

GONIOSCOPIC ORIENTEERING

(or: how not to get lost
in the anterior chamber)

T. David Williams*

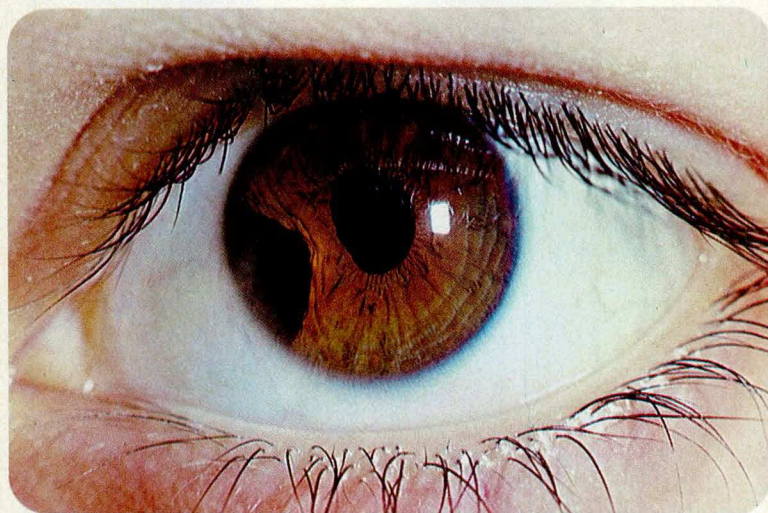


Fig. 1

FRONTAL VIEW

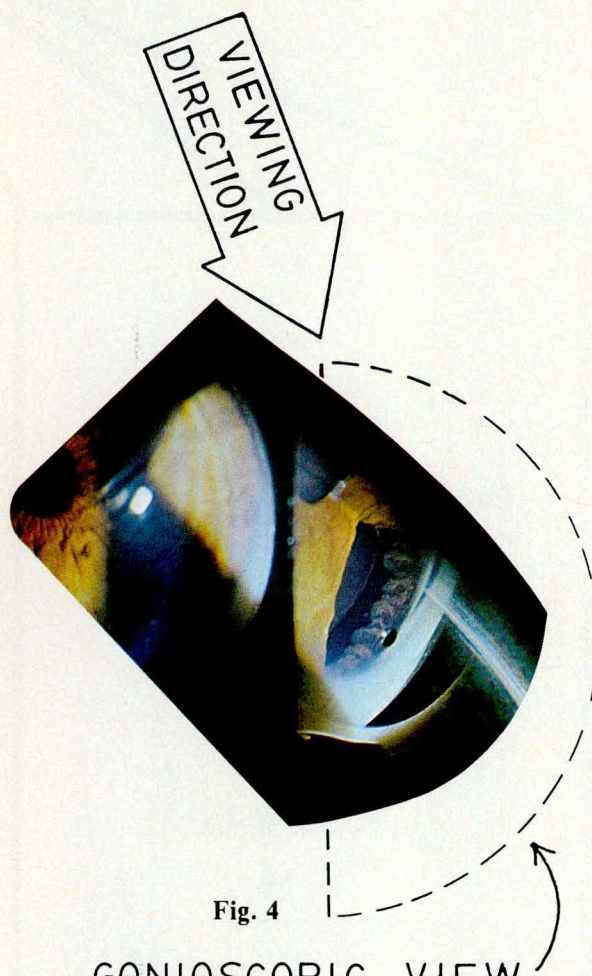


Fig. 4

GONIOSCOPIC VIEW

Patients with iris anomalies (traumatic, surgical, or congenital) afford an excellent opportunity for the practitioner to examine structures behind the iris plane.

Having overcome the mechanical difficulties (more apparent than real) of placing a 3-mirror contact lens on the cornea and bringing the iris into focus at the slit lamp, the practitioner may feel somewhat bewildered by the details seen.

Consider as an example the patient shown in Figures 1 and 2. At age nine, this patient suffered a

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Figure 1 was very kindly supplied by Dr. W.F. Long, School of Optometry, University of Waterloo.

blunt injury to the left eye, due to a thrown rock. Aside from the iridodialysis (iris root torn from the ciliary body) extending from 7:30 to 9:30 o'clock, and the consequent D-shaped pupil (with the flat side of the D adjacent to the iridodialysis) there were no adverse ocular effects. Visual acuity is excellent, and there is no monocular diplopia.

Several landmarks are identified in Figure 2, which is a schematic representation of Figure 1. Points A, B, C, D, and J lie on an imaginary line which bisects the pupil and the iridodialysis. Points A and J are in the cornea, just inside the limbus; point B is on the temporal side of the pupil, while point C is on the nasal side of the pupil (the flat side). Points E, D, F, and J mark the limits

of the externally visible iridodialysis. Points E, D, and F are on the iris.

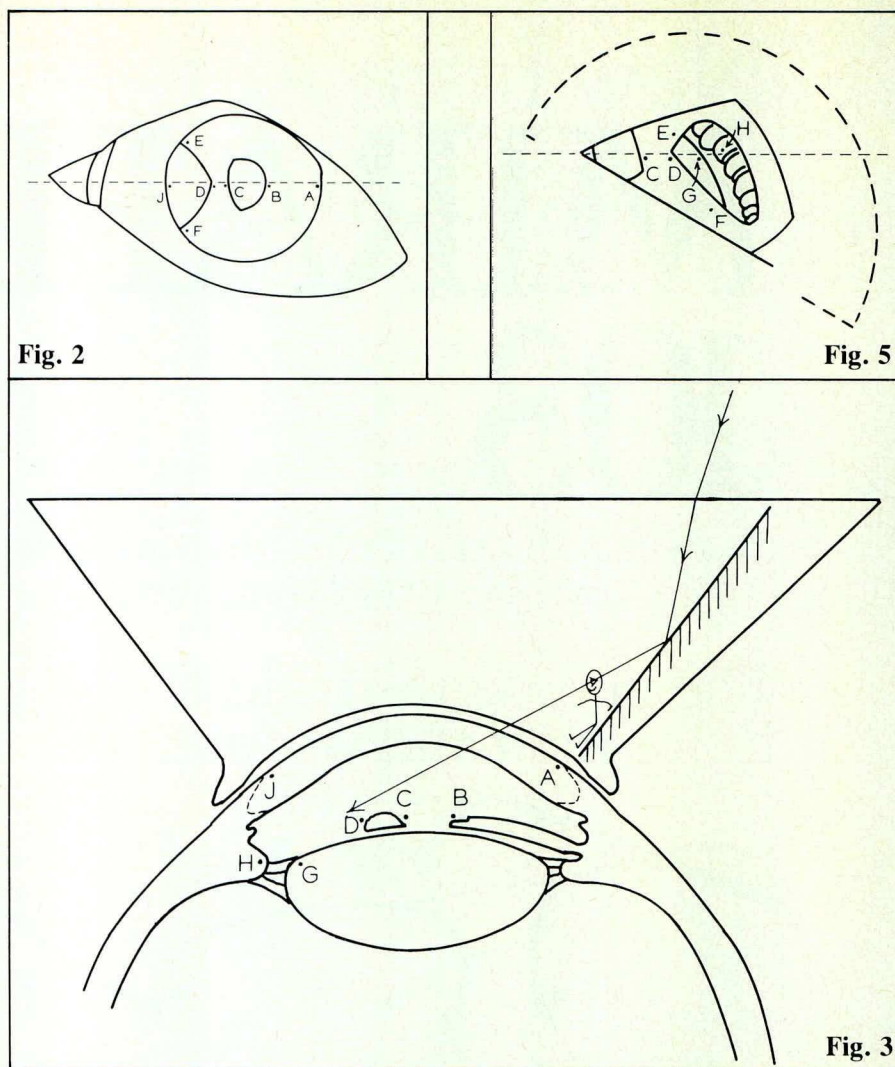
Figure 3 shows what would be seen if the eye were cut in half along the dotted line shown in Figure 2. Notice that many of the landmarks are visible in Figure 3, (E and F are out of the plane of Figure 3). Two new landmarks are included in Figure 3: G marks the lower nasal edge of the crystalline lens, while H marks a ciliary process extending from the ciliary body. In Figure 3 the effect of the iris injury may be seen: the point D was originally attached to the ciliary body near (and ahead of) H, in the same manner as the normal iris root is still attached to the ciliary body on the temporal side.

Also shown in Figure 3 is a cross-sectional view of the gonioscope. In order to view the angle on the side of the dialysis, it will be necessary to rotate the gonioscope so that the mirror lies adjacent to A so the light will be reflected into the lower nasal side of the anterior chamber. The *ingoing* path of light from the slit lamp is also shown in Figure 3. Of course, the *outgoing* path of light will be just the reverse of what is shown.

Figure 4 is a photograph taken at the slit lamp with the gonioscope set up as shown in Figure 3. Figure 5 is a schematic drawing of Figure 4: the same landmarks are shown. The wrinkled edge of the crystalline lens is now easily recognized (see point G in Figures 5, 4 and 3). The ciliary processes look very similar to de-veined shrimp (see point H in Figures 5, 4, and 3).

To orient yourself to the details shown in Figure 4, lay the figure flat on your desk with the 'VIEWING DIRECTION' marker pointing away from you. You will now see the angle details in the same manner as if you were the little stick-figure shown sitting on the mirror in Figure 3.

Once you have oriented yourself in this fashion, it will come as no surprise that pulling back on the slit lamp joystick will bring the pupil into focus, while pushing in with the joystick will bring the lens and ciliary processes into focus (in that order). The zonular fibers are just



beyond the resolution of the indirect gonioscope/slit lamp system; however, they may be seen with a direct (Koeppe type) goniolens. Most practitioners will prefer the ease of handling and examination afforded by the indirect (Goldmann

type) goniolens.

Once the practitioner has sorted out these principles of anterior chamber 'orienting', he/she will have little difficulty in locating and evaluating any anterior chamber anomalies.

Figure 1.

Left eye of patient injured by thrown rock 13 years previously. Note diamond-shaped iridodialysis where iris root detached from ciliary body and resulting D-shaped pupil. All pupillary responses normal.

Figure 2.

Schematic drawing of Fig. 1 with following landmarks noted (see also Fig. 3): A and J are in the cornea, just inside the limbus; B, C, D, E and F are points on the Iris.

Figure 3.

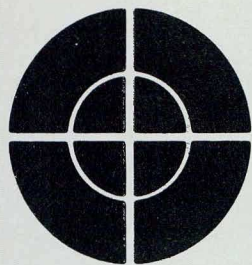
A theoretical cross section of the eye and gonioscopy lens. The dotted line in Fig. 2 gives the orientation of the section. Landmarks are as noted in Fig. 2, with the addition of gonioscopically visible points G (in the crystalline lens) and H (a ciliary process). When Fig. 4 is viewed so that the 'viewing direction' arrow points away from you, then your view of the anterior chamber is the same as that seen by the stick figure seated on the mirror.

Figure 4.

Goniophotograph obtained with gonioscopy mirror positioned as shown in Fig. 3. See Fig. 5 for explanation of visible landmarks.

Figure 5.

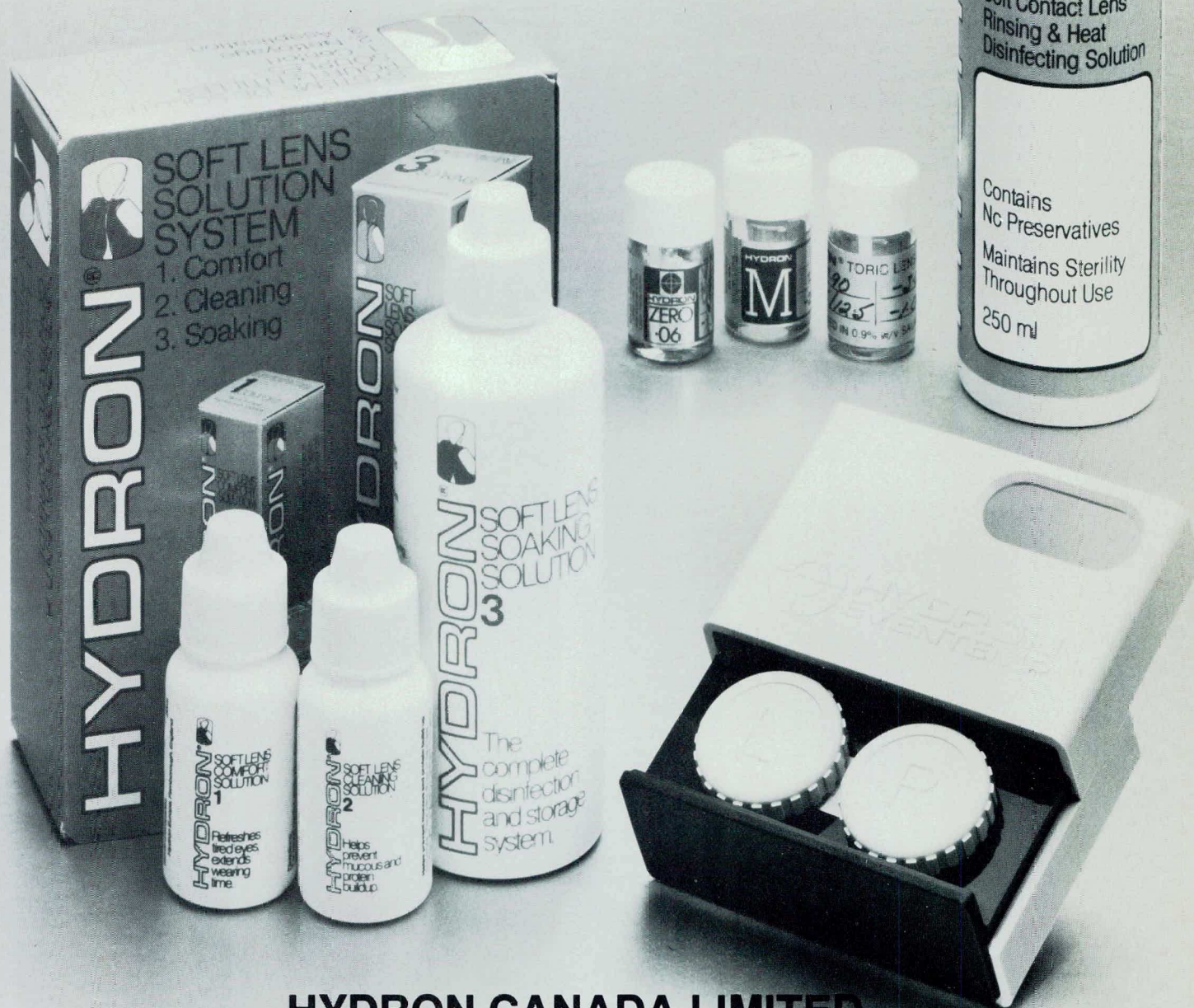
Schematic drawing of Fig. 4. Points C, D, E and F are points on the iris (shown also in Figs. 2 and 3). Point G is actually on the nasal edge of the crystalline lens: the curving bluish line passing close to G is the edge of the crystalline lens. Point H is a ciliary process; more ciliary processes may be seen on either side of H.



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