

Sir Harold Ridley

A pioneer in the quest to eradicate blindness worldwide.

BY DAVID J. APPLE, MD

The story of Sir Harold Ridley, born in 1906, and his groundbreaking invention of the IOL is well known and one of the high points of ophthalmology in the 20th century.¹⁻⁴ In the mid-1980s, many physicians (including members of the academic medical establishment) still did not accept much of his work.⁵⁻⁸ Even his lens implant,⁹⁻¹¹ inarguably one of the most important innovations in the history of ophthalmology and a blessing to society, was widely criticized. Sir Harold's presentations regarding his invention were often met with skepticism, invective, and scorn. Scientific research on his implant that my colleagues (The Apple Korps) and I had performed in our laboratory between 1982 and 1985 strongly supported and, indeed, verified much of his work.¹² He was pleased to learn of our publications and, in 1985, summoned me to his retirement cottage (Figures 1 and 2) in Stapleford, England,

near Salisbury, where we first met.^{4,6} We developed a close personal and professional relationship that lasted until his death on May 25, 2001.

After our initial meeting, I began visiting Sir Harold and his wife, Elisabeth, three times per year, and I was able to observe his important accomplishments personally.^{3,4} I soon became convinced of the injustice under which he labored⁵⁻⁸ and felt compelled to help secure the recognition and high honors that he and his family deserved.

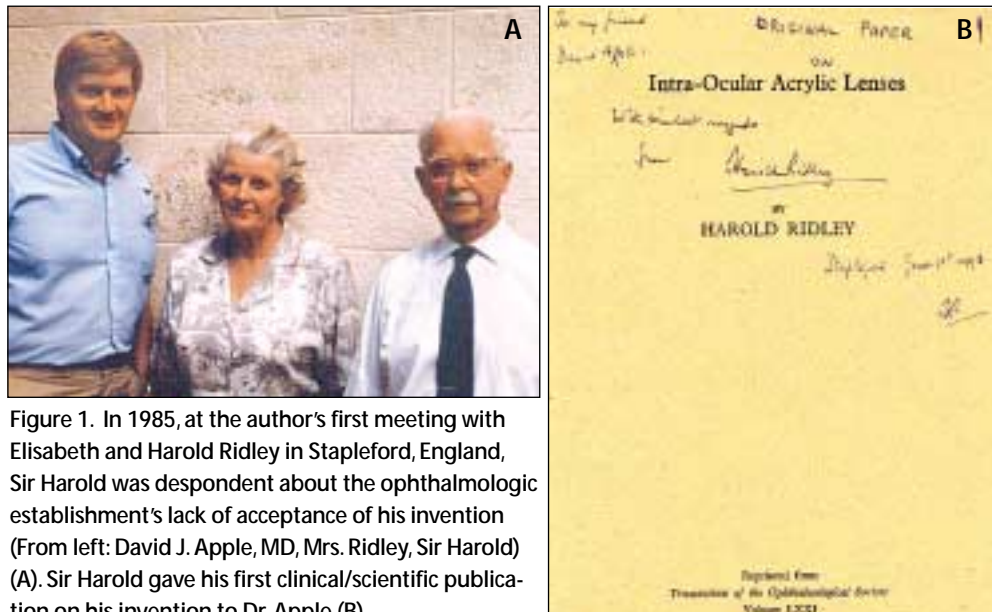


Figure 1. In 1985, at the author's first meeting with Elisabeth and Harold Ridley in Stapleford, England, Sir Harold was despondent about the ophthalmologic establishment's lack of acceptance of his invention (From left: David J. Apple, MD, Mrs. Ridley, Sir Harold) (A). Sir Harold gave his first clinical/scientific publication on his invention to Dr. Apple (B).

POLITICS IN OPHTHALMOLOGY

Overview

Contributing to the lack of recognition for Sir Harold was the fact that some clinical complications occurred early on, many due to variations in the surgical techniques of other surgeons. These complications made some ophthalmologists hesitant to implant an IOL. Also, Sir Harold was not an aggressive advocate of lens implantation. My research then and as late as 2 years after his death^{3,4} (involving the close study of his papers and other items provided to me by his sons, Nicholas and David) has clearly demonstrated that numerous vagaries of ophthalmic politics (including jealousy and a lack of foresight) were the major causes of our specialty's long-delayed acceptance of IOLs.⁵⁻⁸

Ridley Versus Duke-Elder

It is no secret that Sir Harold had major differences with one of the most prominent ophthalmologists of the 20th century, Sir Stewart Duke-Elder. They had various disagreements as early as the 1930s, at which time Sir Harold was the youngest ophthalmologist to receive a full consultant appointment at Moorfield's Eye Hospital in London. Their differences increased as World War II began.

Sir Harold had a special and sincere interest in the field of tropical ophthalmology. His father was an ophthalmologist in the British Royal Navy of the early 20th century, a position providing his family with a worldwide outlook. Also, Elisabeth Ridley had been raised in India. Even more important to Sir Harold's affinity for the field of tropical ophthalmology were the actions of Sir Stewart, the Director of the Institute of Ophthalmology in London. Sir Stewart was a prominent author of some of the most important, comprehensive vol-

umes on the field of ophthalmology of his time (1940s through the 1960s). Almost all ophthalmologists of my generation read these volumes as their bible. He was also well known as the Queen's Ophthalmologist.

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By 1943, Sir Stewart was in charge of almost all ophthalmology assignments for the British military. He sent Sir Harold to an apparently obscure assignment in Ghana, Africa, where he found his way into the rural bush to study various endemic diseases. Rather than hibernate in obscurity, Sir Harold assessed the opportunities there and immersed himself in clinical studies on what was and still is one of the most important blinding diseases afflicting that underprivileged region: onchocerciasis (river blindness). The rest is history.

His work in Africa ranks among the most important of his non-IOL contributions. During his wartime service in Ghana, Sir Harold managed not only to perform clinical examinations on affected patients, but he also completed histopathological analyses of the microorganisms causing this disease. This work resulted in the publication of his classic 1945 monograph.¹² He himself painted a figure showing this disease's fundus (ophthalmoscopic) changes, now universally termed the *Ridley Fundus*.

Even after the war, following Sir Harold's invention of the IOL^{9-11,13,14} (Figure 3), he and Sir Stewart could not communicate. The latter was never able to accept the IOL.

RESISTANCE TO THE IOL

The huge backlash against Sir Harold's invention and surgical procedure by many of his peers occurred within the academic establishment in both England and the US. Derrick Vail, MD, of Chicago, for example, was very critical.^{7,8}

Based on numerous interviews with his contemporaries who observed the evolution of the IOL firsthand, the emergence of this device necessitated a radical paradigm shift. Prior to that time, eye surgeons routinely learned to take things out of the eye (ie, foreign bodies, inflammatory material, tumors). The implementation of the IOL required a new thought pattern, namely, the concept of putting something into the eye. This new idea was difficult for many to accept. Sir Harold's IOL^{9-11,13,14}



Figure 2. The Ridleys' retirement home, Keeper's Cottage, is a magnificent cottage in an idyllic region of south central England.

was a new and important adjunct to cataract surgery (in his own words, a “cure of aphakia”), but it also represented a much broader and more significant innovation. Without realizing it, Sir Harold effectively helped to pioneer the modern field of biomedical engineering, specifically, the field of artificial device implantation. His IOL long preceded the introduction of all major devices designed for tissue/organ replacement and implantation into the body’s various delicate and vital tissues and organs (eg, heart pacemakers, artificial kidneys, artificial hearts).

ENTERING THE MODERN ERA

During the latter half of the past century, the field of ophthalmology sufficiently recovered from the wreckage of World War II to progress into the era that we now term a *Golden Age of Ophthalmology and the Visual Sciences*. Sir Harold’s inventions represented both an actual and symbolic beginning of this modern period, which was characterized by (1) extensive closures of institutes and sanitariums for the blind, (2) the substantial decrease in the number of blinded eyes submitted to anatomic-pathology laboratories such as the one directed by myself since the 1970s, and (3) surgeons’ markedly increased ability to treat and manage eyes injured by various types of disease or trauma—eyes almost assuredly lost in former times.

ACCEPTANCE

One pivotal event that helped remedy Sir Harold’s lack of acceptance occurred in 1986, when he was elected a fel-

low of the highly prestigious Royal Society. Further, in 1989, I presented his credentials and a list of his accomplishments to my former university, the Medical University of South Carolina. I was dumbfounded that some members of the administration and even my department were loathe to honor Sir Harold because they were unaware of his scientific and clinical accomplishments and of his gift to humanity. Fortunately, the president of the university at that time, Dr. James B. Edwards, rapidly grasped my intentions, and the university did agree to confer an honorary doctor’s degree on Sir Harold that year (Figure 4). A torrent of honors for him followed, and he was belatedly knighted in London by Queen Elizabeth II on February 9, 2000, less than 1 year before his death (Figure 5).

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THE IMPACT OF THE IOL

Since its inception, the IOL has benefited well over 60 million cataract patients worldwide. Surgeons annually implant more than 6 million IOLs today. Unfortunately, the IOL’s market penetration into the underprivileged world has been slow, delayed largely by financial and logistical matters, as well as a lingering lack of acceptance in the 1990s by some of our specialty’s leaders. An important turning point was a 1990 World Health

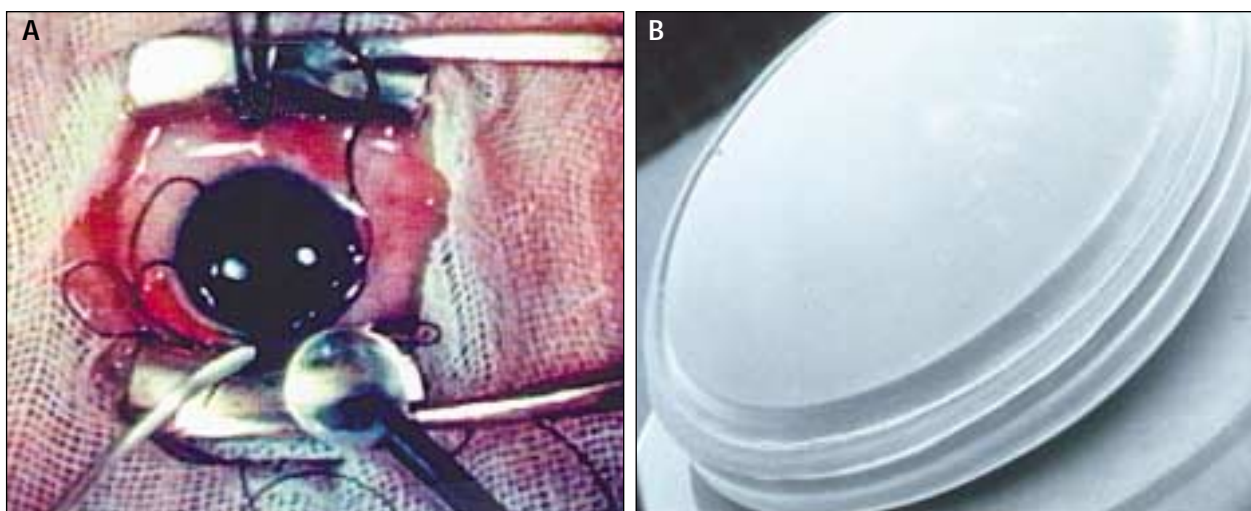


Figure 3. Sir Harold’s cinematographer filmed IOL operation No. 7 in May 1951 (A). Sir Harold has grasped the IOL (Rayner Intraocular Lenses Ltd., East Sussex, UK) for insertion into the open wound, immediately after removing the cataractous, opaque crystalline lens. The operation was performed with minimal draping. Most surgeons of that era, including Sir Harold, wore no gloves, and lighting was provided by the simple flashlight held by the nurse. The IOL was a round, plastic disc (B).

Organization meeting in Geneva, Switzerland, that I had the privilege of attending and advising. The attendees established minimal required criteria for IOL quality, discussed various cost issues, and provided the support from the World Health Organization that was necessary to enhance the acceptance of implants worldwide.

As lens implantation gradually becomes widespread, the demand for the procedure increases, and the number of implantations should more than double by the year 2020. This development is a positive one, because, as the underprivileged world population grows and populations age, the incidence of disabling cataracts will rise rapidly. Almost all of us will develop cataracts if we live long enough. Thus ends a great story.



Figure 4. The author had the privilege of presenting the first university/academic award, an honorary doctor's degree, to Sir Harold in 1989.



Figure 5. Queen Elizabeth II conferred a belated Knighthood upon Sir Harold in 2000.

CONCLUSION

During the final decade of his life, Sir Harold and I worked together in accumulating and cataloging his writings, photographs, films, and other memorabilia. I have completed several short biographies of him and am currently writing a brief overview of his professional life for the *Biographical Memoirs of the Royal Society*. With the support of Sir Harold's wife and three children, I am also acting as his designated, official biographer and writing a full-length biography—an effort that I hope will establish forever his incredible legacy.

As I was working on that biography and sorting through some of his papers in January 2004, I found one of his writings from 1989 that is appropriate to this discussion and, indeed, is a quotation from him that I will always treasure:

"I had 25 years in the wilderness and would have been spared much suffering if David Apple, the one who at last took the trouble to read and analyze the early implant papers, had appeared in the 1950s—had that happened a whole generation of cataract patients might then have enjoyed full visual rehabilitation instead of suffering the abnormalities of aphakia." ■

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