke Howard (1772–1864), an amateur meteorologist from East London.

Luke Howard was not, of course, the first to attempt to understand clouds in a systematic way. Scientific thinkers had long sought to explain the complex mechanics of cloud formation – Aristotle, for example, came up with the theory of atmospheric exhalations, based on the four stratified elements of earth, air, fire and water, with their associated interactive properties of heat and cold, dryness and moisture – but no one had ever hazarded a system of classifying or naming their apparently limitless varieties. This must have been due, at least in part, to the challenge posed by their fleeting instability. Clouds change their form and structure, minute by minute, their shapes appearing 'as indistinct as water is in water', as Shakespeare described them in *Antony and Cleopatra*; so how could objects that remain in

a state of constant flux and flow ever be granted permanent or meaningful identities?

The problem was solved in 1802, when the thirty-year-old Quaker Luke Howard (who was a pharmacist by profession, but a meteorologist by inclination) devised a deceptively simple classificatory system, which overcame the challenge of the clouds' continual merging and demerging, as they rise, fall and spread through the atmosphere, rarely maintaining the same shape for more than a few minutes at a time. In contrast to earlier natural-history taxonomies, in which genera and species were arranged in fixed relationships, Howard's new classification needed to allow for all this continual movement and change, since, as he expressed it at the time, 'the same aggregate which has been formed in one modification, upon a change in the attendant circumstances, may pass into another.'<sup>1</sup>