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From left, professors Peter Ordeshook, Vyacheslav Nikonov, Fuad Aleskerov, and Rod Kiewiet share ideas and data as they consider the myriad political and economic challenges facing Russia.

Rebuilding the Russia House

By Hillary Bhaskaran

In America, if someone renovates his or her house, a neighbor might think: "Maybe I should improve my house too." But in Russia, if someone improves his or her house, a neighbor's natural inclination might be to burn the house down, thinking: "Why is he getting rich and I'm not!"

In America, people respect the Constitution for its guarantees of individual liberties in the Bill of Rights. In Russia, the drafters of a new constitution believe that, for Russians to have faith in this document, it must guarantee the right to housing, pensions, and other socialist ideals.

Although generalizations, these examples help illustrate some of the fundamental differences between American and Russian values—differences that make the westernization of Russia all the more difficult. The first example comes from Vyacheslav Nikonov, a Russian political counselor for the International Fund for Economic and Social Reforms, who was a visiting lecturer at Caltech last quarter. The second example comes from Peter Ordeshook, a Caltech professor of political science, who visited Russia in 1991 and 1992 and analyzed a draft of the country's constitution.

The Caltech-Russian connection extends far beyond these two men. In the Division of the Humanities and Social Sciences alone, the following recent interactions have taken place: Rod Kiewiet, a Caltech professor of political science, visited Russia in February of 1992; Fuad Aleskerov, a

Moscow economics professor and research department director at the Institute of Control Sciences of the Russian Academy of Sciences, was a visiting lecturer at Caltech last quarter; two Russians will visit this quarter; and three Russian students—Katya Sherstyuk, Olga Shvetsova, and Mishel Myagkov—are earning their social science doctorates here.

Looking through a wide-angle lens, these social scientists are struck by the enormity of the challenge of redesigning a country in crisis. Everything must be rebuilt—from the sputtering economy, to the crumbling infrastructure, to the fractious multicultural society, to the unstable political system. They recount how the average Russian is just waiting for something to happen, whether it be a rebellion or perhaps a return to authoritarianism. They understand why many Russians equate democracy with chaos. But the

social scientists haven't given up on the future of democracy or capitalism in the new country, or on the potential for new ideas to take root.

When these scholars and students look at specific problems facing Russia, it is no surprise that they see education as their avenue toward change. In their roles, each can hammer away at a few key points as they work toward bridging what Nikonov calls "an enormous gap" between Russian and Western thinking.

Education will be necessary for everyone, including the educators. For starters, the whole concept of political science, as it is understood and taught in the West, must be imported to Russia. Many of the country's current political analysts have their degrees in American or European studies.

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CAMPUS UPDATE

"Race, Politics, and Region" Program to probe diversity in Southern California

What will an increasingly multiracial and urban Western world be like during the 21st century? Much like southern California today, many authorities believe.

Yet surprisingly little is known about the political, racial, and cultural dynamics of this complex region, says Douglas Flamming, Caltech assistant professor of history and cofounder of the new Race, Politics, and Region (RPR) Program in Caltech's Division of the Humanities and Social Sciences. The program is intended to offer a new focus for research that Caltech historians and political scientists are already carrying out in the field of racial and ethnic politics, and to build a bridge between academic research and community interests.

The program will include three major components—research, education, and community interaction—and will support visiting scholars from a variety of disciplines, including political science, history, sociology, and anthropology. In collaboration with these guest scholars, Caltech faculty will design and teach courses for both undergraduate and graduate students, expanding the Institute's curriculum in multicultural and ethnic studies.

The success of RPR rests largely on the insights to be gained by interactions among students, scholars, and community leaders, says Flamming. The program's first major undertaking, a monthly seminar series entitled "Race Relations in America: Historical Perspectives and Present Imperatives," has been under way since late last year, and appears, says Flamming, "to be providing a lively forum for public debate."

The program's plans include symposia, colloquia, and on-campus workshops. In addition, RPR hopes to create summer student internships in public service agencies. The involvement of leaders in community and government, and in such organizations as the Urban League and NAACP, will also play an important role in the program's evolution, Flamming stresses.

"Initially this program will have a very specific focus," says Flamming. "We will concentrate on southern California as our social research laboratory, and will place particular emphasis on political developments. In this way, we hope to build a program that will



speak directly to the concerns of our own region, and also serve as a model for similar programs throughout the United States.

"Southern California is the ideal geographic region for such a program," Flamming adds. "Los Angeles has emerged as one of the most important multi-cultural centers in the world, and, as a result, must deal with intense interracial and interethnic issues.

"The critical questions facing Los Angeles now—such as how people from such diverse backgrounds can get along, and how an urban society can equitably meet their needs—are questions the rest of the nation, and indeed the world, had better start trying to answer.

"We urgently need to find ways to create and sustain a just and equitable multiracial society. Doing so will demand more than present-minded policy analysis. It will require basic social-scientific research into the long-term dynamics of race, ethnicity, and political behavior. Long-term perspectives can shed new light on our present dilemmas, and thereby allow us to build a better future. That is the challenge and the opportunity before us."

The origins of the RPR Program stem in part from remarks made by President Everhart at the Institute's 1992 commencement exercises. Commenting on the recent upheavals in Los Angeles, Caltech's president said that the Institute had a responsibility to play a role in improving race relations in southern California. Everhart's comments prompted discussions among humanities and social science faculty, which resulted in the formation of the RPR Program.

Flamming, whose research specialty is race relations in Los Angeles, is one of several Caltech faculty members focusing on the politics of the region. Elisabeth Gerber, assistant professor of political science, studies the politics of race and ethnicity in southern California, and Morgan Kousser, professor of history and social science, conducts research on equal rights and voting rights. Another contributor to the program is James Lee, associate professor of history and a specialist on China.

From left, Caltech political scientist Elisabeth Gerber, historian Doug Flamming, and historian and social scientist Morgan Kousser will bring their own diverse perspectives to a new Institute program that will examine racial, political, and cultural diversity in southern California.

Zewail wins Wolf Prize

A few years ago he was called to Riyadh. Then came trips to Cairo and Alexandria. Now, he's on his way to Jerusalem. Henry Kissinger or James Baker? No, it's Ahmed Zewail, Caltech's Linus Pauling Professor of Chemical Physics, who has been awarded the highly prestigious Wolf Prize in chemistry by the Jerusalem-based Wolf Foundation. Established in 1978, the award—a medal and \$100,000—has proven to have some predictive power with regard to the Nobel Prize. Previous Caltech recipients are biologists Seymour Benzer, Edward Lewis, and Roger Sperry, and chemist Rudy Marcus. Zewail will receive the honor from the president of Israel in a ceremony this May.

The Wolf prize committee decided unanimously to confer the award on Zewail, who has carried out pioneering research in the new field of laser femtochemistry—chemistry on the femtosecond time scale. Using lasers and beams of molecules, Zewail and his research team have been able to investigate the dynamics of chemical reactions—the breaking and formation of molecular bonds—as they happen in real-time. Some of these chemical steps occur in amazingly short intervals, measured in a few femtoseconds, or a few billionths of one millionth of a second. (Light requires roughly one femtosecond to travel one one-hundredth the width of a human hair.)

Zewail, 46, was born and raised in Egypt, where he received both his bachelor's (with honors) and master's degrees from Alexandria University.

He earned his doctorate from the University of Pennsylvania in 1974, and joined the Caltech faculty in 1976 after two years as an IBM Fellow at the University of California, Berkeley. He is the father of two daughters, the elder of whom, Maha, is a junior at the Institute, majoring in chemistry.

Now a U.S. citizen, Zewail was elected to the National Academy of Sciences in 1990. In 1989 he traveled to Saudi Arabia to accept the King Faisal International Prize in Science, and last year he was the recipient of the Carl Zeiss International Award. His other honors include the American Chemical Society's Harrison-Howe Award, the Nobel Laureate Signature Award, and the Buck-Whitney Award; and the American Physical Society's Earle K. Plyler Prize. In 1992, *Science Watch*, which tracks trends and performance in basic research, named Zewail fifth among the world's fifty most cited chemists, a ranking that helped propel



Ahmed Zewail

Caltech to first place as the institution with the highest number of citations for chemistry in the world.

Commenting on Zewail's arrival in the ranks of the Wolf winners, his longtime chemistry colleague, fellow Wolf winner, and 1992 Nobel laureate Rudy Marcus said, "Zewail's winning this high award is a reflection of his ability to recognize important problems and his fearlessness in attacking them. In his work on seeing molecules fall apart, cited by the Wolf Prize committee, he combined two different techniques—femtosecond light pulses and molecular beams—and opened up a new area of study. He is utterly dedicated to his work and approaches it with enthusiasm and good humor. It is a delight to have him as a colleague."

The Wolf Foundation was established by the late Dr. Ricardo Wolf, inventor, diplomat, and philanthropist, "to promote science and art for the benefit of mankind."

Yeh awarded Packard Fellowship

For the fifth consecutive year, the David and Lucile Packard Foundation has bestowed a half-million dollar, five-year Fellowship in Science and Engineering on a Caltech researcher of "outstanding promise." The recipient is Assistant Professor of Physics Nai-Chang Yeh, who will receive \$100,000 annually for the next five years to further her research in high-temperature superconducting materials.

Yeh, 31, becomes the sixth Institute professor to be named a Packard Fellow. Past Caltech recipients have been Associate Professor of Chemical Engineering Frances Arnold, Assistant Professor of Cosmochemistry Geoffrey Blake, Professor of Astronomy Shrinivas Kulkarni, Associate Professor of Chemistry Andrew Myers, and Assistant Professor of Electrical Engineering Yu-Chong Tai.

Yeh conducts research in high-temperature superconductivity and is credited by her colleagues with opening up new areas of investigation in the burgeoning field. Specifically, she pointed out that no one had done theoretical work on the behavior of high-temperature superconductors in powerful direct-current magnetic fields and high-frequency electromagnetic fields. She wrote several papers on the theory of these subjects, even though she is trained as an experimentalist, and her innovative work has inspired much new activity among other scientists.

Superconductors expel weak magnetic fields, but stronger fields penetrate the material with magnetic field lines, and generate a small vortex of electric current around each field line.

These whirlpools of current interfere with the material's superconductivity, and the stronger the field, the more vortices it generates. At a certain critical point, the superconductivity vanishes, and the material becomes ordinary. Yeh is trying to increase the endurance of superconductors to magnetic fields by introducing different types of defects into the material by irradiating it with charged particles. These added flaws help to "pin" vortices in fixed locations, which reduces



Nai-Chang Yeh

the loss of electrical energy caused by vortices when they move.

Yeh also studies the combined effects on superconductors of direct-current magnetic fields and electromagnetic waves.

The David and Lucile Packard Foundation was created in 1964 to support and encourage organizations dependent on private funding and volunteer leadership.

New honors for the new year

Jacqueline Barton, professor of chemistry, has been elected to the board of directors of the Dow Chemical Company. President Thomas Everhart remarked that "the insight [Barton] gains from her activities on the board will improve the understanding between industry and academia and will lead to more significant interaction between corporations and universities." Barton is a member of the National Science Board Commission on the Future of the National Science Foundation, and of the California Council of Science and Technology.

Arnold Beckman, chairman emeritus of Caltech's Board of Trustees, has received the Bower Award for Business Leadership for his inventiveness and philanthropic activities in the areas of research and development. He was honored by the Franklin Institute in Philadelphia.

Chris Brennen, professor of mechanical engineering, received the Fluids Engineering Award of the American Society of Mechanical Engineers at its November meeting in Anaheim. Specializing in the study of cavitation—how pockets of vapor form and behave in rapidly moving fluids—Brennen was honored "for exceptional contributions to fluids engineering through outstanding research, teaching, and service to ASME."

Judith Goodstein, Institute archivist, registrar, and faculty associate in history, has been named to the board of trustees of the Pasadena Historical Society for a three-year term. Founded in 1924, the society maintains a research library and museum whose focus is the history of Pasadena.

Harry Gray, the Arnold O. Beckman Professor of Chemistry and director of the Beckman Institute, received the Kaj Linderstrøm-Lang Prize, December 2 in Copenhagen, recognizing outstanding achievement in biochemistry or physiology. The prize of a gold medal and 30,000 Danish kroner (about \$6,000) rewards Gray's "pioneering contributions to the study of the electron transport mechanism in proteins," according to the Linderstrøm-Lang Endowment Fund.

Philip Hoffman, associate professor of history and social science, has won the Arthur H. Cole Prize for his article "Land Rents and Agricultural Productivity: The Paris Basin, 1450-1789." The prize recognizes "the outstanding article" published in *The Journal of Economic History* in 1992.

George Housner, John G. Braun Professor of Engineering, Emeritus, has received an honorary doctor of science degree from the University of Michi-

gan, where he did his undergraduate work before getting his PhD at Caltech in 1941. The university recognized Housner's pioneering efforts in the design of earthquake-resistant structures and in the establishment of government building codes that help protect structures against earthquakes.

Mark Konishi, the Bing Professor of Behavioral Biology, will share the Charles A. Dana Award for Pioneering Achievement in Health with Fernando Nottebohm of Rockefeller University. Konishi's part of the \$50,000 award recognizes his studies of songbird development, in which he studies the role of nerve-cell death—basic research that could help explain human neurological diseases.

Bruce Murray, professor of planetary science and geology, has received a fellowship from the John and Mary R. Markle Foundation to cooperate with the foundation on a study of the role of mass communications in a democratic society. The foundation was established in 1927 to promote the advancement and diffusion of knowledge and the general good of mankind. Murray's research will concentrate on the behavioral changes people will need to make in the next century to reach a sustainable balance in the world, and on the relation of information and communications technology to these changes.

Ares Rosakis, associate professor of aeronautics and applied mechanics, has received the Hetényi Award for a research paper he coauthored, entitled "Quasi-static and Dynamic Crack Growth Along Bimaterial Interfaces: A Note on Crack-tip Field Measurements Using Coherent Gradient Sensing." The Society for Experimental Mechanics commended the paper as the best in its field in 1991.

Thayer Scudder, professor of anthropology, has won the American Anthropological Association's Edward J. Lehman Award for his "creative and valuable application of anthropology in the public sector." Scudder has used data from his long-term studies of the effects of relocation on an African community to understand the social consequences of forced resettlement in other parts of the world.

Paul Sternberg, associate professor of biology and assistant investigator at the Howard Hughes Medical Institute, has been elected a Fellow of the American Association for the Advancement of Science (AAAS), in recognition of his distinguished efforts toward the promotion of science and its applications. Founded in 1848, AAAS is the world's largest general science organization and publishes the weekly journal *Science*.

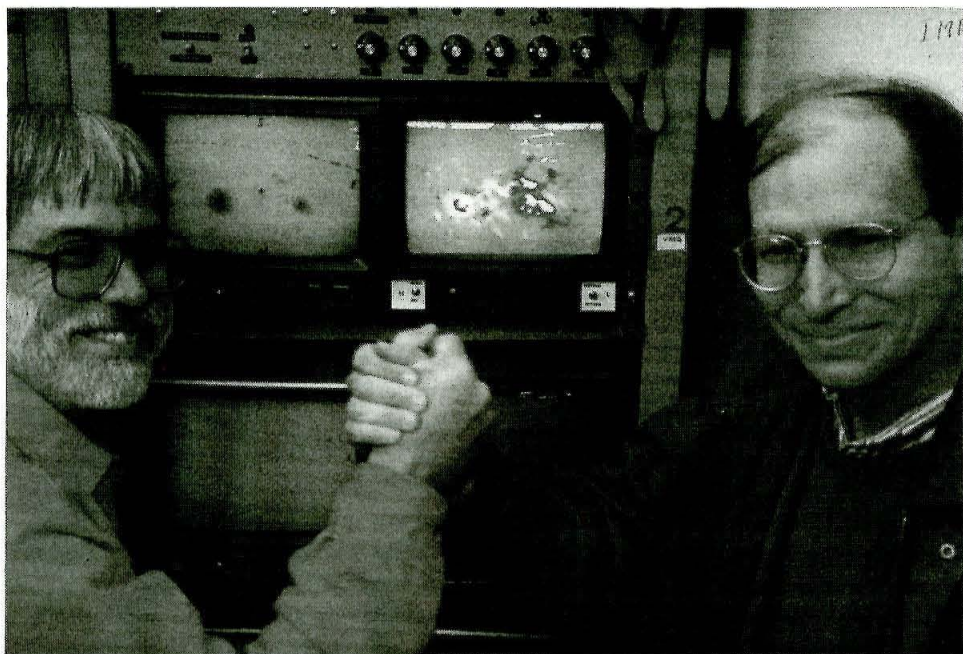


Photo by Jeff Neuw

Solar observers Bill Marquette and John Varsik rejoice as Caltech's Big Bear Solar Observatory reopens and records the first pictures of the sun taken since the June 28 Landers and Big Bear earthquakes. The damage incurred by the magnitude 6.6 Big Bear quake—centered six miles from the observatory—required more than four months to repair. The shaking almost rocked the three-telescope system off its supports and ruined machinery that steers the five-ton instrument.

Russia House

Continued from page 1

Nikonov is one of them, having received Russia's equivalent of a doctorate in American political history. But when he looks at the Russian political spectrum, he asks, "Where is left, right, liberal, conservative? Russians were never taught that in school. I must define these terms for myself,

they'll leave no fingerprints."

The laws may have more legitimacy for the people if lawmakers and government institutions become increasingly representative of the people. Toward that end, the country needs a democratic constitution, says Caltech's Peter Ordeshook. A committee appointed by Yeltsin is struggling to write one. Having analyzed the current draft, Ordeshook believes that Russians need to think differently about the purpose of a document that's meant to lend legitimacy to a government. He's staying out of the political bickering over

thinking won't allow for such a basic rendering. In fact, the current constitutional draft is about 45 pages long, compared to the 5-page U.S. document.

How do the social scientists share their opinions and expertise with the quarreling politicians and the populace? Ordeshook published his analysis of the constitutional quagmire in Moscow's *Izvestia* newspaper. Nikonov frequently writes articles for Russian newspapers and makes guest appearances as a political observer on a weekly TV news program. Together, the two are preparing a series of articles discussing aspects of democratic processes, to be published in Russian newspapers. And, at his Moscow institute, economics scholar Fuad Aleskerov is establishing special courses to reeducate the unemployed. The courses offer man-

and students paying the expenses. These reeducation efforts let people know they're needed, he says.

Aleskerov points out that unemployment is one of the harshest lessons being thrown at the Russian people—most of whom have been assured of a job for the last 70 years. Until recently, people had jobs regardless of the quality of the product they produced. Now, "it's almost impossible to explain to them that if the tractors they make don't sell, they won't have a job. It's necessary to change psychological ideas—not in two generations," but sooner. Aleskerov says people must be retrained in areas like the service industry, which is "absolutely underdeveloped." Assuming a lot of well-managed development and foreign investment, he is optimistic about Russia's economic future.



Olga Shvetsova (left) and Katya Sherstyuk are in their third year at Caltech.

first, and then for others."

Related questions pour forth: Where do Russia's innumerable political parties stand ideologically? And what are the significant parties? Caltech political scientist Rod Kiewiet is tackling a piece of that puzzle by quantifying the voting records of the Russian Congress of People's Deputies. He finds a clear contingent of old-line Communists and another of Yeltsin "democrats"—"reformist-types by Russian standards," adds Kiewiet. Less predictable are about half the legislators, who are, as Russians say, "in the swamp." Their voting patterns seem erratic but may be coalescing around a platform of "Civic Union industrial experts," who might represent a middle group. Kiewiet will keep studying, even though the Congress he studies may not last until its next popular election in 1995.

As legislators make new laws, will the citizens follow them? For hundreds of years, Russians have been forced to adhere to the spoken dictates of a repressive government. But that doesn't mean they've ever respected written laws. Nikonov likes to quote Saltikov-Schedrin, "a Russian Mark Twain," who wrote in the 19th century that "the severity of Russian laws is compensated for by the fact that nobody obeys them." He contrasts Russians with Americans, who generally "follow the rules." And as the 21st century approaches, Nikonov says that "nobody in Russia is paying taxes according to the laws. Business accounts show that companies are earning no money, and that no salaries are being paid." In reality, Nikonov adds, "they may be earning no less than Ross Perot. They make transactions with cash so

details—details that make the document look like a business contract. For example, Ordeshook says the emergency provisions section provides for every contingency and reads something like this: "In case of a hurricane, you don't have to deliver widgets the next day." Ordeshook's concern is that a constitution should not issue edicts, but instead should focus on "creating institutions—executive, legislative, judicial, and federal." He would import a version of the U.S. document with a few extra statements to bolster people's confidence, saying that people *should* have housing, food, etc., rather than making promises that can't be delivered. However, he says Russian



In Russia's more open political climate, Red Square serves as a venue not only for protestors, but also for street entertainers, including this man and his subdued Russian bear.

agement education to former military personnel. Aleskerov wants U.S. universities—maybe even Caltech—to expand this mission by opening their own management or economics programs there, with the Russian army



Armed with their newfound freedom of speech, Russian citizens gather in Red Square to voice their opposition to the state of the economy under Yeltsin.

It might not take two generations for Russian values to change, but it will take some time. One of the things that Americans can learn from Russians is to be patient and to better understand the situation, says Nikonov. Things are not so simple as American newspapers imply when they report that "conservatives" are fighting with "progressives," whose leader is the "good guy," Yeltsin. Even the more objective reports don't convey the constant agitation that Nikonov hears about while in Russia. "Every day there's a scandal, something terrible happens, people die, local wars start up," says Nikonov, who smokes to calm his nerves. On a lighter note, he adds that Americans can learn from the Russians about "the diversity of the world and a very different culture."

The understanding and bridging of cultural values will take place in informal settings as well as public forums. As more people travel between Russia and western countries, habits as basic as smiling at strangers—symbolizing friendly openness—might be picked up by Russians. Graduate students Katya Sherstyuk and Olga Shvetsova differ on this point. Sherstyuk remarks how, in her university city of Novosibirsk,

many Americans visit, and they do smile at strangers a lot. When observing this habit, about "half the Russians like it, and half think it's artificial," she says. The American values she'd like to see Russians adopt are that sense of openness and—in work settings—less formality and more room for creativity. "But Russians are nervous and tired," counters Shvetsova. "You need to create a world for people to smile."

Other influences on Russian habits and values are not so attractive. Shervatyuk talks about a moral deterioration driven by the vagaries of an ailing economy. And Shvetsova gives an example: "Children don't believe in their parents' educational and work values when they [the children] see that they can make more money selling imported and other goods on the street than their father earns in a more traditional job"—as a professor, for example.

Coming to Pasadena, the Russian visitors have learned that not all is rosy, even in this city of roses. As years of Russian "propaganda" warned them, there *are* homeless people, which surprised Shvetsova. Shvetsova was also introduced to the expense and hassles of U.S. health care, remarking that, "until you have to pay, you don't realize that you'll change your behavior and postpone seeing a doctor." In another case, Nikonov has learned that public universities are undergoing economic hardships. These problems break the "fairy-tale" image of America, as Shvetsova calls it, but none compare to the crises facing Russia.

America is "very comfortable," says Aleskerov. But he laughs about his American twist on the classic Russian story of searching for unavailable products. He wanted to buy a morning breakfast tea similar to the type he brews in Russia, with loose black tea leaves. Unsuccessful in the major Pasadena grocery stores, he tried a Chinese market in Monterey Park, but faced a language barrier. He asked if a certain tea was black, and the salesperson smiled and said "yes." When he brought it home, it turned out to be green. The next time he also got a "yes," but the tea was rose-flavored. So it went, and meanwhile he drank the breakfast tea that his American colleague, Rod Kiewiet, had brought back from Moscow the year before but had never used. Eventually he discovered the Yellow Pages and Bristol Farms, and the ordeal was over. In comparison, Aleskerov says, "in the former Russia, people could search for something but not find it. That's what I call a bad economy. Now people can find what they need, but they can't pay for it." He says that when the transition to a good economy is complete, they will be able to find what they need and pay for it.

Then maybe the Russian people will have a reason to smile.

Caltech team finds evidence of water on Mercury, ethane "lakes" on Titan

By Jay Aller

Radio astronomers from Caltech and JPL are among a team of scientists who recently announced that radar images show evidence of ice on the scorching-hot planet Mercury, and possible "lakes" of liquid ethane and methane on Titan, the giant moon of Saturn. They published their findings in two papers in

on the horizon at the poles, and any slight depression or crater is in constant shadow. Besides receiving scant sunlight, Mercury's poles lack the earth's thick warming blanket of atmosphere, so the surface temperature there may be as cold as 125 K (-235° F). Gases in the sparse atmosphere would freeze and

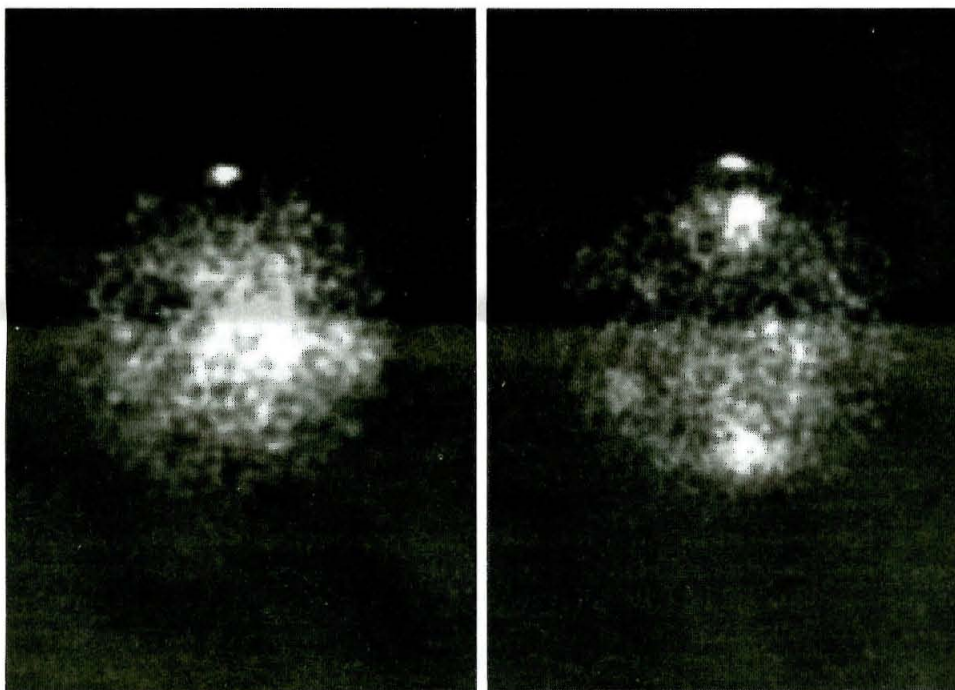
likely water ice," said Caltech planetary scientist Muhleman. The group based their conclusion on the percentage and type of radio waves reflected. "We can't think of any other substance that fits the observations so well," said Muhleman.

Using the same radio telescopes, Muhleman, Grossman, Slade, and Butler bounced signals off Titan, Saturn's huge yellow moon, for several days each July over the last four years. Because of the thick cloud layer that envelops Titan, its surface was not visible to the Voyager probes that flew by in the early 1980s. But radio waves easily penetrate the fog, and give scientists a hint of what the surface is like.

Although Titan is bigger than both the moon and Mercury, it lies 10 times further from the sun than Earth does, so the radio waves that echo back to Earth are almost too faint to detect. Even at the speed of light, the signals take two and a half hours for the round trip.

When the scientists analyzed these radio whispers, they found some puzzling results. Titan's reflectivity varied from day to day, indicating that its surface is not uniform. Previously, scientists suspected that Titan's surface was covered by liquid hydrocarbons that had condensed in the frigid (94 K or -290° F) lower atmosphere and "rained" onto the surface.

But based on the differing strengths of the radar echo, the researchers now believe they probably observed varying terrain of highly reflective pure ice mixed with a dull, dirty surface. These poorly reflecting surfaces might be large bodies of liquid methane and ethane, or possibly tars. The radar reflections most resemble those of Callisto, Jupiter's dirty, icy moon.



VLA (Very Large Array) images of Mercury made with about 100 degrees of rotation apart. The brightest points in the images lie on the planet's north pole and are almost certainly the result of ice in the permanently sun-shadowed terrain, where researchers have calculated that the temperature never rises above roughly -230° F. A similar deposit has been found on the south pole.

the October 23 issue of *Science*.

Participating in the research were Duane Muhleman, Caltech professor of planetary science, Martin Slade of JPL, Caltech graduate student Bryan Butler, and Arie Grossman PhD '90, now at the University of Maryland.

The scientists examined parts of Mercury, which has surface temperatures that can reach 700 degrees Kelvin (800 degrees Fahrenheit), that were missed when the Mariner 10 spacecraft mapped about half the surface in the mid-1970s. These observations, initially released as preliminary results in November 1991, detected highly radar-reflective regions near both poles, similar to areas previously seen only in icy polar regions of Mars and on the frigid moons of the outer planets. The study also found three large moderately reflective areas at lower latitudes.

Ice can exist on Mercury, a planet hot enough at the equator to melt a pop can, because it has no seasons and a very thin atmosphere. On Earth, the tilt of the planet's axis alternately exposes our north and south poles to warming sunlight, but Mercury's axis has no tilt, so the sun is always exactly

"snow" out onto the ground, where they would remain for the lifetime of the solar system.

Visual surveys of the surface of Mercury, a small, rocky planet closer in size to the moon than the earth, are hindered by its proximity to the sun. Scientists use radar to look at Mercury because radio waves are relatively immune to solar interference. Using the 70-meter (230-foot) radio dish at Goldstone, California, they beamed a 500,000-watt signal at Mercury for about eight hours on both August 8 and 23, 1991, and listened to the faint echo with the 27 radio antennas of the Very Large Array near Socorro, New Mexico.

The scientists found surprisingly reflective regions when they looked at their data. The Caltech/JPL scientists and John Harmon of the National Astronomy and Ionosphere Center in Arecibo, Puerto Rico, interpret the large splotches nearer the equator as possible impact craters. The rough ground in a crater, they theorize, would reflect radar better than the smooth surrounding surface.

As for the polar regions, "It's most

FRIENDS

Annual Fund honors top workers

Nineteen fund-raising volunteers have been honored by the Annual Fund for exceptional performance in the fund's Regional, Young Alumni, and Special Gifts Campaigns.

In the Regional Campaign, awards in the Highest Donor Participation Rate category go to *Capt. Robert von Gerichten, USN (Ret.)*, who as Regional Chair Outside California achieved a 66.8% performance rate for Region 11 (D.C.-Virginia). The awardee for Regional Chair Inside California is *Dr. Robert W. De Grasse*, for a 31.6% rate in Region 5 (San Francisco).

Carrying off the top Area Campaign honors are *John Inman*, Area Chair Outside California, for an 86.8% rate in Area 500 (Bethesda), and *James J. Kosmicki*, who achieved a 60.8% rate for Area 026 (Arroyo), as Area Chair Inside California.

This year's highest-performing Volunteers are *Dr. James A. Woodhead*, Area 026 (Arroyo), 100%; *Dr. I-Lok Chang*, Area 500 (Bethesda), 100%; *Alfred M. Goldman, Jr.*, Area 500 (Bethesda), 100%; *Dr. Dallas L. Peck*, Area 510 (Northwest Virginia), 100%; *Robert E. Oliver*, Area 515 (Northeast Virginia), 100%; *Thomas L. Kirtley*, Area 520 (Southern VA-West VA), 100%; *Edward A. Schroeder IV*, Area 565 (Western New York), 100%.

In the Highest Percent of Dollar Goal Attained category, perennial favorite *Capt. Robert von Gerichten, USN (Ret.)*, came through again as Regional Chair Outside California, Region 11 (D.C.-Virginia), 104.4%. Taking the honors for Regional Chair Inside California was *David B. Ritchie*, Region 01 (Pasadena and Vicinity), 101.3%. Excelling in the Area Chair category were Area Chair Outside California *Arthur Niell*, Area 590 (Cambridge), 206.8%; and Area Chair Inside California *Loucas Christodoulides*, Area 20 (East Pasadena), 234.6%.

Recognized for achieving the Highest Donor Participation Rate in the Young Alumni Campaign were House Chair *Daniela Bonafede-Chhabra*, Ricketts House, 31%; and Class Chair *Sven A. Wolf*, Ricketts House, 86.7%. Top honors for Highest Percent of Dollar Goal Attained went to House Chair *Mark Vagins*, Ruddock House, 114.7%; and to Class Chair *Junko Munakata*, 922.3%.

In the Special Gifts Campaign, honors for Highest Dollars Attained went to Special Gifts II Committee Member *Jephtha A. Wade, Jr.*



Lee and Arrola DuBridge have enjoyed a long affiliation with Caltech and the ARCS (Achievement Awards for College Scientists) Foundation, and now ARCS has found a way to honor their commitment to both, by establishing the Lee and Arrola DuBridge ARCS Endowed Scholarship Fund. The new scholarship will be awarded annually to a Caltech student, based on the same criteria used to select other ARCS scholars at the Institute: grades, field of study, need, and U.S. citizenship. The first DuBridge ARCS scholar, junior physics major Dorl Levanoni posed with his new patrons at a recent lunch commemorating the DuBridges' many years of support for and service to young people in science.

Henigsons establish Scholarship Fund

Responding to the Campaign for Caltech's need for student endowment aid, Phyllis and Robert Henigson have pledged \$250,000 to establish an undergraduate scholarship fund in their name. The Campaign goal for endowed undergraduate scholarships is \$15,000,000. With the Henigsons' pledge, 22 of the desired 60 such scholarships have now been provided.

The Henigsons have been members of the Caltech Associates since 1976. Phyllis has served on several of its committees. Bob is now an emeritus director, having completed his service as a regular member of the board and as the Associates' president in 1987. Both remain active in the President's Circle.

Phyllis is a graduate of Stephens College (AA '54) and USC (BS '56). Bob is an alumnus of Caltech (BS '48 and MS '49) and the Harvard Law School (LLB '55). Both think it a critical necessity to ensure that all qualified students have access to a college education, regardless of their financial circumstances. Bob is the personal beneficiary of a half-tuition scholarship he

received while a sophomore at Caltech, as well as of the GI Bill.

Henigson is a retired partner of the Los Angeles law firm of Lawler, Felix, and Hall (now Arter, Hadden, Lawler, Felix, and Hall), whose founding member, Oscar Lawler, was a founder of the Caltech Associates. He currently serves on the board of the Constitutional Rights Foundation, a nonprofit organization geared to educating high school and middle school students in civic responsibility; on the board of the Pasadena Symphony Association; and as a member of the steering committee in the Campaign for Harvard Law School. Phyllis and Bob, in addition to providing support to their respective schools, have been active supporters of the Los Angeles Music Center and the Huntington Library. They live in South Pasadena and are the parents of two sons, the older of whom, Ted, is an honors graduate of the University of Pennsylvania, and the younger of whom, Jeff, is just completing his college education at the London School of Economics and Political Science.



Doris Pankow (in hood, left) and Carl Otte (right) were among 46 Caltech Associates who explored the natural history and geology of the Pacific Northwest during a trip last fall led by Emeritus Professor of Geology and Geophysics Clarence Allen (center). The group toured the Columbia River, the Cascade Mountains, and the Mt. Hood wilderness, and viewed the devastation brought about by Mt. Saint Helens.

Gimbels make gift of real estate

William T. Gimbel and his wife, Georgina, both members of the Caltech Associates and longtime residents of Pasadena's neighboring community of San Marino, have made an unrestricted gift of real property on the Big Island of Hawaii to the Campaign for Caltech. This is the second gift of real property they have made to the Institute, for a total value of nearly \$1 million.

William Gimbel is chairman and chief executive officer of Reliance Steel and Aluminum, a company he has been with since 1947. Prior to that he worked for both Douglas Aircraft and Northrop Corporation. The Gimbels have been members of the President's Circle of the Associates since 1981. Gimbel has also served on the Associates Board, and was that group's secretary for the term 1987-88.

Gifts by Will

Trusts and bequests provide welcome support to Caltech's Operating and Endowed Funds. One recent gift is a legacy of the generosity of Allan C. Balch, who chaired the Caltech Board of Trustees from 1933 to 1943, and his wife, Janet Jacks Balch.

Allan and Janet Balch were part of the founding group of the Associates of Caltech, who first met at the home of Henry Huntington in 1926. At their deaths, numerous trusts were set up for the benefit of various people, and Caltech was named the remainderman. Recently three of those trusts terminated, leaving for Caltech the sum of \$63,437. Of the approximately 19 trusts originally established, one still remains open. The funds are equally divided between the Allan C. Balch Endowment Fund and the Janet Jacks Balch Endowment Fund.

The Balches met while attending Cornell, were married in 1891, and moved to the West Coast, where they helped to develop the cultural and educational resources of southern California. In 1925 Balch joined Caltech's Board of Trustees, serving as its president from 1933 until his death in April 1943. (Janet Balch died in August of that same year.) Together, the Balches gave more than \$1.5 million to Caltech, to endow the humanities and biology, and for the construction of the Athenaeum, including the furnishings and landscaping. In 1930, they were honored for their many contributions to Caltech at an Athenaeum dinner presided over by Robert Millikan.

For information about wording for bequests to the Institute, call the Office of Gift and Estate Planning, at (818) 356-2927.



Rudy Marcus with Henry Keck and Elise Mudd Marvin.



Doris Everhart, Arrola DuBridge, and Caltech President Tom Everhart.



Rudy Marcus with Jean and George Smith.



Marilyn van Wingen with Casper and Beverly Mohl.



Rudy Marcus and Professor of Literature Jenljoy La Belle.

Fit to be black-tied

Speaking before the Caltech Associates can be a daunting experience, but at least Noyes Professor of Chemistry Rudy Marcus had a chance to warm up in front of Sweden's royals before he spoke about life as a chemist and recent times in Stockholm at an Associates Black Tie Dinner in his honor last month. The members of the Caltech support group did their best to allay the inevitable speaker's jitters by including a sprinkling of Marcus's fellow laureates among the 400 guests (Crafoord Laureate Jerry Wasserburg, and Nobelists Willy Fowler, Yuan Lee of UC Berkeley and the Caltech Board of Trustees, and Nico Bloembergen of Harvard), and by making sure that Caltech geochemist and longtime friend Sam Epstein was on hand to provide collegial support. Epstein and Marcus were PhD students together at McGill University in their native Canada, back in the days when they both wondered what the future might hold.



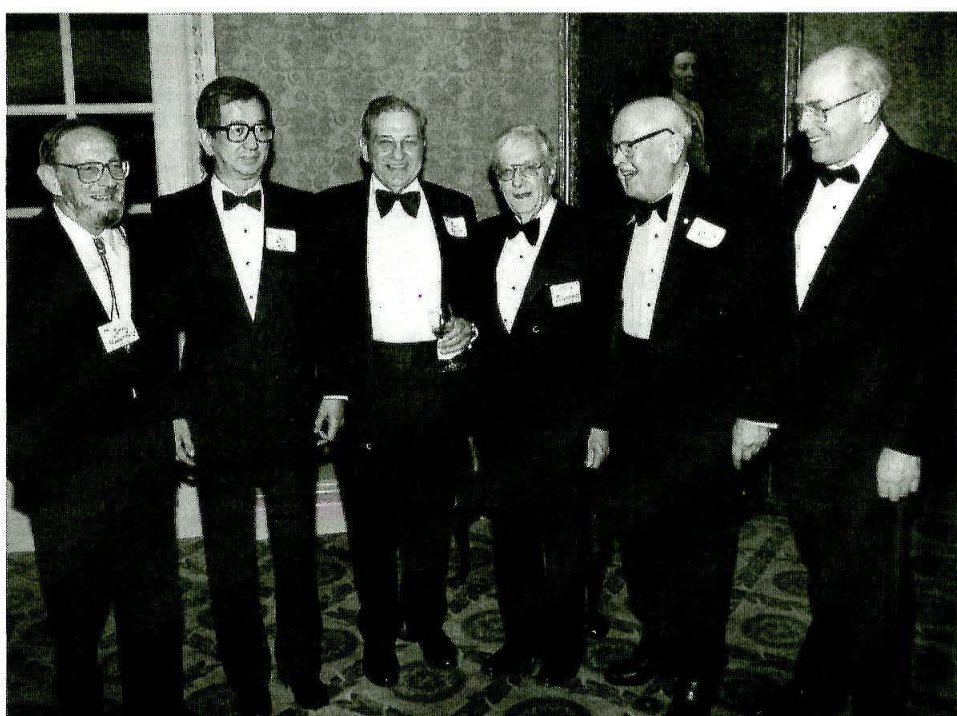
Henry Keck, with Elise Mudd Marvin, Rudy and Laura Marcus, and Willy Fowler.



Leonhard Professor of Geology Emeritus Sam Epstein, with Laura Marcus, Diane Epstein, and Rudy Marcus.



Fran Yarliv, with Nico and Dell Bloembergen; George and Jean Smith.



President Everhart (right) in good company. From left, Crafoord Laureate Jerry Wasserburg, and Nobel Laureates Yuan Lee, Rudy Marcus, Nico Bloembergen, and Willy Fowler.



Institute Professor of Chemistry, Emeritus, Jack Roberts, with Edith Roberts and Laura and Rudy Marcus.



Warren and Katie Schlinger, with Rudy Marcus, and Jean and George Smith.



Albert and Jonie Snider, with Bud and Ruth Smoot.



Seth Hufstedler, George Smith, Jean Smith, MacArthur Professor of Geology and Geophysics Jerry Wasserburg, and Shirley Hufstedler.



What's a director like me doing in a place like this?

By Shirley Marneus

In years past, when such well-known Caltech performers as Beckman Professor of Chemistry Harry Gray, JPL senior scientist and "Voice of Voyager" Albert Hibbs, and the late Richard Feynman have stepped on a stage, it hasn't always been to regale audiences with the latest details of their scientific research. Along with dozens of other Institute faculty, students, and staff, they have been regular participants in Caltech's theater arts program (TACIT), under the direction of Shirley Marneus. Marneus originally came to Caltech seeking peace and quiet after many hectic years in theater and television. But she'd barely arrived on campus when she found herself back in show business, with a cast of characters unlike any she'd previously encountered, including performers who halted rehearsals to debate whether a prop moon hung at the appropriate declination, and a bongo-playing physicist whose previous acting experience consisted of a walk-on in Stockholm. In her more than two decades on campus, Marneus has been the guiding influence behind shows ranging from Shakespeare to experimental theater. But her signature achievement, and one that has brought considerable local fame to Caltech's theater arts program, has been the staging of a string of lively, polished, and hugely popular spring musicals, a feat that might be considered tantamount to successfully peopling a physics experiment with the cast of A Chorus Line. TACIT's 1993 production of Hello, Dolly! marks Marneus's twentieth anniversary of directing musicals on campus, an experience that as she relates in this article has given her a unique and highly entertaining perspective on the Institute and the determination of its people to be the best and most original at what they do, whatever that happens to be. This story is adapted from a talk Marneus gave some months ago to a standing-room-only audience at the Caltech Women's Club.

There have been two decades of musicals at Caltech, but the theatrical tradition on campus goes back much further than that. Back in the 1930s, when this place was all male, there was a fine old tradition of putting on Greek and Roman comedies, with the men wearing balloons under their togas. Somewhere, around '38, I'm told, all the balloons burst, and that stopped.

Then, during World War II, when most of the men on campus were away, working on the war effort, they left a lot of lonely people behind whose morale needed buoying up. So a group of faculty, faculty wives, some staff, and a few grad students got together and started reading plays, and that of course became the Caltech Playreaders. In the '60s, when there were a lot of grass-roots movements all over the nation, some students got together and put on a production of *The Threepenny Opera*.

I came to work at Caltech on April Fool's Day, 1970. I was on hiatus from NBC, because I did not want to move to Arizona with "The New Dick Van Dyke Show." I was looking around for a local job, one preferably nine-to-five. I looked in the Pasadena *Star-News*, and there was a bold-print, small ad that said BRING YOUR TALENTS TO CALTECH.

So, armed with a résumé, I showed up in the Personnel Office, where they

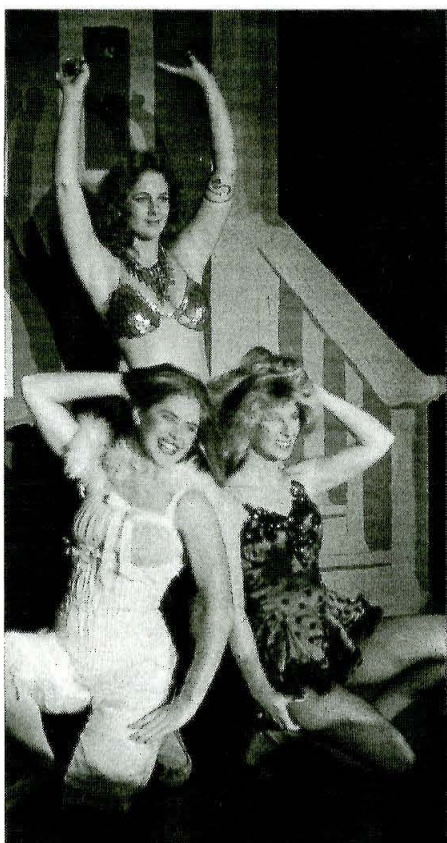
stared at my résumé, then stared at me and said, "Do you know what we do here?" And I said, "I know the Dewey decimal system by heart: I was raised in the county library by a Pima Indian and an old IRA man from Dublin—there must be something I can do." And they sent me over to the public affairs reading room in humanities. But not before they explained to me that "the lady in charge there is a little difficult." She keeps sending people away."

So I went over and I talked with her, and we hit it off immediately. I loved the room, and it looked like a very quiet place to work. No excitement. No sign of theater, which was what I thought I was looking for. When my interviewer learned during our conversation that I had studied Shakespeare extensively, she said, "Of course, Bacon wrote Shakespeare," and I said, "Nonsense!" without thinking, and she said, "You're hired."

As I ran back across the campus that day, I passed Millikan Library, which was then new, and I met my first Caltech student. He was at about the fifth floor, climbing up one of those granite chimneys. I was quite alarmed, and I ran into the library and said, "There's someone climbing Millikan Library!" The librarian said, "Relax, they do it all the time." And this was the first important thing I learned about Caltech students—that they will climb Millikan Library, they will climb the Himalayas, they will rise to meet any idea, any challenge. They want to excel, and they are infinitely curious and inventive.

I can give you a wonderful example of that from one of the musicals we did, *Fiddler on the Roof*, if you'll forgive me for briefly jumping ahead a few years. That show has a Jewish wedding scene

in which four young men wearing hats put bottles on their heads and dance. They do some fairly intricate steps, down on their heels kicking, and so forth. One relatively easy way to do this is to put Velcro on the bottom of the bottles and Velcro on the hats. But this suggestion offended the Caltech student pride, so four young men from entirely different disciplines, who had never seen each other before, became absolutely inseparable on campus, and everywhere they went, they went with wine bottles on their heads. For the two months that *Fiddler* was in rehearsal, you would see them everywhere—walking past the fishpond, into the library, out of Chandler cafeteria—with wine bottles on their heads.



Where others saw literature and chemistry professors, Marneus saw good-time girls and small-time wise guys. Jenloj La Belle (above photo, right) made an engaging frontier temptress for *Music Man*, while Harry Gray's appearance as mobster Harry the Horse in *Guys and Dolls* (right-hand photo, lower right) was generally agreed to be inspired typecasting.



The production that launched Caltech's formal theater arts program was *Fiddler on the Roof*, which was produced by a visit from the show's author Meredith Willson.



When we did the performance, the wine bottles went on with no glue and no Velcro—and they danced. The wine bottles never fell off. It was a beautiful thing to see.

But that came much later. It wasn't long after my odd hiring in 1970 that a group of undergraduates got together and said, "We're going to do *Pirates of Penzance*." They bought a lot of horizontal, striped, blue-and-white T-shirts, made a papier mache rock, and on brand-new Ramo stage stood in a semi-circle and did *Pirates of Penzance*. The following year, they did *H.M.S. Pinafore*, wearing the same T-shirts and a couple of tricorns. The rock did not appear. The third year that I was here—and mind you, I had not really



theater arts program, *Music Man* was enlivened by the presence of Penny the pony.

intended to stay forever—the student producer, Greg Simay, came up to my library desk and said, "We want to do a Broadway musical, and everybody says we can't," and I (not thinking, again) said, "Nonsense." And he said, "Would you direct it?" and I said, "Sure."

So we did *Kiss Me Kate*, and that was the first of a series of Broadway musicals that is almost unbroken. We did the show with three folding screens and several yards of pink ostrich feathers for "Wunderbar," and I learned a little more about the inventiveness of Caltech students—a cast of 27, by the way. *Kiss Me Kate* is of course based on *The Taming of the Shrew*, and there is this wonderful song, "Where is the Life that Late I Led?" sung by Petruchio. Jim Hugg, who was a senior that year, sang it sitting on a table with a fruit bowl, and I thought it would be simply marvelous if he picked a grape out of the bowl and said, "There's more than one way to tame a shrew," popped it in his mouth, and walked offstage.

Throughout rehearsals, he popped the grape in his mouth wonderfully. But, opening night, instead of picking up the grape, he had what he obviously thought was a better idea. He picked up a banana, and said, "There's more than one way to tame a shrew." Now, in those days, we did five performances in one weekend—two each on Saturday and Sunday. By the second performance, Jim had picked up the banana, walked down to the audience, and said "There's more than one way to tame a shrew," just in case they missed the point when he made it from the stage. The third performance, he began to peel the banana; by the fourth one, the peel was halfway down the banana. His fifth and final night was truly magnificent—he walked offstage and

***Guys and Dolls* marked Caltech theater's introduction to Richard Feynman (above, with bongos and drumming partner Ralph Leighton) and Feynman's introduction to theater. "How come nobody ever told me about this stuff before?" he said afterward. The physicist went on to appear in several more TACIT shows.**

the banana broke. And that was Caltech's first Broadway musical.

The next production that we did was *Guys and Dolls*. This turned out to be a groundbreaking show, because, once again, I didn't know any better. We started out with a cast of about 35 students. Now the first two minutes of *Guys and Dolls* is taken up with a number called "Runyonland," in which there are approximately 200 people crossing the stage. I knew that there was no way that 35 actors could cross the stage as all of those rich Damon Runyon characters, so I got on the phone and said, "We're going to call the faculty, we're going to call the administration." I didn't know, or care, who they were—I wanted bodies.

I called Dave and Annette Smith, I called Lance Davis, Jim Morgan, and Charlie De Prima, I called Dave Morrisroe. I had never looked at my check, I had no idea he signed it, he was just a body. I called everybody I could think of, including a very famous person on campus who played the bongo drums, but I had never heard of him. I said, "Great, let's get him. He can play the drums in the opening of the scene that takes place in Havana." He showed up, and said, "Hi, I'm Dick." I said, "Fine," and we oiled him down with peanut oil so he was shining



"Was this part of the job description?" With wife Mildred, Caltech's newly arrived president, Murph Goldberger, imparted a touch of Caltech Gothic to the 1979 production of *Music Man*.

and put a rumpled purple calypso suit on him. After the show was over, I finally realized who Dick Feynman was, and the next time I saw him I said timidly, "Hello, Dr. Feynman," and kind of hid. But, of course, he was great, and that was the moment when he said, "This is fun. How come nobody told me about this stuff before?"

It was just a wonderful experience all the way around. But what was really groundbreaking was that it was the first time that faculty, their families, staff, undergraduates, and graduate students—and a few people who wandered in from JPL—worked together as complete equals with absolutely no hierarchy. They were all new

to the stage, essentially, and they all fell in as family. It was quite wonderful to see people working on homework in the aisles, for example, and Dick solving problems for the first-year physics students.

There's another story I'd like to tell you about Dick, and it's about his performance in *South Pacific*, which we did a few years later. We were hoping to talk him into drumming, dressed up in a great feathered headdress and cape. Dick, however, had just come back to campus after having had cancer surgery. He was not very active, and his morale, perhaps, was not very high. I phoned his secretary and said, "Dare I ask him to perform?" and she said, "Yes, it would be good for him. And don't let him say no." I talked to his wife, Gwenth, too, and she said the same thing. So I called him. And he said, "Well I don't know, Shirley. I got this scar. It goes from here to here; it's pretty ugly. It would spoil everything."

And again, saying the first thing that came into my head, I said, "Oh, but Dick, that's why you're chief." He said, "Whaddaya mean?" "Why," I said, "That's where the shark bit you when you dove to the depths to recover the pearl in the cave for the monthly sacrifice by the full moon. The shark attacked you, but you pulled the knife from your teeth and killed the shark. You floated unconscious to the surface, the maidens carried you to shore, covered you with hibiscus flowers, nursed you, and made you chief."

He said, "No kidding? Then I guess I bettah do it."

Our next musical after *Guys and Dolls* was *Fiorello*, and it made the CBS evening news. It was another time when we broke a little ground. Fiorello La Guardia was the Italian Episcopalian mayor of New York, so he was of course played by a Korean math major. He was the right man for the role—that was all there was to it—and when they interviewed him on CBS, he said, "Well, after they get over the shock, I don't think it will matter." And it didn't.

We had our acting president, Bob Christy, in the show as our radio announcer, and Dick Feynman as a Mafia chieftain. Harry Gray, who had played Harry the Horse in *Guys and Dolls*, came back as a corrupt businessman, and Professor of Literature Jenijoy La Belle was on the end of the tap line. In fact, out of that show she won a national contest sponsored by a deodorant company, in which contestants had to finish the slogan "Nervous is when . . ." Since Jenijoy was in the tap line and could never remember which foot to use, she wrote, "Nervous is kicking left when everyone else is kicking right." She won the contest and appeared on a commercial.

The next year we did *Music Man*. It was another one of those times I didn't know any better, so I asked the student

Continued on page 13

ALUMNI

Chapter activities

Bostonians steep themselves in navigable technology

Boston alumni who made their way from a luncheon in Lexington to a seminar in Bedford last month learned about LORAN (Long-distance Radio Navigation System) and its importance to maritime and airborne commerce. During their research and development seminar at Megapulse Inc., the East Coasters saw Megapulse's newly constructed LORAN C transmitter, which will send signals throughout the north-west Pacific Ocean from South Korea.

Bay-Area BioControl executive says, "Look, ma, no hands"

San Francisco chapter members heard about the fascinating advances at BioControl Systems last month, when the company's president, Dr. Hugh Lusted, gave a talk on "Using Your Nervous System to Control Machines." The company is developing machines that do away with the need for hands-on contact, allowing people to fire missiles with their eyes and write musical scores with non-dexterous motion.

Seattle chapter learns the ABCs of cell-to-cell communication

The language of cells was illuminated by Ellen Rothenberg, Caltech associate professor of biology, in her talk on "Chemical Messengers for the Immune System." Speaking to Seattle-based alums in December, Rothenberg presented recent research on protein-based hormones that make it possible for cells in the immune system to "discuss" how to fight a disease.

There's been a split in the Alumni Association's San Francisco Chapter—a delayed casualty of the 1989 Loma Prieta Quake? Not exactly—turns out that the more than 600 alums who live in the East Bay Area were finding it difficult to participate in chapter activities on the other side of the water. So, last month, alumni (left to right) Ben Burke '61, Clay Englar '49, and Jim Price '74 got together to begin organizing the opening of a new East Bay Chapter. East Bay will hold at least one joint event a year with its sister chapter in San Francisco, whose ranks have now been pared to a paltry thousand or so.

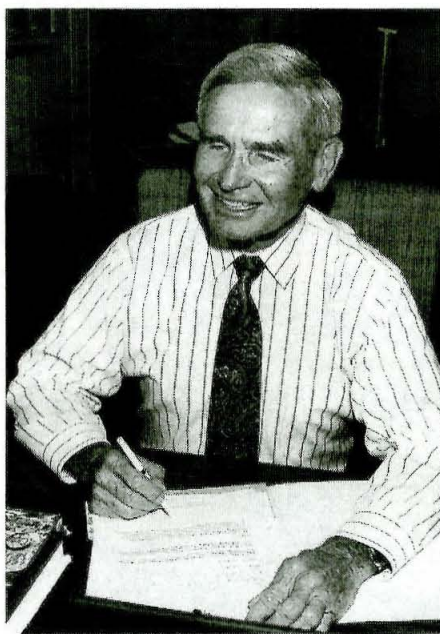
From the alumni president

The Caltech Board of Trustees has created a new Trustee Committee on Institute Relations. The committee will review policy and operating plans for Institute relations programs, including the Alumni Association, the Caltech Associates, Development, Public Relations, Government Relations, and Community Affairs, and will offer advice and counsel to the Institute's president and to the vice president for Institute Relations. It will also encourage and review volunteer efforts and make recommendations on these efforts. Committee members will receive reports on plans and programs from these organizations and will provide direction and counsel to volunteers and staff.

Making up the committee will be the chair of the Institute's Board of Trustees, along with Caltech's president, the presidents of the Alumni Association and the Associates of Caltech, the chair of the Annual Fund, and five trustees, one of whom—Walter Weisman, member of the board since 1988—will also serve as committee chair. Current plans call for the group to meet four times a year.

The committee will also play a role in reviewing Caltech's public relations program in efforts to increase and improve Institute visibility, and will participate in and monitor annual and long-range fund-raising plans, consistent with Caltech's established academic priorities. Members will also be asked to provide advice and recommendations on selected federal, state, and local government affairs and relations with the Caltech community.

Issues that affect the Caltech community may soon be engaging a larger audience, with the introduction of a new publication, *Caltech Community, Commitment and Comment*, or "4C." The new newsletter is produced by Cal-



By Le Val Lund

tech's Office of Government Relations and Community Affairs and will focus on matters of general Institute interest. Included in this first issue is a lengthy discussion of "pork barrel politics," that is, the allocation of funds by Congress on the basis of congressional districts' political clout rather than on merit. In recent years, science funding has been increasingly influenced by the "pork" lobby, a development that is strongly opposed by institutions such as Caltech. In 1980 Congress earmarked \$10.7 million in so-called pork for seven academic institutions. As of last year, the amount of science funding based on pork-barrel allocations had reached \$700 million annually, in support of programs and facilities at 499 academic institutions. "Caltech should do everything in its power to oppose pork in an effective way," says Caltech's President Everhart. "The nature of this institution is that it is based on quality. If pork wins out,

ultimately we will lose."

If Caltech and its alumni write letters to Congress opposing pork-barrel appropriations, that is appropriate lobbying that also serves Caltech's broader interests.

President Everhart has pointed out that after LIGO (Laser Interferometer Gravitational-Wave Observatory) had cleared all reviews, and the NSF was requesting funds from Congress, Caltech people educated congressional representatives about supporting the funding. This is an example of Caltech lobbying for its interest. It is not pork.

Alumni who have any government contacts or interest in government affairs are encouraged to become involved by contacting Hall Daily, director of government relations and community affairs, at (818) 356-6256.

We welcome your comments about the Alumni Association and its activities. Please contact Le Val Lund, president, Caltech Alumni Association, Mail Code 1-97, Pasadena, CA 91125 or via electronic mail c/o judyamis@pcmail.caltech.edu.

For a summer hire, check out ASPIRE

For the eighth successful year, the Alumni Association and the Institute's Career Development Center (CDC) are coordinating a summer work-experience program, ASPIRE (A Summer Position In Research or Engineering), for Caltech students.

According to CDC Director Sally Asmundson, ASPIRE has proven extremely valuable to both the students and the companies that have hired them. Students participating in the program can explore their career options in industry, support their education through summer earnings, and contribute their technical skills to the workplace. For the prospective employer ASPIRE provides the opportunity to do informal recruiting and gives useful clues about whether a match could be made at graduation. Employers also get the chance to introduce Caltech students to their companies and to spread the word about their firms on campus. Employers who have taken advantage of ASPIRE find they get students who are not only self-motivated but also able to make valuable and thoughtful contributions to their organization.

If you are interested in offering a summer work experience to a Caltech student, please contact Rosana Madrid Gatti, assistant director, CDC, at (818) 356-6361.





It wasn't always easy to reach Rudy Marcus in the days and weeks immediately following the announcement that he'd won the Nobel Prize for chemistry, so when the Alumni Association decided they'd like to have Caltech's newest Nobel laureate as the Seminar Day speaker for 1993, they asked the King of Sweden to extend the invitation. Marcus, shown here with King Carl Gustav XVI as he accepted the Nobel Prize in Stockholm last December, will address the alumni on the topic of "Electron Transfer and Stockholm" on May 15. Registration packets for the Association's 56th Annual Seminar Day should be in the mail next month.

New Association officers and board members nominated

At their January meeting, the Alumni Association accepted the proposals of the nominating committees for officers of the Association board of directors and members of the board. The terms of office for directors and officers begin at the close of the annual meeting in June 1993.

Nominations for officers were proposed by committee members Jeanine Hoffmann '86, Edward M. Lambert '82, Le Val Lund '47, Gary Stupian '61, and William M. Whitney '51. The nominees are: President, William M. Whitney; Vice President, Peter V. Mason '51, PhD '62; Treasurer, Franklin D. Dryden '54, MS '57; Secretary, Edward M. Lambert.

Making up the nomination proposal committee for board members were: Lisa Anderson '74, PhD '82, Franklin D. Dryden, James Fanson, PhD '87, Doug Josephson '65, Le Val Lund, Gary Stupian, and William M. Whitney. The following were nomi-

nated for the board: Lisa Anderson, Warren Goda '86, Patricia M. George, PhD '81, Susan Murakami '75, and Tom Tyson '54, PhD '67, all for three-year terms. Named to serve a one-year term as chapter representative was Dennis Kodimer '69, president of the Phoenix Chapter.

Section 5.01 of the Association bylaws provides that members of the Alumni Association may make additional nominations for directors or officers by petition, signed by at least 50 regular members in good standing, providing the petition is received by the secretary no later than April 15. In accordance with section 5.02 of the bylaws, if no additional nominations are received by April 15, the secretary casts the unanimous vote of all regular members of the association for the elections of the candidates nominated by the board. Otherwise, a letter ballot is required.

ALUMNI ACTIVITIES

February 11, *Santa Cruz Area Monthly Luncheon*, Peachwood's at Pasatiempo Inn, noon. For reservations, call Bob Shacklett at 408/722-6021. Lunches are held the second Thursday of each month. The March luncheon will be on March 11, and the April lunch on April 8.

February 16, *San Francisco Chapter Meeting*, with Joel Birnbaum, VP of R&D, and director, Hewlett Packard Labs, "Information Technology: Impact on the Future Society."

February 18, *San Francisco Peninsula Monthly Luncheon*, Ming's Restaurant in Palo Alto, noon. For reservations call Hugh Dubb at 415/362-3800 or 408/773-9100. Lunches are held the third Thursday of each month. The March lunch will be on March 18, and the April lunch on April 15.

February 17, *Orange County Chapter Dinner/Meeting*. There will be a discussion of alumni involvement in community services, with opening remarks by President Everhart.

February 18, *Washington, D. C., Chapter Meeting*, with Charles Elachi, assistant lab director for Space Science and Instruments, JPL.

February 23, *Tri-State Chapter Dinner/Meeting*, with Glen Cass, professor of environmental engineering and mechanical engineering.

February 25-26, *Phoenix/Tucson Chapter Dinner/Meetings*, with David Halpern, senior research scientist, JPL, "El Niño and Climate."

March 11, *Boston Chapter Dinner/Meeting*, with Jean-Paul Revel, Albert Billings Ruddock Professor of Biology.

March 12, *Chicago Chapter Dinner/Meeting*, with Charles Plott, Harkness Professor of Economics and Political Science.

March 16, *Houston Chapter Dinner/Meeting*, with Ronald Blom, PhD, geologist, Earth and Space Sciences Division, JPL.

March 25, *San Diego Chapter Dinner/Meeting*, with Paul Patterson, professor of biology.

March 27, Merle Norman "San Sylmar" Classic Beauty Collection tour.

April 22, *Colorado Chapter Dinner/Meeting*, with Daniel Kevles, J. O. and Juliette Koepfli Professor of the Humanities.

April 22, Santa Ana River Mainstem Project Tour.

April 26, *Washington, D. C., Chapter Dinner/Meeting*, with Ellen Rothenberg, associate professor of biology.

May 13, *Class of 1943, 50th Reunion Dinner*, the Athenaeum.

May 14, *Half-Century Club Reception and Luncheon*, the Athenaeum.

May 14, *Class of 1948, 45th Reunion Dinner*, the Athenaeum.

May 14, *Class of 1953, 40th Reunion Dinner*, the Athenaeum.

May 14, *Class of 1968, 25th Reunion Dinner*, the Athenaeum.

May 15, *56th Annual Seminar Day and Dinner*, on the Caltech campus.

May 15, *Class of 1958 35th Reunion Dinner*, the Athenaeum.

May 15, *Class of 1963, 30th Reunion Dinner*, the Athenaeum.

May 15, *Class of 1983, 10th Reunion Dinner*, the Athenaeum.

June 24, Caltech Big Bear Solar Observatory Tour.

July 12-21, *Iceland Travel/Study Program*, with Robert Sharp '34, Robert P. Sharp Professor of Geology, Emeritus, and Susan Kieffer PhD '71, Regents Professor of Geology, University of Arizona.

August 7, Mt. Wilson Observatory Tour.

August 17-23, *Ashland Shakespeare Festival*, with Jenijoy La Belle, professor of literature.

For information regarding the above, please contact Arlana Bostrom for chapter events (818/356-8363), Patsy Gougeon for Seminar Day/reunions (818/356-8366), and Helen Shafran for travel/study and local programs (818/356-8364).

Alumni computer system update: the world at your fingertips

By Gary Stupian, chair, Electronic Communications Committee

Now that the alumni computer system has been running for about a year, I want to bring you up to date on its operation and urge those of you who haven't yet experienced the joys of electronic communication to give the system a try. I'll begin with a brief description of the capabilities of the system and discuss how it might be even better utilized in the future for the benefit of alumni, collectively and individually, and for the benefit of Caltech as a whole.

Our computer hardware sits physically on campus, somewhere in the Jorgensen computer sciences building. Although I have been involved with the system from the beginning and use it daily, I have never actually worked on this computer or even seen it! Regular users of computers and computer networks are quite accustomed to this sort of remote access. If you have a home or office computer of virtually any type (PC, Mac, laptop, etc.), you can use it as a terminal and connect to the alumni system, either through a telephone line using a modem or via the "network" (which I'll describe later in more detail). Your computer can be converted to a terminal (temporarily!) by using any one of the many communications programs now readily available. Once you establish a link to the alumni computer (available to members of the Alumni Association upon request) and enter your name and password, you are connected to the machine. What can you do then? Quite a bit!

You can easily determine whether an old classmate has an account on the system. Just ask the computer. You can then send electronic mail. When the addressee next logs onto the system, he or she will be automatically notified that mail has been received and can then read and reply to your message. Our computer is a multi-user system, meaning that many people can be connected to it simultaneously. You can, with a few deft key strokes, display a list of the people currently logged on and can even type messages back and forth in real-time. I have chatted via the computer with alums as far away as Hong Kong and England.

In addition to the interchange of mail with individuals, you can post messages that can be read and commented on by all users of our computer, and in fact by users of any computer on the Caltech campus or at the Jet Propulsion Laboratory. We have established several of these "news groups" especially for alumni. Some of the discussions have been quite spirited, and students join in. Other campus interest groups (e.g., undergrads, grad students, academic departments, clubs) also have news groups, which you can read. Caltech's Office of Media Relations has just established a news group that will regularly post press releases as they are issued by the Institute.

If our computer system only provided mail to other alumni and news of

Caltech, an account would still be very desirable, but the computer is not limited to communications with the campus. As I mentioned, the alumni computer is connected to the Internet network, which electronically links together thousands of computers around the world. Internet, which developed originally from links between government and corporate computers, is the largest such agglomeration, but there are others. You can send mail to virtually any one in the world who has computer access. There are hundreds of news groups with worldwide distribution. They accommodate interests ranging from the serious (e.g., scientific disciplines, current events) to the perhaps less serious (e.g., locksmithing, astrology, archery).

About 1150 alumni now have accounts on the computer. Of these, a few hundred are active to varying degrees. We would like to see the number of users increase. Benefits, tangible and intangible, could accrue from better general communication among alumni. One of our alumni news groups, for example, is for the exchange of job offers and résumés. In addition to information contributed by individual alumni, we are working toward providing job postings obtained from various other sources. (This activity is complementary to and separate from ProNet, which is described elsewhere in this issue of *Caltech News*). This sort of networking (literally and figuratively) will only succeed to the extent that alumni participate.

The Electronic Communications Committee (ECC) was established to deal with questions relating to the alumni computer network and to plan for possible future improvements. The members of the committee are Ross Berteig '88, Bob Bunker '69, Pete Mason '51, Gary Stupian '61, Bill Whitney '51, Kimo Yap '78, and Judy Amis, our Alumni Association executive director. You can send e-mail to any or all ECC members if you have questions. Our collective "street address" is: user@alumni.caltech.edu, and we go (in alphabetical order) by these user names: rberteig, rbunker, pvmason, stupian, ww, kby, and judyamis. If you don't currently have e-mail, you can try writing the old-fashioned way via the Alumni Association office.

The committee has quite a few projects under way. I'll mention only one. Many alumni both in industry and academia already have other means of access to the Internet. These fortunate people are able to reach our computer without incurring long-distance charges. The ECC is researching ways in which we might make Internet access more economically attractive for all our users.

The Caltech Alumni Association is leading the way in providing computer access to alumni—our new computer system has already prompted inquiries from MIT, RPI, and the University of

Stage is set for new Ashland excursion

Experience the splendor of beautiful southern Oregon when we attend the award-winning Oregon Shakespeare Festival, to be held in Ashland, August 17–23, 1993. This travel/study program will focus on drama and gourmet dining, and is the second in a series led by Jenijoy La Belle, who in addition to being a Caltech professor of literature, has frequently taught, lectured, and written on the Bard. The itinerary will include performances of *Antony and Cleopatra*, *Richard III*, and *A Midsummer Night's Dream*, as well as *The White Devil* by Shakespeare's contemporary John Webster, and *A Flea in Her Ear* by Georges Feydeau.

Trip fees, not to exceed \$1,100 per person (double occupancy), will include all lodging, activities, entrance fees, entertainment, most meals, and transportation while with the group. The cost of transportation to and from Ashland is not included. Only 20 spaces are available, so if you would like to be a part of this exciting travel/study program, please fill out the form below and return it, with your deposit, to the Alumni Association. Complete details of the program will be mailed with your confirmation. If you have any questions, please call Helen Shafran, assistant director for programs, at 818/356-8364.

CALTECH ALUMNI ASSOCIATION
Ashland II Travel/Study Program, August 17–23, 1993

REGISTRATION FORM

I/We wish to participate in the Alumni Association's travel/study program in Ashland. Enclosed is my deposit check for \$ _____ representing _____ persons at \$200.00 per person.

Name: _____

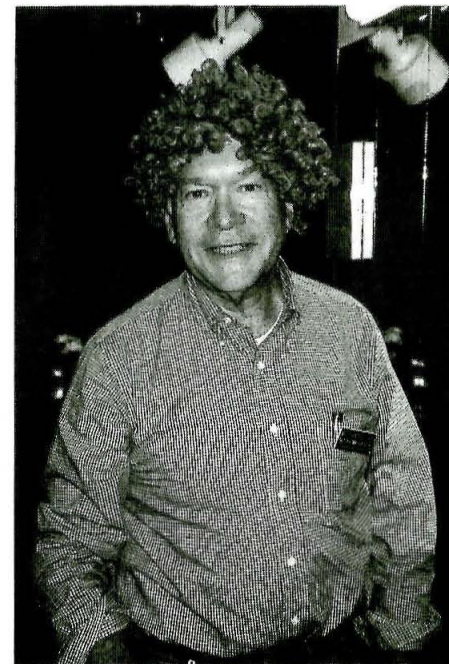
Phone: (home) _____ (business) _____

Note: Please make check payable to Caltech Alumni Association and return it with this form to: Caltech Alumni Association, Mail Code 1-97, Pasadena, CA 91125



"Ain't Misbehavin'": Vic Veysey '36 (top) gets a feel for the realities of Elizabethan life during last summer's Alumni Association travel/study trip to the Ashland Shakespeare Festival, while Milt Andres '49 (right) experiences a wiggling of a different sort.

Michigan. Computer accounts are free to members of the Association. Write to the Alumni Association (Caltech, Mail Code 1-97, Pasadena, CA 91125) for your application form. You will discover that the computer can keep you in touch with the campus and engender a sense of involvement not otherwise easily attained, especially in the case of alumni living some distance away. The members of the ECC, and other users of the alumni system, hope that you will join us.



THE CALTECH ALUMNI ASSOCIATION
ANNOUNCES

CALTECH
PRONET

a career service for people
not looking for a job...
and those who are.

Don't miss the opportunity of a lifetime because a company doesn't know you are there.

From venture capital firms seeking senior management for start-ups to Fortune 500 companies searching for experienced professionals, companies of all types and sizes are always looking for top talent.

Content as you may be with your current position, there are opportunities out there that might entice you to make a change. And, if you're actively looking for a new position, ProNet can help you, too.

Registering with ProNet assures that a profile of your experience and abilities is available to employers seeking to fill challenging positions you wouldn't hear about otherwise.

HOW DOES CALTECH PRONET WORK?

A company calls ProNet and requests a search for the individual they need. This request is cross-matched against the profiles of participating alumni. If you're the one they're looking for, you'll be notified. *Complete confidentiality* is maintained throughout this process and you can restrict the release of your profile.

WATCH YOUR MAIL FOR DETAILS

ProNet information packages were mailed in January. If you have not received one, please write to Caltech ProNet Registration Department, Caltech Alumni Association, Mail Code 1-97, Pasadena, CA 91125; or call (818) 356-0654.

Venture Capital

High-tech

Fortune 500

Start-ups

Bio-tech

Management

Engineering

Pharmaceuticals

Chemicals

Manufacturing

Marneus

Continued from page 9

activities coordinator to write the composer, Meredith Wilson, and invite him to come and play the Wells Fargo wagon driver in the production—he would have one line. We not only got a letter back, we got a phone call. He was thrilled. All these years, and no one had ever asked him to be in his own musical. Unfortunately, he could not play the part, because he had out-of-town guests from New York, but he, his wife, and the guests came to one of the shows.

Now, I'd done something a little dangerous, I guess, because *Music Man* is a play where the collars are up to your chin, the sleeves down to your wrists, and the skirts reach the floor. There were no "girlie numbers," if you'll pardon the expression, and you really need one in a musical. So, during the song "Sadder but Wiser Girl for Me," sung by the music man, Harold Hill, I had decided I would run in a girlie number. We had, again, Professor La Belle, dressed up as a frontier "wicked woman," and we had a belly dancer. We had forgotten that we had interpolated this, and that evening, there sits Meredith Wilson, and I saw his face and thought, "Uh-oh, what have we done?" The conductor gave the cue, and the belly dancer came on. We then saw Meredith Wilson look at his wife, shrug his shoulders, and lean forward and give a big wolf whistle. After the show was over, he came backstage and stayed about two hours. He spent 15 minutes with one of the dancers who had been injured and had to perform again that night. He picked up a flute and played "Seventy-six Trombones," he signed autographs. He was charming, and it was really a delight.

This was also the musical in which we had Penny the horse, which made for an interesting experience, because the Ramo stage is a very small place, and its backstage was apparently designed for a small string quartet. We had 102 people, a dog, and Penny the pony. I had originally thought I'd bring Penny down the freight elevator, but the floor was metal and she slipped around, which alarmed her. So we brought her into the theater down the passenger elevator in Baxter Hall. She was stabled behind the Caltech Office of Public Events where the recycling center is now, with a grad student who slept with her and stayed with her fulltime because of the insurance. We didn't tell anybody we were going to do this because, of course, someone would have said, "You can't." I was still working for the library at that time, and there were lots of leftover newspapers being thrown out. We brought newspapers to a depth of about an inch, papered the entire hall, and

had Penny wait in the wings down by what used to be Baxter Art Gallery. We led her on, led her off, and took her back up the elevator and out to her "stall" for each of her five performances.

On Monday morning, about eleven o'clock, Roger Noll, who was then division chairman for the humanities and social sciences, called me. "Shirley," he said, "I have a very strange question. Was there a . . . horse in the building this weekend?" This kind of caught his attention. There were no repercussions because we had taken precautions and observed the rule of the five P's: "Proper preparation prevents poor performance." We had prepared for Penny, and there was no problem.

There was one other thing that was very important about *Music Man*. Once again, not knowing any better, I called the president—Murph Goldberger—who was brand new, and said, "Look. I need you. I need you and Mildred to play the Grant Wood farmer and his wife." He said, "But we haven't time. We can't rehearse!" I said, "You don't need time, you don't have to rehearse. Just let us send a costumer over to you. We'll put costumes on you; you show up before the performance, you go on stage, and I promise you, it will stop the show." He and Mildred didn't know any better either; they said okay.

We outfitted the president up in his office in bib overalls, and then we went over to the president's house and put Mildred in the tattiest dress you can imagine, so that she looked barely respectable. On opening night they showed up, and Murph looked at a hundred people—and at the horse, the dog, the baby in arms, and a mechanical chicken that an electrical engineering major had designed for us—and I think, although he never admitted it, that he may have had an attack of stage fright. He said, "I don't know what to do. What am I supposed to do?" I said, "Follow Harry Gray. When Harry stops, you stop, face front, stand there. When Harry pushes you, go off." Which he did. And when Murph and Mildred appeared as Grant Wood's farmer and his wife, the show stopped. All five performances. It was wonderful. They lived backstage with us through those five performances, all day Saturday and Sunday.

And when it was all over, and not forgetting that incident with the horse in the elevator, Murph and Roger Noll put their heads together, and Murph came up with a small grant to start a real theater arts program on campus. He said, "If you can keep the campus in an uproar for three months, you should do it year round." It was what I think you would call a field promotion. They took me out of the public affairs room, where I had been opening the mail and quietly racking the paper and going home, and they created TACIT, Theater Arts at the California Institute of Technology. And they made me chief, and that's the story of how I came to be standing before you here today.

How to stay in touch

Looking for involvement in all the wrong places? If you're a Caltech alum who's passing through a new area, or one who has just moved to a new part of the country, you might want to get back in touch with the Institute and its people by contacting your local chapter

of the Caltech Alumni Association. Or, maybe you're a longtime resident who would like to get more involved in alumni activities. In all of these cases, here are the names and numbers of people to contact at twelve of Caltech's alumni chapters nationwide.

Boston
Kelly Beatty '73, 508/458-7361 (h)

Chicago
Ed Seidman '55, 708/945-3602 (h)

Boulder
Bob Dullien '72, 303/499-6777 (w)

Houston
Tim Murray '65, 713/622-9464 (w)

Albuquerque
David Kauffman '62, 505/298-4425 (h),
505/277-5522 (w)

Orange County (CA)
Tom Tyson '54, 714/723-5125 (w)

Phoenix
Dennis Kodimer '69, 602/860-4080 (h)

San Diego
Lee Hanon '55, 619/755-5570 (h),
619/554-1225 (w)

San Francisco
Peter Tong '81, 408/446-3276 (h)

Seattle
Ernest Janzen '61, 206/232-7459 (h),
206/957-5482 (w)

Tri-State (New York, New Jersey, Connecticut)
David Peisner '74, 914/633-8302 (h),
212/305-3373 (w)

Washington, D. C.
John Andelin '55, 703/243-7181 (h)

PERSONALS

1952
RICHARD KENNON, of Sunnyvale, California, writes, "I have retired after 18 years with the Electric Power Research Institute in Palo Alto, California. For the last 10 years I have been Program Manager for Overhead Transmission Lines. Highlights of these 10 years have included the construction of one and managing of two large outdoor labs devoted to transmission-line research. One lab is for electrical and the other for structural testing. I am actively consulting now and expect to keep busy for several years yet." He adds that in the spring his wife, Aileen, and he plan to move up to their mountain home near Pioneer, California, in the Sierra Nevada.

G. NEAL RICHTER, MS, PhD '57, Research Fellow at Montebello Laboratory, was elected a Texaco Honorary Fellow for 1992 in recognition of his history of exceptional achievement during his 27-year career with the company, including, according to Texaco vice president David C. Crikelair, "innovative and significant advances in the development and application of Texaco's proprietary gasification technology." Richter's contributions range from design, pilot, and start-up operations to full-scale commercial projects, including the cool-water plant. He has developed technologies for waste-water treatment and the use of product gas in power generation, and has provided analyses of the environmental aspects of the gasification process. He has been awarded 36 patents and has authored or coauthored 12 technical papers relating to gasification.

1955
GEORGE EPSTEIN, of Charlotte, North Carolina, remains a professor of computer science at the University of North Carolina, Charlotte. His book *Multiple-valued Logic Design: An Introduction* is scheduled for publication in 1993 by Institute of Physics Publishing, Bristol, England.

1956
RAYMOND L. ORBACH, a well-known physicist and the newly appointed chancellor of UC Riverside, and his wife, Eva, received Honorary Fellow Awards at the seventh UCLA College of Letters and Science Awards Dinner on October 8, 1992. After earning his doctorate at UC Berkeley, Orbach joined the UCLA faculty in 1963. He served as provost of the College of Letters and Science for 10 years, and he was appointed chancellor of UC Riverside in March 1992. Eva Orbach holds a degree in psychology from UC Berkeley and has been active in school and civic organizations. The Orbachs live in Pacific Palisades, California. They have been married for 36 years and have three children and five grandchildren.

1963
PAUL J. NAHIN, MS, recently presented an invited lecture at the W. V. T. Rusch Engineering Undergraduate Honors Colloquium at the University of Southern California. Nahin, an associate professor of electrical engineering at the University of New Hampshire, spoke on "The Paradoxes of Time Travel." The lecture was based, in part, on his book *Time Machines: Time Travel in Physics, Metaphysics, and Science Fiction*, just published by the American Institute of Physics. *Time Machines* is a selection of the Library of Science Book Club.

1965
W. ALFRED MUKATIS, PhD, associate professor of business and environmental law at Oregon State University, has recently had two articles published: "Estimating Lost Future Earnings: A Procedural Simplification Using Net Discount Factors," by Wilbur W. Widicus and W. Alfred Mukatis, *Trial Lawyer*, 3 (November 1992), and "Secured Lending in Oregon Under Superfund," by W. Alfred Mukatis and James F. Nielsen, *The Secured Lender*, 56 (November-December 1992).

ARDEN B. WALTERS, of Delray Beach, Florida, writes that he has been presented a Product Champion Award by the Electric Power Research Institute (EPRI) for pioneering the application of advanced electric-power-generation technologies that were projected to save his company \$956 million from their first two power-plant applications. The award was presented by GEORGE T. PRESTON, BS '64, vice president of EPRI's Generation and Storage Division and "a fellow Caltech ChE and Ruddock housemate," on January 13, at the division's Industry Results Review in San Francisco.

1970
CORNELIUS ("NIAL") O. HORGAN, PhD, writes, "I was recently elected a Fellow of the American Society of Mechanical Engineers, and I have been at the University of Virginia since 1988 as professor of applied mathematics. Jefferson's country reminds us of Ireland—green, mountains, and lots of horses!"

1971
DAVID N. SCHRAMM, PhD, of Chicago, has been awarded the 1993 Lilienfeld Prize of the American Physical Society (APS) for his work in nuclear astrophysics. The prize will be presented at the annual Washington, D.C., meeting of the APS in April 1993.

1975
RICHARD N. MITCHELL, of Natick, Massachusetts, writes, "Much against my will, I guess I've become a real adult. I am an assistant professor in pathology at Harvard Medical School and am a staff pathologist at Brigham and Women's Hospital in Boston, teaching, doing cell biology / immunology research, and specializing in cardiac pathology. My wife, Diane, and I have two kids, two dogs, two cars, and a mortgage on a house in the suburbs. Argh! Responsibility! We periodically see fellow Rudds RICH BAKER [BS '74] and KELLY BEATTY [BS '73], but miss a lot of the old gang."

1986
LISA CUMMINGS BAXTER and STEVEN BAXTER, BS '84, have had a baby boy, Colin Tait, born on November 6, 1992. He weighed 8 pounds, 13 ounces. Steven is a senior scientist at Rohm & Haas in Springhouse, Pennsylvania.

MARGARET CARTER, of Ann Arbor, Michigan, writes, "I have just earned my PhD from the University of Michigan in environmental engineering. I am also proud to announce that I am currently unemployed, unmarried, and childless."

GEOFFREY B. MILLS, PhD, of Los Alamos, New Mexico, returned to the United States two years ago after five and a half years in Europe. He has two sons, Alexandre and Jonathan.



As a retired JPL senior scientist, Al Hibbs '45, PhD '55, is no stranger to the new and unexpected, but even he had never encountered anything quite like the concert presented by "throat singers" from the Central Asian land of Tuva, who came to Pasadena last month to ride in the Tournament of Roses Parade. Tuva and Tuvan throat-singing—in which a single singer simultaneously produces and holds two different notes—gained a following at Caltech through the efforts of Richard Feynman, who with his friend Ralph Leighton sought unsuccessfully to visit the formerly Soviet region before his death in 1988. At a barbecue held in the visitors' honor, Hibbs (right) and Leighton (second from right) celebrated the Tuvan New Year with their guests.

SOO-JONG REY, MS, PhD '88, will be returning to Seoul, Korea, in March, where he will join the Center for Theoretical Physics as a professor. He will also marry Seunghye Sunwoo, who is currently a lighting designer in New York City.

1991
MARK LYTTLE, of Decatur, Georgia, is now a graduate student and research assistant in materials science at the University of Virginia, where he plays left wing on the recently crowned intramural-champion floor-hockey team.

PAMELA JOY SHAPIRO, PhD, of Moscow, Idaho, was appointed to the faculty of the University of Idaho in September 1992. She completed a postdoctorate at Du Pont in Delaware. Her field is chemistry.

OBITUARIES

1926
SEERLEY G. KNUPP, on April 28, 1992. He is survived by his daughter.

1927
WILLIAM A. MINKLER, of Alhambra, California, on April 4, 1992. He is survived by Alice, his wife of nearly 60 years.

BERNARD N. MOORE, PhD '30, of New Haven, Connecticut, on October 20, 1992; he was 86. After graduating from Caltech, he did field work in the Rocky Mountains for the U.S. Geological Survey. He undertook exploratory field work in 1938 for the Caracas Petroleum Corp. and the Cia. Consolidada de Petroleo, and, in 1941, in Haiti and the Dominican Republic. In 1942 he joined Sinclair Venezuelan Petroleum Co. in Caracas, eventually becoming vice president and director of exploration. In 1959 he moved to the New York offices of Sinclair as chief of exploration. Both before and after the acquisition of Sinclair by the Atlantic Richfield Co. (Arco), he traveled extensively in the Middle and Far East as well as Africa and South America. He retired from Arco in 1969 and moved to the Westville section of New Haven in 1977. Martha, his wife of 60 years, died in 1991. He is survived by his brother, Gilbert; a son, David; and two grandsons, Sydney and Peter.

KEEP US INFORMED!

Keep us informed so we can keep your fellow alums informed. Send us news about you and your family, about a new job, promotion, awards—anything you'd like to see printed in the Personals section of *Caltech News*. Return this coupon and any additional materials to: *Caltech News*, Caltech Mail Stop 1-71, Pasadena, CA 91125.

Name _____

Degree(s) and Year(s) Granted _____

Address _____

Is this a new address? ____ Day phone _____ Occupation _____

News _____

1929

STANLEY W. LOHMAN, MS '38, of Denver, Colorado, on January 12, 1992. He carried out groundwater studies for the U.S. Geological Survey in Pennsylvania, Kansas, and Colorado, and in 1951 became the staff geologist and in 1956 the branch area chief for the Rocky Mountain area. He retired in 1974 as a senior research geologist, but continued part time until 1981. In addition to his principal disciplines of geology and hydrogeology, he was a musician, a mathematician, an electronics specialist, a photographer, a teacher, and a technical writer and editor with 70 reports to his credit. He authored *Ground Water Hydraulics*, which has undergone six printings, including one in Spanish, as well as several geologic reports for lay readers. He was a Fellow of both the Geological Society of America and the American Geophysical Union, and a member of numerous other scientific and geological organizations. He was the recipient of many honors, including the Distinguished Service Award of the Department of the Interior and the Distinguished Service Award of the Hydrogeology Division of the Geological Society of America. He is survived by Ruth, his wife of nearly 59 years; by sons William, Terry, and Robert; by his brother, Kenneth; and by seven grandchildren and four great-grandchildren.

1930

DONALD C. GRANT, EX, of Upland, California, on January 20, 1985. He was a retired Kaiser Steel mechanical engineer.

1931

REA A. AXLINE, of Rancho Santa Fe, California, on October 30, 1992. He was a retired business executive and a major financial contributor to the San Diego Museum of Contemporary Art. He was also a life trustee of the San Diego Museum of Art, a member of the Finance Committee of the San Diego Zoological Society, a member of the board of Scripps Memorial Hospital Foundation, and a member of the President's Council and a trustee of the UCSD Foundation. He was a member of the Associates of Caltech, and he was a life member and served on the board of directors of the Alumni Association. In 1976 he pledged \$1 million to establish the Rea A. and Lela G. Axline Professorship in Business Economics, in the Division of the Humanities and Social Sciences. He is survived by his wife, Lela.

JOHN R. MCMILLAN, of Pasadena, California, on November 1, 1992; he was 83. A retired oil-industry executive and consultant, he was considered one of the last of his generation of wildcatters. Over the years he worked for Barnsdall Oil, Fullerton Oil, Monterey Oil, Transwestern Pipeline, and Humble Oil and Refining, among others. More recently he had been president and chief executive officer of Reserve Oil & Gas. He served on President Richard M. Nixon's Petroleum Council and was a former president of the Western Oil and Gas Association. He was named Wildcat Oil Man of the Year in 1982. A former president of the Associates of Caltech, he in April 1989 pledged \$1.5 million to establish the Eleanor and John R. McMillan Professorship in Caltech's Division of Geological and Planetary Sciences, primarily to honor the memory of his wife, who had died the previous May. He is survived by his daughters, Linda Bozung and Laurie Dodson, and by three grandchildren.

T. ROBERT WHITE, of Palm Springs, California, on November 29, 1992; he was 83. He received his medical degree from Harvard and was a fellow at Johns Hopkins. He served his medical residency at Queen's Hospital in Honolulu, Hawaii, and later graduated from the U.S. Army Air Corps School of Medicine as a flight

surgeon. On April 18, 1942, he served as both flight surgeon and gunner on a B-25 bomber during the first American air raid on Japan, led by General James Doolittle. He was the first and only flight surgeon whose duties included flying as a gunner. When his plane crash-landed in the China Sea, he attended wounded airmen and escaped with the help of Chinese partisans. He received the Silver Star and the Distinguished Flying Cross, and his diary of the raid appeared in the June 1943 *Atlantic Monthly*. He also took part in the invasions of North Africa, Sicily, and Italy, and served in England. He was discharged as a major. He then practiced general medicine and surgery in Redlands, California, and Kailua, Hawaii. He was a member of Doolittle Raiders Inc.; the Adventurers Club of Honolulu, Hawaii; the Silvergate Yacht Club of San Diego; the American Medical Association; and the Pan Pacific Surgical Association. He is survived by his wife, Marjorie; a son, Nelson; a daughter, Victoria Whitehand; and five grandchildren and seven great-grandchildren.

1932

RUPERT A. BROWN, of San Marino, California, on July 28, 1992. He is survived by his wife, Phyllis.

1933

STERLING BECKWITH, PhD, of Menlo Park, California, on December 1, 1992; he was 87. He worked for the Los Angeles Metropolitan Water District, the Westinghouse Electric Corp., and the Allis Chalmers Manufacturing Co. He held more than 100 U.S. and foreign patents, mainly in the fields of hydrogen-cooled power generators, liquified-natural-gas transportation, and air-curtain multishelf frozen-food display cabinets for supermarkets; he also patented a multirotor helicopter that he test piloted himself, an electric-drive automobile, and a refrigerator using a supersaturated environment for the long-term storage of fresh foods and produce. He was the author of numerous scientific and technical articles, and he was a member of many professional organizations and honor societies. In 1958 he received the Lamme medal of the Institute of Electrical and Electronics Engineers for "his contribution to the art and science and design and application of rotating electric equipment." He is survived by Frances, his wife of 65 years; his son, Herbert; his daughter, Diana Gazis; and seven grandchildren and one great-grandchild.

GERALD L. HASSLER, PhD, of Los Angeles, on May 11, 1992. He is survived by his wife, Mildred.

1935

HENRY W. STOLL, of Mill Creek, Washington, on November 6, 1992. He worked for the Taylor Instrument Company in Rochester, New York, where he achieved an international reputation in process control. After retiring in 1974 he continued to consult for Eli Lilly in Indianapolis for 13 years, and he remained active teaching for the Instrument Society of America until his death. He is survived by his wife, Marjory; his sons, Henry, Howard, Donald, and Gerald; his daughter, Barbara Lindbo; 13 grandchildren and one great-granddaughter; and a brother, Robert.

1937

VERNON A. C. GEVECKER, MS, of Rolla, Missouri, on October 14, 1992. He was a retired faculty member of the civil engineering department of the University of Missouri at Rolla. He is survived by his wife, Mildred.

HUNG-CHANG YIN, PhD, of Shanghai, China, on November 30, 1992. He was honorary director of the Shanghai Institute of Plant Physiology, Chinese Academy of Sciences, and a member of that academy.

1938

ROBERT J. BARRY, of Pasadena, California, on October 24, 1992. He is survived by his wife, Doris; a son, William; two daughters, Barbara Blackman and Jane Balestri; four brothers; and six grandchildren and nine step-grandchildren.

1939

JOHN M. PEAT, JR., of Redondo Beach, California, on October 13, 1992. He served in the U.S. Army Air Forces during World War II, and later became a test pilot for the aerospace industry. He was an avid ocean-racing yachtsman and a member of the Los Angeles, St. Francis, and King Harbor Yacht Clubs. He is survived by his sister, Jean Alderton.

ROBERT A. SANDERS, MS '52, of

Shelbyville, Tennessee, on September 27, 1992. He is survived by his wife, Sara.

JOSEPH D. WINSTON, MS, of Los Angeles, on April 4, 1992. He is survived by his wife.

1940

FRANK W. (BILL) BROWN III, EX, of Kensington, California, on May 15, 1992; he was 77. He was a member of the American Association for the Advancement of Science, the Berkeley Camera Club, the Eastbay Astronomical Society, and the Chi Phi Fraternity of Cambridge, Massachusetts. He is survived by his wife, Sue; two sons, Richard and Lawrence; a daughter, Hope Bowles; a sister, Esther Fox; and four grandchildren, Michele, Lindsay, Matthew, and Robin.

FRANCIS MORSE, MS, of Wayland, Massachusetts, on October 4, 1992; he was 75. During World War II he worked at Lockheed Aircraft Corporation and later at Goodyear Aircraft Corporation in Akron, Ohio. In the 1950s he was employed by General Electric at their division in Pittsfield, Massachusetts. He was an active member in community and ecological groups, and in 1968 he ran for a seat in the Massachusetts House of Representatives. He was an advocate for a stronger United Nations, and an activist for peace during the Vietnam War. He is survived by Carmina, his wife of 47 years; their four children; and three grandsons.

1941

KIM HILL, JR., of La Cañada Flintridge, California, on March 2, 1992; he was 74. After graduating from Caltech, he studied law at USC, and later graduated from its school of business, becoming a CPA. He worked for Haskins & Sells and later for the Department of Defense Contracts Audit Agency, at JPL. He was very active in the Sierra Club, and with his wife hiked the local mountains almost daily. He was also a major collector, and had the nation's largest collection of classic boys' books, such as Tom Swift and the Hardy Boys. He was an active member in the Yosemite Association, the National Trust for Historic Preservation, and the American Institute of CPAs. He is survived by his wife, Louellen; two sons, Brett and Kevin; and a grandchild, Cody.

1943

STANLEY C. SNOWDON, PhD, of Wheaton, Illinois, on November 4, 1992. He is survived by his wife.

1945

WILLIAM F. TIERNAN, JR., MS, of Narberth, Pennsylvania, on November 23, 1990. He is survived by his wife, Jo Anne.

1946

JAMES L. MCCARTHY, of San Rafael, California, on May 24, 1992. He is survived by his wife, Huberta.

JOHN J. SUTYAK, of Pittsburgh, Pennsylvania, on June 5, 1992; he was 68. He retired in 1979 from Mesta Machine Company, where he had served as manager of research and development, and was a certified professional engineer in the Commonwealth of Pennsylvania. He was also a volunteer for the Boy Scouts of America. He is survived by his wife, Mary; a son, John; and a brother, Michael.

1947

JAMES S. LESKO, MS, ENG '48, of Mercer Island, Washington, on November 11, 1992; he was 71. After graduating from Caltech, he worked for Chance Vought on Long Island, New York, and spent five years with the Wright Aeronautical laboratories in Ohio. He joined the Boeing Company in December 1953 as an engineering supervisor, and after 29 years retired as a unit manager in systems engineering. He worked on the B-70 bomber, and later on the U.S. Air Force's Dynasoar, the forerunner of NASA's space shuttle. He is survived by his wife, Barbara Ann; three sons, Peter, Paul, and Andrew; two daughters, Julie Anna Kelley and Catherine Bersos; six grandchildren; a brother, John; and two sisters, Marie Grega and Helen Musante.

JOHN P. PRENDERGAST, of San Jose, California, on November 20, 1992; he was 70. He had been a student at Caltech for three years when World War II intervened. As a lieutenant in the Army Air Forces, he served as a radar officer. After graduating from Caltech, he briefly worked for the California Highway Department, then in 1948 moved to the California Water Service Co. in San Jose, where he rose from assistant engineer to assistant chief engineer before retiring in 1987. He is survived by his wife, Helen; two sons, Jeff and John; a grandson; and a brother, Robert.

1949

JAMES R. WILTS, MS, PhD '52, on August 31, 1992. He is survived by a brother, Herman.

1951

ARTHUR L. FREER, MS, of New Windsor, New York, on February 11, 1992. He is survived by a son.

1952

HENRY E. SUZUKI, MS, of Los Angeles, on December 17, 1992. He had served with U.S. Army Intelligence during World War II. He worked extensively throughout the Antelope Valley as a consulting civil engineer specializing in water-supply and water-distribution problems, and he was also involved with site surveying and subdivision engineering. He began his own company—Henry E. Suzuki Engineering, in Pasadena—in 1960. He is survived by his sons, James and John; his daughters, Judith Walters and Katherine Suzuki; two grandchildren, Amy and Carrie Walters; and four sisters, Agnes, Georgia, Lucy, and Magdalen.

1958

THOMAS O. THOSTESEN, MS, of La Crescenta, California, on October 31, 1992. He is survived by his wife, Sarah.

1962

ROGER E. MESSICK, PhD, of Cincinnati, Ohio, on May 12, 1992; he was 63. After graduating from Caltech he taught mathematics at Case Institute of Technology for four years and then taught mathematics, mechanics, engineering science, and computers at the University of Cincinnati for 22 years. He retired as professor emeritus in 1989. He is survived by his wife, Eleanore; two daughters, Myra Messick-Hersko and Lyla Messick; a granddaughter, Hannah; and his mother, Lillie.

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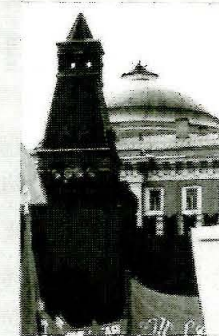
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