Other, equally interesting, applications to electromagnetism, and so on are not treated.

The second part, entitled "Probabilistic Problems," contains chapters on prediction (Wiener), game theory (Bohnenblust), operations research (King), dynamic programming (Bellman), and Monte Carlo methods (Brown).

The third part, entitled "Computational Considerations," treats matrices, with applications to engineering problems (Pipes); functional transformations (Barnes); conformal mapping (Beckenbach); nonlinear (Morrey), relaxation (Forsythe), and steep descent methods (Tompkins); and, finally, high-speed computing devices (Lehmer).

Most of the authors are well-known masters of their subjects, and they give excellent presentations, which, though condensed, are intelligible and stimulating. It is not to be expected that the chapters will form a homogeneous unit. The requirements for intelligent reading vary from elementary advanced calculus to Lebesgue integration. The chapters can be read independently and contain references for further reading. One of the authors states, disarmingly, that he is a pure mathematician with very little contact with engineering problems. Most of the authors, however, have had extensive experience in applied mathematics and specific engineering applications. On the whole, the volume is warmly recommended to the modern engineer who has a good mathematical background.

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Astronomical Optics and Related Subjects. Proceedings of a Symposium. Zdenek Kopal, Ed. North-Holland, Amsterdam; Interscience, New York, 1956. 428 pp. Illus. $12.50.

It is unfortunate that this excellent volume has a rather misleading title. To be sure, all the subjects treated apply to the problems of modern astronomy, but, more than that, most of them apply more broadly, to optics in general. As a matter of fact, many of the contributors to the volume would not designate themselves astronomers.

This is the proceedings of a four-day symposium held at the University of Manchester, England, in April 1955. The aim of the symposium was twofold: to provide a forum for the discussion of certain fields in optics of timely interest and astronomical significance and to strengthen further the liaison between astronomy and optics by bringing current astronomical desiderata to the attention of contemporary optical experts. The symposium was attended by 105 persons from five European countries; America was not represented. In all, 61 papers were presented, and 46 of them are published here, with an excellent 12-page introduction by the editor, Zdenek Kopal, who is professor of astronomy at Manchester, and with brief concluding remarks by J. Rösch of the Observatoire du Pic du Midi. Most of the text is in English, but ten of the papers are in French and two are in German; each of the 12 papers is preceded by a short abstract in English. There is an author index, but no subject index, alas. There are numerous line-drawing illustrations and several excellent plates; the typography is excellent.

The book is divided into seven main sections corresponding to the several sessions of the symposium. Each section contains from four to ten short papers. The subject matter of the first three sections is definitely in the "general physical optics" category: information theory and optics; optical images and diffraction; interferometry and coherence problems. The last four sections are devoted to topics of more special application to astronomy: electronic devices in astronomical optics (including both photoelectric photometry and the new and promising television techniques) that are supplanting photography in many applications; resolution problems and scintillation or "seeing" as the deleterious, irregular refraction by the earth's atmosphere is commonly called; wide-angle optical systems and aspheric surfaces, of such practical importance in modern astronomical telescopes; and filter photography, in which both dye filters and interference (thin film) filters are used. The interest in this last topic surely extends to fields other than astronomy.

An indication of the newness that has come into optics, changing it so radically from a formulism of classical physics, is given by D. Gabor of Imperial College, London, when he states that "optics was always considered as a good didactical preparation for wave mechanics; now it appears that quantum mechanics is not a bad preparation for optics" (page 30). Although it would appear that leadership in the "new optics" has come from Great Britain, France, Holland, Germany, and Italy, the contributions of the Americans Claude Shannon, Norbert Wiener, and Otto Schade are often mentioned by our colleagues overseas. In October 1951 a symposium on optical image evaluation was held at the National Bureau of Standards in Washington, attended by participants from many countries, and in June 1955 a symposium on the formation and evaluation of images was held at the University of Rochester. Several Americans attended the international conference in September 1954 in Florence, Italy, on "Problems in Contemporary Optics," which was, in a scientific sense, the forerunner of the Manchester symposium.

This volume is highly recommended to those who wish to become more familiar with the extent of modern optics and especially to astronomers and other optical folk who are interested in extracting the maximum amount of information to be obtained from the diffraction pattern that is called an optical image.

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Social Characteristics of Urban and Rural Communities, 1950. A volume in the *Census Monograph Series*. Otis D. Duncan and Albert J. Reiss, Jr. Wiley, New York; Chapman & Hall, London, 1956. 421 pp. $6.50.

The volume is an amplification and illumination of materials from the 1950 census dealing with the social characteristics of different-sized communities. The authors consider 11 classes of places, ranging from urbanized areas of three million or more inhabitants to sparsely settled farm regions. They set forth some interesting characteristics of these various bands in the sociological spectrum. Women outnumber men in cities and other incorporated places, but in the extremely rural regions the male animal predominates. The urban population in general is characterized by a higher median age, a lower fertility ratio, smaller families, higher percentages of separated and divorced persons, a larger percentage of women in the labor force, more years of education, higher incomes, and so on. These urban-rural differences might be easily surmised or discovered from other sociological writings, but their extent is here definitely stated and graphically illustrated. The authors have made an instructive and commendable contribution to social science.

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The Human Brain. From Primitive to Modern. A. M. Lassek. Thomas, Springfield, Ill., 1957. viii + 242 pp. $4.75.

The purpose of this book, the author says, "has been to try to portray the significance and impact of the long, past environment upon that dynamic organ, the human brain, and what it may mean to us in the middle of the 20th Century." The description of the brain itself and of the patterns of its working is brief