Guest Editorial

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This issue of *Optical Engineering* offers a series of articles highlighting the reduction-to-practice phase which takes place in the development of an optical system. In this issue, optical hardware evolves from system specification to assembly and test. This evolution follows a pattern that has changed little in the past 364 years, when Gallileo first perfected, then used Hans Lippershey's telescope to discover the satellites of Jupiter. While the pattern remains constant, significant changes have occurred in the development of improved tools and techniques. Science and engineering has provided the lens designer with large computers and faster programs, the optician with better machines and optical materials, and the technician with lasers and other sophisticated test equipment in a concerted effort to advance the state of the optical art. The development and application of this more advanced equipment constantly challenges the experience and training of the applied scientist and optical engineer.

In recent years our ability to thoroughly evaluate an optical system in the laboratory before, and sometimes after, its deployment in the field has served not only to assure the attainment of a specification but also to provide the optics community in general, with resource information for further improvements. This information eventually finds its way into the literature; first, in the form of private communications or in-house reports and finally, as a letter to the editor or full-length article in a professional publication. We find that in highly specialized fields such as optical system design, or optical fabrication and testing, technical communications represent our means for survival.

Sinclair noted in his editorial in the November-December 1972 issue of the Journal, "the raison d'etre for a journal such as this one is to provide a middle ground of technical communication." Beginning with this issue, a new column entitled "Optical Systems Manufacturing Technology" is being introduced for the purpose of discussing aspects of lens design, fabrication, assembly and test which affect the worker in the so-called middle ground. This column results from the combination of two factors. First, there has been a surge of renewed interest and enthusiasm regarding optical fabrication and testing. As a result, in October 1972, the Optical Society of America created an Optical Fabrication and Testing Group within its Technical Council. The chairman of this group, Frank Cooke, has authored the column on "Optical Activities in Industry" for *Applied Optics* since its first issue in January 1962. The purpose of the group is to demonstrate new techniques and discuss ideas for bridging the gap between lens design and system utilization.

The second factor is a well-established tradition with the Journal to "solicit manuscripts concerning the reduction to practice of new optical technology, or the practical application of known optical technology in new and inventive ways." Herman Schepler established a precedent for this column with his "Photo-Optics Note Book" which was first published in the October-November-December issue of the Journal in 1962. Brian J. Thompson and George B. Parrent, Jr. continued the trend with their series "Physical Optics Notebook." This tradition is a logical extension of earlier efforts to document optical manufacturing methods.

Recorded information on the design, fabrication, assembly, and testing of optics ranges from Baptista Porta's 1591 account in *Natural Magic* on the technique for optical polishing, to George Willis Ritchey's *Smithsonian Contributions to Knowledge,* 1904, on the making and testing of optical mirrors. In 1921, the Government Printing Office published Wright's Ordnance Department Document No. 2037 on "The Manufacture of Optical Glass and Optical Systems." Later, a series of articles, the first of which appeared in *Scientific American* in January 1926, precipitated the lens maker's classics – *ATM Book One, ATM Advanced* and *ATM Book Three.* From the late 1930s to the mid-1940s, Strong, Jacobs, Deve and Twyman authored outstanding works on optical fabrication and testing. In 1947, Johnson wrote *Optics and Optical Instruments* which is available today from Dover Publications in paperback. Another important work now available in paperback is Jean Texereau's *How to Make A Telescope* which was published in France in 1951 under the title *La construction du telescope d'amateur.* These works have been supplemented through the years by articles appearing in periodicals such as *Journal of the Optical Society of America* and *Sky and Telescope's* monthly column entitled "Gleanings for ATM's" conducted by Robert E. Cox. More recent periodicals such as the University of Arizona's *Optical Sciences Center Newsletter, Optical Spectra, Laser Focus, Electro-Optical Systems Design* and IPC's *Optics and Laser Technology* feature special issues or sections on optical shop practices. In the past few years, Robert Hopkin's *Military Standardization Handbook, Optical Design, MIL-HDBK-141,* the Kingslake series *Applied Optics and Optical Engineering,* Warren Smith's *Modern Optical Engineering,* and a recent release by D. F. Horne, *Optical Production Technology,* have emerged from the publishing houses to further update the available literature. Worth special mention in a list of current material are Dickson's *Optical Instruments and Techniques* and Van Heel's *Advanced Optical Techniques.* Obviously, it would be impossible to include in this editorial all of the important works dealing with the subject of optical systems manufacturing technology or to enumerate the significant papers which have been presented at professional society meetings.

The primary purpose of this editorial is to emphasize the importance of technical communications and to suggest not a reduction in the volume of information, but rather an improvement in the speed and efficiency in the dissemination process. The subjects featured in this issue represent a small cross-section of the optical technology as it exists in the 1970s. The authors hope that these articles will offer encouragement to others to contribute frequently to the Journal on improvements in optical design and manufacturing methods.