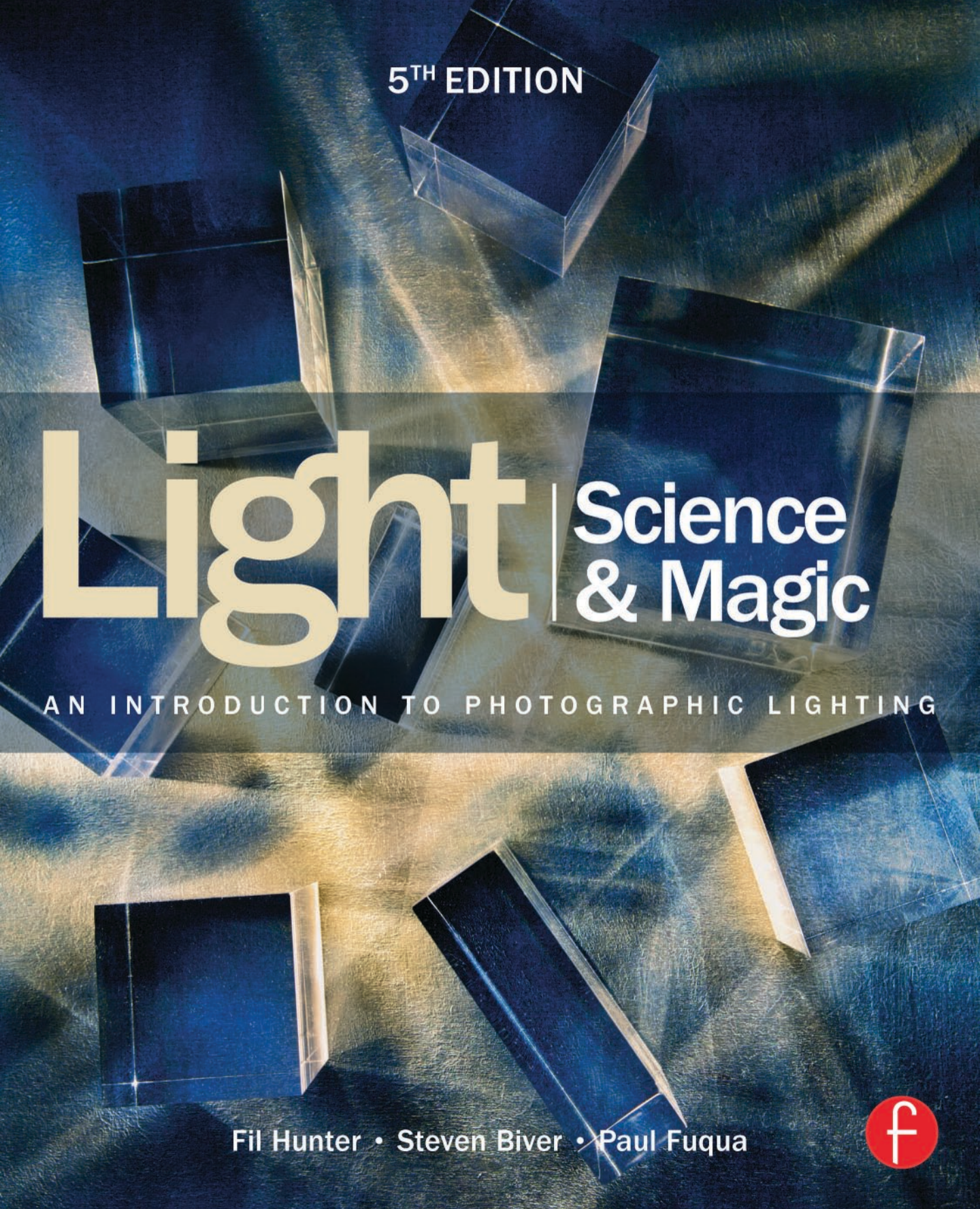
5TH EDITION
Light | Science & Magic
AN INTRODUCTION TO PHOTOGRAPHIC LIGHTING
Fil Hunter • Steven Biver • Paul Fuqua

Light: Science & Magic

Photographic lighting is a topic that will never go out of style, no matter how sophisticated cameras and other technology get. Even with the most high-tech gear, photographers still need to put a lot of thought and vision into lighting their photographs in order to get great results. This key skill has the power to dramatically and quickly improve photographs.

Light: Science & Magic provides you with a comprehensive theory of the nature and principles of light, with examples and instructions for practical application. Featuring photographs, diagrams, and step-by-step instructions, this book speaks to photographers of varying levels. It provides invaluable information on how to light the most difficult subjects, such as surfaces, metal, glass, liquids, extremes (black-on-black and white-on-white), and portraits.

This new edition includes:

- All new chapter entitled "Setting Up Your First Studio"
- A re-vamped and expanded chapter 8, "Making Portraits"
- New appendix of reliable photo gear sources
- Over 100 new photographs and informational sidebars
- Updated information about advances in flash equipment, LED panels, and fluorescent lights

Styles of lighting continue to change, but the nature of light will always remain the same. Once photographers understand the basic physics of lighting, they can apply that knowledge to a broad range of photographic styles.

Fil Hunter was a highly respected commercial photographer specializing in still life and special effects photographs for advertising and editorial illustration. During a career spanning over three decades, he worked for such clients as America Online (AOL), US News, Time-Life Books, *Life Magazine* (27 covers), the National Science Foundation, and *National Geographic*. He taught photography at university level and served as technical consultant on a number of photographic publications. Mr. Hunter won the Virginia Professional Photographer's Grand Photographic Award three times.

Steven Biver has over twenty years of experience as a commercial photographer specializing in portraits, still life, photomontage, and digital manipulation. His client list includes Johnson & Johnson, USDA, William & Mary College, Condé Nast, and IBM. He has been honored with awards from Communication Arts, *Graphis*, *HOW Magazine*, and Adobe, who have also included his work on a Photoshop 'extras' disc to inspire other photographers. He is also the co-author of *FACES: Photography and the Art of Portraiture*, another Focal Press publication.

Paul Fuqua has worked as an editorial and wildlife photographer for more than thirty-five years. He started his own production company in 1970 and is dedicated to teaching through the use of visuals. Paul has written and produced educational and training material in a variety of fields including law, public safety, history, science, and the environment. For the last ten years he has produced educational material dealing with the natural sciences and the need for global habitat stewardship. Paul is also a co-author of *FACES: Photography and the Art of Portraiture* for Focal Press.

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An Introduction to Photographic Lighting

Fifth Edition

Fil Hunter
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Paul Fuqua

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Dedication

We dedicate this book to our friend and co-author, Fil Hunter. It is his pioneering vision that this book so largely reflects.

Sadly, Fil died while this edition was in preparation after a long and tortuous battle against a terrible disease. We shall miss him, as will many others in the photography community.

Steven Biver and Paul Fuqua

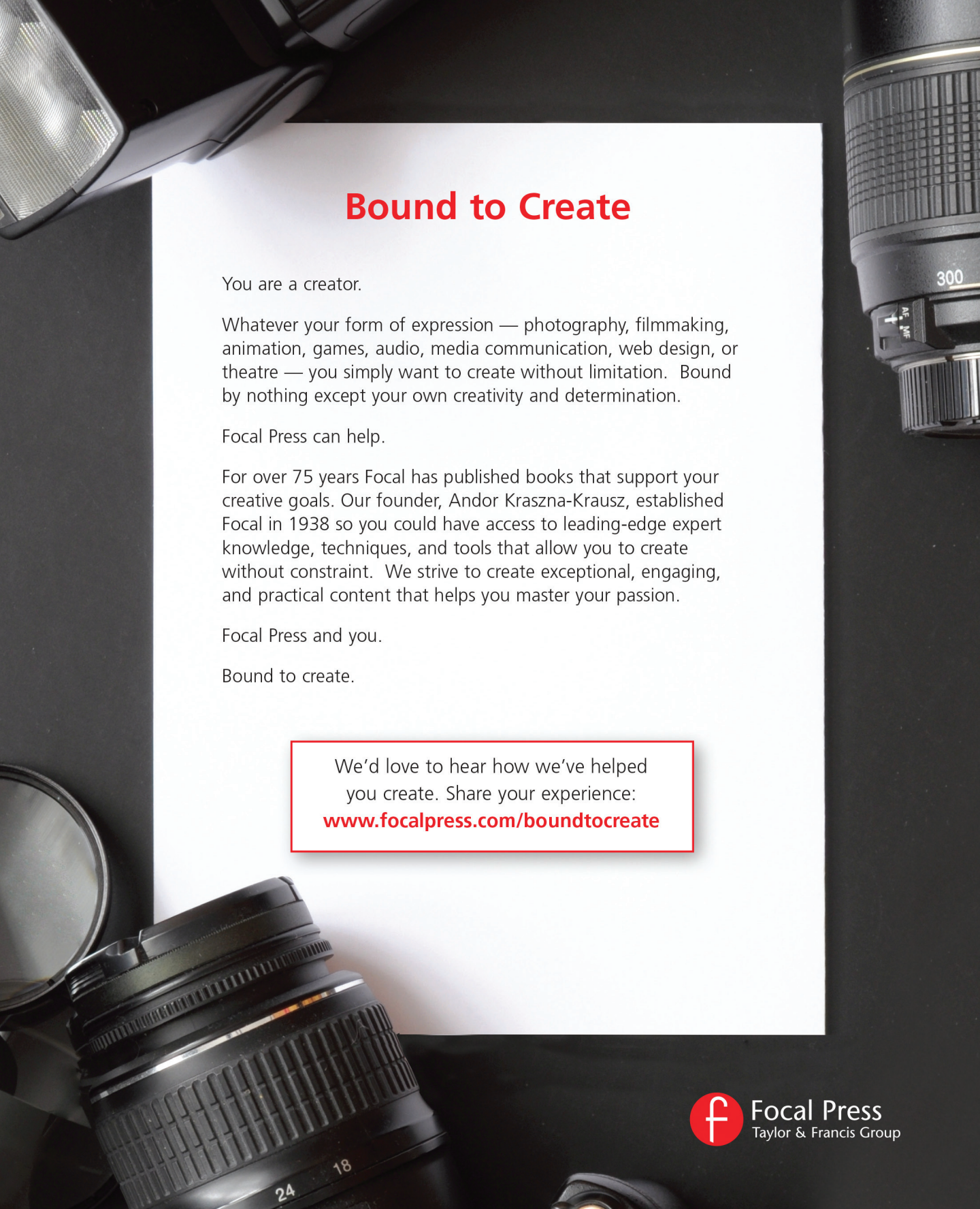

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Table of Contents

Chapter 5

Special Thanks

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Steven Biver

With gratitude and undying admiration for Robert Yarbrough—a teacher who taught.

Paul Fuqua

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Introduction

Lighting is at the very heart of photography. Unlike some of our picture-making colleagues, we will not go quite so far as to claim that "Without great lighting, there can be no great photographs." However, we do believe that comes close to being the truth.

And that is exactly why we wrote the first edition of this book. In it we wanted to present a number of key lighting concepts in a clear, readily understandable way. Our aim remains exactly the same for this—the fifth edition.

It is important to understand that this is *not* a "how to" book in the sense that the term is generally used. In it we rarely, if ever, suggest appropriate lens apertures, shutter speeds, flash settings, or other such information—information that is often an important part of the currently popular "recipe" approach to teaching lighting. If that is what you are looking for, you must look elsewhere. (Personally, we would recommend the brilliantly done "Digital Photography Book" series by Scott Kelby.)

If, on the other hand, you want to understand something about the underlying nature of light and learn how to employ its key characteristics to the lighting of any sort of subject in any location or circumstance, we suggest that this is the right book for you. In it we present an overarching approach to photographic lighting. Applying it will enable you to *understand* why a subject looks the way it does when it is illuminated by any given "light," and how to *use this understanding* to make exactly the picture you are after.

We also include chapters dealing with the peculiarities associated with using hot-shoe and similar flashes, and suggestions for those of you who may be considering setting up your first studio. Finally, in a brief appendix, we list some of the photographic suppliers from whom we have received particularly good services over the years.

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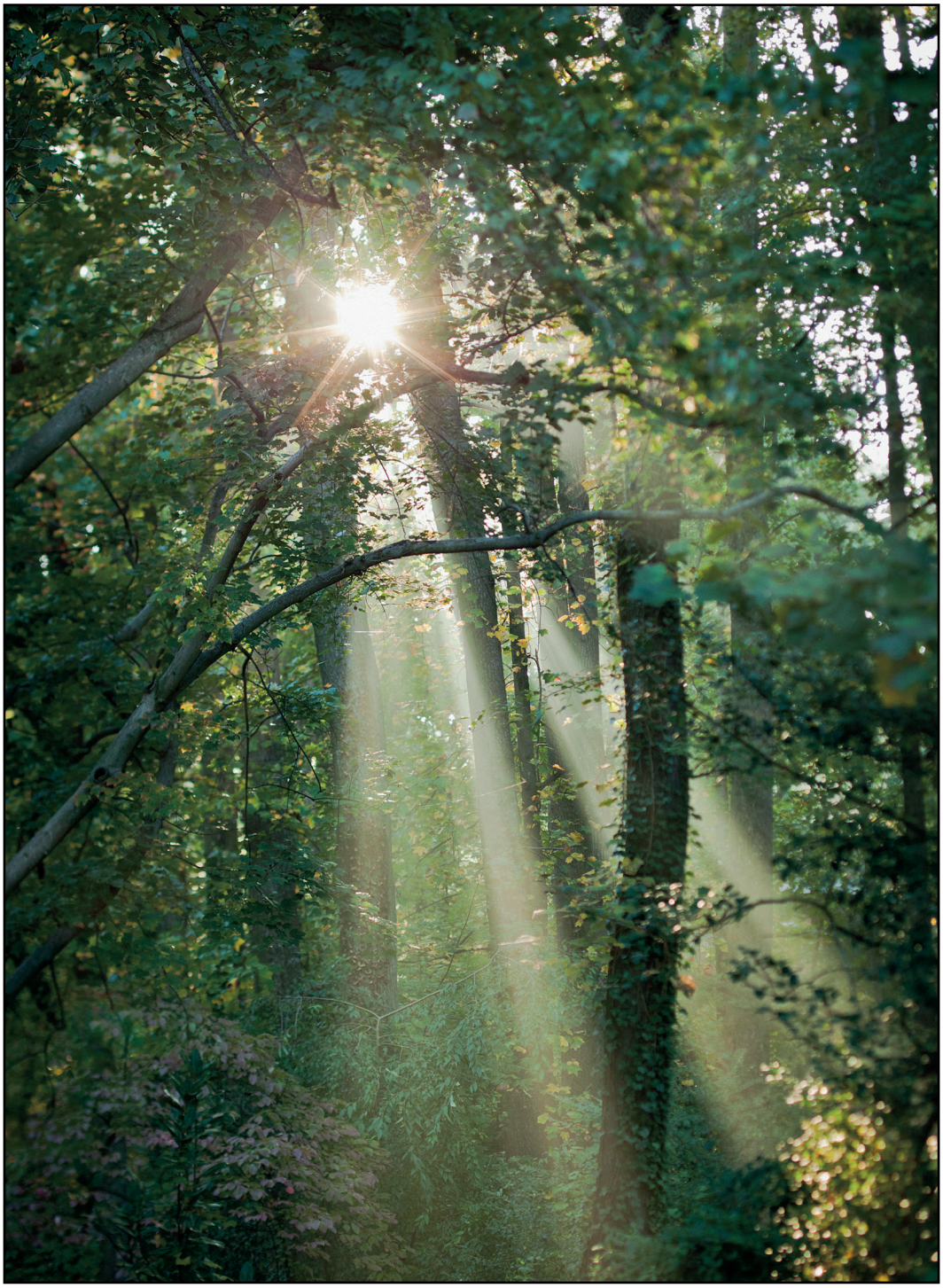

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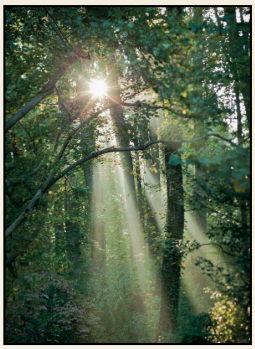
Light: the Beginning



Light: *Science & Magic* is a discussion, not a lecture. You bring to this discussion your own opinions about art, beauty, and aesthetics. We do not intend to change those opinions and may not even influence them very much. We will be more annoyed than flattered if reading this book causes you to make pictures that do nothing but mirror ours. For better or worse, you have to build your own pictures on your own vision.

What we *do* have to offer you is *a set of tools*. This book is about technology. Science. Brass tacks. It is information for you to use when you please, if you please, and how you please. This does not, however, mean that this book is not also about *ideas*, because it is.

The basic tools of lighting are principles, not hardware. Shakespeare's tool was the Elizabethan English language, not the quill pen he used. A photographer without mastery of lighting is like a Shakespeare who could speak only the language of the people in the Globe Theatre pit. Being Shakespeare, he still might have come up with a decent play, but it certainly would have taken a lot more work and, very likely, more blind luck than most people are entitled to expect.

LIGHTING IS THE LANGUAGE OF PHOTOGRAPHY

Patterns of light convey information just as surely as do spoken words. The information that light conveys is clear and specific. It includes definite statements, such as "The bark of this tree is rough" or "This utensil is made of stainless steel, but that one is sterling."

Lighting, like any other language, has a grammar and a vocabulary. Good photographers need to learn both. Fortunately, photographic lighting is a lot easier to master than a foreign language. This is because physics, not social whim, dictates its rules.

The tools we have included in this book are the grammar and vocabulary of light. Whatever we say about specific technique is important only to the extent that it proves the principles. *Please, do not memorize the lighting diagrams in this book.*

It is entirely possible to put a light in exactly the same spot as shown in one of the diagrams and still make a bad picture—especially if the subject is not identical to that in the diagram. But if you learn the principles, you may well see several other good ways to light the same subject that we never mention, and which perhaps have never even occurred to us.

WHAT ARE THE "PRINCIPLES"?

To photographers, the important principles of light are those that predict *how it will behave*. Some of these principles are especially powerful. You will, however, probably be surprised to find how few they are, how simple they are to learn, and how much they explain.

We discuss these key principles in detail in Chapters 2 and 3. They are the tools we use for everything else. Then in later

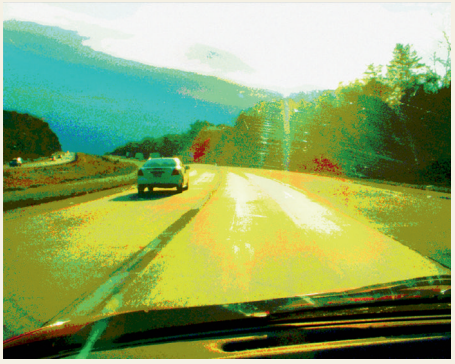
Working with Light

Figures 1.1 These four images—very different pictures—are a small sample of some of the many different ways photographers have worked with light, be it either in a studio or the outside world.

Credit: Steven Biver

Credit: Steven Biver

Credit: Mark Romanoff



Credit: Paul Fuqua

1.1 Some examples of the different photographers that have worked with light.

chapters we put them to work lighting a wide range of subjects. At this point we will simply list them:

1. The effective *size of the light source* is the single most important decision in lighting a photograph. It determines what types of shadows are produced and may also affect the type of reflection.

2. Three *types of reflections* are possible from any surface: direct reflection, diffuse reflection, and polarized direct reflection. They determine why any surface looks the way it does.
3. Some of these reflections occur only if light strikes the surface from within a limited *family of angles*. After we decide what type of reflection is important, the family of angles determines where the light should or should not be.

Just think about that for a minute. If you think lighting is an art, you're exactly right—but it's also a technology that even a bad artist can learn to do well. These are the most important concepts in this book. If you pay close attention to them whenever they come up, you will find they will usually account for any other details you may overlook or we forget to mention.

WHY ARE THE PRINCIPLES IMPORTANT?

The three principles we have just given are statements of physical laws that have not changed since the universe began. They have nothing to do with style, taste, or fad. The timelessness of these principles is exactly what makes them so useful.

Consider, for example, how they apply to portrait style. A representative 1952 portrait does not look like most portraits made in 1852 or 2014. However, and this is the important point, *a photographer who understands light could duplicate either of them.*

Chapter 8 presents a number of useful approaches to lighting a portrait. But some photographers will not want to adopt those approaches, and even fewer will do so in 20 years. We do not care whether or not you use the methods of portrait lighting we chose to demonstrate.

We do, however, care very much that you understand exactly *how* and *why* we did what we did. It is the answers to those very "hows" and "whys" that will allow you to produce your own pictures your own way. Good tools do not limit creative freedom. They make it possible.

Good photographs take planning, and lighting is an essential part of that planning. For this reason, the most important part of good lighting happens *before* we turn on the first lights. This planning can take many days or it can happen a fraction of a second before pressing the shutter release. It does not matter when you plan or how long it takes, as long as you get the planning done. The more you accomplish with your head, the less work you have to do with your hands.

Understanding the principles we presented above enables us to decide what lights need to be where before we begin to place them. This is the important part. The rest is just fine-tuning.

HOW DID WE CHOOSE THE EXAMPLES FOR THIS BOOK?

The portrait is but one of the several basic photographic subjects we discuss. We chose each to prove something about the basic principles. We also lit the subject to show the principle, regardless of whether there might be other good ways to light the same thing. If you master the principles, you will discover the other ways without any help from us.

The above means that you should give at least some attention to every representative subject. Even if you have no interest in a particular subject, it probably relates to something you do want to photograph.