

# Random Walk

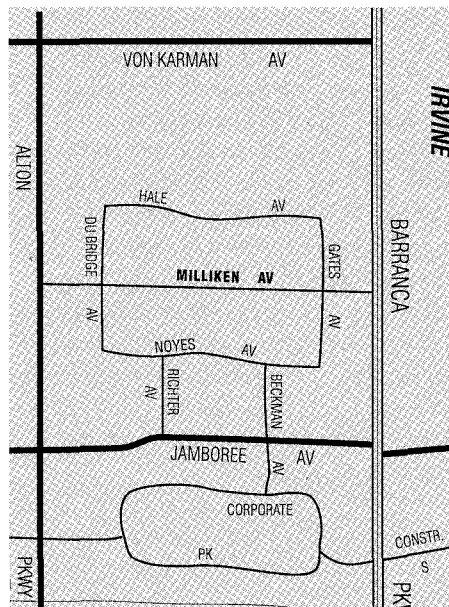
## *Millikan's Proper Vowel Restored After 20 Years*

Richter, Beckman, von Kármán, and DuBridge all have streets named after them in an industrial tract in Irvine, California. And parallel to each other in the same complex lie three streets honoring Caltech's founding fathers—Hale Avenue, Noyes Avenue, and Milliken Avenue. Milliken?

City officials don't know how Robert Andrews Millikan's name came to be misspelled back in 1972, but it has stood uncorrected for 20 years. Lee Carleton, BS '33, noticed the error a few years ago and recently, with the backing of the Orange County chapter of the Alumni Association, came right out and asked the Irvine City Council to correct the faulty vowel.

At its February 11 meeting, the city council agreed to spend \$350 to patch an "a" over the "e" on each of 12 signs on the 2,607-foot-long street. Not everyone is pleased. The *Los Angeles Times* reports that a printer complained that "customers who come by and see the street name 'Millikan' on signs and notice 'Milliken' on the shop's delivery van, price lists, calendars and other promotional material might question the company's professional standards."

But Caltech's professional standards are satisfied, and Carleton is happy that Caltech's first chief executive is finally receiving his due. The city's letter, however, informing him of passage of the spelling-change resolution began "Dear Mr. Carlton . . ."



## *Honors and Awards*

Lew Allen, senior faculty associate and former director of JPL, has been elected a Fellow of the American Physical Society.

James Bailey, the Chevron Professor of Chemical Engineering, received the 1991 Food, Pharmaceutical, and Bio-engineering Award, presented by the American Institute of Chemical Engineers.

Diana Barkan, assistant professor of history, has received a \$10,000 Arnold L. and Lois S. Graves Award for young faculty in the humanities. She also won the 1992 Marc-Auguste Pictet Prize presented by the Société de Physique et d'Histoire naturelle de Genève.

Nine members of the Caltech faculty have been elected Fellows of the American Academy of Arts and Sciences: Jacqueline Barton, professor of chemistry; John Bercau, professor of chemistry; Lance Davis, the Mary Stillman Harkness Professor of Social Science; George Housner, the Carl F Braun Professor of Engineering, Emeritus; Steven Koonin, professor of theoretical physics; Carver Mead, the Gordon and Betty Moore Professor of Computer Science; Elliot Meyerowitz, professor of biology; John

Seinfeld, the Louis E. Nohl Professor and professor of chemical engineering, and chairman of the Division of Engineering and Applied Science; and Edward Stolper, the William E. Leonhard Professor of Geology.

Pamela Bjorkman, assistant professor of biology and assistant investigator with the Howard Hughes Medical Institute, has been selected as a recipient of the Cancer Research Institute's 1991 William B. Coley Award for Distinguished Research in Fundamental Immunology.

Ronald Bush, professor of literature, has been awarded a National Endowment for the Humanities grant for the academic year 1992-93 to study Ezra Pound's *Pisan Cantos*.

Sunney Chan was named the George Grant Hoag Professor of Biophysical Chemistry, a new professorship made possible by a \$1.5 million gift from the George Hoag Family Foundation of Los Angeles.

David Goodstein, professor of physics and applied physics and vice provost, has been elected a Fellow of the American Association for the Advancement of Science.

Michael Hoffmann, professor of environmental chemistry, has received a Senior Scientist Award from the Alexander von Humboldt Foundation of Bonn, Germany. The award offers the opportunity for an extended research period in Germany.

Hiroo Kanamori, the John E. and Hazel S. Smits Professor of Geophysics and director of the Seismological Laboratory, will be honored with the Medal of the Seismological Society of America at their annual meeting in April.

Mary Kennedy, associate professor of biology, and Mary Lidstrom, professor of applied microbiology, are among 100 recipients nationwide of the Faculty Award for Women Scientists and Engineers, presented by the National Science Foundation.

James Knowles, professor of applied mechanics, has been named the William R. Kenan, Jr., Professor.

Rudolph Marcus, the Arthur Amos Noyes Professor of Chemistry, has been elected an honorary Fellow of the Royal Society of Chemistry and has also received two awards from the American Chemical Society.

Charles Seitz, professor of computer science, was elected to the National Academy of Engineering.

Edward Stone, professor of physics, vice president, and director of JPL, has been elected a Fellow of the American Institute of Aeronautics and Astronautics.

Mark Wise was named the first John A. McCone Professor of High Energy Physics; the chair is part of a \$2.5 million gift from the estate of John McCone, a Caltech trustee, and the McCone Foundation.

Peter Wyllie, professor of geology, has been elected vice president of the International Union of Geodesy and Geophysics.

Ahmed Zewail, the Linus Pauling Professor of Chemical Physics, has received the 1992 Carl Zeiss Research Award.

## Correction

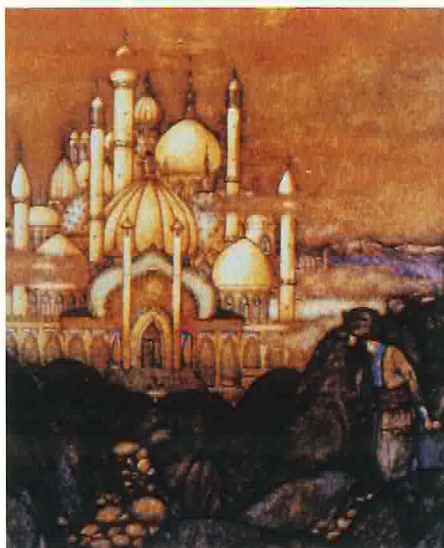
The VLBI image of radio quasar 3C345 on the cover of the Fall 1991 issue of *E&S* should have had shared attribution; it was produced by astronomers Stephen C. Unwin (Caltech) and Ann E. Wehrle (Infrared Processing and Analysis Center/JPL/Caltech).

**Ubar was one of the "enchanted cities" in the *Arabian Nights*.**

## Space Technology Helps Find Fabled City

Led by space images of ancient trade routes, a group of amateur archeologists and Jet Propulsion Laboratory scientists has discovered the fabled city of Ubar in the Empty Quarter of Oman. Ubar, center of the Arabian frankincense trade in Biblical times, was one of the "enchanted cities" of *The Thousand and One Nights* and "the City of Towers" in the Koran.

A number of expeditions had failed to unearth the legendary site before Nicholas Clapp, a Los Angeles filmmaker, armed with clues to Ubar's whereabouts from Huntington Library manuscripts, got in touch with Charles Elachi (MS '69, PhD '71), assistant laboratory director at JPL. Using Shuttle Imaging Radar (SIR-A), which



**In the field JPL geologist Ron Blom plots satellite data on a Landsat image of the Oman Empty Quarter.**



could penetrate arid sands, Elachi, who is also a Caltech lecturer in electrical engineering and planetary science, had discovered ancient channels under the Sahara (*E&S* September 1983). Elachi agreed to have SIR-B, which flew on the shuttle Challenger in 1984, scout the southern Arabian peninsula for evidence of abandoned caravan routes. JPL geologists Ronald Blom and Robert Crippen then combined long-wavelength data from the Landsat Thematic Mapper and high-resolution images from the French SPOT satellite to zero in on promising tracks in the Empty Quarter.

The enhanced images revealed a network of tracks that converged on Shisr, a remote waterhole in a region of 600-foot-high dunes that had been dismissed as a site in 1930. The expedition, which also included Clapp's partner and fellow Ubar-aficionado, George Hedges, a Los Angeles attorney, as well as a couple of "real" archeologists, and JPLer Kristine Blom, who supervised the ground geophysical surveys, used radar to scan the ruins under the sand and then began to dig. This past January they were rewarded with the remains of a castle with several tall towers and artifacts dating back to 2000 B.C.

While the expedition members don't expect to find a sign stating "City of Ubar," they are quite sure that their goal has been reached. The April issue of *Caltech News* will carry a more extensive story of the Ubar expedition.

# Random Walk continued

**At the former Kaiser Wilhelm Institute for Brain Research, Erhardt Geissler shows Manny Delbrück and Jonathon (left) and Toby Delbrück the laboratory where Timoféeff used to work.**



## *Germany Names Center for Max Delbrück*

In January the Max Delbrück Center for Molecular Medicine was officially opened in Berlin-Buch, a suburb in what used to be East Germany. The first ambitious attempt to combine and restructure the scientific institutions of the formerly divided nation, the new center will provide an innovative interdisciplinary setting for cooperation between basic research and clinical medicine, with emphasis on the molecular and cell-biological basis of cancer and of heart and neurological diseases. The expected staff of about 600 scientists will be drawn from groups organized around a particular project for a few years' time—a flexibility that represents a departure from traditional German research institutions.

Why would the Germans name their new institution after Max Delbrück, who left Berlin for Pasadena in 1937? He remained at Caltech as professor of biology for most of the next 45 years, winning the Nobel Prize for Physiology/Medicine in 1969 for his work on bacteriophage, considered the basis for modern molecular biology.

The roots of this work, however, go back to Berlin where Delbrück, then a physicist, arrived in 1932 to be the theoretical physics consultant to Lise Meitner. Delbrück's interest in biology had already been awakened by Niels Bohr's complementarity argument, which posed a complementary relationship between biology and physics

analogous to the particle/wave phenomenon, and Delbrück chose Berlin primarily to be near the Kaiser Wilhelm Institutes of Biology.

At one of these, the Kaiser Wilhelm Institute for Brain Research in Berlin-Buch, a young Russian biologist, Nikolai Timoféeff-Ressovsky, was working in radiation genetics. Delbrück and Timoféeff became acquainted at an informal group of physicists and biologists (which Delbrück described as "internal exiles") that met regularly at Delbrück's mother's house in Berlin-Grünwald. Out of their collaboration, along with K. W. Zimmer, came a paper, "On the Nature of Gene Mutation and Gene Structure," in which the three men interpreted the x-ray-induced rate of mutation to arrive at a quantum mechanical description of the gene as a stable macromolecule. The paper received what Delbrück described as a "funeral first class" through publication in an obscure journal, but when it was quoted later by Erwin Schrödinger in his famous book *What is Life?*, it had a powerful influence on a generation of biologists who would eventually unravel the structure and mechanisms of the gene. Delbrück admitted later that he thought "the argument really wasn't that good," and he himself abandoned this approach because "it was clear that this was not an optimal way to get closer

to the nature of the gene." Nevertheless, the revolutionary fusion of physics and biology established a new field of science.

While Delbrück left for America, Timoféeff remained in Berlin-Buch through the Nazi period, was arrested after the war and taken back to the Soviet Union, where he spent some years in labor camps before being allowed to continue his biological research. But he was forbidden to travel and still suffered under the shadow of Lysenkoism and of his "tainted" past. When Delbrück accepted his Nobel Prize in 1969, he traveled on to Moscow to try to make things a bit more comfortable for Timoféeff. He was never sure if he had accomplished much on that trip, says Delbrück's widow, Manny, but Max did give the Russian his down jacket.

Both men died in 1981. Timoféeff's old laboratory still exists in the hospital complex in Berlin-Buch that now will house the Max Delbrück Center for Molecular Medicine. In January Manny Delbrück and their two sons visited the lab as guests of honor at the opening of the new center, which is dedicated to breaking down walls of several kinds. "I could imagine Max doing something like this," says Manny, "It's the sort of pioneering thing he might have done himself."