



Mitchell appeared in the January 1972 *E&S* with some of his *Drosophila*—in this case miniflies he had produced by injecting two-day-old larvae with a polypeptide derived from bee venom.

(tryptophan synthetase in this case) was absent from the mutant but present in the wild type from which the mutant arose was an essential step in the argument that eventually established that genes control metabolism by producing (in a manner not then understood) the enzymes required for specific chemical reactions, the rule being that one gene governed the synthesis of one particular enzyme. Beadle called this the “one-gene-one-enzyme” hypothesis. It later was refined to become “one-gene-one-protein” and, finally, since some proteins are composed of more than a single polypeptide, each with its own gene, “one-gene-one-polypeptide.” Other refinements are now recognized, but all are reducible to the idea of a simple relation between genes and proteins.

Mitch’s interests were wide ranging. His published works include papers dealing with the biosynthesis in neurospora of adenine, pyrimidine nucleosides, nicotinic acid, lysine, histidine, and tryptophan; and they include studies on topics as diverse as maternal inheritance and temperature-sensitive mutants in this organism.

In the early ’50s, Mitchell became interested in the

problem of development in higher organisms and turned his attention to the genetically important insect *Drosophila*. Development can be described, at one level, as the programmed synthesis of specific proteins through time. Since the structure of every protein of an organism is encoded in the organism’s genes, development involves the activation of specific genes at the time and place the proteins they encode become needed for production of the organism.

The problem that came to occupy Mitch’s attention starting in the 1970s and to which he made important contributions was the phenomenon of heat-shock. Heat-shock refers to the effect of brief exposure to heat on the biochemistry of cells and tissues. It had been known since the early ’60s that heat-shock causes “puffing” of specific regions of the giant salivary chromosomes of *Drosophila*, and it had been suggested that puffing was an indicator of gene activity. In 1973 Mitchell, together with Swiss biochemist Alfred Tissières, began to work on heat-shock. They made the basic discovery that heat-shock induces the production of a small number of proteins and inhibits the production of

most others. This was the first chemical work ever done on heat-shock, and it gave rise to a large amount of research on its mechanism and biological role. It has recently been found that the proteins induced by heat-shock are principally “chaperones” that function in the refolding of proteins damaged by heat stress. The phenomenon is not restricted to *Drosophila*, but has been found in all species examined, from bacteria to man—indicating that it is very ancient and also very important. Since 1973, the study of heat-shock has become a new area of biological research, one for which Mitchell was a founding father. □

Elliot Meyerowitz, a specialist in the genetics of flowering plants, has been named chair of the Division of Biology at the California Institute of Technology. Meyerowitz replaces Mel Simon, who is returning to full-time faculty and research duties after serving five years in the office.

A member of the Caltech faculty since he arrived as an assistant professor in 1980, Meyerowitz has been professor of biology since 1989 and was executive officer from 1995 to 2000. His primary research interest is the genes that control the formation of flowers, and how altering these genes will affect flower development. He has identified mutations that cause petal cells to develop into stamens instead, and another mutation that causes these same embryonic petals to become sepals (see *E&S*, 1997, No. 4).

Meyerowitz earned his bachelor’s degree in biology, summa cum laude, at Columbia University in 1973, and his doctorate at Yale University in 1977. He received the John S. Nicholas Award for Outstanding Biology Dissertation from Yale for his doctoral research. He came to Caltech following a post-doctoral appointment at Stanford.

MEYEROWITZ NEW CHAIR

TEACHING AWARDS

This year ASCIT (Associated Students of the California Institute of Technology) honored five with its teaching awards: Juan De Castro, lecturer in Spanish; Dennis Dougherty, professor of chemistry; Bradley Filippone, professor of physics; Joseph Kirschvink, professor of geobiology; and Kip Thorne, the Feynman Professor of Theoretical Physics.

Honorable mention went to John Allman, the Hixon Professor of Psychobiology and professor of biology; Gregory Smedley, instructor in mechanical engineering; Douglas Smith, instructor in history; and Katherine

Stevenson, Taussky-Todd Instructor in Mathematics.

ASCIT also recognized William Bridges, the Carl F Braun Professor of Engineering, and Steven Frautschi, professor of theoretical physics, with lifetime achievement awards.

The Graduate Student Council gave its teaching awards for 2000 to Markus Keel, Taussky-Todd Instructor in Mathematics; Hideo Mabuchi, assistant professor of physics; and Anthony Leonard, the von Kármán Professor of Aeronautics. □

AND OTHER HONORS

Giuseppe Attardi, the Steele Professor of Molecular Biology, was corecipient of the 2000 Passano Award for “ground-breaking accomplishments in human mitochondrial DNA research.”

Of the 14 new Foreign Associates of France’s Académie des Sciences, five were American, and three of the five were from Caltech: President David Baltimore, Nobel laureate and professor of biology; Seymour Benzer, Crafoord laureate and the Boswell Professor of Neuroscience; and Peter Dervan, the Bren Professor of Chemistry.

Professor of Astronomy Richard Ellis has received the title of Honorary Professor of Observational Astrophysics, conferred on him by Cambridge University in recognition of his “significant contributions to the development of astronomy at Cambridge.” He will hold the title for a period of three years.

Caroline Fohlin, assistant professor of economics, has been awarded a Berlin Prize Fellowship by the American Academy in Berlin, an institute for the advanced study of arts, culture, and public affairs, where scholars can engage in independent study for an academic year or semester. Fohlin’s project for her fellowship period of spring 2001 will be “Financial System Design and Industrial Growth: Lessons from the German Experience.”

Harry Gray, the Beckman Professor of Chemistry, was named cowner of the \$50,000 Harvey Prize, presented annually by the Israel

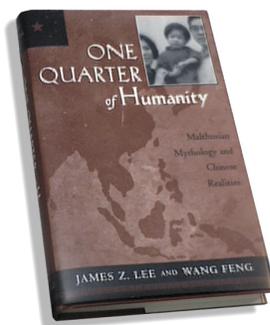
BOOK PRIZES

Books written by faculty members in the Division of the Humanities and Social Sciences continue to rake in recognition.

Morgan Kousser, professor of history and social science, was selected as a cowner of the American Political Science Association’s 2000 Ralph J. Bunche Award for his book *Colorblind Injustice: Minority Voting Rights and the Undoing of the Second Reconstruction*.

James Lee, associate professor of history, received the Otis Dudley Duncan Award for his book *One Quarter of Humanity: Malthusian Mythology and Chinese Realities*. This award is made annually by the American Sociological Association for distinguished scholarship in social demography.

For her book *Mesmerized: Powers of Mind in Victorian*



Britain, Alison Winter, associate professor of history, was given the 1999 Arthur Shapiro Award by the Society for Clinical and Experimental Hypnosis for the best book on hypnosis.

Articles, too, are winning prizes. The Program in Early American Economy and Society has selected Lance Davis, the Harkness Professor of Social Science, to receive a cash award “for one of the best journal articles” in the field of American economic history. He and his coauthor, Stanley Engerman, are being recognized for their article “The Economy of British North America: Miles Traveled, Miles Still to Go.” □

OF BIOLOGY



He was corecipient of the 1996 *Science pour l'Art* Science Prize, presented by the firm LVMH—Moët Hennessy•Louis Vuitton to researchers whose science is of aesthetic and artistic merit. His other honors include the 1996 Genetics Society of America Medal, the 1995 Gibbs Medal from the American Society of Plant Physiologists, and the 1994 Pelton Award from the Botanical Society of America and the Conservation Research Foundation.

Meyerowitz is a member of the National Academy of Sciences, the American Academy of Arts and Sciences, and the American Philosophical Society. □—RT

Institute of Technology to a scholar or scientist who has worked toward promoting good will between Israel and the nations of the world. Also, Gray and Maarten Schmidt, the Moseley Professor of Astronomy, Emeritus, have been elected members of the American Philosophical Society. The society is the oldest learned society in the United States devoted to the advancement of scientific and scholarly inquiry.

Professor of Biology Paul Patterson has received a \$100,000 grant from the Charles A. Dana Foundation for his work on stress, cytokines, and melanoma.

Niles Pierce, assistant professor of applied mathematics, has won the 1999 Leslie Fox Prize in Numerical Analysis, a competition for scientists under the age of 30.

Douglas Smith, instructor in history, has been awarded a National Academy of Education/Spencer Foundation Postdoctoral Fellowship for 2000–2001. As a Spencer Postdoctoral Fellow, he will continue his work on the politics and policies of racial segregation in the 20th-century South.

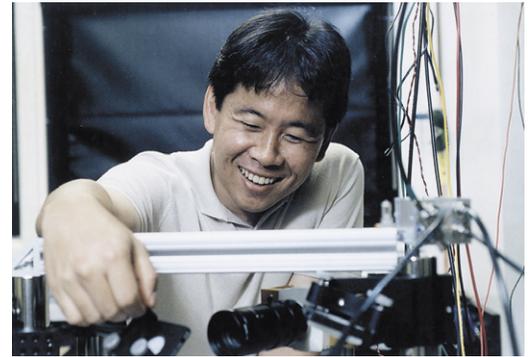
Armand Tanguay, Jr., visiting associate in electrical engineering, has been elected a fellow of the American Association for the Advancement of Science “for distinguished contributions to physical optics, optical materials, and devices, and optical information processing and computing, including the invention of stratified-volume holographic optical elements.”

Alexander Varshavsky, the Smits Professor of Cell Biology, has received a \$450,000 Medical Investigator Award from the Steven and Michele Kirsch Foundation. □

NO-STRINGS MACARTHUR GRANTS GO TO TWO YOUNG FACULTY MEMBERS



Erik Winfree



Hideo Mabuchi

Two members of the California Institute of Technology faculty have been awarded \$500,000 grants from the John D. and Catherine T. MacArthur Foundation.

Erik Winfree, assistant professor of computer science and computation and neural systems, and Hideo Mabuchi, assistant professor of physics, were among the 25 new MacArthur Fellows announced in June. The awards are presented each year to individuals chosen for their exceptional creativity, accomplishments, and potential—no strings attached.

Winfree and Mabuchi, along with the other 23 winners this year, were nominated by an anonymous panel and then selected by a 13-member committee, also serving anonymously. The Fellows are required neither to submit specific projects to the foundation, nor to report on how the money is used.

An important underpinning of the program is the foundation's confidence that the Fellows are best able to decide how to use the money

in furthering their work. Mabuchi, a specialist in quantum optics, says he is not yet sure exactly what he'll do with the money.

“I may try to incorporate creativity into the type of science education we normally do at Caltech,” he said. “Physics usually builds technical skills, so I would like to see if something could be done to encourage creative skills.”

Mabuchi's research primarily explores the details of how microscopic quantum systems interact with macroscopic measurement and control devices used in the lab (see page 29). This is an important avenue of work for future electronic devices, because, as those devices become increasingly smaller, designers will find it more necessary to take quantum effects into consideration.

“Microelectronic devices are coming down to the size where you have to understand the physics very carefully,” he said.

Winfree said he felt a “sense of freedom” when he

received word of the award. Winfree's research emphasis is the emerging field of biomolecular computing, and he has been especially interested in DNA computing.

“I might, if I am lucky, be able to augment our understanding and imagination of computation in the molecular world,” he said of his goals as a scientist. “The understanding of algorithms will serve as a key to understanding the behavior of complex systems such as the biological cell. The question is how to make this transfer of concepts concrete and useful.”

“Thus, if my brief moment in the limelight is good for anything, I would like to champion—as others have before me—the notion that computer science is not just about computers. It is the study of processes that generate organization, wherever you find them: algorithms are a fundamental part of nature.”

Both Mabuchi and Winfree earned their PhD degrees from Caltech in 1998. □
—RT