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# RETINA RESEARCH FOUNDATION NEWSLETTER

Foresight for Sight

Number 2/2006

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## Charles Schepens – Scientist, Surgeon, Educator

Where there was darkness, he brought light. Where there was despair, Charles Schepens brought hope to millions faced with blindness. He educated, inspired and led multiple generations of retina specialists beginning with Samuel Adams, Harold Pierce, Edward Norton, Bob Welch, myself. This was a special time when the idea of a dedicated retina sub-specialty was born and when the success rate doubled following retinal detachment repair. Singularly responsible for these advances, Dr. Schepens was a brilliant scientist, a compassionate surgeon and a dedicated educator, up to the final days of his life at the age of 94. He passed on March 28 of this year. He has left a void that will not be filled.

The son of a physician, he was born in Belgium in 1912. All his siblings were doctors or nurses. His attendance at the medical school at the State University of Ghent was followed by study at the prestigious Moorsfield Eye Hospital in London. Later, he worked with Dr. Weve in Holland, one of the first students of Gonin.

In 1939, after a stint as a private practitioner, he joined the Medical Corps of the Belgian Air Force. When the war broke out, he escaped to France where he became a distinguished leader in the French resistance. He was subsequently decorated for heroism by both France and Belgium.

After the war, he accepted a post as research scholar at Moorsfield's where he built the first binocular indirect ophthalmoscope out of materials found in the rubble of bombed buildings. This was later seen as the innovation that did the most to revolutionize ophthalmology. The indirect ophthalmoscope is now used throughout the world and is on display in the Smithsonian Institution in Washington, D.C.

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*1. Dr. Charles Schepens,  
inventor of the indirect  
ophthalmoscope.*

## Charles Schepens *(continued from page 1)*

After the war he decided to immigrate to the US where he toured medical facilities before accepting a research fellowship at Massachusetts Eye and Ear Infirmary (MEEI). In 1949 he established the first retina service at MEEI and served as director until 1972 when he became director emeritus. He also served as a clinical professor of ophthalmology at Harvard until 1978 when he earned the title of Clinical Professor of Ophthalmology, Emeritus.

It was during these years that the use of the indirect binocular ophthalmoscope became wide spread and he performed the first scleral buckling procedure and other innovative surgical techniques. It was also the time when the LASER Doppler flow meter and the scanning LASER ophthalmoscope were developed. He authored more than 350 publications; some of which report the first observations of the normal peripheral fundus, the techniques of scleral buckling for retinal detachment, the first description of familiar exudative vitreoretinopathy, studies on the optimal wavelength for photocoagulation and the role of the vitreous in cystoid macular edema and diabetic macular edema.

Dr. Schepens held a strong belief that progress in clinical practice is the dividend of investing in basic research. Without a solid understanding of the mechanism of disease, he believed there would not be an improvement in patient care. In this spirit, in 1950 he established the Retina Foundation in order to promote the intensive investigation of retinal conditions. Ahead of his time, Schepens, along with Endre Balazs, the first fulltime faculty member at the foundation, focused his attention on creating a vitreous substitute. This work resulted in the characterization and production of hyaluronic acid viscoelastic in ophthalmic surgery.

The foundation expanded and was renamed the Schepens Eye Research Institute (SERI) in 1974 to reflect that research was not limited to retinal conditions only. In 1998 the Schepens Retina Associates (SRA) branched out of the SERI in order to allow the latter to be a dedicated basic science research institute whereas the former to further

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2. *The Vantage Indirect Ophthalmoscope.*

3. *Further improvements (left) The all Pupil II Indirect Ophthalmoscope and the Spectra (right).*

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## Charles Schepens *(continued from page 2)*

pursue clinical practice and research. He continued to practice at SRA.

His whole approach capitalized on the synergy that comes from combining education, research and clinical practice in one institution. This was key to his success in training what became the leadership in retina. He trained more than 600 specialists in ophthalmology and single-handedly established the subspecialty of retina within ophthalmology.

Schepens founded the Retina Society in 1967; to this day it remains a forum for vitreoretinal diseases and surgery. He also founded the Schepens International Society (SIS) for specialists all over the world to exchange ideas.

He received the Weisenfeld Award from the Association of Research in Vision and Ophthalmology in 1994. His peers elected him one of the ten most outstanding ophthalmologists of the twentieth century. In 2003 he became a Laureate of the American Academy of Ophthalmology. Finally in March, 2006 one week before his death, he received France's highest civilian honor, the French Legion of Honor.

Doctor Schepens is survived by his wife, four children, eight grandchildren and four great-grandchildren. His legacy is enormous. As ophthalmologists, we cannot help but remember him in the direct ophthalmoscopes we use, the scleral buckles, lasers and vitrectomies we perform; but most importantly, we remember him for his innovative approaches, tireless research, and zealous pursuit for the seemingly impossible cure. His example is sure to guide and inspire many more generations of ophthalmologists and visual scientist to even greater accomplishment in understanding and treating eye disease.

“What we have done for ourselves alone – dies with us.  
What we have done for others and the world – remains  
and is immortal.” Albert Pike

*Reprinted with permission from Dr. Alice McPherson.*



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4. A doctor using the indirect ophthalmoscope.

## Gene Therapy for Retinoblastoma and Other Eye Diseases

The transfer of genetic material for treatment of disease (gene therapy) offers the potential to help enormous numbers of patients. This is especially true for people with eye diseases such as cancer, diabetes and retinal degenerative diseases including retinitis pigmentosa and macular degeneration. Our laboratory emphasizes approaches to gene therapy that we believe can be brought to the bedside to test in patients as soon as possible.

We have chosen the disease retinoblastoma, the most common form of cancer of the eye in young children, to test the use of gene therapy. Retinoblastoma occurs as the result of a change in a portion of DNA called the “retinoblastoma gene” although the protein produced from this gene is important in regulating the growth of many different kinds of cells. Retinoblastoma tumors can be the result of inherited changes (mutations) or can result from spontaneous mutations that occur as the retina develops. The disease occurs in both eyes in about one third of children. If the disease has not spread outside of the eye, the retinoblastoma can be cured by removal of the eye. Because of advances in ophthalmologic surgery, the eyes of some children with retinoblastoma have been able to be salvaged; however, most children also require chemotherapy or radiation therapy to save the eye. These additional therapies have recently been shown to contribute to the development of other forms of cancer as the child grows up. Patients with small pieces of tumor that grow in the fluid of the eye called the vitreous have little hope of having their eye saved.

Our laboratory has shown that retinoblastoma is very susceptible to a form of treatment called “suicide gene therapy”. We start with a virus that can cause the common cold and modify the virus so that it cannot make us sick. We use this engineered virus to deliver a gene that makes the cancer susceptible to a commonly used drug that is usually used to treat cold sores. Using this combination of

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*5. Dr. Hurwitz in his laboratory working on his treatment, “suicide gene therapy.”*

## Gene Therapy *(continued from page 4 )*

suicide gene therapy and drug, cancer cells rapidly die. We have used this treatment for children with retinoblastoma and found that it is safe. Early data also suggest that this therapy may kill the retinoblastoma tumors and can successfully treat the vitreous tumor seeds that are not responsive to other therapies. Our laboratory is now planning to initiate additional clinical trials to further explore the safety and efficacy of this treatment for children with retinoblastoma. We are especially interested in studying how this therapy works to kill the tumors in the eye.

By understanding how the children respond to this therapy, we hope to expand the use of these viral vectors to treat other diseases of the eye. We have also found that, by changing the way the virus binds to cells, we can direct the viral vector to specific target cells. For example, we have found that the receptor for the virus commonly used in gene therapy is found on the retinoblastoma cells but not on the photoreceptors of the retina. That is good if our goal is to treat cancer but not good if we want to treat retinal degenerative diseases like retina pigmentosa and macular degeneration. We have recently found the receptor for another form of the cold virus on photoreceptors and, after further modifications to the suicide gene therapy vector, we can target the retinal photoreceptors. We can now change the therapeutic portion of the DNA to use this viral vector to correct the genes that are abnormal in these retinal degenerative diseases. We are currently studying the feasibility of treating these diseases in mouse models.

Gene therapy appears to work in the eye extremely well as compared to other parts of our body. We have found that the immune response to these gene therapy vectors in the eye is very different than in the rest of the body. The gene therapy vectors, are therefore much less toxic and much more efficient in the eye than in other parts of our body. In addition, we have observed that chemicals in the vitreous of the eye make gene therapy vectors more efficient. By understanding how these mechanisms work in people, we hope to be able to use these vectors not just for diseases of the eye but for other diseases as well.



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*6. Dr. Hurwitz with one of his patients.*

## **Emmett A. Humble**

*RRF Board Service:* Chairman, Board of Advisory Trustees 1974 to 1987; Member, Board of Managing Directors 1977 to present; Chairman, Board of Managing Directors 1987 to present.

*Career:* Prior to his retirement from Exxon, Emmett established an international reputation in the energy community with 36 years of experience in technical and general management positions. His tenure at Exxon included thirteen years of Board level service, the last five years as CEO of Esso Exploration Inc., Exxon's affiliate responsible for international exploration and drilling, and as a Director of Exxon Production Research Company. Upon retirement in 1986 from Exxon, he formed a consulting firm, Petroleum Associates International.

*Professional Associations:* Member Emeritus, American Association of Petroleum Geologist; American Geological Institute; Society of Economic Paleontologists and Mineralogists; American Association for the Advancement of Science; Society of Naval Architect and Marine Engineers; Marine Technology Society; Advisory Council to US Government, International Law of the Sea; National Council for U.S.-China Trade.

*Memberships:* Houston Chamber of Commerce; Houston Petroleum Club; Life Member, Board of Directors, Sam Houston Area Council, Boy Scouts of America; Second Baptist Church of Houston; Houston Committee on Foreign Relations.

*Honors Include:* President, East Texas Geological Society; President, Exxon East Texas Employees Federal Credit Union; Transportation Council, Business School, The University of Texas; Silver Beaver Award & Distinguished Commissioner Award, Boy Scouts of America; United States Coast Guard Public Service Commendation; Retina Research Foundation Service Award.

*Personal:* Born in Kerens, Navarro County; Texas; and graduated High School in Anahuac, Texas. Following military service with the Navy in the Pacific Theater in WW II, he returned to Anahuac where he married his High School sweetheart, Lorine Crumpler, and headed for Austin where he

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7. Emmett A. Humble

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## Great Expectations

At this point, it appears highly unlikely that nonprofits will realize anywhere near the amount of bequests that were projected to be received between 1998 and 2017. In order to reach the \$1.7 trillion goal, charitable bequests would have to average over \$120 billion per year for the next 13 years. The annual average would thus have to be some six times the amount received in 2002, which, at \$20.1 billion, was the record year so far for charitable bequests.

### Good News

Is there any good news regarding the transfer of wealth to charity? Looking at longer-term trends, there is indeed good news. There has, in fact, been a tremendous growth in bequest receipts for nonprofits in recent years.

The key to successfully projecting bequest revenue may be to adjust expectations to a more reasonable level going forward. A continuation of growth rates over the past 20 years would result in more than doubling bequests to over \$40 billion a year by 2017, not a bad showing.

### Unraveling the Mystery

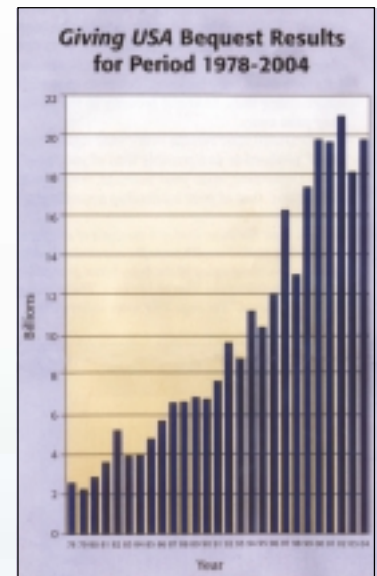
The authors of the Boston College wealth transfer projections maintain that, despite the aftermath of 9/11 and economic uncertainty in recent years, the wealth transfer is on track. The death rates in America over the period 1998-2053 play an important role in the nature and timing of the wealth transfer. According to the authors of the study, the transfer was always expected to take place in the second phase from 2018-2053. That's because the death rates in America will accelerate dramatically during that period of time.

— *Give & Take*, May 2006

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### Humble *(continued from page 6)*


entered The University of Texas. After earning Bachelor and Masters Degrees, he went to work for the Humble Oil and Refining Company, now ExxonMobil, in Tyler, Texas. This was followed by several moves within the U.S., and a couple assignments overseas, before finally returning to Houston in 1971.



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8. Graph showing bequests for the years from 1978 and 2004.

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Retina Research Foundation is dedicated to the eradication of retinal disease through programs in research and education.

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