Guest Editorial

William N. Rosenblum

Associate Professor Physics and Optometry
The University of Alabama in Birmingham
The Medical Center/School of Optometry
University Station, Birmingham, Alabama 35294

Instrumentation in Vision

When I was first contacted about the possibility of developing a special issue devoted to vision, I was left in a quandary as to what elements to discuss and emphasize. The task has proved to be easier than I had thought, due to the help of the authors and the editor John DeVelis.

I have chosen ten articles dealing with modern instrumentation of testing, analyzing, and improving human vision. As the reader will see, we have come a long way from Young's optometer which he constructed from "card-paper." I am always surprised by the rebirth of basic optical concepts and the coupling of these to state-of-the-art instrumentation. With this in mind, I have tried to arrange the articles in the following manner: instruments which measure visual performance, instruments which measure components of the visual system, and instruments which test and develop visual aids.

The lead article by William E. Humphrey shows a new approach to an old problem, that of changing the vergence of the incoming light at the spectacle plane or corneal plane. The uniqueness of his method is in the employment of a novel lens and mirror system which eliminates the need of a phoropter or a trial frame in order to prescribe the refractive correction needed by the patient. This type measurement is viewed from another angle by H. A. Knoll and R. C. Mohrman in the instrument developed for Bausch and Lomb.

The automated halposcope developed by Thomas A. Decker et al exemplified modern technology by the use of a computer system and the multiple functions which the unit can perform. This is truly an omnibus instrument. In the field of vision measurements as they relate to changes in the body as a whole,

the work of Merton C. Flom and Anthony J. Adams indicates a trend toward using visual information to measure the altered state of an individual, brought on by the use of drugs or alcohol.

One might say that the bricks which form the foundation of instrumentation development are the measurements of the optical and physiological components of the eye itself. With regard to this, I regard the papers by Sami G. El Hage, Bernard Grolman, and Ronald E. Furukawa and Kenneth Polse, to be fine examples of instrumentation when faced with the complications of making a measurement on a living human eye embodied in a sometimes reluctant subject.

In the case of Thomas P. Piantanida's article on the anomaloscope, I found it to be instructive and to demonstrate what one has to do to miniaturize instrumentation in order to transport it to the locality of the subjects involved.

Finally, the articles by Stephen A. Benton and Dwight P. Merrill, and W. F. Coombs and H. A. Knoll, deal with the optical elements which aid and correct vision. Benton and Merrill have taken the concept of the Talbot interferometer and employed it in a most interesting way to determine the optical quality of Polaroid sunglasses. Again we see an old idea brought back and uniquely applied. The last of the series belongs to Coombs and Knoll with their description of a new technology, that of spin-casting optical surfaces, in this case contact lenses. The portent of this type of development is enormous and the impact of this type of visual correction can be seen in the growth of Bausch and Lomb.

As editor for this series, I can only thank them, hoping that this gathering of papers on the instruments of vision, as I call them, will stimulate others to contribute. ☺