SCIENTIFIC APPARATUS AND LABORATORY METHODS

A NEW CONTACT LENS FOR VIEWING THE ANGLE OF THE ANTERIOR CHAMBER OF THE EYE

THE angle of the anterior chamber of the eye is hidden by opaque tissues and by total internal reflection at the outer surface of the cornea. It is possible to examine the chamber angle by use of a contact lens which eliminates internal reflection and creates a visual angle which passes behind the limbus.

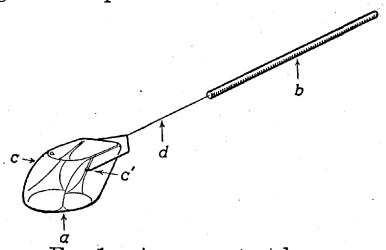

FIG. 1. A new contact lens.

A new instrument is introduced as an improvement over lenses now in use. As illustrated in Fig. 1, it consists of a new type of contact lens *a* and a handle *b* which are connected by a forked spring wire *d* pivoted at *c* and *c'*. This flexible spring wire permits the lens to be held in position without damage to the surface of the cornea. The lens is made of E. I. du Pont's plastic, H. C. 208 or of lucite, the former being preferable, since it does not scratch as easily, takes a finer optical surface and may be sterilized in boiling water. The quality of its internal reflection is excellent. Glass might be used but is heavier and more fragile than the plastics.

The concave contact surface, A (Fig. 2), of the lens has a diameter of 10 mm and a radius of curvature of 7.86 mm. Since the outer surface of the average cornea has a radius of curvature of 7.84 mm, a capillary film of tears forms between the lens and cornea when the two are in apposition (a drop of normal saline or other suitable solution may be used to wet the contacting surface of the lens before application). This film creates optical continuity between the contact lens and cornea and also serves to hold them together.

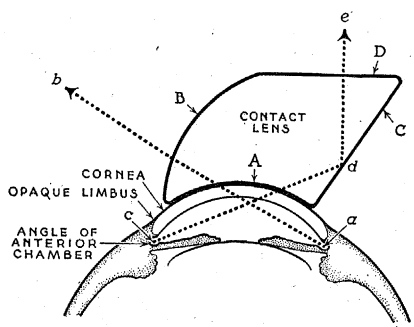

FIG. 2. A new contact lens.

When the lens is on the cornea (Fig. 2), a ray of light from a point *a* in the chamber angle is not reflected internally as before, but continues with little refraction to *b*. Refracting surface, B, which may be molded or ground with any desired magnifying power, is used with the loupe or unaided eye. On the opposite side of the lens, plane surfaces, C and D, form a reflecting prism. Reflecting surface, C, is not silvered; instead, total internal reflecting properties of glass or plastic are utilized. A ray of light from *c* is reflected at *d* to the observer at *e*. This prism is designed for use in combination with a standard slit lamp biomicroscope. The prism may be rotated on the cornea, and emerging rays, at any point in rotation, are directed toward the binoculars.

All other contact lenses used for this purpose depend upon the lids and sclera for support and include a deep liquid chamber between the lens and outer surface of the cornea. The lids frequently displace the lens, permitting air, which destroys optical continuity, to enter the liquid chamber. Furthermore, pressure of the lids, through the lens contact on the sclera, may create distortion of the tissues. For these reasons, only a few groups of workers have used gonioscopy routinely.

These objectionable features are not present in the new instrument; therefore, it is more practical for general clinical use.

Variations in lens surfaces and prism combinations are possible when the principles of the capillary film and the flexible supporting unit are used. Experiments with such variations are proposed and may be reported in the future.

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BOOKS RECEIVED

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Table of the Bessel Functions $J_0(Z)$ and $J_1(Z)$ for Complex Arguments. Prepared by the Mathematical Tables Project Work Projects Administration of the Federal Works Agency. Illustrated. Pp. xliv + 403. Columbia University Press. $5.00.

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