Stolen Sight
Why Nana Can’t Recognize Johnny

Age-related Macular Degeneration
We Americans live in an extraordinary time and place: a high standard of living, combined with a superb health-care delivery system has lengthened human life well beyond the expectations of only a generation ago. My father made few plans for his retirement because he fully expected death to intervene within a few years of his 65th birthday. To his surprise (and to my great thankfulness), he lived to the age of 88; my mother, five years his junior, lived to the age of 87. During the last two decades of their full lives, my parents experienced the diseases associated with aging: in my father’s case, arteriosclerotic heart disease and prostatic cancer; for my mother, Alzheimer’s disease and age-related macular degeneration.

It is incumbent upon those of us who conduct biomedical research, as well as those who support this type of research in the spirit of philanthropy, to direct our attention to the diseases that rob our senior citizens of happiness and comfort as life slowly ebbs. Since not all individuals of advanced age come to suffer from these so-called age-related diseases, the problem does not appear to be the aging process itself. Therefore, it is important to distinguish aging as a biologic phenomenon from age-related diseases as pathologic processes.

A major goal of The Schepens Eye Research Institute is to find the causes and develop preventions and cures for age-related diseases of the eye. Whereas macular degeneration is the most widely known and feared eye disease of the over-65 set, it must share its notoriety with diabetic retinopathy, glaucoma, and dry eye syndrome as the so-called “four horsemen of age-related vision loss.” Our research efforts extend to each of these four diseases.

Everyone is aware of the fact that the American population is “aging.” This means that with each passing year a progressively larger proportion of the population is older than 65 years. At present, approximately 12.7 percent of Americans fit into this category. By the year 2030, this number will grow to 20 percent! As an example, there are 3.6 million Americans who now suffer from age-related macular degeneration. By the year 2030, this number will swell to 6.3 million. While the word epidemic is too histrionic to use in this context, the projected increased prevalence of age-related eye diseases in America (and in other developed countries) in the next decades represents a crisis unfolding.

As the leading eye research organization in America, The Schepens Eye Research Institute is working on several fronts to meet, and if possible, prevent, this crisis. More than a year ago, the Institute created the Center for Research on the Aging Eye, a multidisciplinary effort by many of our scientists who are working collaboratively to solve the most vexing problems.

(continued on page 9)
Stolen Sight

Why Nana Can’t Recognize Johnny

“I will be standing there and someone approaches me, and no matter how well I know them, until they come up close to me, I really can’t tell who they are. This is true of my children, my grandchildren, my great grandchildren, and my best friends,” says 84-year-old Ina Ward, grandmother of seven, great grandmother of six, and victim of age-related macular degeneration (AMD).

Recognizing the people we know and love at first glance is something most of us count on and take for granted until that ability begins to dissolve with fading vision. “In many ways this is the most difficult part of having macular degeneration,” says Ward. “It can be really terrible and depressing for me and I am sure disconcerting for my family and friends, especially my great grandchildren who are still pretty little and don’t really understand.”

Depression is a common companion of AMD, along with frustration and embarrassment. And, it is not just loss of face recognition skills that contributes to this malaise. Reading, driving, and other skills that impart a sense of competency and independence are also in jeopardy from a disease that slowly robs the eye of what most people feel vision is all about, according to Kameran Lashkari, M.D., assistant clinical scientist at The Schepens Eye Research Institute.

When asked why face recognition is so difficult for AMD patients, Schepens experts describe what it is like for the person with AMD. They say, “It is like looking at a face through a piece of gauze,” or “It is like seeing someone through a Swiss cheese-like pattern,” or “It is like watching a television picture that has no contrast.” But however it is described, the facts for sufferers like Ina Ward are the same.

AMD is a disease that slowly and irreversibly destroys some of the most precious cells in the human eye and, indeed, the human body: the light-sensitive (photoreceptor) cells of the macula. The macula is the part of the eye responsible for detail, color, and the sharp focus needed for driving, reading, and recognizing faces.

“Because AMD can be devastating to a person’s life and lifestyle, early detection, future prevention if possible, and access to rehabilitation are essential,” says Lashkari, who has seen hundreds of people with AMD in his practice.

The Schepens Eye Research Institute scientists are exploring all aspects of this sight-stealing disease to help detect it earlier, mitigate its impact, and ultimately find a way to cure it.

About AMD

AMD is the leading cause of low vision and central blindness in Americans over 65. Nearly 10 percent of the population over age 52 has AMD and up to 33 percent of those

(continued on next page)
older than 75 are afflicted. With the aging of the general population, by the year 2030, 6 million Americans will be afflicted. Risk factors for AMD include smoking, high fat diets, diets low in antioxidants, being female and Caucasian, over-exposure to sunlight, and a possible genetic predisposition.

Although there are two forms of AMD, dry and wet, many experts would argue that the underlying basis for these two diseases is the same. In dry macular degeneration, the cells of the macula slowly begin to atrophy and die over a period of years. Wet AMD develops when new, abnormal blood vessels start to grow in a layer of vascular tissue beneath the retina called the choroid membrane. These tiny blood vessels break through tissue called Bruch’s membrane and bleed, and in the process, kill, macular cells—causing loss of central sharp vision within days or weeks.

In both cases, patients initially complain of visual distortions and unexplained blurred vision. Because AMD progresses slowly in the early stages, by the time a patient notices these changes the disease is already fairly advanced. On visual examination, a physician will see yellow spots under the retina, known as drusens, which seem to be a precursor of the disease.

At this point, there are no treatments for dry macular degeneration. The purpose of existing treatments, which are designed only for wet AMD, has been to stop the bleeding by destroying the blood vessels before they destroy the photoreceptors. Until recently, laser photocoagulation has been the most common treatment. Now photodynamic therapy (PDT) is the treatment of choice because it is more focused and destroys fewer healthy cells than the earlier treatment. In PDT, the drug selectively enters the vacuolar cells within the membrane and destroys them without directly damaging the retina. Neither procedure is a cure. PDT generally requires repetition because these blood vessels have a tendency to recur.

“The limited options are very disheartening to patients like Ina Ward,” says Lashkari. “They feel that they have lost total control over what is happening to their eyes and to their lives because of AMD.”

Giving patients back a sense of control over their vision and their lives is a major goal of the research efforts at The Schepens Eye Research Institute.

**Learning more about the cause**

“One of the possible causes of this mess called AMD is a chemical known as lipofuscin, which is found in large quantities in the eyes of older people and in patients with some other macular dystrophies,” says François Delori, Ph.D., senior scientist at The Schepens Eye Research Institute. Delori is determined to learn whether high levels of lipofuscin play a role in the development of AMD.

Found in the retina pigment epithelium or RPE (a layer of tissue under the retina attached to the blood supply), lipofuscin is a waste product of a process that daily renews the photoreceptor cells in the macula. After a day of light exposure, the photoreceptor cells lose their outer tips and develop new layers. The RPE, which promotes the shedding of the old membranes, also digests them and delivers the waste products to the blood stream to be carried away. The tiny remaining portion of those waste products is lipofuscin. “Although we don’t know if lipofuscin is found in babies eyes, it does
exist in teenagers and we know it accumulates throughout life and reaches high levels in old age,” he says.

Delori believes that congestion caused by large quantities of lipofuscin might destabilize the photoreceptor cells and prevent their normal activity. Understanding how lipofuscin in different levels contributes to the development of AMD and other retinal diseases could ultimately lead to a new diagnostic tool for early detection, notes Delori, who is currently involved in a twin study to learn if levels of lipofuscin are genetically determined. “It is another piece of the AMD puzzle,” he says.

While Delori’s work may not change Ina Ward’s prognosis, it could help diagnose the potential for AMD in her offspring.

Prevention is the key

Max Snodderly, Ph.D., senior scientist at The Schepens Eye Research Institute, believes that nutrition may be a useful tool for retarding the process that leads to AMD. “I really want to know what is going on early in the process,” he says. “If we can figure that out, we can eliminate this disease.”

Snodderly is gathering data on the role that carotenoid pigments play in the macula, and whether supplementing them in the diet can help delay or prevent the onset of AMD. Although Snodderly has been involved in studies of other nutritional factors, he is particularly interested in lutein and zeaxanthin, which are the pigments in the macula. The theory is that these pigments protect the macula from light damage just as they protect plants during photosynthesis. Previous studies have already shown that levels of these chemicals are low in the retinas of AMD patients and in smokers. There is also suggestive evidence that women absorb lutein less readily than men do from the diet.

According to Snodderly, carotenoid supplements have had a lot of promotion in the press, and many people are already taking them. However, he believes long-term, large-scale studies are needed to confirm the effectiveness of supplementing with these chemicals.

Snodderly’s research may help to stabilize Ina Ward’s disease, but more importantly, it may help prevent it in her children or grandchildren.

A passion for reading

For Elisabeth Fine, Ph.D., assistant scientist at The Schepens Eye Research Institute, reading is a passion in more ways than one. She loves to read, and she believes losing that ability would be the worst part of AMD. Learning how to help people regain that ability is her passion and her work.

To help her shed light on AMD’s impact on reading, Fine uses an optical image stabilizer to put people with normal vision under conditions that simulate some of the visual impact of AMD. “I can give them the central field loss common in AMD and take it away and see how it changes their ability to read.”

With this technique, she can ask questions and make comparisons she cannot make with AMD patients. For example, she can compare reading with large and small blind spots, or change the position of the blind spot. By introducing a simulated scotoma (blind spot) into a person’s visual field, Fine can look at how this changes reading time and the eye movements made to read.

Fine can also look at what part of the retina each person uses as a substitute for the missing fovea. People who have central field loss often develop a “pseudo-fovea,” which is an area on the retina that they use as a substitute for the missing fovea. The fovea not only has the most detailed vision, it is also the anchor for eye movements and for visual attention. “We use both to move our eyes to sample the information in the visual world,” says Fine, who has a theory that the pseu-
Born in Chicago, Illinois, Andrew W. Taylor earned his bachelor of science in biochemistry from the University of Wisconsin in 1983. He went on to obtain a master of science in Immunogenetics in 1986 and a Ph.D. in Microbiology and Immunology in 1990 from Ohio State University.

In 1990, Taylor became part of the team at the University of Miami School of Medicine, headed by J. Wayne Streilein, Ph.D., now president of The Schepens Eye Research Institute. There Taylor discovered several immunosuppressive factors in the eye. He joined The Schepens Eye Research Institute in 1993, where he continues in his commitment to unravel the mystery of the eye’s immune privilege. He is the author of 37 publications in Immunology, Visual Science, and Neuroimmunology.

Q: I have heard that some molecules in the eye may help prevent inflammation and may affect autoimmune diseases in the eye and other parts of the body. Can you enlighten me?

A: To answer your question, I first need to describe the way the immune system works in the eye.

Because it is extremely intricate, delicate, and so vital to survival, the eye has evolved a special way of handling immunity to prevent inflammation in response to foreign invaders such as bacteria, viruses, and other harmful substances. In the scientific community, we say that the eye is “immune privileged.”

At The Schepens Eye Research Institute, my laboratory is part of a team of other scientists and laboratories determined to increase our understanding of this “privileged” state and how it might be harnessed to prevent inflammation not only in the eye but in other parts of the body as well.

In most other tissues of the body, the immune response to foreign invaders involves the rallying of several cells and substances to fight off the threat. With T cells as the ringleaders of this process, the defensive response eventually causes inflammation, characterized by redness and swelling. As the invader is defeated, the inflammation gradually subsides and the tissue heals.

But in the eye, inflammation of any kind can cause irreparable damage to its delicate tissues and thus to vision. So the act of protecting itself in the typical way is devastating to the eye.

Faced with this dilemma, the eye evolved a way to suppress the inflammatory immune response. The eye’s special immune suppressive properties are something that scientists have known about for 150 years, and are the explanation for the success of corneal transplants. Corneal transplants have a very low rate of rejection and the highest success rate for any transplanted tissue.

Although there are many unknown factors involved in this immune suppression, we have begun to find some important clues over the past decade. In my laboratory at the Institute, we have discovered at least one of the keys to unlocking the mystery.

In animal studies supported by the National Eye Institute, we identified a factor within the aqueous humor of the eye called alpha-melanocyte stimulating hormone (alpha-MSH), which plays an important role in the process. This molecule, we learned, blocks the immune system from initiating inflammation in response to foreign threats. It does this by causing the development of regulatory T cells, cells which turn off other T cells that are responsible for the inflammatory immune response. Alpha-MSH also causes T cells to convert into regulatory T cells. When we learned that the activity of this factor is very low in cases where the eye becomes inflamed, we knew we were on to something very important.

(continued on back cover)
For nearly a decade, Madelon Zimner has been making annual gifts of $100 to The Schepens Eye Research Institute in loving memory of her late husband Ben. Madelon has a strong desire to support the Institute’s work so that others may be spared from the devastating effects of blindness—a crusade that she has been on since 1985, when Ben Zimner was robbed of his sight by macular degeneration.

“I truly wish I could give more,” Madelon has frequently said, “but I am living on a fixed income.”

Speaking to Madelon Zimner, one soon realizes how much she adored her husband. “Ben was a wonderful husband and father,” Madelon recalls, “and he was so handsome ... he looked like a movie star.” It is understandable therefore that Madelon feels so strongly about the Institute’s dynamic research efforts to cure blindness. At the age of 72, Ben was afflicted with an aggressive form of macular degeneration that rendered him legally blind overnight. According to Madelon, “most people, including physicians, are not aware of the devastating that blindness can cause. Ben suffered from clinical depression as a result of his sudden blindness and it affected our entire family. He lost his will to live when he lost his sight and that deprived us of the love and affection that we normally shared.”

Although there was no cure to restore Ben’s sight, the Zimners found comfort in the medical care they received from Dr. Marc Yoshizumi, an accomplished ophthalmologist who had trained at The Schepens Eye Research Institute. “Dr. Yoshizumi understood the emotional and psychological effects of blindness and recommended psychotherapy to treat Ben’s depression,” Madelon explains. Heeding Dr. Yoshizumi’s advice, “Ben received counseling from Dr. Rhee Aquado, a clinical psychologist, who helped Ben dramatically,” according to Madelon.

“I am not a wealthy woman. This is the only way for me to make a gift of this size.”

Madelon was delighted to learn that she could make a larger gift than she thought possible to support the Institute’s research by contributing through a Charitable Gift Annuity. It is quite a simple arrangement. In exchange for an irrevocable gift of cash or securities, the Institute agrees to pay the donor an annuity each year for the remainder of his or her life. The older the donor is at the time of the gift, the greater the annuity that the Institute can pay. In Madelon’s case, the 8 percent annuity payment was far greater than she could receive from a money market or certificate of deposit, and she was entitled to take a significant income tax deduction. The tax and financial benefits of a Charitable Gift Annuity enabled Madelon to achieve her philanthropic dreams by making a five-figure gift to the Institute in memory of Ben. As Madelon put it, “I am not a wealthy woman. This is the only way for me to make a gift of this size.”

“I am receiving so much more than I am giving,” Madelon commented recently, after seeing the research of Dr. Michael Young, assistant scientist at The Schepens, featured on the PBS program,

(continued on page 14)
Traveling exhibit kicks off at the CambridgeSide Galleria

The Schepens participated in the National Eye Institute’s traveling exhibit on low vision—the kickoff event was held on Monday, June 3 at the CambridgeSide Galleria, Cambridge, MA. The Eye Sight, which provided information on low vision in English and Spanish, featured five kiosks with an interactive multimedia touch screen program, a display of assistive devices, and a list of local low vision resources. The exhibit was free and open to the public. Congressman Michael Capuano and members of the Eye Sight committee kicked off the event with a ribbon cutting ceremony.
From the President (continued from page 2)

stages of this dreaded complication of diabetes mellitus. Multidisciplinary teams of research workers at the Institute are working toward truly innovative treatments for age-related blinding diseases through the Minda de Gunzburg Research Center for Retinal Transplantation, and through the Ocular Gene Therapy Research Program. In aggregate, these research efforts represent a full-scale attack upon the problem.

Yet we are acutely aware that these diseases are already causing serious vision loss in people who are now in the over-65 age group. Until and unless cures and preventions can be found, it is extremely important that our research scientists seek strategies that will offer—here and now!—relief for people whose vision is already impaired. The leading scientists in the world developing novel low vision aids are working at the Institute, and their research holds great immediate promise.

This issue focuses on age-related macular degeneration—enumeration of its possible causes, improved methods for evaluation of retinal function, current methods of treatment, and the role of nutrition. I hope that you will find this issue informative and helpful.

Although a crisis with respect to preservation of fine vision is looming as the American population ages over the next decades, the crisis can be avoided. Along with their peers at numerous biomedical research institutions around the world, the scientists at The Schepens Eye Research Institute are working hard to find answers that can be translated into clinical benefit. We are pleased that you have joined us in this effort—with your encouragement, your support, and your prayers. Together we can stop the “four horsemen.”

Sincerely,

J. Wayne Streilein, M.D.
President

New Publication Highlights Financial and Philanthropic Planning

A new publication by The Schepens Eye Research Institute, entitled “Envision,” is being sent to many of our long-time friends and donors. The newsletter provides information that is timely and helpful in planning for the future. Many of the Institute’s friends were delighted to learn about the attractive benefits offered by the estate, financial, and philanthropic opportunities featured in the inaugural issue.

Annual Winter Phonathon

This December we will take to the telephones again, reaching out to our loyal supporters to enable our scientists and researchers to continue their quest to conquer blinding eye disease. With your help, we will reach our goal to support the operational needs of the Institute and ongoing research projects. If one of our callers reaches you, please be as generous as you can.

If you are interested in this publication, send us your name and address and we will be sure to forward a copy to you. Send it to George Constant, The Schepens Eye Research Institute, 20 Staniford St., Boston, MA 02114, or e-mail constant@vision.eri.harvard.edu.
Kathryn Colby, M.D., Ph.D., Director, Joint Clinical Research Center, Massachusetts Eye and Ear Infirmary, The Schepens Eye Research Institute, was born and raised in New Jersey, and received her B.A. at Johns Hopkins University in 1981, a Ph.D. in Neurobiology from Brown University in 1986, and her M.D. from the University of Maryland Medical School in 1992. Following an internship in internal medicine at Mercy Medical Center in Baltimore, she went on to complete her ophthalmology residency at Massachusetts Eye and Ear Infirmary (MEEI) in 1996.

Colby is now a corneal specialist and a full-time staff member at MEEI. In 1998 she became the founding director of the Joint Clinical Research Center and an investigator at The Schepens Eye Research Institute. Her special interests are corneal endothelial dystrophies and ocular surface tumors.

Colby currently lives in Winchester, Massachusetts, with her two daughters.

**Question:** My doctor keeps telling me that I should have corneal transplantation. The idea scares me. Should I be worried?

**Answer:** You should always think carefully about any surgical procedure, but the facts about corneal transplantation may help to ease your fears and help you make an educated decision.

Approximately 35,000 people a year undergo corneal transplantation in the United States, and 95 percent have successful results. The procedure is so well established that it is considered the most common and successful transplant operation in medicine today.

Corneal transplants are done for a variety of conditions that affect the cornea. The cornea is the clear windowlike covering for the eye, which focuses light on the retina and protects the internal eye from injury. Corneas can be damaged by injury; infection including herpes; inherent corneal disease such as keratoconus, a thinning of the corneal tissue, or corneal dystrophy such as Fuchs’ Dystrophy, a progressive dysfunction of the corneal endothelial cells; or previous eye surgery.

A transplant becomes necessary when disease or injury scars the cornea enough to become opaque and incapable of delivering a sharp image to the retina. Replacing a damaged cornea can restore clarity to vision, and quality to life.

As with other transplant surgeries, in corneal transplantation diseased tissue (host cornea) is replaced by healthy tissue (donor cornea). The donor cornea comes from someone who has died and donated his or her eyes for the benefit of others.

Unlike other transplanted tissue, corneal tissue does not require extensive type matching. Cause of death, length of time between death and transplant, and the presence of donor eye disease are the determining factors. Also, because the cornea has few blood vessels and because of the eye’s natural immune suppression (see Ask a Schepens Scientist on page 6), corneal transplants are less frequently rejected by the body than other transplanted tissue.

The surgery itself is painless and straightforward, typically taking less than one hour in an uncomplicated case. Most corneal transplants are done under local anesthesia on an outpatient basis. During the surgery, a surgeon carefully removes a part of the diseased cornea and replaces it with the donor tissue, cut precisely to fit, and then sews it into place with tiny sutures.

During recovery patients are encouraged to refrain from lifting heavy objects, and bending or straining. Water should not be allowed in the operated eye until the surface cells have healed (usually one to two weeks). An eye shield is worn at night for at least one month after surgery. Medicated eye drops (including antibiotic and steroid eye drops) are used, frequently at first, to help prevent infection and calm inflammation.

(continued on page 15)
The Third Annual Boston Eye Ball, “A Night for Sight,” was held at the Fairmont Copley Plaza Hotel on November 15, 2002. The guests enjoyed a wonderful evening of dinner, dancing, and a silent auction.

Mark your calendar now to attend the Fourth Annual Boston Eye Ball—Friday, November 14, 2003.
Tour of the American Folk Art Museum and Reception Preceded New York Symposium

The New York area “Friends of The Schepens” and the Jewish Guild for the Blind collaborated to host a small tour of an exhibit from the Ralph Esmerian collection at the American Folk Art Museum in New York preceding the May 22 Eye and Vision Research Seminar held at the Harvard Club. SERI Trustee and Chairman of the New York City “Friends of The Schepens,” Ted Voss, hosted a reception following the tour.

Left to right: David Korb, Holly Grieg, Ted Voss, and Dr. J. Wayne Streilein at the reception following the tour.

Dr. Mara Lorenzi from the Institute discussed “Diabetes and Diabetic Retinopathy.”

Left to right: David Denniston, Susan Rich, Allan Patt, and Norbert Ratliff.
The Palm Beach Area “Friends of The Schepens” hosted a Vision for the Future luncheon at the Mar-A-Lago Club in Palm Beach on Thursday, April 4.

At the luncheon, neuroscientist Michael Young, Ph.D., presented and discussed the results of his state-of-the-art research being conducted in the Minda de Gunzburg Research Center for Retinal Transplantation at The Schepens Eye Research Institute.

Chairwoman of the event, Hermé de Wyman Miro, assisted by Kathryn Vecellio, Judy Grubman, and Cheryl Gowdy, helped the Institute in creating an educational and informative event.

**Man of Vision Award**

With the support of the New York area “Friends of The Schepens,” the Institute honored Henry Grunwald with the Man of Vision Award at the “Vision for the Future Luncheon” on October 15 at the Mutual of America Ballroom in New York City. Mr. Grunwald is the former editor-in-chief of Time, Inc., former US ambassador to his native Austria, and author of *Twilight*, a personal account of his struggle with macular degeneration. The award was presented by Sharon King Hoge, a member of the New York “Friends of The Schepens” committee.

In conjunction to the award presentation, Scientist Michael Young, Ph.D., a neurobiologist at The Schepens Eye Research Institute, presented promising research involving retinal transplantation and stem cell research that may one day lead to regeneration of retinas damaged by disorders such as macular degeneration.
do-fovea develop in the area of the retina where a person is best able to deploy their visual attention.

This information will help us better understand why pseudo-fovea develop where they do and may lead to improvements in vision rehabilitation. Ultimately, it will help us develop the skills in patients that they need to improve their reading, according to Fine.

The work that Fine loves may help Ina Ward return to an activity she loves and misses.

**Improving facial recognition**

“Most facial features are of low contrast anyway, just shadows of the structure of the face,” says Eli Peli, O.D., a senior scientist at The Schepens Eye Research Institute. “Imagine how blurred or broken vision can contribute to the difficulty of recognizing a face,” he says.

Peli has been studying face-recognition skills for a number of years. He shows patients photos of celebrities that have been enhanced in different ways and asks them to rank their certainty that a particular individual is a celebrity on a scale of one to five. He has found the greatest improvement in recognition (when a picture is enhanced) for patients who were originally the most impaired.

His studies have also led him to test devices that can restore recognition skills. “If you move closer to or magnify a face, it becomes more recognizable even when the central vision is blurred or nearly missing,” he says. According to Peli, “while the contrast doesn’t change, the retina has a better sensitivity to larger rather than to smaller things.”

**“Because AMD can be devastating to a person’s life and lifestyle, early detection, future prevention if possible, and access to rehabilitation are essential.”**

According to Peli, a device like a bioptic telescope mounted on a pair of glasses can make it possible for Ina Ward to recognize her friends and family at a distance with a quick telescopic glance. Peli is also developing and testing enhanced-contrast televisions and a portable video camera attached to a pair of video glasses which enhance outside images as a person with AMD walks around.

These are just a few of the researchers at The Schepens Eye Research Institute who are investigating AMD. Others will be featured in future issues of Sightings.

---

**Profiles in Philanthropy**

(continued from page 7)

“**Because AMD can be devastating to a person’s life and lifestyle, early detection, future prevention if possible, and access to rehabilitation are essential.”**

According to Peli, a device like a bioptic telescope mounted on a pair of glasses can make it possible for Ina Ward to recognize her friends and family at a distance with a quick telescopic glance. Peli is also developing and testing enhanced-contrast televisions and a portable video camera attached to a pair of video glasses which enhance outside images as a person with AMD walks around.

These are just a few of the researchers at The Schepens Eye Research Institute who are investigating AMD. Others will be featured in future issues of Sightings.

**“Because AMD can be devastating to a person’s life and lifestyle, early detection, future prevention if possible, and access to rehabilitation are essential.”**

According to Peli, a device like a bioptic telescope mounted on a pair of glasses can make it possible for Ina Ward to recognize her friends and family at a distance with a quick telescopic glance. Peli is also developing and testing enhanced-contrast televisions and a portable video camera attached to a pair of video glasses which enhance outside images as a person with AMD walks around.

These are just a few of the researchers at The Schepens Eye Research Institute who are investigating AMD. Others will be featured in future issues of Sightings.

---

**Profiles in Philanthropy**

(continued from page 7)

“**Because AMD can be devastating to a person’s life and lifestyle, early detection, future prevention if possible, and access to rehabilitation are essential.”**

According to Peli, a device like a bioptic telescope mounted on a pair of glasses can make it possible for Ina Ward to recognize her friends and family at a distance with a quick telescopic glance. Peli is also developing and testing enhanced-contrast televisions and a portable video camera attached to a pair of video glasses which enhance outside images as a person with AMD walks around.

These are just a few of the researchers at The Schepens Eye Research Institute who are investigating AMD. Others will be featured in future issues of Sightings.

---

**Profiles in Philanthropy**

(continued from page 7)

“**Because AMD can be devastating to a person’s life and lifestyle, early detection, future prevention if possible, and access to rehabilitation are essential.”**

According to Peli, a device like a bioptic telescope mounted on a pair of glasses can make it possible for Ina Ward to recognize her friends and family at a distance with a quick telescopic glance. Peli is also developing and testing enhanced-contrast televisions and a portable video camera attached to a pair of video glasses which enhance outside images as a person with AMD walks around.

These are just a few of the researchers at The Schepens Eye Research Institute who are investigating AMD. Others will be featured in future issues of Sightings.

---

**Profiles in Philanthropy**

(continued from page 7)

“**Because AMD can be devastating to a person’s life and lifestyle, early detection, future prevention if possible, and access to rehabilitation are essential.”**

According to Peli, a device like a bioptic telescope mounted on a pair of glasses can make it possible for Ina Ward to recognize her friends and family at a distance with a quick telescopic glance. Peli is also developing and testing enhanced-contrast televisions and a portable video camera attached to a pair of video glasses which enhance outside images as a person with AMD walks around.

These are just a few of the researchers at The Schepens Eye Research Institute who are investigating AMD. Others will be featured in future issues of Sightings.

---

**Profiles in Philanthropy**

(continued from page 7)

“**Because AMD can be devastating to a person’s life and lifestyle, early detection, future prevention if possible, and access to rehabilitation are essential.”**

According to Peli, a device like a bioptic telescope mounted on a pair of glasses can make it possible for Ina Ward to recognize her friends and family at a distance with a quick telescopic glance. Peli is also developing and testing enhanced-contrast televisions and a portable video camera attached to a pair of video glasses which enhance outside images as a person with AMD walks around.

These are just a few of the researchers at The Schepens Eye Research Institute who are investigating AMD. Others will be featured in future issues of Sightings.

---

**Profiles in Philanthropy**

(continued from page 7)

“**Because AMD can be devastating to a person’s life and lifestyle, early detection, future prevention if possible, and access to rehabilitation are essential.”**

According to Peli, a device like a bioptic telescope mounted on a pair of glasses can make it possible for Ina Ward to recognize her friends and family at a distance with a quick telescopic glance. Peli is also developing and testing enhanced-contrast televisions and a portable video camera attached to a pair of video glasses which enhance outside images as a person with AMD walks around.

These are just a few of the researchers at The Schepens Eye Research Institute who are investigating AMD. Others will be featured in future issues of Sightings.

---

**Profiles in Philanthropy**

(continued from page 7)

“**Because AMD can be devastating to a person’s life and lifestyle, early detection, future prevention if possible, and access to rehabilitation are essential.”**

According to Peli, a device like a bioptic telescope mounted on a pair of glasses can make it possible for Ina Ward to recognize her friends and family at a distance with a quick telescopic glance. Peli is also developing and testing enhanced-contrast televisions and a portable video camera attached to a pair of video glasses which enhance outside images as a person with AMD walks around.

These are just a few of the researchers at The Schepens Eye Research Institute who are investigating AMD. Others will be featured in future issues of Sightings.

---

**Profiles in Philanthropy**

(continued from page 7)

“**Because AMD can be devastating to a person’s life and lifestyle, early detection, future prevention if possible, and access to rehabilitation are essential.”**

According to Peli, a device like a bioptic telescope mounted on a pair of glasses can make it possible for Ina Ward to recognize her friends and family at a distance with a quick telescopic glance. Peli is also developing and testing enhanced-contrast televisions and a portable video camera attached to a pair of video glasses which enhance outside images as a person with AMD walks around.

These are just a few of the researchers at The Schepens Eye Research Institute who are investigating AMD. Others will be featured in future issues of Sightings.

---

**Profiles in Philanthropy**

(continued from page 7)

“**Because AMD can be devastating to a person’s life and lifestyle, early detection, future prevention if possible, and access to rehabilitation are essential.”**

According to Peli, a device like a bioptic telescope mounted on a pair of glasses can make it possible for Ina Ward to recognize her friends and family at a distance with a quick telescopic glance. Peli is also developing and testing enhanced-contrast televisions and a portable video camera attached to a pair of video glasses which enhance outside images as a person with AMD walks around.

These are just a few of the researchers at The Schepens Eye Research Institute who are investigating AMD. Others will be featured in future issues of Sightings.

---

**Profiles in Philanthropy**

(continued from page 7)

“**Because AMD can be devastating to a person’s life and lifestyle, early detection, future prevention if possible, and access to rehabilitation are essential.”**

According to Peli, a device like a bioptic telescope mounted on a pair of glasses can make it possible for Ina Ward to recognize her friends and family at a distance with a quick telescopic glance. Peli is also developing and testing enhanced-contrast televisions and a portable video camera attached to a pair of video glasses which enhance outside images as a person with AMD walks around.

These are just a few of the researchers at The Schepens Eye Research Institute who are investigating AMD. Others will be featured in future issues of Sightings.
Ocular Challenges for the 21st-Century Military

Clear, unimpeded vision can be a matter of life and death for a pilot, a soldier, or a naval officer, and protecting that vision is the goal of military eye specialists. Eighteen of the military’s most skilled ophthalmologists and optometrists spent two full days at The Schepens Eye Research Institute this September to share their experiences, problems, and concerns with Schepens scientists and discuss and develop possible research solutions.

“We were thrilled to meet this illustrious group of physicians who gave us a firsthand account of the special eye care challenges faced by our military,” says J. Wayne Streilein, M.D., president of The Schepens Eye Research Institute. According to Dr. Streilein, the ultimate goal of the symposium was for The Schepens Eye Research Institute to propose research projects that in the short term address urgent needs of those in combat and that in the long term enhance the lives of all people dealing with visual impairment.

Each year, scientists and medical researchers around the country are granted funding from the U.S. Defense Department’s TATRC, which stands for Telemedicine Advanced Technology Research Center. The Schepens Eye Research Institute has been a consistent recipient of funds from that organization. This year is the first time that TATRC has come to the Institute to talk about the full range of their concerns about eye care in the military.

One full day of the symposium was devoted to the military’s recent use of refractive surgery (laser corrective surgery) to eliminate some of the difficulties created by glasses and contact lenses in combat situations. Although the use of this surgery has dramatic positive effects, it also can have serious drawbacks such as slow wound healing and haze that can suddenly appear in treated eyes which can leave a military person unable to function in a remote location. Night vision may also be an issue, sometimes helped by refractive surgery, sometimes made worse. And at this point, the military does not have a good method for assessing function in low light after surgery.

Among the topics discussed on the second day of the symposium were battlefield injuries in Desert Storm and Kosovo, corneal/globe wound stabilization, retinal laser injuries, and terrorism and bio-terrorism and the eye.

At the conclusion of the symposium, Dr. Streilein was able to present the military with a number of ways that The Schepens Eye Research Institute might help, including devices for simulating flight conditions to test low light vision, the creation of a special corneal bandage to protect the eye after injury, and wound healing techniques already under development at the Institute.

Clinically Speaking (continued from page 10)

Over the course of the next year, the surgeon may need to adjust the shape of the new cornea by manipulating the sutures. It typically takes six to nine months after corneal transplantation for the vision to stabilize. The degree to which vision improves and how long that improvement lasts will depend on the state of the original eye disease or injury.

Of course, as with all surgery, there can be complications, and with corneal transplants they can range from infection and inflammation to glaucoma or retinal detachment. However, the overall complication rates are very low.

So my advice to you is to have a heart-to-heart discussion with your physician to determine what your particular needs and risks are. If corneal transplantation is what you choose, your chances of improving your vision are very high, and good results can last for many years.
So what does this mean for autoimmune diseases? Autoimmune diseases occur when the body mistakenly sees its tissues as a foreign intruder and attacks itself. This attack on itself can cause such diseases as uveitis in the eye, diabetes in the pancreas and multiple sclerosis in the spinal cord and brain. The ringleaders in this process are auto-reactive T cells.

We theorized that we could use alpha-MSH to make regulatory T cells outside the body and then when they were re-injected into the body, they would turn off the T cells causing autoimmune disease. For example, uveitis, a blinding inflammation of the retina, might be cured by this technique. We also hypothesized that we could inject alpha-MSH into a uveitic eye and suppress the inflammation. In both cases, we accomplished our goal and suppressed autoimmune uveitis in experimental animals.

Now a pharmaceutical (biotech) company is working with our discovery to develop a product that we believe could help millions of people. If successful it could not only affect autoimmune diseases, but it could also prevent rejection of other types of organ transplants.

The next phase of our research will focus on using gene therapy to promote the expression of alpha-MSH inside the body to prompt the activation of regulatory T cells without the need to treat T cells outside the body.

Beyond that, we are also trying to understand, why, in light of so much local immunosuppression, the eye is so highly resistant to bacterial infections, even when bacteria have been introduced into the eye. The answer may also lie with alpha-MSH and the other suppressive factors we have found in the eye.