



THE FAR-B NEWS

Dedicated to promoting the research and education programs of the BELTSVILLE AREA, Beltsville, MD

Friends of Agricultural Research-Beltsville, Incorporated P.O. Box 1061, Beltsville, MD 20704-1061

JANUARY 2016

Editor: Hank Becker

Area Director's Message

Quite a few positive things happened in the Henry W. Wallace Beltsville Agricultural Research Center since my last report in the June's issue of the FAR-B Newsletter. On October 19, 2015, BARC was designated a National Historic Chemical Landmark by the American Chemical Society. The discovery and isolation of phytochrome by scientists at the Beltsville Agriculture Research Center (BARC) was one of the most important developments in plant science of the 20th century.

It took a 41-year hunt from 1918 to 1959 to identify this pigment-containing protein that the BARC team named phytochrome. Red light switches phytochrome to a biologically active form, while far red light reverses it to a biologically inactive form. This "biological switch" allows seed to germinate at the barest glimpse of light, plants to sense their neighbors, and sun-loving plants to overtop their neighbors. This switch also is responsible for the plants of same species to bloom at exactly the same time every year, and for some species to bloom early (tomatoes) while some others late (chrysanthemums) in the growing season.

The official ceremony, which took place in the main auditorium at BARC, was attended among the others by Dr. Chavonda Jacobs-Young, ARS Administrator; Mr. Joseph Bartenfelder, Maryland Secretary of Agriculture; Mr. Rushern Baker III, County Executive, Prince Georges County, and Dr. Pat N. Confalone, Chair, ACS Board of Directors and a former Vice President of DuPont Chemical Company. Also present was Dr. Karl Norris, a retired ARS scientist and a member of the original ARS phytochrome discovery team.

The ceremony was followed by a symposium hosted by BARC on past, present and future research related to phytochrome. The keynote speaker was Dr. Peter H.

Quail, professor, Department of Plant and Microbial Biology, University of California, Berkeley and research director of the Plant Gene Expression Center, Albany, CA.

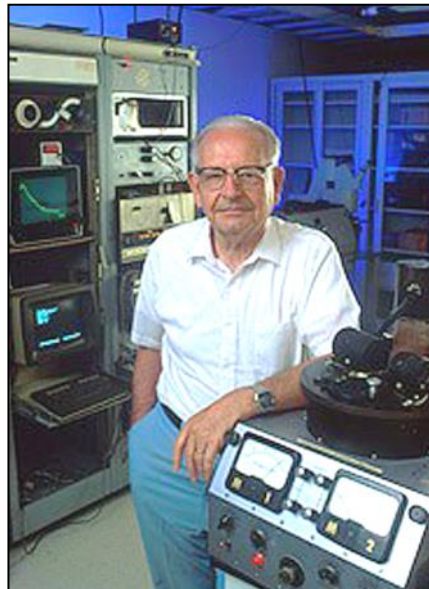
Last December, Congress passed the Consolidated Appropriation Act of 2016, also known as the omnibus bill. It is favorable for ARS. It includes

\$1,143,825,000 for the Salaries & Expenses account--an increase of \$11.2 million above the FY 2015 operating level. The Bill also provides \$212,101,000 for the Buildings and Facilities account. As a result of this appropriation, the US National Arboretum has received a \$350,000 programmatic increase and BARC \$37 million to renovate Building 307 located on the east side of the BARC campus. The funding of all the other programs in Beltsville remained at the Fiscal Year 2015 operating levels, which is a very positive development considering the current tight budgetary environment.

Last December, Dr. Dawn Gundersen-Rindal completed her 3.5 months long detail to the position of Acting Associate Area Director in NEA. Her professionalism, dedication, and exceptional work ethic significantly contributed to and benefited the NEA programs.

Dr. Gundersen-Rindal resumed her function as Research Leader of the Invasive Insect Biocontrol and Behavior Laboratory in BARC.

In January 3, 2016, Dr. Vangimalla (VR) Reddy was detailed to the position of Acting Associate Area Director in NEA for 90 days. Dr. Reddy has been the Research Leader and Supervisory Research Plant Physiologist for the USDA-ARS-BARC Crop Systems and Global Change Laboratory (CSGCL) and its predecessor laboratories since 1995. His research focuses on crop responses to climate change in terms of photosynthesis, respiration, transpiration, carbon and nitrogen



Engineer Karl Norris displays the dual monochromator spectrophotometer which made history with its rapid and precise assays of phytochrome.

metabolism and growth. He uses the results of his studies to develop mechanistic growth simulation models and computer-aided farm decision-support systems for major crops such as corn, cotton, soybean, potato, wheat, rice and others. He has authored and co-authored over 180 publications in peer-reviewed journals, several book chapters and two books.

Effective January 10, 2016, Dr. LeAnn Blomberg was appointed the Assistant Director of the Beltsville Agricultural Research Center in Beltsville, MD. She joined the USDA-ARS, BARC as a postdoctoral fellow in the Biotechnology and Germplasm Laboratory in 2002 and in 2004 became a Research Scientist in the same Unit. Following the formation of the Animal Biosciences and Biotechnology Laboratory, Dr. Blomberg served as Lead Scientist for a swine project before becoming the Laboratory's Research Leader in 2010. She holds an undergraduate degree in Biology from John Brown University, Siloam Springs, AK. She received a Ph.D. in Physiology and Biophysics from Georgetown University, Washington, D.C. in 2001. Prior to joining ARS, Dr. Blomberg conducted research at NIH on various aspects of human development, particularly postnatal airway development. Dr. Blomberg's research at ARS has focused on specific aspects of swine reproductive efficiency, encompassing embryo through neonatal development. She was the first to perform in-depth gene expression analysis on porcine embryos, not only reporting pre-implantation stage specific differences, but also demonstrating influence of the uterine environment. We are very pleased that Dr. Blomberg has assumed this very important leadership position.

Dariusz M. Swietlik, Area Director, NEA

Financial Report

In 2015, FAR-B had operating income of \$23,818 and expenses of \$31,390 with \$35,452 in reserve funds to cover the net loss, which was approved by the Board. In addition the investment income of \$2,436 was earned and reinvested. Operating income comprised of dues (\$5,141), individual donations (\$620), and Combined Federal Campaign (\$6,376). Dues receipts increased slightly and the receipts from CFC contributions also increased.

FAR-B helped the ARS National Germplasm Resources Laboratory and the APHIS Plant Quarantine program host the WERA-20 multistate program of public and private sector scientists meeting on virus and virus-like diseases of tree fruits, small fruits and grapevines (see article pg. 6). FAR-B also supported the agency and the American Chemical Society in the

celebration and seminar on the discovery of phytochrome.

FAR-B funded four high school student interns at Beltsville in 2015 (see article pg. 7). Other programs supported were activities of the Beltsville Diversity Task Force, the science enrichment program at the Beltsville Academy, the Beltsville Poster Day and funded award prizes for the winners at the middle school science fairs in Montgomery and Prince George's counties.

Richard Parry, Treasurer

President's Message

Although I have been involved in FAR-B activities for several years, after being elected president, I decided to delve back in FAR-B's history a bit. The first thing that I discovered is that FAR-B is 30 years old. In late 1985, Beltsville science icons Morton Beroza, Victor Boswell, Warren Shaw, Russell Steere, Jane Wall, and Martin Weiss drafted and signed the Articles of Incorporation that created the FAR-B Corporation. The Articles listed 13 purposes for creation of the organizations, all of which were to support the program, facilities, equipment, and needs of ARS and USDA in Beltsville.

Certainly times have changed, but the current FAR-B board of Directors remains as committed as ever to supporting the Beltsville facility and its programs. Except for aiding in the conduct of an annual symposia and publishing the proceedings, the activities of FAR-B have changed little in 30 years. The biggest change has been the availability of financial resources. The decline in the number of scientists and changing nature of the Beltsville research programs has made it increasingly difficult to raise funds. Private industry and non-profit organizations have for various reasons become more reluctant to contribute to support Beltsville programs and the aging and declining numbers of retirees and potential personal members has gradually resulted in declining resources.

Nevertheless, we continue to support Beltsville by providing annual written testimony to Congress, provide financing for student interns, support the annual poster day, provide funding for a wide range of diversity and community outreach programs, and assist the Area Director and management units as special needs arise. As you read the following pages you will get a good feel for many of these programs that FAR-B supports.

As I close, I want to invite any of you who have an interest and think you can help, to consider joining

us on the FAR-B Board of Directors. Please give me a call. We only meet for a couple of hours, 10 times a year, so it's not a huge commitment of time, but can be very rewarding.

Alan Stoner, President

CFC Update

FAR-B submitted application to the National Capital Area Combined Federal Campaign to participate in the 2016 Campaign. FAR-B's charity number will likely remain the same as last year, 40122. Charities accepted for the 2016 Campaign will be notified by mid-summer. This can be followed on the web at www.NCACFC.com book of 2016 Charities.

Lew Smith, CFC

American Chemical Society Honors BARC as National Historic Chemical Landmark

The discovery of phytochrome by scientists at the USDA [Beltsville Agriculture Research Center](#) was honored as a [National Historic Chemical Landmark](#) by the [American Chemical Society](#) (ACS). Phytochrome is recognized as one of the universal regulators of plant physiology and growth.

It took a 41-year hunt from 1918 to 1959 to identify this pigment-containing protein, which the BARC team named phytochrome. Red light switches phytochrome to a biologically active form, while far red light reverses it to a biologically inactive form, a process that controls germination, growth and flowering.

"Phytochrome was one of the most important discoveries in plant science of the 20th century, making possible many valuable leaps forward for agricultural science, such as growing crops in new seasons and latitudes and even creating new ways to protect plants from pests," said ARS Administrator [Chavonda Jacobs-Young](#) at a ceremony to mark the award. BARC is part of ARS, USDA's chief intramural scientific research agency.

For example, knowledge of phytochrome, and related photoperiodism, enabled soybean varieties to be bred to mature at staggered dates, boosting the value and importance of soybeans as a crop.

Awareness of phytochrome also brought the discovery that exposing chrysanthemums to light for just minutes in the middle of night prevents flowering. This allowed growers to time blooming, and

turned mums into one of the country's most valuable ornamentals with US sales of more than \$135 million a year.

"The discovery of phytochrome explains how plants germinate, grow and flower in predictable cycles over the course of a year," said Pat N. Confalone, chair of the ACS Board of Directors. "This extraordinary collaboration between physiologists, biologists, chemists and other scientists at USDA demonstrates the importance of federal research in the fundamental sciences to unlock nature's most powerful mysteries." ACS, the world's largest scientific society, founded the National Historic Chemical Landmarks program in 1992 to recognize important milestones in chemical research.

The ceremony to mark this honor was followed by a symposium hosted by BARC on past, present and future research related to phytochrome. The keynote speaker was Peter H. Quail, professor, Department of Plant and Microbial Biology, [University of California, Berkeley](#) and research director of the [Plant Gene Expression Center](#), Albany, CA. His talk was titled *A Pigment of the Imagination*. Also speaking was Karl Norris, a member of the original ARS phytochrome discovery team and the developer of near-infrared reflectance spectroscopy, which can quantify the chemical composition of substances using certain light wavelengths.

FAR-B's contributions included work on planning this celebration of the discovery of Phytochrome and providing financial assistance for the luncheon and speaker travel expenses.

Kim Kaplan, ARS Information Staff

Diversity Task Force Update

The NEA Diversity Task Force-Beltsville thanks FAR-B for your organization's support of our endeavors. Since 2008, our group has had the mission to provide support and leadership to the NEA-Beltsville administration to ensure that the research mission of ARS is performed at the highest scientific level possible.

The Task Force is employee organized and Task Force committees are a part of the Department and Agency's initiatives associated with accountability, program delivery, and employment of minorities--which includes outreach, collaborations, special emphasis programs/observances and cultural transformation in support of ARS' civil rights goals.

This was accomplished in no small part because of the support of **FAR-B** and its membership. We have recently had great success in the implementations of such outreach programs as:

- Cultural Heritage Month celebrations.
- A flourishing Student Discovery Garden that attracted 800 visitors in 2015 and donated over 900 pounds of produce to a local food pantry. Located next to building 006 on BARC west), the SDG celebrated its fifth year and continues to prosper and grow. This year, the garden hosted over 800 students, including the entire school of Berwyn Heights (grades K to 6) who toured the garden in early June. The SDG features diverse research over broad disciplines, from container gardens, to medicinal plants, to biofuels, to nutrition, to ornamentals. Such an effort is designed to attract and inspire students of all ages to consider a career in plant sciences and continue the 100-year tradition of ARS. The SDG is an all-volunteer effort. Technicians, scientists, current employees and FAR-B retirees come together—to work, plant, improve, educate, advocate and weed. Every group of students the garden host is unique and diverse. They include students from Coahoma Community College in Clarksville, MS to a group of teachers (FDA summer training program for teachers). The garden recently hosted the White House's Council of Women and Girls (Champions of Change) and in October hosted a workshop for Prince Georges County 4H members for the second time this year.

Since opening in 2010, the garden has received over 2,500 student visitors and donated over a ton of produce to local food kitchens. The SDG is open to anyone and there is a self-guiding tour. As it celebrates the SDGs fifth anniversary, the group sincerely thanks the volunteers who have given unstintingly of their time, their labor and their ideas and FAR-B for their support.

- The Area put together last summer a learning experience for Hispanic Serving Institutions (HSI) students in cooperation with Dr. Lawrence (National Program Leader of the Hispanic-Serving Institutions Education). The Diversity Taskforce Leadership Advisory subcommittee and the ODEO Program Manager organized and provided Hispanic students with a two month learning experience that will prepare them for future USDA careers. Mentors were identified for 40 undergraduate and graduate, students from several HSIs, which included universities located in



ARS scientist Matt Greenstone examines a caterpillar with other visitors from the White House.

Puerto Rico, Florida, and Texas. The learning experience contributed to the students' knowledge, preparation and expertise leading to their future agricultural related careers. This program included an overview of our research programs, hands-on learning experiences, and group activities to enhance the interns' knowledge of research as it relates to ARS programs and future careers in agricultural research. This was a phenomenal learning experience for both students and mentors which contributed to the Area's goal of increasing Hispanic participation in the BA workforce.

- The Leadership Advisory subcommittee also organized and sponsored the Hispanic-Serving Institutions Grants Program New Project Directors' Training in December 2015. After the morning program and lunch coordinated by FAR-B, the attendees presented their posters which described their proposed research. After the poster session tours of various BA labs were given. There were 44 Project Directors and 18 students attending from 27 different HSIs. We believe the program was a great opportunity to share the work that is being done in ARS and to learn about the HSIs.

FAR-B members have helped make all of these endeavors successful with their constant support. We anticipate that our efforts will inspire a diverse com-

munity of future scientists to see the wealth of possibilities in Agricultural Sciences and **FAR-B** will be an integral part of that achievement. We applaud your dedication to promoting the importance of Agricultural Science through outreach.

2016 will be another year with new Special Emphasis programs, continuing to offer internships for HSI students, and tours of the Student Discovery Garden. We hope **FAR-B** will continue to support our future initiatives and endeavors.

Martha Tomecek, Chair NEA Diversity Task Force and Plant Physiologist at the BARC Crop Systems and Global Change Labs



Task Force member Ann Simpkins discusses the garden with a visitor from the White House's Council of Women and Girls (Champions of Change).

BARC Scientist Is Sammie Medal Winner

ARS Molecular Biologist at BARC, Dr. Hyun Soon Lillehoj received the 2015 Career Achievement Medal for “her pioneering scientific discoveries on treatment for commercial poultry that lessen the use of antibiotics and make it safer to eat poultry.”

The Partnership for Public Service has released the names of the 2015 Samuel J. Heyman Service to America Medal winners. The “Sammie” awards, as they are known within the federal workforce, are considered to be among the most prestigious honors for U.S. civil servants. Categories range from Federal Employee of the Year and Career Achievement Medal to the Management Excellence and International Affairs medals.

Dr. Lillehoj said, “The Sammies are important for letting the public know the work we do at the federal research laboratories.”

Dr. Lillehoj received her B.S. degree in Biology from the University of Hartford, M.S. degree in Microbiology from the University of Connecticut, and Ph.D. in Immunology from Wayne State University, School of Medicine. After graduation, she was a NIH post-doctoral fellow in the Department of Immunology and Microbiology, Wayne State University where she conducted research on the immunology of prostate cancer and immunogenetics of autoimmune diseases. In 1981, she was appointed as a staff fellow in the Laboratory of Immunology, NIAID, NIH where she studied T-cell immunity.

Since 1984, Dr. Lillehoj has worked at the BARC. Since joining ARS, she has progressively risen in the ranks to where she is now highest grade level, Supergrade. Her research career has focused on the immunobiology of host pathogen interactions, vaccine development, mucosal immunology, and immunogenetics. Dr. Lillehoj developed the first set of mouse monoclonal antibodies detecting chicken lymphocyte subpopulations that have been commercialized and used by poultry scientists world-wide and have been instrumental for investigation of avian cell-mediated immunity. More recently, she constructed the first chicken intestinal cDNA microarray which has been of seminal importance in national and international poultry genomics research.

FAR-B Continues to Support AG Science Students

During the week of November 30 to December 3, the Maryland Agricultural Education Foundation’s Mobile Science Laboratory (MSL), using the joint sponsorship of FAR-B, the Beltsville Academy Public School, and the school Parent Teachers Association, presented one-hour agricultural science demonstration projects to some 722 students from 28 classes, grades K-5.

Grades K-2 learned about connecting Maryland farmers, farm animals, and crops to food and clothing. Grades 3-5 learned about testing to measure properties of candy. MSL teacher-instructor June Kron said she was astonished to have received the on-hands support of Beltsville scientists, who included Naomi Fukagawa, Rose Hammond, Eric Handy, Peter Thomson, Janet Slovid, Mimi Jackson, and Benjamin Rosenthal.

The cost of the outreach program was borne by FAR-B, the School, and the PTA. Each will pay one-third of a \$1,800 fee to bring the MSL to the school.



The theme this year was the MLS Aquatics Lab—one of three mobile science labs managed and operated by the Maryland Agricultural Education Foundation (MAEF). For one-week, MLS instructors lead students through hands-on scientific activities where they learned about agricultural products, aquatics/conservation and food and fiber. MSL instructors—usually retired school teachers—presented selected, age-appropriate agricultural science projects to grades K through 5. FAR-B scientists and members as well as Beltsville scientists volunteered their time and expertise to assist MLS instructors in leading students in through scientific investigations.

Grades K - 2nd participated in Here, There, and Everywhere. Students connected selected farm crops and animals to the products they produce and then used map skills to highlight counties that are the highest producers.

Grades 3rd - 5th participated in Candy Science Investigation. Students act as food scientists as they discovered the properties of some of their favorite candies using a chemical test that bubbles and fizzes. Ingredient cards were used to inform them if their predictions are correct.

In a separate activity, the school's 8th grade science honors class gratefully accepted an invitation to attend the ACS Phytochrome Symposium at BARC on October 21. School Principal Leslie Lowe confirms that teachers and students alike were excited and looking forward to these activities. She coordinated students' symposium attendance details with Beltsville's Jim Poulos.

Jim Butcher, BARC Outreach

FARB Sponsored Research on Fruits

FAR-B helped the USDA-ARS National Germplasm Resources Laboratory and USDA-APHIS Plant Germplasm Quarantine program host the annual meeting of the WERA-20 committee at BARC on July 6-9, 2015.

WERA-20 is a multistate project coordinated from the Western Agricultural Experiment Station Directors Office. Public and private sector scientists conducting research on virus and virus-like diseases of deciduous tree fruits, small fruits, and grapevines meet annually to share research information and plan collaborations.

In addition to the scientific talks, two days of the 2015 meeting were dedicated to a workshop discussing the opportunities and challenges for using next generation sequencing technologies in plant quarantine and clean stock service programs. Next generation sequencing (NGS), also called high throughput sequencing, is the latest technological advancement for sequencing genomes. It achieves significantly more read coverage and therefore generates more data from a single sequencing reaction than older methods. Gigabytes of data can be obtained and this creates challenges for computational algorithms to assemble and analyze the sequence data. The burgeoning field of bioinformatics is essential to help connect this data to biological events. NGS is being used throughout BARC to study plant and animal genomes and gene functioning. As the technology matures and its costs decline, the WERA-20 group and its stake-

holders are exploring the technique for routine pathogen detection. This powerful tool makes it possible to detect virus-specific nucleic acids, of both known and unknown diseases, in infected plants. This creates tremendous opportunities to detect pathogens with more sensitivity and speed than existing techniques, some of which can take years to complete.

Such technological advances create challenges for regulators, and numerous officials from APHIS and state departments of agriculture attended the meeting. All agreed that ongoing dialogue among researchers,

regulators, and stakeholders are essential for balancing our common goal of facilitating agricultural production while minimizing the threats caused by plant pathogens.

It was a productive meeting with about sixty in attendance. Guests enjoyed a wonderful group dinner at the U.S. National Arboretum one evening. FAR-B was glad to help sponsor this important professional event at BARC and salutes the organizers on a successful conference.

Thank you note to FAR-B for Summer Intern

I just wanted to express how very much I appreciate FAR-B's expression of support for my program in the form of funds to sustain the summer research of Brandon Adams.

Brandon is a graduate of Flowers High School who worked with us throughout his senior year and also during the summer prior to his freshman year at Cornell University, where he is studying animal science. Brandon assisted Detiger Dunams-Morel in characterizing *Trichinella* derived from a variety of wild carnivores in order to better understand the diversity and epidemiology of trichinellosis.

For 13 years, Detiger Dunams-Morel has served as a Biological Science Technician, and now as Support Scientist for my program in the molecular systematics, population genetics, and epidemiology of foodborne zoonotic parasites (emphases: *Trichinella spiralis*, *Toxoplasma gondii*, various species of *Sarcocystis*).

Support scientist, Detiger Dunams-Morel, served as Brandon's principal mentor, coach and cheerleader. Neither Brandon's senior-year project nor his

subsequent efforts would have been possible without her.

Ms. Dunams-Morel earned her Bachelors from the University of California, Irvine and a Masters in Bioinformatics from the University of Maryland while working for ARS (and with ARS assistance).

Benjamin Rosenthal, Supervisory Zoologist and Research Leader for the Animal Parasitic Disease Laboratory at BARC



Support scientist Detiger Dunams-Morel and FARB intern Brandon Adams.

IN MEMORIAM

John C. Bouma

John Charles Bouma, long-time resident of Beltsville, died June 8, 2015. He lived 87 years--73 of them with diabetes. His childhood years were spent in Gambrills, where his father worked at the Naval Academy dairy. He had two younger sisters, Emma and Gertrude. The family moved to Beltsville in 1942 when his father got a job at USDA in the cattle "maternity barn."

John graduated from Laurel High School in 1944 and then earned his bachelor's degree at the University of Maryland. He earned a Master's in Agriculture Marketing in 1949, working on a project at USDA. This led to his employment as a marketing specialist with ARS, first in Washington D.C., and later in Hyattsville and Beltsville.

At the time of the reorganization of ARS, John was working in the Transportation and Facilities Research Division (TFRD) in Hyattsville. With the 1972 reorganization, employees in the MQRD at Beltsville and in the TFRD in Hyattsville were combined into a new group called the Agricultural Marketing Research Institute (AMRI) in Beltsville. At that point, Bouma was appointed Chief of the Market Operations Research Laboratory where he provided leadership for research sys-

tems and costs for marketing groceries from producers and manufacturers to wholesale warehouses and retail stores.

John received a USDA Meritorious Service Award in 1964, and later contributed to development of the UPC scanners (bar codes) that are now used in stores worldwide.

Dr. Robert R. Oltjen

Dr. Robert R. Oltjen died December 12, 2015 in Sykesville, MD. He had a long career with ARS, starting as a research animal scientist in the Ruminant Nutrition Laboratory at Beltsville. Later, he was appointed Center Director of the U.S. Meat Animal Research Center in Clay Center, NB. In the latter part of the 1980s, Dr. Oltjen was asked to return to Beltsville. He then served as an Associate Deputy Administrator of the ARS National Program Staff where he provided leadership for improving the efficiency of livestock, poultry and aquacultural production.

With his dedication to excellence, breath of research experience, and commitment to agency goals and objectives, he served both the National Program staff and ARS with distinction. He had a wonderful personality and sense of humor. His colleagues remember him as being direct and forthright but always cooperative and willing to work with

others to solve pressing agency and national problems. He retired from ARS in 1996.

Judy McBride

On September 24, 2015, Judith "Judy" L. McBride passed away at the age of 74. Judy received a BS in zoology, pursued her master's degree in zoology and studied journalism at University of Maryland. For many years, she worked as an ARS science writer and was the sole reporter covering all of ARS's human nutrition research, which required her to be knowledgeable about the work of hundreds of scientists at six major ARS locations across the country.

Findings from that diverse work appeared in hundreds of Judy's news articles, magazine features, and her quarterly newsletter, *Food & Nutrition Research Briefs*, which she compiled and edited for many years. Judy continued skillfully interpreting technical research for lay readers worldwide until her retirement from ARS about 11 years ago.

Then Judy's life opened to expanded possibilities. She began her hypnotherapy practice and continued with massage and other hands-on techniques for easing other people's problems and pain. She founded the Lighthouse Hypnosis Center in Annapolis to care for her patients.

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