Optics in Photography
Cover: photograph of a cutaway section of a Vivitar Series 1 90mm f/2.5 lens
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I am greatly indebted to the Society of Photo-Optical Instrumentation Engineers (SPIE) for undertaking the publication of this book. It is really an updated third edition of my previous book entitled *Lenses in Photography*, two editions of which were published, in 1951 and 1963, and which have long been out of print. The new title is more truly representative of the contents, as such subjects as scene brightness, emulsion speed, exposure determination, and flash equipment do not involve lenses at all. However, the rest of the book is concerned with lenses, including perspective considerations, depth of field, resolving power, viewfinders, image brightness, enlargers, projectors, and stereoscopy.

As was stated in the two previous editions, this book is addressed mainly to the advanced amateur photographer who wishes to know more about the equipment and how it should be used. No consideration has been given to the purely professional aspects of the subject, such as 35mm motion pictures and sound recording, medical and x-ray photography, aerial photographs, photogrammetry, astronomical and space photography, high-speed cameras, photocopying machines, and halftone printing. Nor has any attention been paid to the design and construction of modern cameras and their electronic components, or to the chemistry of the photographic process.

The principal changes in the present edition are the result of the rapid advance in the complexity of the modern amateur camera, particularly the SLR and rangefinder models using 35mm film. Interest in 8mm and 16mm motion pictures has waned considerably, and those now interested in making movies are more likely to be using a camcorder than a film camera. Other major changes are the shift from flashbulbs to electronic flash, the general use of multicontrast printing paper, a strong interest in underwater photography, and the introduction of cameras equipped with automatic
focusing. The modern camera, full of mechanical and electronic gadgetry, is a remarkable piece of equipment, and the user is tempted to rely entirely on the automatic features, which it must be admitted generally work perfectly.

Chapter 7 on lens types has been entirely rewritten, as the whole field has changed. Very few of the old classical lenses are still in production, while zoom lenses and reversed telephotos are becoming almost universal. Large cameras such as the Speed Graphic and other 4 × 5 view cameras have virtually disappeared, except for those being used by the few individuals who still cling to them. The possession of a named lens, formerly the mark of a serious photographer, is no longer applicable, as lenses today do not have names, and indeed it is hard, if not impossible, to ascertain the structure of any modern lens.

Aside from changes in cameras, the external form of slide projectors has changed from the older tall models to those of a flatter shape, thanks to the introduction of projection lamps that can be operated in a horizontal position. The familiar overhead projector, or Vuegraph, has largely replaced slides as a lecture medium. Color photography has almost entirely replaced the older black-and-white pictures among amateurs, and in magazines and even in some newspapers. Stereoscopy has, however, remained unchanged except for a brief introduction of multilens cameras that yield a ribbed lenticular print.

I am indebted to various sources, acknowledged individually in the first edition of Lenses in Photography, for many of the illustrations used in this book.

My sincere thanks are due to Eric Pepper of the SPIE staff, who supervised the production of this book with great care and patience.

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