OPTICAL INSTRUMENTS*

IN the bewilderment caused by the recent advances in atomic physics and electronics, the scientist is apt to overlook the role of optics in modern scientific and industrial development. The *important contributions made by optics to* such development is brought home by these *Proceedings* of the London Conference on Optical Instruments held jointly with the International Optical Commission.

Photographic and projection lens manufacture, so important in aerial telephoto and wide-angle recording, received its due share of attention and a new zoom lens of variable focus has come into regular use. A new feature in the development of microscopy is the introduction of the reflecting microscope, which has a double advantage of greater achromatism and longer working distance. The ever-increasing demand of the biologist to study, not merely the structural outlines, but the detailed internal constitution of their objects of investigation, is met by the design of the phase-contrast microscope. In the ultra-violet region, the problem of imperfect achromatism is solved by the introduction of fused quartz-fluorite objectives which give virtual images, which are rendered real by their combination with spherical mirrors which are inherently achromatic.

In the field of spectroscopy, a new feature is the Echelle spectroscope whose performance lies intermediate between the *diffraction grating* and the Michelson *Echelon* in respect of resolution of spectral lines and concentration of light into one order. New types of mounting of gratings with additional mechanical and opical advantages are also designed. Spectrophotometry, which was till recently a laboratory technique for chemical analysis, has found important application in industry. Rapidity of work combined with high accuracy of the results obtained, which are so important for industrial concerns, are both achieved by the latest types of spectrophotometer in which are incorporated compact and complicated optical, photoelectric and electronic assemblies, in addition to mechanical devices for automatic recording. The range of investigation is also extended far beyond the visible region into the infra-red and ultra-violet.

The problem of designing a *coma-free astronomical* reflector of large aperture and large field is now solved by the new Schmidt camera in which the aberrations of the spherical reflector are corrected by the introduction of a thin, nearly plane-parallel corrector plate placed in an aperture stop at the centre of curvature of the mirror. A new 98-inch telescope incorporating the latest optical and mechanical features is under erection at the new site of the Greenwich Observatory and the final results will be awaited with great interest. Reflecting telescopes are replacing the refractors in the smaller theodolites and binoculars also on account of their greater freedom from chromatism.

New types of testing equipment for determining transmissions of optical instruments are also discussed. Synthetic optical crystals and plastic glasses are new sources of raw material in optical technology which seem to open up new methods of scientific investigation.

The *Proceedings* which report the above developments in optical instrument designs, are thus of interest to the biologist, the astronomer, the spectroscopist and the industrialist. The discussions that followed each of the papers read, are highly illuminating as the contributors are all experts in their respective fields of optical research. All the topics dealt with are fully illustrated. The get-up of the book is good in respect of both arrangement of subjects and their general presentation.

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WATUMULL ESSAY COMPETITION RESULTS

THE following are the prize-winners in the Essay Competition on "Population Control in Relation to Food in India": Dr. A. R. Mehta, Retired Deputy Director-General of Health Services, Government of India *(Rs. 3,000)*; Dr. S. Ranganathan, Nutrition Research Laboratories, Coonoor (Rs. 1,000); Mrs. Kamalini Kulkarni, Poona (Rs. 500); and Dr. B. P. Ghosh, Calcutta (Rs. 200).

Six prizes of Rs. 100 each have been awarded to Mr. Pravakar Sen, Government College, Darjeeling; Nikhil Ranjan Banerjee, Cuttack, Orissa; Dr. Moreshwar Patwardhan, District Belgaum, Bombay; Mr. Padmanabhan Nair, Farook College, Malabar; Anikendra Mahalanobis, Calcutta, and Arun Krishna Banerjee, New Delhi.