

Biophysical Society

9650 Rockville Pike
Bethesda, Maryland 20814-3998
Tel: 301-634-7114; Fax: 301-634-7133
E-mail: society@biophysics.org
<http://www.biophysics.org/>

Officers

President

Steven M. Block
President-Elect
Barry R. Lentz
Past-President
Stephen C. Harvey
Secretary
Ruth A. Altschuld
Treasurer
Mordecai P. Blaustein

Council

Paul H. Axelson
Stephen M. Baylor
Christopher L. Berger
Richard G. Brennan
Clara Franzini-Armstrong
Sharona E. Gordon
Kathleen Hall
Eric Jakobsson
Linda J. Kenney
Elizabeth A. Komives
Ben de Kruijff
Stephen L. Mayo
Tobias Meyer
Ruth Nussinov
Diane M. Papazian
Nils Petersen
Eduardo Rios
Frederick Sachs
Suzanne Scarlata
Paul R. Selvin
R. John Solaro
Lynmarie K. Thompson

Biophysical Journal

Editor-in-Chief
Robert Callender

Executive Officer

Ro Kampman

Publications Manager

Dianne McGavin

Newsletter Production

Michelle Norman

Profiles

Lee Bien

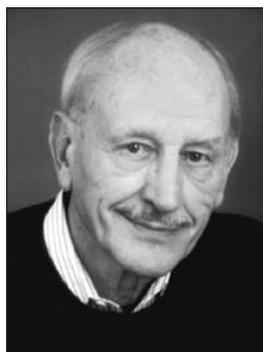
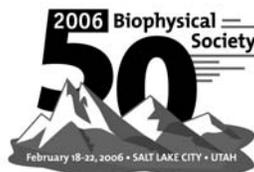
Public Affairs

Ellen Weiss

The Biophysical Society Newsletter (ISSN 0006-3495) is published six times per year January/February, March/April, May/June, July/August, September/October, and November/December by the Biophysical Society, 9650 Rockville Pike, Bethesda, Maryland 20814-3998. Distributed to USA members and other countries at no cost. Canadian GST No. 898477062. Postmaster: Send address changes to Biophysical Society, 9650 Rockville Pike, Bethesda, MD 20814-3998.

Copyright © 2005 by the Biophysical Society. Printed in the United States of America. All rights reserved.

Biophysicists in Profile



David Davies

Looking back on his life, *David Davies* considers himself lucky to have had the opportunities he did. He attended Oxford University, researched at Caltech, and eventually ended up at the National Institutes of Health in Bethesda. This is a far cry from the small village of Pontardulais, Wales, where Davies was born in 1927. He was the first member of his family to attend college, but it was his family that encouraged him to apply to Oxford. Once accepted by Magdalen College, Davies never looked back.

Following in the footsteps of neighbor and former editor of *Nature*, *John Maddox*, Davies earned his MA and PhD in physics at Oxford. His undergraduate days were spent playing rugby and rowing, while trying to remember to write assigned weekly essays. After graduation, he went to work in the crystallography laboratory at Oxford under the supervision of renowned crystallographer H.M. Powell.

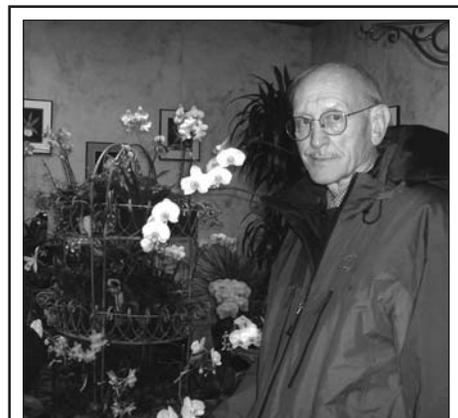
In 1952 Davies moved to California where he was a postdoctoral fellow at Caltech. The beauty of California overwhelmed him, as did the social atmosphere of Caltech. There, Davies and his lab partner discovered the configuration

of an eight-atom structure called parabanic acid.

After finishing his postdoctoral work, Davies returned to England where he spent a year as a research associate at Albright and Wilson, an industrial company that manufactured phosphorus fine chemicals. Receiving an invitation from colleague *Alex Rich* in 1955, Davies again traveled across the Atlantic to work at NIH in the Mental Health Institute. During this period at NIH, Davies developed a computer program for calculating helical forms and observed the first G-quartet structure from fibers of GMP.

Deciding that it was time for a change, in 1959 Davies began focusing on proteins and went to Cambridge, England. There he worked with Chemistry Nobel Prize recipient, *Sir John Kendrew* in creating the first direct visualization of the alpha-helix. This was the beginning of protein crystallography.

Davies' studies led him to the first meeting of the Biophysical Society in 1957. "It was exciting," he says, "everything was changing from the traditional biochemistry and biology, and it looked like biophysics might be the way to go." His interest in the field and in the Society has not waned. He still attends every meeting and is a speaker in the 50th Annual Meeting Symposium, *Biophysics from Molecules to Cells*, at the 2006



David Davies at the Smithsonian Museum's Orchid Show. Davies' love of orchids extends to growing many of them at home.

Annual Meeting. "Originally," he remembers, "there was concern that the Society might be too physiological. However, over time physiology has become very molecular, and we structural biologists fit right in."

Davies moved in 1961 to work in the National Institute of Arthritis and Metabolic Diseases in the new Laboratory of Molecular Biology in the Arthritis and Diabetes Institute. He continued his

"Crystallography," he says, "has changed from a nice gentlemanly field to cutthroat competition."

work on protein crystallography, but also took up a new hobby, sailing. "I learned sailing from the NIH sailing club in the 1960s," he says, "and have always found it a challenge."

As studies became more competitive, Davies shifted interests once again. "Crystallography," he says, "has changed from a nice gentlemanly field to cutthroat competition." This time around, Davies focused on structure of antibodies where he looked at precipitates of the cryoglobins. In 1971, *Ian Swan* joined the laboratory and Davies started to study and identify the structure of proteases. Unfortunately, material came up short and the group eventually turned to the third enzyme of HIV and then to tryptophan synthase. More recently, Davies and other scientists have worked on determining numerous other structures, including TGFbeta. Presently, Davies' main research interest lies in the proteins of the innate immune system and, in collaboration with *David Segal* who had been his postdoctoral fellow in the work on antibody structure, they have recently determined the first structure of a Toll-like Receptor.

Davies cannot imagine what he would be doing had science not entered

his life. His research throughout his career has expressed and continues to demonstrate the vitality and development of the field of biophysics. *Phil Gordon*, former Director of NIDDK, sums up Davies in one sentence, "The most remarkable thing about David is the consistent excitement that he brings to science and that science brings to him."



Harold Morowitz

"It was fated." That's how *Harold Morowitz* describes his entrance into a career in science, biophysics in particular. Born in Poughkeepsie, New York, on December 4, 1927, Morowitz loved science starting from high school. Like his two sisters, he entered the academic life, although in a different field. To this day, science is still what he spends the majority of his time doing.

Morowitz received his BS at Yale, where *Ernest Pollard* was the director of the Yale Biophysics program. This is what influenced Morowitz to become the second student to register in that new discipline.

After earning his PhD in biophysics, Morowitz headed for the National Bureau of Standards before going to the National Institutes of Health. In 1955 he returned to Yale as an Associate Professor of Biophysics, ultimately becoming

Professor of Molecular Physics and Biochemistry. From 1982 until 1986 he was Master of Pierson College, one of Yale's 12 residential colleges, which at the time housed 300 students. "I learned to sleep with a lot of noise," says Morowitz of the experience.

In 1988 Morowitz left Yale to teach at George Mason University, where he was appointed Robinson Professor, a distinguished professorship dedicated to undergraduate teaching. As a Robinson Professor, Morowitz teaches subjects on broad, fundamental intellectual issues including biology and natural philosophy. From 1993 until 1998 he also served as Director of the Krasnow Institute for Advanced Study.

During the years that he studied topics such as the origin of life and thermodynamic foundations of biology, along with biophysics, Morowitz got to know numerous colleagues, many of whom attended the first Biophysics Conference in Columbus, Ohio. "The founding of the Society was an exciting moment," states Morowitz, "the time was right." He

"Looking back at the history of the Society...that volume defined the field."

remembers the meeting attendees gathering in a large room and voting for the creation of the Biophysical Society.

"Everyone cheered," he says. Looking back he remembers how young everyone was. "By and large we were a youthful group, post-doctorates and new faculty," he recalls. Morowitz was on the Editorial Board for the proceedings of the first meeting and was charged with collecting manuscripts to be published in that volume. Looking back at the history of the Society, he says "that volume defined the field."

Morowitz shares his love of science with a love of writing. He has published numerous books including, *The*

(Continued on page 10.)

(Continued from page 3.)

Thermodynamics of Pizza and Mayonnaise and the Origins of Life. His wife, *Lucille*, runs a publishing company, Ox Bow Press, which has published many scientific reprints. Morowitz continues to teach and conduct research at George Mason University.



Richard Podolsky

Renowned for his work in muscle physiology, *Richard "Dick" Podolsky* took great pride in knowing that his work had practical applications that could touch people's lives in positive ways.

Born in Chicago in 1923, Podolsky received his BS in physical science from the University of Chicago and in 1952 a PhD in biophysics. He began what would be a long and productive career at NIH in 1962, when he became Chief of the Laboratory of Physical Biology. Over the next 20 years Podolsky had a tremendous impact on others through his research, teaching, and interactions with the larger, non-scientific community.

While at NIH, Podolsky demonstrated an obvious talent for teaching. "He loved teaching scientists," explains his son *Paul*, adding that teaching people with-

out a mathematical mind, however, frustrated his father. He cites his own experience at seeing the frustration when his father tried to teach him calculus. Teaching young scientific minds was another story altogether. More than thirty postdocs passed through Podolsky's lab, among them some of the leading biophysicists in today's world. One of them, *Clara Franzini-Armstrong*, now at the University of Pennsylvania, remembers his thoroughness and attention to detail. "He always liked to have the details fully explored," says Franzini-Armstrong.

Another former postdoc, *Leepo Yu*, at NIAMS, remembers him for his "exceptional determination and focus on his research." Colleague and friend

Annemarie Weber, of the University of Pennsylvania, remembers that "he had a facility to be skillful with his hands." She notes that "he was able to use his hands for research in such a way that others could not duplicate." This skill, coupled with his determination, she explains, led to countless contributions including the discovery of very active calcium stores in

muscle and initiating the study of cross-bridge kinetics. He also made advances to the mechanical study of muscle contraction, using the tension clamp, as opposed to the

length clamp for research purposes, and studying in vivo muscle structure by X-ray diffraction with physiological measurements.

He was most proud, however, of the practical use of his findings. Podolsky's research paved the way for advancements in treatments of muscle diseases and injuries, as well as skin diseases. Through his research came a better understanding

of muscular dystrophy. His contributions to muscle physiology are recognized as having laid the groundwork for understanding muscle function and structure.

Podolsky attended the first meeting of the Biophysical Society in 1957, and his abstract, entitled *The Influence of Hydrostatic Pressure on Ion-Solvent Interaction and Its Application to the Study of Biological Ionic Specificity*, appears in the Meeting's proceedings.

He continued to be an active member of the Society throughout his life. "He liked the people in it," says Weber, "and

had a special feeling for the Biophysical Society." After the untimely death of his wife, Podolsky

became less active in the Society so he could focus on raising his two young sons, *Alexander* and *Paul*. "He sacrificed a lot for us," says Paul.

In addition to his Society activities, Podolsky often contributed to *Biophysical Journal*. "I believe one of his major contributions was to promote *Biophysical Journal* by submitting his papers to the Journal when very few, if any, muscle papers were published there (early 1980s)," says Yu. "With his initiative, the Journal has become one of the premier journals for the muscle field."

Podolsky was a classic NIH scientist, remembers his son. "On a typical night home," says Paul, "he would listen to classical music and read diagrams and big charts. For a person at NIH this is normal." Podolsky had other interests as well, including cycling, swimming, and even ballroom dancing. Raising two boys also afforded him the opportunity to go camping and hiking.

Podolsky gained respect through his research, but also through his quiet, thoughtful manner. He died on October 11, 2001, in Boston at the age of 78.

"With his initiative, the Journal has become one of the premier journals for the muscle field."

"His contributions to muscle physiology are recognized as having laid the groundwork for understanding muscle function and structure."



Photo taken by Busath Photography.

J. Walter Woodbury

J. Walter Woodbury's name is synonymous with science and biophysics. He himself cannot conceive of a life lived as anything other than a scientist, immersed in the world of biophysics. Gifted genetically with a curious nature, and having an older brother who interested him in physiology, his love of science seemed inevitable.

Woodbury attended the University of Utah, where he earned his BS in physics in 1943. Rushed to complete his studies because of WWII, Woodbury graduated and went to work at the Radiation Laboratory at MIT, where he worked on radar in the field and where he remained until 1945. He remembers many unique and "educational" experiences while at the Radiation Lab, including an overnight cruise to tune the radar aboard the USS St. Paul, a WWII warship.

Once the War ended, Woodbury proceeded to earn a PhD in Physiology in 1950 from the University of Utah. While working on his PhD, Woodbury was one of the first people to receive an NIH Pre-Doctoral Fellowship. He subsequently became a professor at the University of Washington, where he helped build the graduate program in biophysics and managed the Biophysics Training Grant from NIH. Most of his research focused on intracellular recordings of resting and/or action potentials from various cell types

and animals. Many of his papers were published during this period, as he moved into a new field of research studying thyroid tissue in rats and guinea pigs. Woodbury learned how to make micropipette electrodes from *Gilbert Ling* at the University of Chicago. He discovered that nerve cells can be stimulated by an electric current through the recording micropipette and invented the flexibly mounted micropipette for recording from moving tissues such as heart.

Around the year 1955, Woodbury began writing limericks to use as teaching tools. One example is:

*The membrane is made of lipid;
The channels are pretty well hid.
There's ion penetration
At infrequent fenestration
And elsewhere the ions just skid!*

As students remembered these poems, it became easier to teach biophysics, something Woodbury spent a good amount of time doing, and doing well. He says one of his greatest achievements is being the first to present the Hodgkin and Huxley analysis in a textbook. "Nobody understood it for about 10 years and I was the first one to put it in a textbook of physiology," he states "I feel the best about that: that I put that out into the scientific public and helped promote general understanding."

In 1957 he attended the First Annual Meeting of the Biophysical Society, in which he voted against the formation of the Society. "I'm still not quite sure why I did it," he says, "I just didn't see the

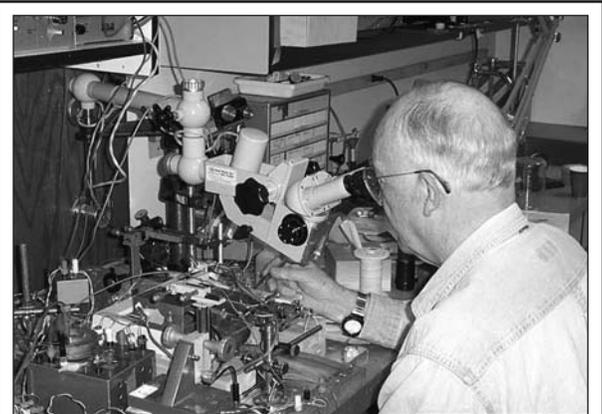
need for it." This vote proved to be a mistake by his own admission, and one he regrets immensely. "I was too conservative at the time," he says. Roughly 15 years later, Woodbury developed the Society's Membrane Biophysics Subgroup, making up for his previous decision. He persuaded *K. S. Cole* to endow a Cole award in the Membrane Group in addition to the Society's K.S. Cole award.

To say that the Society helped create the field of biophysics is an understatement, Woodbury says. "As we developed it (the Society), biophysics departments and departments of physiology and biophysics sprang up all over the place," he explains.

In 1963 Woodbury was one of 24 people in the world to receive the first personal computer for his lab. The Laboratory Instrument Computer (LINC) was far beyond its time. "It was a really nifty thing," Woodbury notes. "To this day you can't buy a computer like that with a built in a/d converter. It was really far ahead of its time." The computer was used for analyzing the information

(Continued on page 12.)

"To say that the Society helped create the field of biophysics is an understatement, Woodbury says."



Woodbury's final experiment study was on the inhibitory effects of vagus nerve stimulation on the nociceptive reflex of an anesthetized rat.

Members in the News



Michael R. Wasielewski, of Northwestern University, and Society member since 1979, received the 2006 James Flack Norris Award in Physical Organic Chemistry.



Lila Gierasch, of the University of Massachusetts, and Society member since 1981, received the 2006 Francis P. Garvan-John M. Olin Medal.



Eva Nogales, of the University of California, Berkeley, and Society member since 2000, received the 2005 Early Career Life Scientist Award from the American Society for Cell Biology.



Roderick MacKinnon, of Rockefeller University, and Society member since 1985, was recently elected to the American Philosophical Society.



Todd Martinez, of the University of Illinois, Urbana-Champaign, and a Society member since 2000, was named a 2005 MacArthur Fellow.



Clare M. Waterman-Storer, of Scripps Research Institute, and Society member since 2003, received a 2005 NIH Director's Pioneer Award.

(Continued from page 11.)

pouring into his lab, including measuring electrical potential of cells.

Woodbury moved to the University of Utah in 1973 where he taught and was Master for the Medical Physiology Course. He retired in 1993, but has been doing research on vagus nerve stimulation for control of epileptic seizures. He's proud that these implanted stimulators have improved the quality of life for over 32, 000 people worldwide. He is also currently writing a book about the comprehensive theory of brain function.

Woodbury will receive a Biophysical Society Fellow Award at the 2006 Annual Meeting. "It came as a total shock to me," he says. He is being honored for "his considerable contribution to the study of ion channel function."

Apart from doing science, Woodbury and his wife *Betty*, grow fruits and vegetables. They have over 30 fruit trees, raspberries, 6 rows of corn and bushels of tomatoes and beans, which they love to share with family and friends. His talents spill over into drama as well. He and his wife having performed with the Seattle Gilbert and Sullivan Society in the 1960s, a group that still brings top-notch performances to a wide audience at an affordable price. Woodbury served as secretary to the board for a number of years. Coincidentally, this year is the 50th anniversary of the Seattle Gilbert and Sullivan Society.

In a family of three generations of academicians, it is no surprise that at least one child of J. Walter Woodbury chose a science career. His son, *Dixon*, is a professor of Physiology and Developmental Biology at Brigham Young University. We will continue to hear the name Woodbury connected with science for many years to come.

Does Your Library Subscribe to *Biophysical Journal*?

Archived back issues from the Journal's inception in 1957 will be available online in early 2006.

Complete a library recommendation form at <http://www.biophysjcs.org/members/> and let your librarian see what's been missing.