to review the cases of uveitis occurring with Glauine distributed in ethylene oxide sterilised bottles, as mentioned by Mr Akingbehin. If the same peculiar pattern of uveitis were to be observed, one might look for similar mechanisms. Minims, a unit dose product that is still approved for sale in the United Kingdom as 0.3% and 0.1% solutions of metipranolol, is distributed in plastic containers that are not sterilised by γ irradiation. These formulations, as well as the multidose metipranolol formulations available in the United States made using aseptically produced sterile bottles, show no free oxygen reactions in assays of their eyedrop solutions in contrast to the Glauine data.

Until the mechanisms responsible for the adverse reactions of Glauine eyedrops are more clearly defined, caution should, of course, be exercised. Experimental studies in tissue culture using corneal endothelial cells and other cell types may help to sort out the independent effects of γ irradiation from other sterilisation procedures. These and additional investigations may reveal whether or not the metipranolol molecule could participate under certain conditions in an immunological reaction capable of evoking a granulomatous process. Such studies could help to clear up a mystery that has not yet been solved regarding the unusual, reversible uveitis syndrome that has been reported primarily with high dose metipranolol distributed under the Glauine trademark in the United Kingdom.

G RICHARD O'CONNOR

Deep lamellar keratoplasty in the treatment of bullous keratopathy

EDITOR,—We read with interest the article by Chau *et al.*¹ We agree with the authors that even though, nowadays, penetrating keratoplasty has a high success rate and a better visual outcome, deep lamellar keratoplasty might still be indicated in certain conditions. They mention, that the procedure is indicated only in eyes with a normal, functioning endothelium. We feel that the indication can be extended even to corneas in which the disease is caused by a decompensated endothelium such as bullous keratopathy after cataract surgery. In these cases, however, a full thickness graft must be used as donor material. In our experience, if a supernumerary anterior chamber is formed between the retained host's Descemet's membrane and the graft, the transplanted endothelium may function properly, assuring graft clarity.^{2,3} McCulloch *et al* have reported that if the endothelium is left on the donor tissue in lamellar keratoplasty it does not survive.⁴ This is probably true only when the anterior face of the retained Descemet's membrane and the graft's endothelium are in close contact. However, when a double anterior chamber exists, the aqueous that separates these two layers prevents the damage to the endothelium. Concerning the surgical technique, in oedematous corneas of bullous keratopathy, dissection of the stroma from the underlying Descemet's membrane is not difficult since a cleavage plane exists owing to the marked oedema. We feel that air injection is not necessary in these cases.

Deep lamellar keratoplasty is a safe procedure, with an acceptable visual outcome. It might be indicated in severely damaged and high risk eyes with bullous keratopathy, in which opening the anterior chamber might necessitate difficult and major reconstruction of the anterior ocular segment, intraocular lens

exchange, and vitrectomy. Performing an 'extraocular' procedure might avoid severe complications in these selected cases and achieve acceptable results.

ANAT LOEWENSTEIN
MOSHE LAZAR
Department of Ophthalmology,
Ichilov Hospital,
6 Weizman Street,
Tel Aviv 64239, Israel

- 1 Chau GK, Dilly SA, Sheard CE, Roston CK. Deep lamellar keratoplasty on air with lyophilised tissue. *Br J Ophthalmol* 1992; 76: 646–50.
- 2 Loewenstein A, Geyer O, Lazar M. Intentional retention of Descemet's membrane in keratoplasty for the surgical treatment of bullous keratopathy. *Acta Ophthalmol* 1993; 71: 280–2.
- 3 Lazar M, Loewenstein A, Geyer O. Intentional retention of Descemet's membrane during keratoplasty. *Acta Ophthalmol* 1991; 69: 111–2.
- 4 McCulloch C, Thompson GA, Basu PK. Lamellar keratoplasty using full thickness donor material. *Trans Am Ophthalmol Soc* 1963; 61: 154–80.

Reply

EDITOR,—Loewenstein *et al* are to be congratulated on their innovative variation of deep lamellar keratoplasty in which fresh tissue with intact endothelium is used in the treatment of corneal endothelial failure. In their series,¹ five of six grafts remained clear with functioning endothelium, and there was only one graft failure where the supernumerary anterior chamber was lost and the host Descemet's membrane came into apposition with the donor endothelium.

The risk of rejection with Loewenstein's technique is probably no different from that in conventional full thickness penetrating keratoplasty, and the advantages of an 'extraocular' technique are balanced against the risk of endothelial failure owing to contact between the donor endothelium and the host Descemet's membrane.

In the technique of Chau *et al.*,² deep lamellar keratoplasty with lyophilised tissue has the advantage of lack of graft rejection and lack of sensitisation of the host to donor antigens, and this is balanced against potential problems with re-epithelialisation of the graft and of interface opacification.

No doubt both of these techniques are valuable new options for treatment of selected cases of corneal disease.

CHAD ROSTON
St George's Healthcare,
Blackshaw Road,
London SW17 0QT

- 1 Loewenstein A, Geyer O, Lazar M. Intentional retention of Descemet's membrane in keratoplasty for the surgical treatment of bullous keratopathy. *Acta Ophthalmol* 1993; 71: 280–2.
- 2 Chau GK, Dilly SA, Sheard CE, Roston CK. Deep lamellar keratoplasty on air with lyophilised tissue. *Br J Ophthalmol* 1992; 76: 646–50.

BOOK REVIEWS

Colour Guide Ophthalmology. By J J Kanski. Pp 92. £7.95. Edinburgh: Churchill Livingstone, 1992.

Mr Kanski has yet again produced a concise pocket sized and beautifully illustrated colour guide of basic ophthalmology. I am sure that most students and trainee doctors will find this

book of great benefit. Within its pages, including an adequate index, the book manages to cover a wide variety of ophthalmic disorders. It is logical and sequential in its description of disease and is easy to read, with well reproduced pictures and succinct text. It manages to cover both common ophthalmic problems which would be of interest to non-ophthalmologists and also the more specific ophthalmic disorders particularly retinal disease; it would act as good aide memoire for the trainee ophthalmologist. Medical students I am sure will find this book of use during their short clinical attachments in ophthalmology.

ANDREW DICK

Ultrasound of the Eye and Orbit. By Sandra Frazier Byrne, Ronald L Green. Pp 506. £81. London: Mosby Year Book Europe, 1992.

Ophthalmic ultrasonography (echography) has experienced great advances and widening application in the past two decades. This technique is now the method of choice in the investigation of many ocular lesions and is an excellent alternative and support to computed tomography and magnetic resonance imaging in the investigation of orbital diseases. The low cost, safety, and ability to perform echography in the office, bedside, or operating theatre will ensure its prominent role for many years to come. Such views are echoed in the Foreword of this book by two eminent ophthalmologists; Edward Norton at the Bascom Palmer Eye Institute and Stephen Ryan at the Doheny Eye Institute, who experienced at first hand the valuable services of the two authors in their respective institutions.

This book is, to date, the most comprehensive work on this subject. Comprising 506 pages, it describes in detailed but easy to read text the technique and application of ultrasonic diagnosis in ophthalmology. A superb set of echograms among the 415 illustrations is clearly labelled and consistently displayed to be read from left to right; a pleasing feature that avoids confusion. Many echograms are also supported by line drawings and, particularly in the orbital section, by computed tomograms and magnetic resonance images.

A relevant and to the point description of ultrasound physics is contained in the first chapter. Thereafter, the chapters are logically arranged into two major sections; the Eye and Orbit. Each section is further divided into indications, methods of examination, followed by a number of specialised sections. In the eye these are vitreoretinal, trauma, intraocular tumours, and axial eye length measurements, and in the orbit they comprise orbital tumours, vascular lesions, extraocular muscles, optic nerve, and trauma and periorbital diseases. A useful feature is a concluding glossary of technical terms. The book is well referenced with each chapter containing its own bibliography.

Throughout the book, the wide experience of the two authors is tangible, especially their description of the method and applications of standardised A-scan. This technique, developed by K Ossoinig and yet to be popularised in the United Kingdom, is a valuable diagnostic tool, particularly in the tissue differentiation of ocular and orbital tumours, and in the detection of extraocular muscles and optic nerve diseases. The chapter on orbital vascular lesions is an excellent example of the merit of combining standardised A-scan, B-scan, and Doppler ultrasound in the investigation of such lesions.

The best chapter overall, however, must be