

is an acknowledged pioneer in algebraic K-theory and this monumental work presents (in amplified form) a graduate course given at Columbia University in 1966-67. It is a systematic and comprehensive treatment of the subject and collates important results from all sources, not least from the author's earlier papers. It also contains many results and attitudes published for the first time.

To the non-expert, algebraic K-theory may be grossly oversimplified as a generalization of vector space theory when the ground field is replaced by a more general ring. It is the study of projective modules and their automorphism groups. To the uncommitted reader the text may seem a morass of difficult technical details; however, an interested party will find it a veritable mine of information.

The first part is a review of background material (category theory, categorical algebra, rings and modules). The speed of exposition would require at least a passing acquaintance with most of the ideas. The remaining 600 pages cover the major advances of algebraic K-theory in such prolific detail that they cannot all be accounted for in this review. They come under the general headings of stable structure of projective modules and their automorphism groups, algebraic K-theory (in an axiomatic categorical context) and K-theory of projective modules. There is also an appendix on the relations between vector bundles and projective modules. Certain topics (symplectic and quadratic modules, the functors  $K_n(n \geq 2)$ ), which have yet to be given a satisfactory treatment, are omitted. Nevertheless, the text remains astonishingly comprehensive.

The casual reader wishing to browse through the book is warned that certain symbols are given more subtle meanings as the text progresses. Also the reader with nothing better to do may find an average of a misprint per page (endemic in the nature of the publication). Such facts, however, pale into insignificance when compared with the mammoth achievement of preparing a tract of encyclopaedic proportions. The author and publishers are to be congratulated on producing such an epic. No serious student of the subject should be without a copy.

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ferometers is very general and consequently suffers both in rigour and in detail. For the diffraction grating, the formulae assume normal incidence, a case which is rare in practice, and the treatment of the Fabry-Perot interferometer, particularly in view of its many applications for laser spectroscopy, is inadequate, even for a book dealing "mainly with principles".

Lasers themselves are given a short treatment which unfortunately contains obvious errors. A xenon flash tube with discharges lasting  $10^{-6}$  s (page 370) would be very useful for pumping dye lasers, but such short light pulses are not required for pumping a ruby crystal. The helium-neon laser is a four level laser and the lasing transition does not terminate on the ground state (page 372). The description of laser dynamics in terms of the Fabry-Perot interferometer is now rarely employed and a more rigorous approach to modes in lasers should have been included.

There are several misprints of an irritating nature, particularly when there is confusion between references to sections, and references to equations, such as occurs on page 306. Again in the figures on page 221 dealing with blazed gratings, the angles  $\alpha$  and the grating spacing  $d$  are both printed as  $\alpha$ . Hopefully these errors will be corrected in the second edition which the book certainly deserves because of the many good sections it contains. These include the initial chapters on waves and Fourier theory, and the classical theory of dispersion is dealt with in a manner which makes the physics clear. The final chapter on some applications of optical ideas to the study of matter, astrophysics, and radioastronomy and the appendices on optical components and practical Fourier computations are valuable.

To sum up, this is a useful addition to the available texts on modern optics and its applications. It will probably prove most useful to the increasing numbers of non-physicists who use optics as a tool, but the optics specialists, particularly the physics student working for a PhD, will certainly need a more extended treatment than is to be found here. The informal style and clear illustrations and diagrams make for pleasant reading and the price is reasonable for a text of this size.

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## PHYSICAL OPTICS

### Optical Physics

By S. G. Lipson and H. Lipson. Pp. xiii + 494. (Cambridge University Press: London, February 1969.) 75s; \$12.50.

This book obviously had to be compared with the one of identical title by Garbuny (Academic Press, 1965). In the earlier book, optical physics is defined as "the study of dynamic interactions between light and matter and the conclusions on structure and state that can be derived from optical phenomena". The authors of the present text describe it thus: "It deals essentially with the principles of optics but wherever possible we have emphasized the relevance of these principles to other branches of physics, hence the rather unusual title". In fact, the bulk of their material is essentially physical optics and, because the book is intended for advanced undergraduate and graduate courses in physics, it should really be compared with *Principles of Optics* by Born and Wolf. Unlike this classical text, the present treatment is phenomenological rather than rigorous and postgraduate students will find that there is a consequent inadequacy in the approach. Thus in the chapter on coherence, temporal and spatial coherence are treated mainly pictorially and the fundamental description in terms of the degeneracy parameter is not mentioned.

Again the treatment of diffraction gratings and inter-

## MALE BONDS

### Men in Groups

By Lionel Tiger. Pp. xviii + 254. (Thomas Nelson: London, March 1969.) 50s.

THE field studies of non-human primates carried out in the early 1960s are catching the imagination of an increasing number of social scientists; these studies show that the social life of men is similar to that of apes and monkeys in a number of ways, suggesting the operation of innate mechanisms which had survival value for our remote ancestors. Lionel Tiger pursues one aspect of this—the tendency of males to form cooperative groups. He suggests that "male-male bonds are of the same biological order for defensive, food-gathering, and social-order-maintenance purposes as the male-female bond is for reproductive purposes" (page 42). The evolutionary history of the male-male bond is admittedly speculative but a comparison between two kinds of primates is suggestive. Baboons, which form strong male hierarchies, live in open country; langurs, which do not form dominance hierarchies, live in the forest. It is usually accepted that baboons have evolved their social system because of the greater need for defence of the group; man's ancestors moved from the forests at some stage, and may have evolved the male-male bond at this point.

The body of the book is concerned with an account of male groups in human societies. (1) Political groups are