It must be recognized that, given the nature of ARVO, there will be overlap among Sections. One result of this overlap is that in many instances a single paper could be reviewed in one or another or any of several Sections with equal justice. For this reason and for reasons of logistics, it is essential that all papers submitted to the journal go first to the journal office. Thereafter, papers can be assigned to the Section or Sections that are most appropriate.

Under any Section Editor system it is natural to worry about relative performance: whether reviews in one or another Section are equally thorough; whether one or another Section gets too large a share of the journal's pages; and whether the quality of accepted manuscripts is kept to a high and equal standard in all Sections. In order to ensure adequate performance of these large tasks, those listed on the Editor's page as members of the Board of Editors have been asked to help. In this regard they will not only take part in the general oversight of the journal but will also undertake specific reviews of the work of the Section Editors. Finally, they will be called upon to arbitrate complaints.

Contributors to Investigative Ophthalmology & Visual Science should know that the shift to a Section Editor system makes necessary some changes in our Instructions to Authors. It also may result in a somewhat longer period for manuscript review than has heretofore been the case. Every effort will be made to handle manuscripts with despatch. However, it is hoped that authors will find that the brief additional time required for review is worthwhile because of the merits of the Section Editor system.

In closing this brief report to the membership, I also want to mention the splendid cooperation given me by Herbert Kaufman, the outgoing Editor-in-Chief, and by Maija Uotila, the outgoing Managing Editor. If the transition of Editorial Boards has indeed gone smoothly, it is largely due to their unstinting generosity and thoughtfulness. It is also appropriate to recognize the fine job they and the 1972-1977 Editorial Board have done for Investigative Ophthalmology & Visual Science. Together they have set a challenge for the future. The membership of ARVO certainly owes them a debt of gratitude.

Alan M. Laties

Visual science and investigative ophthalmology

Technological progress during the last few decades has had an interesting impact on visual science. Accompanying the application of physics and chemistry in technology has been the development of attractive efforts in applied mathematics, popularized under such names as cybernetics, systems theory, and information theory. Laplace and Fourier transforms are now everywhere, and advanced methods of stimulus and response analyses in terms of even more sophisticated series and functions are on their way. Visual science was one of the first to be influenced by these trends, and with an appropriate time lag, they are now making themselves felt in ophthalmic diagnosis. Current pages of the journal (and now our cover, too) show how patients are subjected to novel stimuli, but this is only a forerunner of undreamt-of sophistication in many, many more dimensions of ocular testing.

It may, however, be a little too early to relegate the Snellen acuity chart and the Bárány chair to nostalgia. These old procedures are clearly not arbitrary. Developed and refined by generations of clinicians for generations of patients, they have evolved to optimize information exchange between pa-
tient and doctor. Snellen letters, for example, won out over myriad other kinds of charts: separate rows of letters were never seriously challenged by zooming optical systems. Although the current armamentarium of ophthalmic diagnosis may be primitive, naive it is not, and any recommendation that it be supplanted or even supplemented needs good justification.

What stance is called for by the avalanche of new tests threatening to overwhelm the clinic? The renovation and refurbishing of present procedures in the light of technological progress, although easily accepted, constitute no true advance. For a new test to have real virtue, it must address visual functions additional to those already being measured. A good criterion for success is whether it matches normal—and hence can highlight abnormal—anatomical, physiological, biochemical, or similar substrates of a function. The current interest in modulation sensitivities can serve as an example.

Periodic stimuli in time (flicker) and space (gratings) were already used in the eighteenth century, but it was not till the 1950's that DeLange, Selwyn, and Schade (working in engineering laboratories!) pioneered the application of sinusoidal stimuli in the visual time and space domains. Using simple psychophysical examples, they neatly exposed the band-pass characteristics of the visual system, i.e., the reduction in performance at high and low frequencies. This work gained ready acceptance because it fits what we already know about retinal properties: on/off effects in time and center/surround organization in space have been characterized both behaviorally, and electrophysiologically in single retinal cells. The clinical significance of the modulation sensitivity curve would be minimal were it not for its probing of the resolution and center/surround properties of elements in the visual pathway.

For a new test, then, the chances of survival are best if its kernel has a basis in the "hardware" of the visual system rather than in something proven by a mathematician to be true. The relationship between physics and mathematics, incidentally, is no different: time and again physics has had to handcraft an analytical tool rather than take it off the mathematicians' shelf.

So the prognosis is guarded but hopeful. Investigative ophthalmology will continue to be proffered new tools, and if a good case has been made for them, they should be tried. Most likely to be effective will be those that have been handcrafted by visual scientists to fit the substrates whose abnormalities have to be diagnosed, cured, and prevented. Ultimately the fate of all tests is decided in the clinical situation. Those best matched to it will survive; the rest may not even end up in a museum.

Although the concern here has been the impact of visual science on the development of tests for ocular dysfunction, the interaction between visual science and investigative ophthalmology, which the new title of the journal emphasizes, has another facet. There is a reverse component, namely the contribution that clinical findings can make to the scientific exploration of visual processes. It will be commented on at another time.

Gerald Westheimer