An improved diagnostic contact lens

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SUMMARY Modification of a standard Goldmann goniolens by reducing the curvature of the contact surface to 8.5 mm radius of curvature (from the standard curvature of 7.4 mm) enabled gonioscopy to be carried out without the nuisance of air bubbles.

One of the principal difficulties encountered in the use of diagnostic contact lenses is the presence of a central air bubble. This can be largely avoided by filling the lens with a solution of 1 or 2% hydroxypropyl methyl cellulose (HPMC) made up in 0.8% sodium chloride instead of water to avoid corneal oedema (Smith and Watkins, 1976).

Experience with the Zeis 4 mirror goniolens showed that a smaller corneal segment with a flatter curve tended to eliminate the central air bubble without the need of Methocel, and it was then decided to try modifying a normal Goldmann single mirror goniolens by working a flatter corneal curve.

An old goniolens (with scleral rim) was therefore cut down. The rim was removed, and the corneal contact surface was ground and polished to a single curve of 8.5 mm radius of curvature (the standard lens has a curvature of 7.4 mm) (Fig. 1). The effect on gonioscopy and central fundus examination is dramatic. All that is now needed (after anaesthetising the cornea with a drop of benoxinate 0.4%) is simply to put the lens against the cornea while the patient is seated with the head in the full slit-lamp position, that is, not held back from the chin and head-rest but forward ready for examination. No fluid of any sort has to be added, though a single drop of saline or Methocel can be put on the lens surface if there is a suspicion of an inadequate tear film. In practice, however, this is normally unnecessary. When the lens is placed in position it needs to be lightly held in the normal way, but if released it is more likely to fall out than formerly. The view obtained is of a central air-free zone with wrinkling of Descemet's membrane if much pressure is exerted. The tear film makes an efficient optical bond in the central cornea and a thin peripheral air bubble shifts about as the lens is manipulated. The peripheral bubble does not interfere with the gonio-

Fig. 1 Side view of lens

scopic or central fundus view unless the lens is so tilted by the observer as to allow it to do so.

In practice, therefore, the use of the modified lens enables the observer to put the lens straight on to the eye to be examined with virtually no preliminaries whatsoever. The examination is frequently carried out immediately after applanation tonometry, so that the eye is already anaesthetised. The advantages in saving of time in application, independence from a supply of methyl cellulose, and avoidance of the air bubble nuisance are obvious.

Another occasion on which the lens may be invaluable is in the examination of the prone patient in the operating theatre with an operating microscope. Air bubbles and the need to avoid methyl

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cellulose just before possible surgery have meant that the Goldmann contact lens has had hitherto a very limited application in the operating theatre. This is not the case with the improved lens, which can be freely used in routine examinations under anaesthetic for congenital glaucoma.

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Reference

Smith, R. J. H., and Watkins, R. (1976). Corneal epithelial oedema. *British Journal of Ophthalmology*, **60**, 75.