

those flies which are more attractive to fish and on fly dressing. There are four appendixes giving a list of angler's insects, keys to duns and spinners, descriptions of Ephemeroptera and hints on fly dressing.

The book is handsomely illustrated: one illustration in particular, of a stretch of water on the River Teith, gave me a sharp fit of nostalgia. Distribution maps and a good bibliography complete the angler's fare.

The special interest of this book lies in its combination of fisherman's lore and entomological science, in which neither is allowed for too long to dominate the other. Some of the author's comments are shrewd and worth noting, such as that while dichotomous keys afford the best scientific means of identifying an insect, really the best way is to be so familiar with the insect as to know it by sight, a method employed long after the diagnostic characters of the key have been forgotten. How true we know that to be. Then it is interesting to note that it may be more easy to identify an insect not from a dead specimen but from its effigy. Here again, long experience and intuition, only to be passed on in practice, can remind the man of science that his vocabulary is still too limited or his observation subconsciously too acute to allow him to record and describe all.

To me the best thing about this book is that the author never suggests that angling may become a science. To him, as to all true anglers, it is an art, and it would indeed be a bad day for us if all the rods on the river were equally lucky because everyone knew which ephemerid to put on. There are two questions one would like to ask the author: Why are the *Cænis* species called the "Angler's curse" and what has happened to "Jock Scott"?

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REFERENCE BOOK OF INTERFEROMETERS

Modern Interferometers

By C. Candler. Pp. 502. (London: Hilger and Watts, Ltd., 1951.) 57s. 6d. net.

FOR many years Ewart Williams's "Applications of Interferometry" has been a standard British reference for physicists: the fact that a hundred-page monograph should occupy such a position for so long is evidence of the need for a more comprehensive work on interferometry. C. Candler's book goes far to satisfy this need. Whereas Williams treats the subject from a theoretical point of view and describes interferometers as examples of a particular class, Candler generally discusses a whole range of instruments in a more-or-less arbitrary order. For this reason the book is somewhat discontinuous, but is very suitable for the practical scientist who wishes to learn something about an instrument he has to use. Two-thirds of the book are devoted to interferometers, and the remainder to diffraction gratings.

The first chapter outlines the proposed arrangement of the material adopted. Instruments are to be grouped according to their functions: the measurement of difference in optical path, of length, of wave-length and of refractive index, and the analysis of hyperfine structure. This system is barely

recognizable in the ensuing chapters, however. Chapter 2 deals with suitable light sources and factors affecting the widths of spectral lines, while Chapter 3 discusses the fundamental standards of length, although descriptions of the determination of the length of the metre in terms of light wave-lengths are deferred to Chapters 5 and 19.

Chapter 4 deals with interference effects in thick plates and thin films, and includes accounts of non-reflecting films, interference filters and surface finish; in connexion with the last, it is misleading to suggest that the technique adopted by Timms is very similar to that employed by Tolansky, as in only one of these is multiple-beam interference utilized. The next three chapters describe the principle and application of the Michelson interferometer and its derivative due to Twyman and Green. Bates's wave-shearing interferometer receives only two pages, with the Mach-Zehnder interferometer mentioned only (a diagram of one version of this instrument is also included at the end of the book). An account of the latter applied to the examination of fluid flow, as in wind tunnels, would have been a useful addition.

Interferometers used in the measurement of length and angle gauges are described in Chapter 8. The inclusion of an optical measuring machine and an optical comparator, neither employing interference, appears irrelevant. In Fig. 8.3 (p. 195) the author states that the prism has been drawn oversize "to avoid violating the laws of optics": a more serious violation is the inclusion of an eyepiece in the diagram, as with this arrangement the observer merely views an image of the pinhole. The eye is, of course, placed in the plane of the pinhole; a telescope of low power can both transfer this to a more convenient position and slightly magnify the gauges under examination.

Chapter 9 describes the Fabry-Pérot étalon and its use in the determination of the metre, while the next chapter deals with the stellar interferometer. Reflexion and transmission échelons are considered in some detail in two further chapters. An illustration of the rather discontinuous treatment, Chapter 13 returns to the Fabry-Pérot étalon, dealing with its application to the measurement of wave-length and to the analysis of hyperfine structure. A chapter is allocated to the Lummer-Gehrke plate: the statement that this interferometer employs a process combining diffraction with refraction should surely read—reflexion with refraction. Four chapters on diffraction gratings follow, covering plane and concave gratings, their ruling, properties and methods of mounting. A short account of grating replicas is included; but no mention is made of developments during the past few years. Three short, concluding chapters describe the Fabry-Pérot étalon as a refractometer, and the Rayleigh and Jamin refractometers.

Numerous references are listed at the end of each chapter, with additional ones given in an appendix. The book already covers an enormous field, but, from the point of view of completeness, micro-interferometers might well have been included; the only reference is two paragraphs on the interference microscope. Space could have been found by the omission of irrelevant material, such as the examples quoted. Diagrams and script are clear, and the style is very readable. Because of the distribution of material, however, it is more suited as a book for reference than for general reading.

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