Correspondence

Acuity and contrast sensitivity

SIR, The *British Journal of Ophthalmology* has been a leader in publishing articles on spatial contrast sensitivity. The journal's recognition of contrast sensitivity as an important advance in visual diagnosis was further emphasised by editorials in 1978¹ and 1981.² But a recent article³ in the *BJO* contains a fundamental confusion about interpretation of contrast sensitivity data that we fear may become widespread because of the journal's prominence.

In their paper³ on macular vasculature and visual function in homozygous sickle cell disease Marsh and colleagues wrote that 'Visual acuity was assessed by Snellen's type test and by measuring contrast sensitivity' (p. 155). This identification of contrast sensitivity as a measure of acuity impedes understanding of the proper use of the test and of its power.

Michaels's excellent treatise⁴ has a particularly good treatment of this issue. Michaels notes that both Snellen type tests and spatial contrast sensitivity tests measure thresholds. But Snellen type tests measure an *extensity* threshold, the minimum size target that can be resolved or recognised, while contrast sensitivity tests measure *intensity* thresholds, the minimum luminance difference that can be seen.

Contrast sensitivity tests, particularly as embodied in Arden's plates,⁵ measure intensity thresholds for very large targets, whose component bars cover distances very many times greater than the extensity threshold for normal vision (6/6). Except under special circumstances the extensity threshold (visual acuity) and the intensity threshold (contrast sensitivity) are uncorrelated.⁶ That is, knowledge of a patient's visual acuity may give little or no ability to predict that patient's contrast sensitivity. This empirical fact simply reminds us that the 2 tests do not measure the same underlying ability and that comprehensive assessments of visual loss should include both measures.

We are also concerned about the wisdom of compressing contrast sensitivity measurements taken at several spatial frequencies into a single, 'representative' score. Here the fault evidently lies with the instructions for using the Arden plates. There is considerable evidence that pathology may cause 'notch' losses over a restricted range of spatial frequencies.⁷ In nonclinical populations measurements of thresholds for similar spatial frequencies are highly correlated ($r > +0.90$); thresholds for spatial frequencies differing by a factor of 4 are statistically independent ($r = 0.0$). These facts suggest that using a single summary score to express sensitivity to different patterns diminishes the test's power as a diagnostic instrument.

Department of Psychology,
Ophthalmology, and
Neurobiology/Physiology,
Northwestern University,
Evanston, Illinois 60201, USA.

ROBERT SEKULER
PATRICK MULVANNY

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- 4 Michaels DD. *Visual optics and refraction: a clinical approach*. St Louis: Mosby, 1980.
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- 7 Bodis-Wollner I, Camisa J. Contrast sensitivity measured in clinical diagnosis. In: Lessel S, van Dalen JTW, eds. *Neuro-ophthalmology*. Amsterdam: Excerpta Medica, 1980.

SIR, I must agree with Professor Sekuler and Dr Mulvanny that there was an error in nomenclature of the contrast sensitivity, which is of course a measure of visual function and not of visual acuity. We are going to search through our retinal material and carry out statistical tests to see if there are any correlations between the foveal vascular zones and the individual grating scores.

Western Ophthalmic Hospital,
Marylebone Road,
London NW1 5YE.

R. J. MARSH

Book reviews

Histological Typing of Tumours of the Eye and its Adnexa. Eds. L. E. ZIMMERMAN and L. H. SOBIN. Pp. 82. Sw.fr.60. With 150 colour transparencies Sw.fr.210. WHO: Geneva. 1980.

If pathologists and ophthalmic surgeons from different centres are to compare their findings it is important that the diagnostic criteria they use are clear and readily intelligible and, even better, that there should be a degree of conformity. To this end the World Health Organisation has sponsored a series of panels to provide an internationally acceptable classification of all tumours, the present volume concerned with the eye being one of the last to emerge.

The classification is supplemented by brief but helpful notes where the basis for recognition of the entities may not be immediately obvious. A section encompassing half the book consists of representative colour photographs of many of the tumours listed, and, although the colour reproduction is less than perfect in some instances, the opportunity to see what the panel is describing is most valuable. (Happily, the colour of the separately available matching transparencies is much more faithful.) In line with the general philosophy of an integrated classification every attempt has been made to let the designations reflect those used to describe tumours of other tissues. Thus the section on eyelid tumours follows the categories listed in the skin volume, and that on lacrimal gland tumours is aligned with the volume dealing with salivary tissue.

Not all pathologists will agree with every aspect of the classification, especially as the histogenesis of some tumours is a matter for conjecture, but there is little to which strong

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exception can be taken and every reason to believe that it will further international understanding in the study of ophthalmic tumours. This inexpensive volume should be at the side of all those required to report on tumours of the eye and its adnexa.

ALEC GARNER

Zur Biochemie des Auges. By Ilona L. Kahán. Pp. 113. US\$12.50. Akadémiai Kiadó: Budapest. 1982.

This book on the biochemistry of the eye consists of 86 pages of text and 13 pages of references. Of the 363 quoted only 5 were published in 1979, 11 in 1978, and the rest earlier. This is a little surprising considering that the date of publication of the book is 1982. It is obvious therefore that the work lacks information on recent advances in eye research. For example, in the section on the retina there is no mention of the occurrence of neuropeptides.

The book does not really provide the reader with an introductory view of the biochemistry of the eye but more of an insight into certain aspects of it. There are 5 chapters in all, dealing with the tears, the lens, the ocular fluids (vitreous, and to a limited extent, aqueous), the retina, and lastly the eye muscles. Information on the biochemistry of the cornea is most conspicuously lacking. The chapter on the tears is in my opinion the best because it succeeds in highlighting the more important data. I cannot honestly recommend that the German text be translated for the benefit of the English-speaking public because of its uniqueness when more accurate, detailed, and recent information may be obtained from any of a number of reviews which appear regularly. For those scientists who read German but have difficulty with English the book will undoubtedly be useful.

NEVILLE N. OSBORNE

Microsurgery of the Anterior and Posterior Segments of the Eye. Ed. M. J. ROPER-HALL. Pp. 134. SFr.90.00. Karger: Basel. 1981.

This is the fifth volume in the series of Developments in Ophthalmology from these publishers and is a collection of papers delivered at a meeting of the International Microsurgical Study Group in 1980. No attempt has been made to provide a comprehensive treatise of the subject, and the contributions are confined to recent advances in instrumentation and surgical technique. Therein lies the interest this book has to offer.

It can be warmly recommended to ophthalmologists practising microsurgery and who already have comprehensive surgical knowledge. It is interesting to see how microsurgery has advanced from being confined to the anterior segment to include techniques for a wide variety of disorders, especially of the posterior segment.

ARTHUR D. MCG. STEELE

Techniques en Ophtalmologie. By H. SARAUX and J. CHEVALERAUD. Pp. 137. 56F. Masson: Paris. 1982.

This compact volume includes within its compass all the information necessary for the undergraduate medical student and for the postgraduate student reintroducing himself to ophthalmology. It is presented in 4 main parts.

The first deals with the instrumental examination of the globe, ending with a good description of fluorescein angiography and, by example, of its pathological aspects. The second part reviews the subjective methods of examination, beginning with the assessment of the visual acuity. Visual field examination is considered in some detail, together with a critical review of the available instrumentation. The principal causes of visual field defects are discussed. The authors emphasise, in the section on the phenomena of adaptation, that this is a generally neglected subject, and attribute the neglect to some extent to the subject's time-consuming nature. Its importance must not, however, be overlooked. The concluding section of this part describes the methods of examining colour vision and classifies its anomalies.

The third section is devoted to the electrophysiology of the retina and to the changes found in various pathological conditions affecting the retina and choroid. The diagnostic, prognostic, and medicolegal interests of the visually evoked response are discussed.

In the last part attention is given to the ocular adnexa. The clinical and instrumental methods of examining the extraocular muscles and their anomalies are followed by a brief description of the electrophysiology of ocular motility and of electromyography. The concluding chapter deals somewhat summarily with the examination of the lacrimal apparatus.

Although this useful book is written in French, any reader with an elementary knowledge of the language should be able to get its message and will be rewarded by a sound background knowledge of the essentials of the subject.

JAMES R. HUDSON

Los Melanomas Uveales: Histología y Clínica. By SERGIO BONAFONTE ROYO, ALFREDO MUÑOS SIMON, RAFAEL BARRAQUER COMPTE. Pp. 189. No price given. Editorial JIMS: Barcelona. 1982.

Uveal melanomata are by far the commonest intraocular tumours encountered in general ophthalmic practice, and it is refreshing to find a clear and concise textbook devoted to the subject. From the wealth of material at the Instituto Barraquer in Barcelona the authors have compiled a superbly illustrated histopathological account of these fascinating tumours, discussing melanogenesis, aetiology, and incidence, as well as clinical features, diagnosis, treatment, and prognosis. An extensive bibliography is provided after each chapter.

My only regret is that the book is written in Spanish, but I look forward to reading the English edition, should this ever become available.

CLIVE MIGDAL

The Actions and Uses of Ophthalmic Drugs. 2nd edn. By P. H. O'CONNOR DAVIES. Pp. 386. £20.00. Butterworths: Sevenoaks, Kent. 1981.

Based on a series of lectures to undergraduate opticians this book will probably be of most value to this professional group with a special section on medical legislation and the ophthalmic optician.