The invention of iridotomy by William Cheselden in 1727 was the first intraocular operation after the ancient technique of couching for cataracts, and was thus a turning point in ophthalmic history. Whereas cataract barber-surgeons entered the eye blindly without accurate knowledge of its anatomy or the actual mechanism of the surgery, the iridotomy was done under direct visual guidance, with true awareness of the ill it was supposed to cure, and the reason for its effect. In today’s spectrum of ocular diseases, it may be hard to appreciate the enormous blessing of an optical iridotomy, but at the beginning of the 18th century it was the second most frequently performed procedure for the restoration of vision to the blind.

The history of iridotomy is thus of some importance to ophthalmologists in general, and to ophthalmic historians in particular. These historians often begin by looking to see what the eminent Julius Hirschberg said on the subject, for his 9-volume history of ophthalmology is the most voluminous and detailed of any other specialty history, and was recently translated into English by Frederick Blodi. Hirschberg complained that previous authors misunderstood Cheselden’s operation, saying that, “these descriptions were full of doubt, errors and uncertainties.” Hirschberg then, in the bibliography, dwells at some length on the errors of each author.

Cheselden (1688-1752), a contemporary of the composer Johann S. Bach, originally published his operation in a few words, and without details. (Figure 1).

C is a Sort of a needle with an Edge on one Side which being pass’d thro’ the Tunica Sclerotis, is then brought forward thro’ the Iris a little farther than E. This done, I turn the Edge of the needle and cut thro’ the Iris as I draw it out.

Surgery was indicated in cases of aphakic pupillary occlusion by the iris, through either previous inflammatory processes or cataract couching. A similar description was also appended to the fourth edition (published in 1730) of Cheselden’s famous Anatomy of the Human Body.

. . . a small knife or needle, edged on one side, is thrust through the Tunica Sclerotis, as in the lower figure; and then forward through the iris, the edge being turned to the iris; in drawing of it out, a slit is cut as in the two upper figures.

As instructions to a practicing surgeon, the narrative was vague. How far from the limbus does the knife enter the eye? Does it go to point E “thro’” the tissue of the iris or in front of it? Is the edge turned forward or backward? It appears that if the knife went through the iris from a point in the sclera behind the iris, it entered the anterior chamber, and when it was then turned to cut the iris, it must have done so backward into the vitreous cavity. Pre-YAG surgeons worth their salt would probably agree that cutting the elastic iris from behind poses imminent danger to the cornea. Starting with the fifth edition, Cheselden (Figure 2) clarified the point a bit (emphasis added): “A knife is passed through the tunica sclerotica, under the cornea before the iris, in order to cut an artificial pupil where the natural one is closed.” (Figure 1).

Hirschberg first dealt with the history of iridotomy in 1892 when he stated that Cheselden placed the iris knife behind the iris (“hinter die Iris”) and cut it.
A knife passed through the tunica sclerotis, under the cornea before the iris, in order to cut an artificial pupil where the natural one is closed. This operation I have performed several times, with good success; indeed it cannot fail when the operation is well done, and the eye no otherwise diseased, which is more than can be said for couching a cataract.

Figure 1. Cheselden’s original iridotomy, 1727. A, Original description. B, Figure depicting technique.

Figure 2. William Cheselden late in life (from the Historical Library, Yale University School of Medicine).

from behind forward (“von hinten nach vorn”). In his history (submitted 1905, published 1908), he repeated the same rendition and emphasized that “Cheselden is brief, but not unclear. He perforates the sclera with a small knife behind the iris and cuts it from behind to the front.” Later, he stresses again that Cheselden went into the posterior chamber, whereas Sharp proceeded from the anterior chamber. There seems to be no record that anyone actually operated in Hirschberg’s manner. He himself described a case he did bilaterally with a Graefe knife thrust into the anterior chamber, followed by cutting the iris backward toward the vitreous. In textbooks prior to Hirschberg’s textbook (such as texts by Heister, Himly, and Adams), an iridotomy was described as proceeding from the anterior chamber backward. The same in recent 20th-century books (Meller, Stallard).

Hirschberg’s misreading of Cheselden was dutifully repeated by the American Encyclopedia and Dictionary of Ophthalmology, Casey Wood’s A System of Ophthalmic Operations, and S. Lewis Ziegler. On the occasion of introducing his knife-needle, Ziegler wrote a history of iridotomy without acknowledging the prior work of Hirschberg, giving reference only to Cheselden’s article in the Philosophical Transactions, but in fact repeating Hirschberg’s version of it: “He then cut through the iris from behind forward as he withdrew the knife.”

Cheselden may seem to have cast an evil eye on ophthalmic historians to this day if we consider the recent Source Book of Ophthalmology. It cites his Anatomy of 1713 and a figure 37, and directs the reader to pages 290 to 304 for “an anatomical description of the eye” and to pages 317 to 318 “for his innovation, the iridotomy.” Alas, the reader will search in vain because first, the iridotomy was not invented until 1729, and second, the book has only 269 pages. Hirschberg himself was a polyglot, and understood English as well as any Englishman. How he came to insist steadfastly that, printed on the same page, “before” means “behind,” remains an interesting psychological or perceptual puzzle, while
the moral from this cautionary tale is anyone’s choice to draw.

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Corresponding author: Harry H. Mark, MD, FACS, 2 Church St S, New Haven, CT 06519-1717 (e-mail: iimd@aol.com).

REFERENCES


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