

UNRUH: The Reality of Higher Education

Jesse Unruh, an announced candidate for governor of California, called for more student participation in the "real world" in an address on higher education at Beckman Auditorium on November 25.

Unruh's address was part of a two-day "Leaders of America" program sponsored by the Caltech YMCA. During his two days on campus the minority leader of the California Assembly participated in three briefing sessions by Caltech faculty, an informal seminar in Winnett Lounge, and a noon talk on the Olive Walk.

In the Beckman lecture he attacked a proposal to charge tuition at the state universities and colleges and outlined an internship program that he felt would answer the demands of both activist students and their detractors.

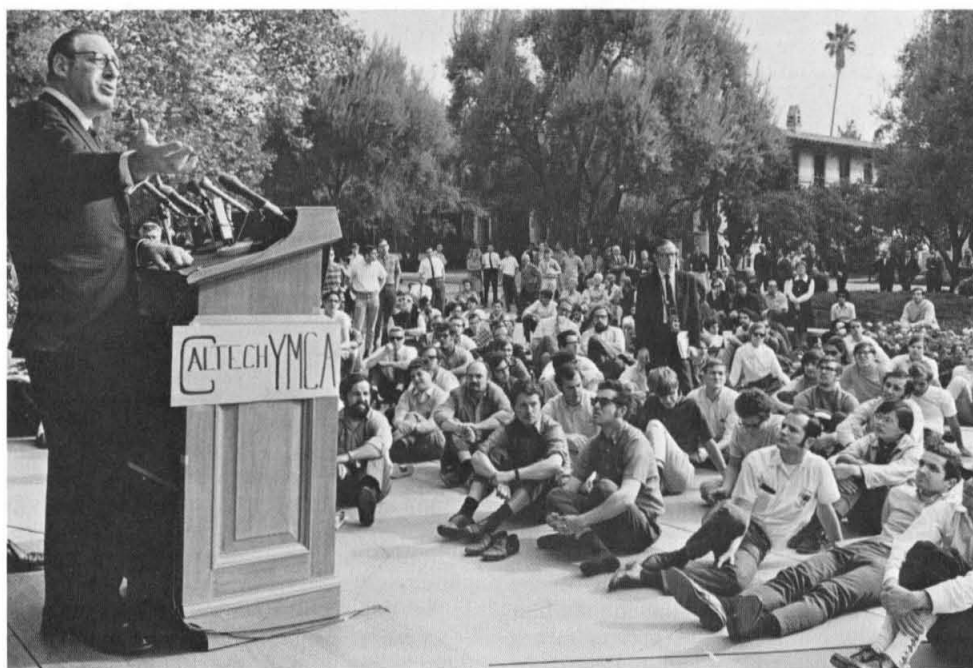
Unruh told the audience that "today's students are breaking out of their traditionally cloistered environments on their own to become active in community work, and to criticize both their educational institutions and their chosen pro-

fessions. They are objecting to the colleges' isolation from social and urban problems, the under-representation of nonwhite students, and the overemphasis on technical training at the expense of dealing with the social and human impact of the professions.

"Many students are struggling to attend school and earn a living at the same time, and they are finding it difficult to cope with an educational system which still reflects the philosophy that higher education is a bucolic, four-year hiatus from the real world and its material obligations. Students' concerns, in short, are really not that different from the rest of society."

Citing Caltech's student research center and its studies on elimination of smog and improvement of teaching methods in public schools as an outstanding example of how students can participate in the life of the community, Unruh said: "This need for participation in life and its evolution is a drive which we cannot afford

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A former CBS News president responds to Agnew's criticism of broadcast journalism.

"Second Sober Thoughts"

Fred W. Friendly Speaks of Agnew and American Television

Former CBS news president Fred W. Friendly, a member of Caltech's visiting committee for humanities and social sciences, spoke to a noontime Olive Walk crowd on November 21 in answer to Vice President Spiro Agnew's attack on television newscasters. His speech, "Some Second Sober Thoughts on Vice President Agnew," sponsored by the Caltech YMCA, called for more, not less, interpretive reporting. "We require bolder, not blander, illumination of the issues which divide men of reason," he said.

Friendly, now the Edward R. Murrow Professor of Broadcast Journalism at Columbia University, defended the TV analysis following President Nixon's latest Vietnam speech, then faulted himself for agreeing to postpone analysis of President Johnson's Tonkin Gulf speech in 1964.

"In spite of the pleas of our Washington bureau," Friendly said, "I made the decision to leave the air two minutes after the President concluded his remarks. I shall always believe that, if journalism had done its job properly that night and in the days following, America might have been spared some of the agony that followed the Tonkin Gulf Resolution."

Friendly told his Caltech listeners: "Where Mr. Agnew went astray, in my view, was in his suggestion that the media ought somehow to be a conduit for the views of the government, or merely a reflector of public opinion. He was not the first, nor the last, high official to equate fairness and the possession of great power with the obligation of conformity."

The ex-chief of CBS news said he shares the Vice President's view that television leaves something to be desired, and that the geographic and corporate concentration of power in broadcasting is a matter for concern. But he added: "He had the right target, but a misdirected aim. His criticism of broadcasters for centralization and conformity better describes the commercial system and its single-minded interest in maximum ratings. . . . This

system minimizes the presentation of hard news and analysis, leading the broadcast journalists into occasional overdramatization in the interest of impact." He went on to say that he believes some tendencies toward distortion do exist; however, the proper action of the government is not censorship but expansion and diversification of the broadcasting system and environment in which professional journalists work.

Friendly, who is also the Ford Foundation's adviser on television, called on Agnew to support a national public television network that would have the independence and high quality of England's BBC. Such a noncommercial system would require VHF channels in every major city and a budget of at least \$100 million a year. The money, Friendly said, could be raised through a tax on TV sets, as is done in England, or by contributions from the profits of commercial television.

NEW TRUSTEES

Caltech's board of trustees has elected four new members: George W. Beadle, 66, Nobel Prizewinner in physiology and medicine, former chairman of Caltech's division of biology, and director of the American Medical Association's Institute for Biomedical Research; Otis Chandler, 41, publisher of the *Los Angeles Times* and the third member of his family to serve on Caltech's board; Robert S. McNamara, 53, former Secretary of Defense and now president of the World Bank; and Ruben F. Mettler, 45, assistant president and executive vice president of TRW Inc. and chairman of President Nixon's task force on science policy. At their national meeting November 1 the trustees voted to increase the size of the board from 40 to 45 in an effort to represent a wider variety of interests from all areas of the country. The four new trustees bring the membership to 42.

NEWS IN BRIEF

DuBridge Professorship

The Associates of the California Institute of Technology have launched a fundraising project to establish and endow a Lee A. DuBridge professorship in honor of the Institute's former president, who is now President Nixon's special assistant for science and technology. The Associates are a group of public-spirited citizens (now numbering about 400), interested in the advancement of learning, who were incorporated in 1926 as a non-profit organization "for the purpose of promoting the interests of the California Institute of Technology." While they hope that the professorship may be rotated among the various fields of scholarship at Caltech, The Associates would like their first candidate to be someone whose interests are "in an area of biological sciences in which an understanding of behavior is important or in an area of science or technology which is closely associated with Dr. DuBridge's career or interests."

Arms Talks

Harold Brown is a member of the six-man delegation appointed by President Nixon to represent the United States at a series of strategic arms limitation conferences with the Soviet Union. Brown, accompanied by his wife, Colene, arrived in Helsinki November 12 for the first of the talks, designed to determine topics, ground rules, and a meeting place for future discussions. President Brown says he will probably not participate in the talks more than once a year.

Honorary Degree

Harrison S. Brown, professor of geochemistry and of science and government, received an honorary Doctor of Science degree from the University of Cambridge on November 1, which marked the 150th anniversary of the Cambridge Philosophical Society.

Armin Deutsch

Armin J. Deutsch, astronomer at the Mt. Wilson and Palomar Observatories since 1951, died November 11 of a heart ailment and complications. Deutsch, a staff member of the Carnegie Institution of Washington and of the Royal Astronomical Society, studied the composition and rotation of stars, star clusters, cool stars with unusual chromospheric activities, and a group of magnetic stars called peculiar A stars. He also discovered that giant red stars generate great stellar winds which carry matter through space.

Community Relations

Aron Kuppermann, professor of chemical physics, has been appointed by Harold Brown to head Caltech's administrative committee on community relations. Kuppermann and the Institute's director of community relations, James Black, will work with interested persons and groups in Pasadena and southern California in improving the "physical, educational, social, and economic environment" of the community. The committee will intensify its efforts in the areas of public education and the quality of the Los Angeles Basin environment.

Chemistry Award

Cornelius Pings, professor of chemical engineering, won the \$1,000 Professional Progress Award for 1969 from the American Institute of Chemical Engineers. The award recognizes his work in "theoretical and experimental developments in the fundamental behavior of fluids, particularly in the critical region."

Lecture Grant

The Shell Oil Companies have given a \$5,000 grant to finance one or two lectureships at Caltech in 1970. They will involve a series of technical lectures for students and faculty, possibly on the topics of aircraft noise and large-scale fires, and a general lecture open to the public in Beckman Auditorium. The Shell Oil Companies are members of Caltech's Industrial Associates.



Assembly minority leader Jesse Unruh

UNRUH: "The physical solutions are before us..."

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to ignore. In fact, I think we would do well to incorporate this desire directly into our higher educational system as a means of reconnecting the university with the real world by giving the student a sense of participation in society rather than increasing his alienation from it."

In his talk on the Olive Walk the following day, Unruh said he had learned a great deal from the "educate-the-governor program," as the *Los Angeles Times* called his briefings at Caltech, and said he was impressed by the fact that "we had overcome some of the problems we were told were impossible to overcome... I believe if we really want to solve our problems, the physical solutions are before us, and most of them are with us today."

In the first briefing session, "The Future of Science," Unruh heard faculty members George Hammond on "the problem of

priorities," Lester Lees on "understanding complex systems," Ray Owen on "biology and biomedical problems," and Fred Thompson on "a bridge between biology and social science."

In the second session, "Man and His Environment," he heard Norman Brooks on "coastal pollution control," James Morgan on "the chemical quality of the environment," Jack McKee on "waste management," John Seinfeld on "air quality," and Wheeler North on "man's impact on marine ecology."

In the final briefing session, Unruh listened to approaches to "Economic and Social Problems" from Roger Noll on "ghetto unemployment," John Benton on "community action," Murray Gell-Mann on "the reform of education," Lance Davis on "new political coalitions and social choice," and Robert Oliver on "public finance and local politics."

Students, Alumni Discuss Housing

The current presidents of Caltech's seven student houses; 17 alumni (all former house presidents); and trustees Arnold Beckman, Henry Dreyfuss, and William Zisch met at a dinner on November 12 to discuss the good and bad aspects of on-campus student housing.

Chip Smith, president of Page House, gave a talk in which he indicated that in spite of existing problems of noise and overcrowding most students find on-campus living more congenial than is generally supposed.

The dinner was part of a continuing program designed to bring alumni and students together in small groups. Two more discussions, one on the "student research associates" who came from predominantly black colleges to work at the ASCIT Research Center, and one on athletics at Caltech, are scheduled for next term.

CALTECH NEWS

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Race For Clean Air

New kinds of lower pollution vehicles—electric, steam, turbine, hybrids, etc.—will compete in a Clean Air Car Race scheduled to run over public roads between California and Massachusetts in September 1970.

An outgrowth and expansion of the Great Electric Car Race in the fall of 1968 between cars built and operated by students at Caltech and MIT, the clean air car race will be open to vehicles designed and built by any organization, including commercial and foreign groups.

The competition will consist of three parts: short distance events emphasizing performance, safety, and energy consumption; a race from MIT to Caltech; and air pollution emission measurements to be made in California at the conclusion of the cross-country race. Prizes will be awarded to the winner of each phase as well as to the over-all winner.

Organizers of the contest, Richard B. Thornton, MIT professor of electrical engineering, and Jerome Shapiro, Caltech professor of applied science, have set the entrance deadline at February 28, 1970. Prospective contestants should contact either organizer and obtain a copy of preliminary rules from the public relations offices of either institution. No vehicle will be barred provided it produces less air pollution than is specified by the 1974 California standards.

Football Is Still Fun At Caltech

On a chilly autumn afternoon in 1869 a rugged bunch of moustached students from Princeton and Rutgers took part in a roughnecked, free-for-all variation of English rugby that has come to be known as American football. Although the "game" was only slightly more refined than a street fight, no one called the cops.

A hundred years after that first Princeton-Rutgers match, a relatively clean-shaven squad of Caltech students took on a combination of freshmen and sophomore players from Claremont-Harvey Mudd and came out on the short end of a 34-0 score.

The setback from Claremont-Mudd marked the finale of a winless season for the 28-man Caltech team, but, to a man, they were ready to give it a try again next year. Coach Tom Gutman, a man of great hopes and even greater patience, said: "This was a building year. Next season we will have more experience, and, if the alumni give us some help, we will have more players."

Gutman had words of praise for his seniors led by team co-captains Alan Beagle and Dennis Pucekay, who had tasted victory only once in four years (last year against UC San Diego, in its first—and only—season of football). Other seniors, who did yeoman duty on offense and defense, included Bob Vance, Eric Jensen, and John Messmer. Gutman also singled out the "bearded one," Mike Brennan, for his efforts as fullback. Probably the most harried player on the field in Caltech's final effort of the season was freshman quarterback Bob Bales who spent his time running for his life on offense, and trying to stop opposing ends a foot taller from catching the ball on defense.

Bales and the rest of the freshmen on the Caltech squad will probably face some long afternoons in the next three years. They will not play before sellout crowds in the Coliseum, nor will they see their names in headlines from coast to coast. But they will have fun; and that is what the boys from Rutgers and Princeton really had in mind when they got together that afternoon in 1869.

Placement Assistance To Caltech Alumni

The Caltech Placement Service may be of assistance to you in one of the following ways:

- (1) Help you when you become unemployed or need to change employment.
- (2) Inform you of possible opportunities from time to time.

This service is provided to alumni by the Institute. A fee or charge is not involved.

If you wish to avail yourself of this service, fill in and mail the following form:

To: Caltech Placement Service
California Institute of Technology
Pasadena, California 91109

Please send me: (Check one)

- ☐ An application for placement assistance
- ☐ A form indicating a desire to keep watch of opportunities although I am not contemplating a change.

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Degree(s) Year(s)

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Membership in the Caltech Alumni Association (\$10 a year) brings:

- *Engineering and Science* magazine seven times a year
- Alumni Directory
- Athenaeum membership privilege

ARTICLES IN THE NOVEMBER ENGINEERING AND SCIENCE MAGAZINE

- *In 1969—Two Nobel Prizes*
Biologist Max Delbrück and physicist Murray Gell-Mann become the Institute's twelfth and thirteenth winners.
- *Delbrück: Conscience, Goad, and Sage*
While looking for a paradox he never discovered, he helped found molecular biology and inspired hundreds of colleagues to emulate his own high standards of scholarship.
- *Gell-Mann: Order Out of Chaos*
His three major contributions have given hope that man may someday understand what matter is really made of.
- *The Inauguration of Harold Brown*
- *Caltech: A Singular Opportunity*
by Harold Brown
The Inaugural Address
- *The Death of a Star*
by Kip S. Thorne
A star is only a glowing pause in the inescapable contraction of a gas cloud to an uncertain, sometimes fantastic, end.

ALUMNI DONORS

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In November 1967 Caltech announced the beginning of a major development program. The response of alumni and parents concerned with the future of the Institute has been most gratifying. To all those alumni and parents, listed on the following pages, who have generously supported the growth of Caltech, I give my sincere thanks.

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1913
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Duncan L. Hooper
George W. Housner
Ernest R. Howard
Robert A. Howard
Paul L. Kartzke
Fred Kurata
Elvin B. Lien
John R. Little*
Gilbert McCann
William C. McFadden
Henry A. Mitchell
Bryant E. Myers
Garth F. Nicolson
Franklin F. Offner
Warren L. Patton

Edwin W. Paxson
John F. Pearne
Jeffrey A. Wineland
John Read
John A. Romoli
Donald R. Rooke
G. Foster Rucker
Frank A. Schaak, Jr.
J. Robert Schreck
Robert P. Sharp
John E. Sherborne
Darrell H. Sluder
Louis Stevenson
Nick T. Ugrin
Edgar J. Wheeler
Charles E. White
Roland J. White
W. Wayne Wilson

1935
Horace W. Baker
Wallace M. Beakley
Alan Beerbower
Horace W. Davenport
Albert O. Dekker
Edward H. Dennett
Norman B. Dewees
Oliver C. Dunbar
Eugene L. Edwards
Carl R. Estep
Harry Estes
Arthur N. Etz
Gordon R. Ewing
Hans H. Fuhrmann
Robert G. Fussell
Clifford S. Garner
Howard P. Gluckman
James J. Halloran
John B. Higley
Jesse E. Hobson
Arthur T. Ippen
Richard H. Jahns
James H. Jennison
Robert G. Jones
Milo C. Ketchum
Robert L. Kramer
Chester W. Lindsay
Howard M. McCoy
Daniel H. Miller
Nelson P. Nies
Kenneth S. Pitzer
Warren T. Potter, Jr.
Louis T. Rader
A. Allen Ray
Donald H. Ricketts
John Ritter
Jack M. Roehm
James S. Russell
Ivan V. Scherb
Robert K. Seidel
Sander D. Sheff
Norwood L. Simmons, Jr.
Alfred L. Slater
Robert M. Stanley
Laurence J. Stuppy
Jay C. Taylor
Charles F. Thomas
Charles S. Thompson, Jr.
Bernard B. Watson

1936
Harold H. Bassett
Albert G. Bodine
C. M. Bolster
Raymond H. F. Boothe
Kenyon T. Bush
Hugh F. Colvin
William C. Cooper
Frank W. Davis
Holley B. Dickinson
Robert P. Dilworth
Malcolm E. Douglass
Louis G. Dunn
Minor L. Fahrman
Stuart R. Ferguson
William A. Fowler
James M. Fox
Robert I. Gardner
Ernest W. Graham
David Harker
Ralph L. Haver
Charles O. Heath
Robert G. Heitz
Ivar E. Highberg
Ray Jensen
Robert L. Jerauld
Charles B. Jordan
Edward J. Kasnicka
M. Smoot Katow
John P. Klockslem
Peter E. Kraght
Thomas Lauritsen
Robert H. Marsh
Hugo A. Meneghelli
Conrad R. Muller
Perley G. Nutting
William E. Oberholtzer, Jr.
Jack Paller
Newell Pottorf
Simon Ramo
O. James Salisbury, Jr.
Sidney Schafer
Paul J. Schneider
Fred B. Stitt
Tyler Thompson
Theodore Vermeulen
Donald L. Webb
Reuben E. Wood
Dean E. Wooldridge
Donald L. Young
Don Z. Zimmerman

1937
John R. Austen
Joseph Axelrod
Robert A. Becker
Irving Berler
Richard T. Brice
Roland A. Budenholzer
John K. Bussey
Don C. DeVault
John S. Edwards, Jr.
Warren E. Fenzi
I. Stanley Feuer
John W. George
Daniel L. Gerlough
LeVan Griffis
Charles F. Hadley
Dale R. Harris
Edward J. Horkey
James A. Hurst
Donald H. Hyers
Robert B. Johnston
Jasper R. Leggett
Paul E. Lloyd
Robert M. Mahoney
W. G. McSparran
Robert G. H. Meyer
Wendell B. Miller
Walter L. Moore
Alfred E. Munier
Dean Nichols
Joseph J. Peterson
Martin J. Poggi
David Pressman
Fremont Radcliffe
Richard L. Ridgway
John S. Rinehart
T. R. Sandberg
Robert S. Schairer
Leonard F. Schombel
John R. Schultz
Daniel G. Schuman
Wilbur F. Snelling
Foster Strong
Meyer J. Test
Robert D. Townsend, Jr.
Vsevolod Tulagin
Bernard Walley
Hugh F. Warner
Martin H. Webster
William O. Wetmore
Walton A. Wickett
Harold F. Wiley
Charles C. Woolsey, Jr.
Peter H. Wyckoff
W. Gordon Wylie
Shao-Wen Yuan

1938
Robert J. Barry
Elliott P. Bennett
Theodore A. Bertness
Sidney Bertram
Waldo M. Claflin
Roger H. Cowie
Robert S. Custer
Donald D. Davidson
Robert C. Davidson
Leverett Davis
Munson W. Dowd
Arthur C. Downing
Armand F. DuFresne
William B. Elconin
Norman Elliott
Herbert B. Ellis
Eugene Eyster
Carl F. Friend
Oran A. Graybeal
Newman A. Hall
Clyde W. Harris
Paul C. Henshaw
Henry S. Hopkins
Carlton L. Horine
Nickolas G. Ivanoff
Samuel S. Jack
Stephen J. Jennings
Ralph W. Jones
Albert E. Jurs, Jr.
Henry O. Kruse
Dalimil Kybal
Peter R. Kyropoulos
Edwin Lassette
Noble R. Maines
John G. McLean
John L. Merriam
Robert G. Metzner
William E. Milburn
Frederic H. Moore
Henry T. Nagamatsu
William F. Nash, Jr.
Harper Q. North
J. Kneeland Nunan
Robert H. Olds
George H. Osborn
Kenneth J. Palmer
Donald L. Putt
H. Hollis Reamer
Richard Rosencranz, Jr.
H. S. Seifert
Clay T. Smith
Donald S. Taylor
Paul O. Tilker
James W. Van Horn
William B. Voss
Edward L. Weinberger
Joseph Westheimer
Gardner P. Wilson
Saul Weinstein
Stanley T. Wolfberg

1939
Gustave A. Albrecht
Clarence R. Anderson
Noah H. Anderson

Basil P. Antonenko
Edgar L. Armi
George Asakawa
Leo R. Beard
Carrol M. Beeson
Steven E. Belsley
Richard H. Bishop
John W. Black
William H. Bonell
Richard R. Bradshaw
Claude H. Brown, Jr.
Perry H. Brown
William L. Brown
William R. Cabeen
Joseph Carlton
Charles F. Carstarphen
George O. Crozier
Harry O. Davis, Jr.
Herman S. Englander
John C. Evvard
Andrew Fejer
Harold S. Fischer
J. Louis Fredrick
J. Scott Gassaway
Jack H. Goodell
Harold V. Hance
Robert W. Haussler
Franklin R. Hepner
Frederick C. Hoff
Norman H. Horowitz
Frederick D. Knoblock
Ole Lilleland
Harlowe J. Longfelder
Harry Majors, Jr.
Tyler R. Matthew
Frank E. McCreery
Walter H. Munk
Simon Pasternack
Carlton H. Paul
Richard K. Pond
Frank Radovich
L. James Rainwater
Josiah E. Smith
Paul L. Smith
Philip E. Smith
Willard M. Snyder
Arthur J. Stosick
Edwin F. Sullivan
Robert F. Tangren
John F. Tatom
Neal W. Thomas
J. Norton Wilson
Donald N. Yates
U. E. Younger

1940
Sherwin P. Avann
Raymond C. Baird
Erwin Baumgarten
F. W. Beichley
Dwight H. Bennett
Robert R. Berlot
Cydnor M. Biddison
Roswell J. Blackinton
Leo Brewer
George R. Brown
William E. Brown
Clifford C. Burton
Lee S. Christie
Raymond O. Clinton
Sheldon C. Crane
James V. Crawford
Harold B. Crockett
Leo Davis
Frank W. Dessel
Edward O. Dickerson
John A. Dilworth III
Russell Doolittle
Ludwig I. Epstein
A. Finley France III
Irvine F. German, Jr.
Robert A. Gewe
James B. Glassco
Robert B. Glassco
Lloyd T. Goodmanson
Robert W. Grigg
Alfred V. Guillou, Jr.
Eustace P. Hetzel
Harold E. Heywood, Jr.
Gilbert W. Hofeller
Riley C. Horne, Jr.
W. C. House
John W. Jackson
Millard W. Jacobs
Geoffrey L. Keighley
L. James Kemp
John H. Keyser, Jr.
Stuart A. Krieger
Ellis Lapin
Walter R. Larson
Willys Lemm
Donald E. Loeffler
Bernard Love
Robert B. Meyer
Harold S. Mickley
Park Hays Miller, Jr.
Robert S. Moore
Francis Morse
Darragh E. Nagle
Yoshinao Nakada
Douglas B. Nickerson
Frank Olney
Shih-I Pai
Ralph G. Paul
Miller W. Quarles, Jr.
Raymond G. Richards
Hubert D. Samuel, Jr.
W. Bertram Scarborough
E. Wilbur Silvertooth
Randlow Smith
Robert E. Spear
Dumont S. Staatz
David H. Steinmetz III
Homer J. Stewart
Newton C. Stone
Frank Streightoff
Herbert C. Sumner
George J. Todd
Kiyo Tomiyasu
David J. Varnes
Richard L. Walker
Don L. Walter
Dana B. Waring
A. R. Wasem
Alan T. Waterman, Jr.
Robert W. Wayman
Theodore Weaver
Gordon B. Weir
Robert L. Wells
H. Jack White
David W. Whittlesey
Victor Wouk
Robert B. Young
Luke Chia-Liu Yuan

1941
Roy M. Acker
Howland H. Bailey
Alfred J. Bersbach
Glenn W. Billman
Robert R. Bowles
Hugh Bradner
George H. Bramhall
Woodburn A. Brown
Robert Buss
Carl A. Carlson
John H. Carr
William F. Chapin
Buck-Sam Chu
Frederick W. Clarke
William H. Corcoran
Carl F. Damberg
Walter Z. Davis
Donald E. Dawson
Willis E. Dobbins
Quentin Elliott
Merritt V. Eusey, Jr.
Paul S. Farrington
Walter E. Fellers
Robert E. Fisher
Glyn Frank-Jones
Sidney K. Gally
John E. Goode, Jr.
Martin J. Gould
Alex E. S. Green
Francis M. Greenhalgh
George A. Hardenbergh
James T. Harlan, Jr.
George B. Harr
William B. Hebenstreit
John B. Hiatt
Kim Hill, Jr.
Tom Hudspeth
Carol K. Ikeda
Homer Jacobson
Charles B. Johnson
Gilbert A. Jones
Jeremy A. Jones
John T. Jordan
R. E. Kingsmill
Emerson H. LaBombard
E. A. Lakos
Robert B. Leighton
Joseph W. Lewis
Donald S. Nicholson
Newell T. Partch
John G. Partlow
John J. Paulson
John M. Richardson
Joseph F. Rominger
Claud S. Rupert
Virgil E. Sandifer
Alfred Schaff, Jr.
Edward E. Shelton
Richard S. Shevell
Reuben P. Snodgrass
Stanley E. Sohler
John D. Spikes
H. Guyford Stever
William T. Stewart
Robert F. Strickler
Leland G. Swart
Frederick W. Thiele
Eben Vey
Austin L. Wahrhaftig
Edwin P. Wald
Robert H. Weight
Joseph Weiss
Thomas H. Wiancko
Lawrence C. Widdoes

1942
Albert P. Albrecht
Robert D. Altmaier
Robert E. Anderson
Thomas G. Atkinson
Edward R. Bartlett, Jr.
Frederick K. Bauer
Andrew A. Benson
John A. Brockman
David H. Brown
Sheldon W. Brown
Victor G. Bruce
Stanford Church
Richard H. Cox
Stewart Davis
Frank A. Fleck
Joseph B. Franzini
John C. Freeman, Jr.
Frank I. Given
S. Kendall Gold
Robert W. Goldin
Allan L. Grossberg
Arnold L. Grossberg
Robert N. Hall
Wendell W. Harter
Lawrence A. Hanson, Jr.
Alfred B. Head
Willard J. Hendrickson
William B. Hicks
Benjamin F. Howell, Jr.
Jack H. Irving
Donald K. Jephcott
Alexander S. Jerrems
Emerson L. Kumm
Murray L. Lesser
George W. Lind, Jr.
Philip B. Lutz
Francis V. Lyle
Wayne MacRostie
Gershom R. Makepeace
Adrian S. Mayer
Richard W. McCornack
Paul S. McKibben
Henry W. Menard, Jr.
Robert T. Merrick
George F. Meyer
John W. Miles
Walter P. Mitchell
Enver M. Muradoglu
Peter L. Nichols
Richard M. Noyes
Pichel W. Pichel
Myron Pollycove
John H. Rubel
Carl H. Savit
Kenneth D. Schureman
Irvin P. Seegman
Jack C. Smith
Robert R. Staley
Leo Stoolman
Maynard Strader
Everett P. Tomlinson
Kenneth Urbach
E. W. Van Ness
Roy C. Van Orden
Carol M. Veronda
LeRoy A. Weller
Edgar P. Williams
Frank W. Wood

1943
Leonard S. Alpert
Earle R. Atkins, Jr.
John W. Bacon, Jr.
Edward R. Ban
N. A. Begovich
Arthur D. Belmont
Amasa S. Bishop
Leon Blitzler
John W. Buchanan
Theodore D. Buettell
Redgnald D. Bushell
Claude L. Carter
Joseph V. Charyk
Warren L. Christianson
Loren W. Crow
Mitchell H. Dazey
Peter Dehlinger
Charles J. DeLancey
Clyde A. Dubbs
Stanley A. Dunn
Leonard B. Edelman
Albert T. Ellis
David A. Elmer
Clarence E. Erickson
Howard N. Farmer, Jr.
Edgar W. Flavell
Edward P. Fleischer
Harold K. Garner
DeWitt R. Gayle
Jesse B. Graner
George D. Griffith
Hollis K. Hanchett
Willard M. Hanger
Arthur Hilsenrod
James B. Hull
Kenneth W. Johnson
W. Lawson Jones
George A. Kendall
David J. Klein
Robert V. Langmuir
Herbert A. Lassen
John Laufer
Theodore G. Lawrence
Thomas S. Lee
Richard M. Lemmon
David A. Lind
Harrison C. Lingle
Malcolm Mason
Charles G. McGee
William H. McNeely
Melvin L. Merritt
Paul R. Moore
Samuel P. Morgan
Arthur B. Pardee
Ernest L. Patterson
Kenneth L. Powlesland
Lloyd C. Pray
Lewis W. Rambo
Ralph R. Rau
Alexander C. Ridland
Roland Saye
Richard Schamberg
Arthur J. R. Schneider
Robert M. Sherwin
William Snyder
John R. Spencer
Jack D. Stephenson
Paul G. Thiene, Jr.
Ernest Wade
Charles D. Wagner
John P. Warnken
Allen D. Weeks
David F. Welch
Wayne S. Wheelock
John E. Wissinger
Stanley G. Wood
James A. Young, Jr.

1944
Warren H. Amster
Tway W. Andrews
Holt Ashley
William P. Bair
Frank A. Barnes
Elvis E. Beauchamp
James E. Broadwell
Ross A. Buchanan
Joseph S. Buller
Willis A. Bussard
H. J. Cabral
Howard H. C. C. Chang
Dean R. Chapman
Robert S. Clark
Clifford I. Cummings
William R. Davis
John M. Debevoise
Douglas G. Dethlefsen
Howard H. Dixon
Joseph B. Earl
Albert B. Furer
Richard H. Gilman
Forrest R. Gilmore
Bert H. Golding
Clarence H. Grasso
Leon Green, Jr.
Donald T. Greenwood
Lewis L. Grimm
Wilbur L. Hall
Garman Harbottle
Harry J. Heimer
W. David Hinton, Jr.
Lawrence U. Hudson
Charles Warren Hunt III
William G. Jackson
Ronald S. Johnson
David R. Jones
Jack R. Kettler
Robert W. Lester
Richard H. Lockett
William E. Lockwood, Jr.
Neville S. Long
Robert W. Mapel
Ralph W. Marshall, Jr.
Joseph S. Martin
George D. McDonald
Ruben F. Mettler
Knox Millsapa
John A. Mitchell
Robert K. Mitchell
Fred W. Morris, Jr.
John B. Nelson
James C. Nicholson
Thomas W. Norsworthy
Wheeler J. North
Francis E. Odell
George M. Osgood
Theodore B. Parker
Robert J. Parks
Ralph B. Pastoriza
Eugene W. Peterson
Bruno H. Pilorz
Eugene F. Pischel
H. Brian Proctor
Robert O. Randall

John R. Rempel
Ralph S. Riffenburgh
Frederick T. Sadler
Wesley R. Sandell
LeRoy Sanders, Jr.
Raymond A. Saplis
Willard R. Scott, Jr.
Richard W. Seed
George G. Shor, Jr.
Harrison W. Sigworth
Frank C. Smith, Jr.
George F. Smith
John J. Sogorka, Jr.
Richard J. Soike
Joseph Solomon
Albert T. Spaulding
William A. Tookey
James Tuedio
John R. Ukropina
Clarence L. Welliver
Paul H. Winter
Allen E. Wolfe
Donald Wyckoff

1945
Dale H. Austin
Eldon C. Beagle
Robert R. Bennett
Howard A. Booth, Jr.
Charles W. Bozarth, Jr.
Harry W. Brough III
Billy F. Burke
James D. Burke
Stanley D. Clark
Charles R. Cutler
Walter B. Dandliker
F. Miles Day
Richard A. Dean
Frank J. Dore, Jr.
William H. Eberhardt
Albert A. Erkel
George S. Fenn
Wallis T. Fleming
William E. Frady
Albert S. Fulton
Paul R. Gardner, Jr.
John H. Gerpheide
James W. Hadley
Jerome S. Harrington
Richard V. Henry
Richard C. Honey
William F. Hornyak
Clive T. Jackson
Robert J. Kieckhefer
Leslie H. Levin
Charles N. Levy
Wallace A. Lien
Arthur L. Lowell
Donald D. MacDougall
Norman J. Magneson
Richard G. Markham
William C. McDonell
Duane T. McRuer
Walter L. Murphy
Richard F. Neerken
M. Whitney Nesbitt
Warren H. Parker, Jr.
Lowell C. Parode
Robert E. Phillips
Richard J. Reed
Wayne A. Roberts
Robert Y. Scapple
A. Dale Scarbrough
Harris M. Schurmeier
Eugene L. Scott
Dudley B. Smith
John L. Stern
Charles Arthur Teets
Donald C. Tillman
Merle G. Waugh
Ralph Simpson White
Carl P. Wiedow
George M. Wilhelm
Merritt A. Williamson
Clarence J. Woodard
Ernest B. Wright

1946
John H. Altseimer
John B. Anderson, Jr.
Robert F. Blocker
Robert D. Bonner
Elmore G. Brolin
John J. Burke
William W. Butler
Andrew B. Campbell
Edward E. Carr
Roger W. Clapp
Charles W. Cole
Donovan C. Davis
Joseph B. Deodati
William E. Ditch
Keith N. Doig
Donald A. Dunn
Lincoln K. Durst
Paul C. Durup
Douglas S. Ellis
Frederick C. Essig
James C. Evans
Jerome S. Field
John E. Fleming
Conrad T. O. Fong
Mike W. Fossier
Yoshiyuki J. Fujimura
Frank S. Gates
Theodore S. Gilman*
James W. Glanville
Theodore R. Goodman
Norman A. Gottlieb
Howard L. Greenfield
Norman R. Greve
Charles W. Griffing
Luther A. R. Hall
William F. Horton
Edward S. Ida
Louis K. Jensen
Howard E. Jessen
Paul J. Jurach
Richard P. Lagerstrom
Frank H. Lamson-Scribner, Jr.
Harold C. Larsen
Bernard B. Levitt
Charles H. Lewis
David C. Lincoln
Samuel T. Martner
James L. McCarthy
C. R. McEwen
G. Donald Meixner
Richard A. Montgomery
Howard W. Morgan, Jr.
John O. Nigra
Henry T. Ponsford
G. Robert Pool, Jr.
Edwin Pounder
Maurice M. Rapport

Eberhardt Rehtin
Carl Richardson
Paul C. Ricks, Jr.
Robert L. Schrag
Richard P. Schuster, Jr.
John D. Seagrave
John W. Sease
Allen E. Seneat
John S. Showell
Richard A. Smith
Harry M. Steele, Jr.
Basil G. Stergis
Milton A. Strauss
H. William Strong, Jr.
Richard M. Tunnell
Stuart A. Warren
George P. Weber
David Whitlow
Charles Williams
Howard R. Woods
Jerry A. Zagorites

1947
Norman C. Appold
Paul G. Atkinson, Jr.
Charles E. Auerbach
Robert O. Barkdoll
Floyd K. Becker
Robert C. Belyea
Dudley E. Bennett
John S. Billheimer
Zegmund O. Bleviss
Richard A. Boettcher
Arthur S. Bolles
Alfred B. Brown, Jr.
Harry P. Brueggemann
Latham L. Brundred, Jr.
Charoen Charoen-rajapark
Roderick K. Clayton
William C. Cooley
Edwin J. Cowan
C. Burton Crumly
Harold M. DeGroff, Jr.
Orin J. Demuth
David L. Douglas
Wesley M. Dynes
Morris Feigen*
Richard L. Felberg
Edward A. Flanders
Darwin L. Freebairn, Jr.
Edward W. Garrison
Richard C. Gerke
George E. Gompf
Donnell H. Gould
Donald I. Granicher
William D. Graziano
Lee M. Griswold
David Hagelbarger
Elmer E. Hall, Jr.
George F. Hardy
Robert B. Harris
David S. Hatcher
Langdon C. Hedrick
Merwyn E. Hodges
John D. Holmgren
Kenneth F. Holtby
Robert M. Ilfeld
Paul B. Johnson
Robert W. Kenney
Seymour Lampert
Harvey J. Lawrence
H. Kirk Lewis
Bart N. Locanthi
Le Val Lund, Jr.
Robert S. MacAlister, Jr.
Richard H. MacNeal
John L. Mason
Thomas R. McClellan
Gordon McClure
Andrew W. McCourt
Robert R. McDonald
Charles H. McDougall, Jr.
George B. Melrose, Jr.
Charles N. Miller
Thomas G. Monroe, Jr.
Return F. Moore
Albert H. Mueller
Conrad N. Nelson
John B. Opfell
David R. Opperman
Norman C. Peterson
Carl F. Rasmussen
David C. Regnery
Harold E. Rice
Will Richeson, Jr.
Robert K. Roney
Fred E. Rosell, Jr.
Joseph Rosener, Jr.
Anatol Roshko
Herbert N. Royden III
William T. Russell
Henry W. Schroeder
Jarvis L. Schwenneesen
Leon Shenfil
George D. Shipway
David P. Shoemaker
Carter Sinclair
Lyle D. Six
Frederick Stevens, Jr.
Donald Stewart, Jr.
Loren F. Stringer
Clayton R. Sturdevant
Francis D. Sullivan
Calhoun W. Sumrall
Peter Swerling
John P. Terry
Milton D. Van Dyke
Jerry D. Ward
Dean A. Watkins
Jerard B. Werner
Thomas N. Wilson
Barton C. Wood
Eric J. Woodbury
Warren S. Wooster
Richard D. Young

1948
Mihran S. Agababian
Matthew J. Altenhofen
John J. Attias
Niels J. Beck
Earl Beder
Julius S. Bendat
James R. Brown
Robert J. S. Brown
John M. Buchanan
James L. Buhler
J. Sage Burrows
Stuart M. Buttler, Jr.
William W. Carter
Warren A. Christopherson
Donald E. Coles
Eugene W. Cowan
Arthur N. Cox
Daniel H. Deutsch

Edwin B. Dickson
William J. Dixon
William A. Drew
Lorne C. Dunsworth
Phillip Eisenberg
Howard L. Engel
Francis E. Fairman III
Alfred P. Fay
Richard A. Ferrell
Paul W. Fullerton, Jr.
Yuang-Cheng Fung
Robert C. Gaskell
Bruce D. Gavril
George J. Gleghorn, Jr.
Gordon H. Goff
Reed A. Gray
Howard W. Green
Fred C. Gunther
Thomas H. Hamilton
Warren D. Harrison
Kenneth W. Hedberg
Keith W. Henderson
Robert Henigson
George S. Holditch
Alexander F. Holser
Robert C. Hopkins
Paul J. Howard
George L. Humphrey
Martin Hybertsen
Harold S. Johnston
Abner Kaplan
Jack W. Keuffel
Robert I. King
Howard B. Lewis, Jr.
Donald M. Lilienthal
Donald E. Lovelace
Paul B. MacCready, Jr.
Irwin L. Markowitz
Sol Matt
Raymond A. Maurus, Jr.
Ross M. Mehl
Albert H. McEuen
David E. Metzler
Robert L. Mills
Glen H. Mitchel, Jr.
Edward E. Mitchell
Boude C. Moore
Harry J. Moore, Jr.
Stephen C. Morrison
John K. Mullen
C. Gordon Murphy
Harvey O. Nay
George J. Newgarden III
W. Lawrence Noon
Thomas E. Oberbeck
Frederick D. Parker
C. Craig Paul
Robert Peeler
Herbert L. Podell
Robert W. Poindexter
Allen T. Puder
John Rasmussen, Jr.
Arthur W. Reed
Bruce B. Rennie
Martin S. Robinson
Frank C. Rock, Jr.
Richard M. Roehm
Edward F. Roshowski
Hector A. Schetne
George R. Schull
George R. Scott
Robert E. Scott
Sidney R. Shannon, Jr.
William E. Smyth
Mike Spooner, Jr.
Douglas C. Strain
Ferdinand C. Suhrer
Robert K. Swank
Kenneth K. Tang
James R. Thorpe, Jr.
Tom Tracy
Roland W. Ure, Jr.
Vincent A. Vis
Thomas Vrebalovich
Fred M. Wells
William A. Wenzel
Harvey J. White
James E. Whitney
Curtis C. Whittlesey
John R. B. Whittlesey
David B. Wilford
Donald P. Wilkinson
William J. Williamson
David B. Willmer
Thornton A. Wilson
John K. Wimpres
Robert L. Winchester
William L. Woodson
Robert M. Wray
Frederick H. Wright
Harvey W. Wright, Jr.
William S. Wunch
Byron L. Youtz
Robert Zacharias

1949
C. Harris Adams
Thomas L. Allen
John M. Andres
Charles H. Arrington, Jr.
Douglas C. Atkins
Wallace A. Barnes, Jr.
William L. Basham
Carlos L. Beeck
Edward L. Bennett
John H. Beveridge
Ernest W. Blair
Murray S. Bornstein
Gerald P. Breaux
Douglas R. Brown
Davenport Browne, Jr.
Arthur E. Brington
Arthur E. Bryson, Jr.
Joseph F. Burkholder
Ben Cagle
Donald W. Chapin
Howard J. Cohan
Robert P. Crago
James H. Crate
Theodore V. Crater
Frederick A. Curtis, Jr.
Warren E. Danielson
John H. Dannan
Ralph E. Darling
Raymond E. Davis
Jesse C. Denton
Joseph A. Dobrowolski
Patrick D. Doherty
Edwin J. Dolan
Clayton Englar
Robert C. Evans
Kendall F. Famularo
Henry Fasola, Jr.
Robert L. Fisher
Samuel Fong

Robert D. Forester
Myrven F. Gift, Jr.
Alan H. Green
Harry Gruenberg
William N. Harris
David K. Hayward
Philip Hayward
Radoy W. Heggland
Carl W. Helstrom
Wayne M. Herzig
Don E. Hibbard
William J. Houghton
Paul W. Hubay
Frank G. Hylton
Toru Iura
Roger C. Johnson
Stanley L. Kameny
Naomi Kashiwabara
Paul H. Kidder
Charles H. Knight, Jr.
John F. Kostelac
Charles E. Kuchar
Victor N. Lawford
P. Herbert Leiderman
Edward Levonian
Lionel L. Levy, Jr.
David A. Liberman
Ralph E. Lind, Jr.
Myron Lipow
John R. Love
Dave W. Madden
Arturo Maimoni
John C. Marshall
Eugene K. Maun
Glenn D. Maxwell
William M. McCardell
Jack A. Mones
Emmett P. Monroe
G. Richard Morgan
Merle L. Morgan
Ralph Morrison
William R. Muehlberger
Ridley Myers
Judd C. Nevenzel
Fred H. Nicolai
Jack N. Nielsen
Laurence H. Nobles
Thomas S. Oey
Robert N. Oliver
Fred Ordway
Stanley C. Pace
William E. Palmer
Byrne Perry
Donald W. Peterson
Irwin Pfeffer
Heinz G. Pfeiffer
Robert R. Pilling
Robert L. Pons
David O. Powell
Walter G. Prevost
William D. Pyle
William J. Ramsey
John D. Richartz
Theodore W. Rose
James Rounds*
William I. Rumer
Paul D. Saltman
Richard I. Schoen
Robert Schwarz, Jr.
Clyde R. Seitz
Frederic T. Selleck
Frank H. Shelton
Harry H. Shibata
Bernard Shore
Emerson W. Smith
William W. Smith, Jr.
Arthur O. Spaulding
Robert F. Stappler
Dale J. Stephens
Albert Sundsmo
Vernon E. Teig
Kent M. Terwilliger
John H. Thomas
Thomas A. Turner
William T. Vickrey
Milton C. Vogel
Dale Vrabec
Richard A. Wallace
Robert L. Walquist
William W. Ward
Lowell G. Wayne
Wilton W. Webster, Jr.
Steven Weisbrod
Mitchell Weiss
James R. Wilts
H. Hugh Woodbury
Clayton M. Zieman

1950
Harvey J. Amster
Frederick C. Badger
Donald R. Baker
Donald S. Barrie
Donald R. Bartz
J. Allan Beek, Jr.
Raymond E. Brow
Werner Buchholz
Stanley C. Burket
James L. Cass
Andrew J. Check
Philip J. Closmann
James C. Conly
Thomas J. Connolly
Phillip G. Cook
William P. Cox
Robert E. Crawford
Robert N. Curtis
Milford H. Davis
Bain Dayman, Jr.
Richard D. DeLauer
Jerome K. Delson
Donald A. Dooley
W. S. Dorsey
Thomas E. Dowd, Jr.
Cecil W. Drinkward
Frederick W. Drury, Jr.
Gardner W. Earle, Jr.
Vern A. Edwards
Ralf A. Erickson
Norman S. Fink
Carl E. Fox
William A. Freed
Boyd M. Gage
Donald J. Gimpel
Michel Gossot
Robert L. Gottier
John M. Greene
Raimo J. Hakkinen
C. Darle Hale
Geoffrey B. Holmes
J. Robert Holmes
James H. Hottenroth
Peter A. Howell
Floyd B. Humphrey

John K. Inman
Jerome E. Jacobs
Rodman Jenkins
Robert Ross Jennings
Eric B. Johansson
Walter John, Jr.
William F. Jones
Louis Katz
Donald V. Kendall
Richard H. Knipe
William Kroll
William D. Lansdown
Ralph H. Lovberg
Rubin W. Ludwig
Robert V. MacAllister
David B. MacKenzie
Daniel Markoff
Craig Marks
Harold C. Martin
Max V. Mathews
Richard M. McIntyre
Robert E. McMillan
James O. McCaldin
Robert V. Meghreblian
Ralph L. Merrill
Roland Albert Missman, Jr.
Jay A. Montgomery
Walter L. Mudgett
Alfred J. Monroe
Robert L. Nelson
Gibson Oaks
David C. Oakley
Irving L. Odgers
Jack B. Ottestad
Harvey L. Pastan
Richard S. Pierce
J. Howard Pinckard
Calvin E. Porcher
William H. Proud
Ronald L. Quandt
M. Darwin Quigley
Dean A. Rains
John R. Reese
Edwin Reinecke
Werner B. Riesenfeld
Glenn D. Robertson, Jr.
Marco A. Romero
Martin N. Ross
Leonard Gene Schultz
Dwight Clare Schroeder
Adam F. Schuch
Henry Shapiro
Jack L. Shoenhair
Virgil J. Sims, Jr.
Donald L. Smathers
George E. Solomon
Eugene G. Spencer
Donald W. Stillman
Hugh Franklin Stoddart
John H. Sullivan
John Vrolyk, Jr.
A. Virgil Tollestrup
David Warren
William D. Warters
Wilbur A. Wikholm
Calvin Wong
Kam L. Wong
Edsel A. Worrell
Richard Bruce Wright

1951
George O. Abell
Robert G. Adler
Clarence R. Allen
Peter L. Auer
Leo L. Baggerly
Frederick G. Baily
Mitchell B. Bain
Charles J. Bates
Graydon D. Bell
David Benun
Robert E. Bible
Barrie H. Bieler
Dean M. Blanchard
Eli Botkin
Ray D. Bowerman
Robert G. Boyer
John M. Bozajian
Richard G. Brewer
Frank C. Bumb
Thorne J. Butler
Ronald T. Caldwell
George S. Campbell
Bert H. Clark
Thomas W. Connolly
Robert E. Covey
Dean C. Daily
Edwin G. Dankworht, Jr.
Robert P. Day
Robert W. DeGrasse
Aram J. Dervy
William A. Drake
David L. Durham
Fred H. Eisen
James A. Enslow
Erdem L. Ergin
John R. Fee
Arthur L. Freer
Leland R. Gardner
Oliver H. Gardner
Walter V. Goeddel
Rudolph J. Goerke III
John V. Hallstrom
Phillip C. Halverson
Francis A. Haskins
Riddell L. Hawk
Fred G. Hayos, Jr.
Paul F. Helfrey
Julius Hermann
Richard H. Homewood
Frank L. Hooper
Richard A. Hoppin
Bradford C. Houser
Herbert M. Hull
Henry Ito
John R. Jannarone
William A. Kelley, Jr.
James B. Kendrick
Terry W. Koerner
Thomas W. Layton
Carroll R. Lindholm
John H. Lobdell
James T. Luscombe
Robert J. Mackin, Jr.
Gordon J. MacLeod
Harold F. Martin
Harden M. McConnell
Howard M. McMahon
Richard G. Merritt
Ulrich Merten
James C. Norris, Jr.
Richard K. Nuno
Robert E. Odensing
Max H. Ostrander

Kenneth Paigen
R. Stephen Pardee
Cornelius J. Pings
John E. Plapp
Victor D. Porizky
Edwin E. Pyatt
Kendrick Radey
Rex B. Ragon
David S. Rathje
H. Kendall Reynolds
Sergio E. Rodriguez
Winston W. Royce
William F. Sampson
Kazuhiko Sato
George V. Schlietett
Richard S. Sharp
Albert Siegel
George I. Smith
Robert E. Smith
William R. Smythe
Lawrence V. Sokol
Walter L. Starr
Harry Sutcliffe
Alfred W. Thiele
Richard Z. Toukdarian
L. Rupert Vreugde
Robert L. Waid
Elmer R. Ward
William M. Whitney
Frederick E. Wood, Jr.
William W. Wood
William V. Wright
Alexander Wylly
Yusuf A. Yoler

1952
Paul M. Aagaard
Helmut A. Abt
Berni J. Alder
Robert B. Altermatt
Michel Bader
Fred Barker
Jack L. Becker
Max Bettman
David D. Beyer
Robert G. Blair
Oswin N. Brown
Norman Bulman
Michael J. Callaghan
Ralph S. Carrigan
Wesley Caspers
Mell D. Cassidy
George E. Cook
Dale W. Cox, Jr.
Leland Cuff
Forrest W. Davis
Robert S. Davis
Paul Dergarabedian
Alexander Dessler
Richard R. Dickinson
Joseph A. Dove
William F. Edmondson
George L. Ellman
George A. Eriksen
Gerald D. Fasman
Richard H. Fuller
Waheed K. Ghauri
Martin Goldsmith
Stanley Groner
David L. Hanna
Raymond L. Heacock
John L. Howell
Harry C. Hoyt
Marvin H. Hyman
William W. Irwin
Boyd P. Israelsen
Howard E. Johnson
Richard Y. Karasawa
Melvin L. Katz, Jr.
Peter M. Kelly
William A. Kemmel, Jr.
James M. Kendall, Jr.
David Koons
Karamcheti Krishnamurty
James K. LaFleur
Carl V. Larson
David A. Lee
Clinton Lew
John P. McCourt
A. John McEwing
Samuel F. Middlebrook
Randolph G. Moore
J. Crawford Noll
Robert C. Perpall
Stanley R. Rawn, Jr.
Henry L. Richter, Jr.
Denton D. Riggs
Evan E. Roberts, Jr.
Martin L. Sandell
Edwin P. Schlinger, Jr.
William F. Sheehan, Jr.
James N. Shoolery
Ronald L. Shreve
Deane K. Smith, Jr.
Donald E. Stewart
Donald K. Tautz
John C. Thompson
John R. Thomas
Robert D. Waldron
Richard E. Wallace
William T. Webber
Harry E. Williams
Keith L. Winsor
William L. Wise
Edgar Y. Wong
Frank A. Woodward
Gordon E. Zima

1953
Robert H. Alexander
Daniel E. Appleman
Thomas H. Applewhite
John H. Atkinson, Jr.
R. Keith Bardin
Philip K. Bates
William T. Beale
John C. Behnke, Jr.
Charles E. Benjamin
Howard Boroughs
Andrew C. Boush
Bert E. Brown
John W. Cagle, Jr.
Coy R. Cantrell, Jr.
Paul R. Carter
David J. Clark
Gerald A. Cohen
Thomas J. Curkendall
Donald C. Curran
Edward H. Daw
George R. Dubes
William C. Dueterhoeft, Jr.
Lester D. Earnest
Robert L. Easton
Gordon P. Eaton
David D. Elliott

Donald O. Emerson
Patrick J. Fazio
Caesar Fernandez, Jr.
Kenneth E. French
William D. Gardner
John D. Gee
Robert E. Gillingham
Joseph D. Gleckler
James A. Hendrickson
Lyle N. Hoag, Jr.
Bruce W. Holloway
H. Robert Hunt
R. Douglas Inglis
Richard M. Jaffe
Morton E. Jones
Kenneth R. King
James T. LaTourrette
John E. Leib
Budd W. LeTourneau
Artur Mager
Duane Marshall
Warren E. Mathews
William D. McCormick
Leon C. Michaelsen
C. Edward Miller
Stanley J. Minton
Naoki Morishita
Kenneth F. Nicholson
H. R. Poorman
Carl A. Rambow
Irving Rappaport
Noel E. Reed
Carl A. Rouse
Sheldon Rubin
Carl G. Sauer, Jr.
Wallace W. Short
William M. Smith, Jr.
Donald P. Snowden
Robert J. Stanton, Jr.
Lawrence D. Starr
Neil J. Stefanides
David F. Stevens
Edwin J. Stofel
George S. Stranahan
Arnold A. Strassenburg
Alfred H. Sturtevant III
George W. Sutton
Dee W. Swayze
Nicholas S. Szabo
Thomas F. Talbot
Charles R. Tallman
Thomas T. Taylor
David S. Twining
Perry H. Vartanian, Jr.
Jack D. Walker
Lawrence Wallcave
Rolf D. Weglein
Richard D. Welsh
Ronald H. Willens
Robert H. Wood

1954
John L. Abbott
Fred C. Anson
Samuel W. Autrey
George A. Baker, Jr.
Sidney B. Bellinger, Jr.
John T. Billings
John J. Bondra
Gary D. Boyd
Norman H. Brooks
George E. Bryan
Patrick C. Carroll
Thomas K. Caughey
Stephen J. Chamberlin, Jr.
John M. Charles
Paul Concus
Robert J. Dickson, Jr.
Robert D. Dikkers
Franklin D. Dryden
Charles Dunn III
Don E. Edmondson
LaVerne G. Eklund
Frederick W. Garrison
Edward J. Gauss
John G. Goetten
Roger M. Golden
Reinaldo V. Gutierrez
Walter C. Hamilton
Ralph D. Handen, Jr.
Kenneth L. Hanson
Leonard Hawn
David A. Heiser
Lee A. Henderson
Richard R. Hodges
G. Neal Huntley
Weldon H. Jackson
Kay D. Jefferson
Harvey E. Johnson
Bruce A. Kaiser
John T. F. Kuo
Charles Mertz III
Arthur E. Miller, Jr.
Philip D. Miller
Gordon E. Moore
Bruce H. Morgan
Hampton E. Mulligan
Joe H. Mullins
Joseph J. Murray, Jr.
Kenneth H. Olsen
Robert W. Olsen
Robert W. Peterson
Albert R. Pitton
Donald B. Potter
Philip D. Potter
L. Willard Richards
James D. Richey
Benjamin M. Rosen
J. Keith Rowley
Robert M. Rufsvoid
Ronald S. Saliba
Allan R. Sanford
Takeshi Sato
Andrew Sergeyevsky
Allan W. Scott
Robert H. Shennum
C. Richard Smith
Robert C. Speiser
Quayton R. Stottlemeyer
Simon Tamny
H. Nelson Upthegrove
George Wada
Hugo D. Wahlquist
John K. Wall
Stuart H. Wemple
Mih Yin

1955
James L. Adams
John P. Andelin, Jr.
Joseph D. Bennett
Lloyd E. Best
Egil K. Bjornerud
Edward M. Boughton

Jimmie R. Bowden
Carl Bowin
John D. Britton
Charles J. Brokaw
Delano A. Brouillette
Donald G. Bryant
Daniel T. Chilton
David H. Campbell
Vincenzo M. Cestari
John W. Converse
Roy S. Cornwell
William J. Creighton
David L. Crowther
Stephen F. Crumb
Ernest A. Dernburg
Eugene H. Dryden
George Epstein
Harvey S. Frey
Alfred M. Goldman, Jr.
Raymond G. Grieser
Daniel J. Griffin, Jr.
William R. Hagemeier
William B. Haigler
Leighton D. Hanon, Jr.
McGlachlin Hatch
Alan L. Helgesson
Thomas B. Howes
Hsung-Cheng Hsieh
Richard M. Jali
Walter A. Johnson
Marion A. Joncich
Armin D. Kaiser
Louis U. Kilchenman
Arthur E. Lewis
James P. Lewis
William B. Lindley
Stanley L. Manatt
Joseph D. Mandell
Royal R. Marshall
Frederick Martin
James N. McCloud
George H. McDonald, Jr.
John W. McKee
Robert F. Meldau
F. Curtis Michel
Ralph F. Miles, Jr.
Arthur H. Muir, Jr.
Miles A. Nesman
Richard L. Nielsen
E. Vern Nogle
Stanley F. Parkill
Robert V. Powell
Robert G. Rinker
Bruce J. Rogers
Kenneth W. Rogers
Manley E. Rogers
Richard R. Schmid
Bernard P. Schweitzer
Oscar Seidman
Leon T. Silver
Stephen L. Stamm
Rodney W. Supple
Salvatore P. Sutura
Donald J. Taylor
Alan J. Teague
Thomas Trilling
Alvin W. Trivelpiece
Martin Vogel
Walter D. Wales
Van I. Walkley
Paul K. C. Wang
Theodore S. Webb, Jr.
Walter L. Whirry
David M. Wilson
Donald U. Wise
Truman O. Woodruff
Hsun-Tiao Yang

1956
Norman W. Albright
Harold R. Almond, Jr.
Jan L. Arps
Gene A. Barnes
Leon H. Bassett
Kyle D. Bayes
Frederic N. Benning
Myron W. Black
Arthur H. Blair
Ross M. Brown
William W. Buchman
Forrest L. Carter
Robert L. Chapkis
Daniel T. Chilton
Philip R. Conley
Edward M. Davis, Jr.
Aldo G. Diloreto
Hubert E. Dubb
Everett T. Eiselen
Eugene E. Epstein
Gerald W. Freeman
Jean-Paul Frignac
H. Mark Goldenberg
Thomas P. Gordon
Thomas L. Gunn
Eastman N. Hatch
Robert I. Jetter
Byron B. Johnson, Jr.
Richard A. Johnson
Robert R. Johnson
Wayne V. Jones II
Arne Kalm
Arthur A. Kamii
Robert C. Kausen
Ralph O. Kehle
Ronald D. Kelly
James B. Kennedy
John F. Kennedy
Milton J. Kimmel
Gilbert W. Kirby, Jr.
James H. Koontz
Hans H. Kuehl
Moshe Kupfer
Peter O. Lauritzen
Kenneth L. Laws
Paul O. Lindfors
James R. Lloyd
Reginald M. Machell
William L. Marcy
John S. Mathis
Delbert C. McCune
Paul E. McHorney, Jr.
Bernard L. Mitchell
John L. Moser
Vincent O. Mowery
John L. Nairn, Jr.
Charles A. Norman
Raymond L. Orbach
Rex B. Peters
Arthur F. Pfeifer
Jerry R. Pixton
Alan M. Poisner
Richard H. Pratt
Charles B. Ray
Gordon S. Reiter

Rudolf A. Schindler
Garry L. Schott
Tom G. Slanger
Richard K. Sloan
Huntington W. Small, Jr.
John D. Sorrels
Terry W. Spencer
Irving C. Statler
Ronald O. Stearman
Kenneth E. Stiefel
Bradford Sturtevant
David A. Tansey
Frederick M. Trapnell, Jr.
Ronald D. Wann
Eric B. Ward
Ray J. Weymann
Fred Witteborn
Tetsuo Yamane

1957
Peter K. Abbey
James D. Acord
Donn A. Allen
Charles H. Anderson
George F. Babbitt
Frederick J. Beutler
Michael N. Bleicher
Gunnar Bodvarsson
Baird H. Brandow
John F. Brewer, Jr.
Robert S. Brown
Roger W. Caputi
Walter H. Christiansen
Stanley V. Dawson
Robert J. Deffeyes
Franklin P. Dixon
Michael B. Duke
Duane D. Erway
Donald G. Fraasa
Albert E. Gaede
Frank E. Goddard, Jr.
Allan M. Goldberg
Fred B. Hagedorn
Frederick C. Hall
James E. Hall
Daniel E. Harris
Thomas C. Hays
Neil H. Herman
Douglas B. Holdridge
Richard O. Hundley
Orval E. Jones
Milton Kamins
Kanau Kawashima
Gerald Klaz
Bernard B. Lopez
Charles L. Malone
J. Howard Marshall
Jon Mathews
William T. McDonald
James P. McHugh
Robert M. McKeon
Gerald W. Medsger
Thomas W. Miller
Dwight A. Moberg
Peter M. Moretti
Reuben B. Moulton, Jr.
Bernard H. Mueller
Edwin D. Nelson
Joseph Neustein
Bruce A. Nevelli
Donald P. Nierlich
Haruo Oguro
R. Edward Park
Walter A. Petersen, Jr.
Philip M. Platzman
Robert F. Prammann
Robert W. Prentice
Seymour A. Rapaport
Herbert E. Rauch
A. Stuart Richert
Edwin B. Royce
David A. Russell
Roy R. Sakaida
Glenn A. Savage
James C. Savage
William J. Schatz II
Harrison H. Schmitt
Richard F. Smisek
Roy T. Stake
Richard D. Stark
J. L. Swedlow
Frederick W. Tahse, Jr.
William J. Takei
Gerd A. Tuchen
Robert J. Tuttle
John R. Velman
Raymond A. Virzi
Larry G. Whitlow
James W. Workman
David E. Yount

1958
Frank A. Albini
Frank E. Augustine
Boris Auksmann
Gordon S. Barenbrock
Laurence E. Berry
Frank J. Berto
Robert Blakeley
Michel A. Bloch
Olaf A. Boedtker
David F. Bowersox
Warren V. Bush
Charles J. Byrne
George M. Canova
Berken Chang
Donald B. Chesnut
John M. Clark, Jr.
Albert C. Claus
Richard T. Cowley
Harold D. Culver
David S. Dennison
John K. Dienes
Harvey M. Eandler
Joseph C. Fineman
Jerrold Fried
Juart Goff
William B. Gray
David E. Groce
Nathaniel Grossman
Millard A. Habegger
John T. Harding, Jr.
Riley H. Holly
William J. Hooker
Harvey H. Horiuchi
Daniel H. Horowitz
Anthony L. Howell
Robert S. Johnstone
Mauritz J. Kallerud
Richard M. Kirk
William J. Klenk
Wolfgang G. Knauss
Frank B. Mallory

Maury I. Marks
Malcolm L. Matthews
Bruce T. McKeever
Lawrence H. Nelson
Richard K. Nelson
Theodore C. Oakberg
Hugh D. Palmiter
Roderic B. Park
Ernest R. Parkinson
R. Reid Parmerter
Donald D. Peckham
Charles R. Penquite
Gerald M. Pierrou
Rowland Richards, Jr.
Jacques M. Rieunier
Robert E. Schenter
Lee O. Schmidt
Thomas G. Schumann
James W. Sedin
Alex Shumka
Edward B. Shuster
Richard L. Sicol
Norton Starr
Donald W. Stocking
Charles J. Stone
Roger D. Sumner
Vincent D. Taylor
Philip D. Thacher
Martial L. Thiebaux, Jr.
Jonathan C. Tibbitts, Jr.
William G. Tift
Robert E. Tokheim
Richard L. Van Kirk
Thomas R. Warriner
James N. Weaver
Carl J. Weyl, Jr.
Lawrence Z. Wieder
Robert M. Worlock
George A. Yankura
Jack H. Zeilenga

1959
Gustave Akselrod
DeLoyce Alcorn
Bruce Allesina
William T. Alt
Don L. Anderson
Gerald J. Arenson
Walter S. Baer
Louis N. Bathish
Richard A. Baugh
Harvey H. Bird
Robert R. Blandford
Walter K. Bonsack
Richard H. Briceland
J. Philip Bromberg
Carl J. Buczek
William D. Burnett
Clark E. Carroll
I. Dee Chang
Douglas R. Christman
Donald D. Clayton
Joseph M. Colucci
John A. Conover
Ritchie B. Coryell
Paul P. Craig
Charles K. Daniels
John I. Dick-Peddie
Eugene R. Doering
Rolf Engleman, Jr.
Michael E. Fournay
Nicholas George
Richard M. Goldstein
Joel D. Greenberg
Francis W. Groesbeck
Lewis B. Gustafson
Philip D. Harriman
Jay H. Harris
Donivan R. Howard
W. Norris Huse
J. Michael Jenkins
C. Richard Johnson
John J. Kalvinskas
David Kipping
William L. Ko
Murray A. Koerner
Donald A. Kohler
Kalman I. Krakow
Dennis W. Kuli
DeWitt Landis, Jr.
James D. Larson
Anthony Leonard
Lewis M. Linson
David G. Luenberger
William O. McClure
Francis C. McMichael
Richard C. Montgomery
Andrew R. Nasser
Martin E. Nordberg, Jr.
Gordon C. Oates
Martin G. Olsson
Ralph B. Owen
Robert M. Pailthorpe
Dennis L. Paull
John C. Peterson
Allan R. Porush
Donald O. Rasmussen
Donald W. Rice
John R. Rice
Michael H. Rusin
Marc S. Silver
Darwin W. Smith
Noboru Sueoka
Ivo Tammaru
Terry O. Teigen
John Vinje
Joseph L. Vogl
John W. Wesner, Jr.
Jain-Ming Wu
Norman J. Zabusky

1960
Eric G. Adelberger
William L. Anderson, Jr.
Samuel Bergman
Graeme A. Blake
David J. Blakemore
Billy R. Blanchard
Thomas K. Boehme
Thomas E. Bowman
Philip R. Brooks
David G. Cassel
Lowell E. Clark
Lawrence E. Curfman
Kendall L. Dinwiddie
Bruce R. Doe
Robert B. Eglington
David A. Evensen
James L. Farmer
Edward A. Flinn
Herbert S. Glick
Robert R. Golden
Meredith C. Gourdine
Egbert Graeve

Anthony P. Grande
Matthew M. Grogan
Alfred W. Hales
Gilbert A. Hegemier
Henry H. Hilton
Leroy E. Hood
Vladimir Hvoschinsky
Delbert H. Jacobs
Paul C. Jennings
Richard Jensen
Peter A. Johanson
Martin A. Kaplan
Gordon Kramer
Donald J. Krotser
Donald A. Kugath
Marshall Lapp
D. M. W. Lindquist
R. Michael Lloyd
Gordon D. Long
Jacob V. Maizel, Jr.
Jean C. Meuris
Jarold A. Meyer
David L. Mitchell
Carleton B. Moore
Edward R. McDowell
Gerry Neugebauer
Robert L. Norton
Peter E. Oettinger
Daniel B. Olfe
Jerald V. Parker
Raymond Pittman, Jr.
William W. Porterfield
James R. Pousson
Roy E. Reichenback
Eli Reshotko
David A. Resnik
Max C. Richardson
Richard E. Robertson
Peter R. Rony
William G. Scheerer
Kenneth P. Scholtz
Neil R. Sheeley, Jr.
Edward H. Simon
James C. Sorensen
Timothy L. Sullivan
Keith A. Taylor
Thomas H. Tebben
Robert C. Thompson
Robert C. Thompson
Michael R. Thomson
Samuel B. Trotter
Robert T. Walsh
Lawrence R. Weill
James A. Wooster
Gary A. Zimmerman

1961
Henry I. Abrash
Charles A. Allen
Hugh R. Anderson
James L. Aronson
Richard E. Balsam
George W. Beeler, Jr.
Harris Bernstein
James B. Blackmon
James H. Boyden
Ralph E. Bredehorst
Richard T. Brockmeier
Ben G. Burke
Ward M. Calaway
Kendall F. Casey, Jr.
Marvin Chester
Shin-Kien Chow
Peter O. Clark
DelMar E. Curtis
Duane F. Dipprey
Joel K. Donnelly
Donald P. Dubois
Theodore H. Elconin
Douglas K. Fenwick
Richard B. Fradella
H. Kent Frewing
Allan B. Friedland
John A. Garba
Lawrence P. Giver
Alexander F. H. Goetz
Arthur B. Griffin, Jr.
James F. Hays
John E. Hearst
E. Alexander Hill III
Bent Huld
Richard T. Jones
Jerome V. V. Kasper
David W. Kendle
John J. Kennedy
Vassilios Kerdemelidis
William E. Kirhofer
Donald R. Lampe
Delano R. Lawin
Henry Luming
Hayden B. Macurda
Roy H. Makino
Wayne A. Massey
William B. Mather, Jr.
Peter C. Mayer
Lawrence W. McCombs
Howard C. Merchant
David B. Morse
Robert D. Nason
Manuel Panar
Elliot N. Pinson
John M. Poindexter
Paul W. Purdom, Jr.
Charles A. Ray
Dwain J. Reed
Neil R. Richardson
Michael R. Ruecker
Oliver Seely, Jr.
Douglas W. Shakel
Lawrence F. Shampine
William K. Shubert
Charles J. Siegel
George W. Simon
Frank W. Spaid
John P. Stenbit
Kaytaro G. Sugahara
Donald G. Swanson
William K. Tabata
Henry A. Thiessen
Bruce T. Ulrich
Gary O. Walla
Kenneth G. Wilson
Kenneth W. Wood
Victor L. Yen
Clyde S. Zaidins

1962
Bruce R. Abell
Ahmad K. Abu-Shumays
Ronald D. Bercov
Richard C. Brandt
Robert B. Bump
Richard G. Burke
Robert E. Carter

Gary C. Chamness
Tsiu Chiu Chan
Dick M. Chang
Seung C. Choy
Don Paul Clausing
Edward T. Cline, Jr.
James E. Cordes
John D. Curtis
Melvin D. Daybell
William F. Dove, Jr.
David K. Edwards III
Charles M. Flynn, Jr.
Bernard Foran
Peter C. Ford
Gary S. Fraley
Joseph P. Giesing
Scott E. Gilles
John R. Golden
Ralph C. Greenough
John M. Grover
Harrison B. Hall
Lyndon M. Hardy
William V. Hassenzahl
Howard T. Hilton
William J. Hogan
Charles H. House
Paul Yu-fei Hu
Roy S. Jordan
Howard A. Kabakow
David Kauffman
Joseph Kohler
Ronald K. Linde
Hans Ludewig
Harold E. Marr III
Franklin L. Marshall
Gerald A. Marxman
Sami F. Masri
John F. McCarthy, Jr.
James A. McCray
Jack R. McInturff
Hugh T. Millard, Jr.
Gary F. Mitchell
Ralph C. Moore, Jr.
Carlos W. Moreno
Milton E. Morrison
Donald A. Nisewanger
Marc L. Renard
Frank Ridolphi
George R. Root, Jr.
Robert L. Rosenfeld
Carl M. Rovainen
Peter T. Rux
Edward J. Seppi
Ernest R. Seymour
Harvey K. Shepard
Fred Shimabukuro
John C. Stansel
Stottler K. Starr
Raynold A. Svenson
Lance J. Taylor
Joel Tenenbaum
Neng-Ming Wang
William H. Weihofen
Albert C. Whittlesey
Dennis R. Wik
Robert W. Wilson

1963
William J. Anderson
John E. Baldwin
Philip O. Banks
Dennis Barrett
Brian C. Belanger
Richard C. Blish II
John M. Caywood
David C. Clark
Thomas A. Cole
Frank R. Curtis
John W. Davies*
S. Willard Elieson
Remigio Fernandez
Thornton R. Fisher
Robert P. Foss
Terry R. Galloway
David W. Hall
Carole L. Hamilton
Harold J. Haskins
Thomas M. Helliwell
Robert Hickling
Alan F. Huber
Wayne C. Huber
Jackson I. Ito
Algis J. Juodikis
James W. Kessel
John L. Kleiderer
Michael M. Krieger
Alvin L. Kwiram
James E. Lancaster
Anastasios G. Livitsanos
Ben E. Lynch
Wendell W. Mendell
James R. Midgley
Frederick R. Norwood
Howard Oringer
David R. Owen
John C. Porter
James Renken
Arthur B. Robinson
N. Paul Rosenthal
Larry E. Ruff
Charles D. Russell
Joseph E. Russo
Robert W. Schmieder
Philip A. Seeger
Jay Smith III
Will G. Spiegelman
Himan Sternlicht
Robert F. Stewart
F. William Studier
Thomas R. Thompson
Pin Tong
Harris E. Ulery
Ned C. Webb
Warren H. White
James G. Williams
David F. Windsor
Ying-Chu Lin Wu
Alvin K. Yedlin
Louise D. Young

1964
Stephen A. Andrea
Robert J. Arenz, S.J.
James R. Barnes
Bruce R. Beeghly
Philip H. Bowles
Daniel A. Brogan
Richard R. Burgess
William B. Bush
Paul W. Butler
Chia-chun Chao
Der-Shyr Chen
Bob L. S. Ching

Spicer V. Conant
Wayne R. Cooper
Albert E. Cosand
Francis A. Dahlen, Jr.
Robert F. Davey
Robert W. Diller
Fred W. Dorr, Jr.
William T. Fehlberg
Ralph E. Graham
Ray Green
Charles R. Hamilton
Thor P. Hanson
Howard E. Harry, Jr.
James B. Hartle
Douglas W. Hill
James C. Hilton
Alan C. Hindmarsh
James W. Hole
Wallace I. Honeywell
David L. Hyde
Alexander D. Jacobson
Arthur E. Johnson
Noel D. Jones
Lisle T. Jory
Boris J. Kayser
Warner B. Kover
David R. Lambert
Charles F. Leonard
Robert C. Liebermann
Joseph Tsu Chieh Liu
Tom C. Lubensky
John M. J. Madey
Richard D. Maxson
George A. McBean
Robert J. McEliece
Roger L. Minear
Hans-Karl Mueller
Elliott R. Nagelberg
Dan C. Paxton
George T. Preston
Alan O. Ramo
George N. Reeke, Jr.
Thomas S. Roberts, Jr.
Jack Saltiel
David H. Seib
Lionel S. Senhouse, Jr.
LeRoy E. Sievers
Ralph V. Skarda, Jr.
Lionel J. Skidmore
William C. Stawalley
Stafford E. Tavares
Don W. Terwilliger
Usha Varanasi
Volker M. Vogt
Willes H. Weber
Patrick D. Weidman
Martin E. Weiner
Mason L. Williams
David E. Wood
Ralph H. Young

1965
Raymond Arrathoon
Gerald R. Ash
Edward S. Bauer
John H. Beamer
Thomas R. Bierma
Chang-Chih Chao
Phillip J. Chase
Ider Cheema
Arthur N. Chester
Donald R. Chivens
Stanley A. Christman
Robert W. Conn
Ronald Cusson
Lee Davison
David T. Denhardt
Theodore N. Divine
Nicholas I-T Djeu
Richard C. Essenberg
Robert P. Frosch
Stephen H. Garrison
Michael S. Gazzaniga
Robert J. Gerbracht
Henrik G. Gronroos
John F. Gunn
Steven D. Hall
William M. Hardham
John M. Holte
Richard A. House II
Ronald E. Hutton
Martin Isler
Robert T. Jenkins
Gordon E. Keller
James R. Kercher
Leon Keyser
James T. Kindle
Edgar Kuplis
Angelo A. Lamola
Jean-Pierre R. Laussade
Amos Levin
Del E. Levy
Robert S. H. Liu
Rainer McCown
John T. McCrickerd
Paul G. Mikolaj
Harold D. Moeller
Kenneth K. Murata
Timothy O. Murray
Arthur E. Niell
George C. Nieman
Maynard V. Olson
Thomas A. Pucik
Thomas C. Rindfleisch
Freeman H. Rose, Jr.
Dana L. Roth
Peter M. Ryan
William F. Satterthwaite
Robert E. Spitzer
Robert M. Sweet
Jefferson K. Wise
David K. Yoshikawa

1966
David A. Bird
James L. Blue
Gary L. Bornzin
Jonathan F. Callender
Joe Ching
DeLo K. K. Chun
Milton J. Clauser
Dean N. Clay
Philip L. Coleman
Ronald L. Constable
Michael A. Cunningham
Walter Z. Davis, Jr.
Charles D. DeBoer
Charles L. Dorsett
Robert C. Erdmann
Leonard A. Fisher
Douglas W. Gage
Stuart W. Galley
William L. Gavan
Sankaraiyer Gopalakrishnan

James A. Hall
James R. Hannigan
Wm. G. Herkstroeter
Albert V. Holm
Michael D. Hunsaker
Eric M. Jones
Andrew J. Kampe
Robert Alan Karski
Susan E. Kayser
Philip J. Laipis
George T. Lengyel
John V. Levy
Peter J. Lingane
Dan McCammon
Tom R. Miller
Joseph B. Milstein
Donald W. Moon
Gordon E. Myers
Richard L. Myers
Lawrence H. Nagel
Wallace L. Oliver, Jr.
William F. Orr
Edward L. Robertson III
Richard D. Rocke
John D. Rouse
Charles A. Sawicki
Henry G. Schwartz, Jr.
L. David Shields
Frederic W. Shultz
Sean Carl Solomon
David L. Stofla
Joseph J. Stupak, Jr.
Alexander J. Sutherland
Joseph P. Tymczyszyn
Robert K. Weatherwax, Jr.
Harold A. Williams, Jr.
Richard A. Wolf
Jerry M. Yudelson

1967
Robert C. Ashenfelder
Kenneth P. Bartos
George S. Brown
Michael P. Burke
Stanley Butman
Douglas A. Carne
George F. Chapline, Jr.
Ronald B. Chesler
Cary N. Davids
Stanley D. Ecklund
Dennis M. Furuiki
Joel Goldberg
Norton R. Greenfeld
Richard D. Hackathorn
David A. Hammond
Michael G. Hauser
Howard M. Hoffman
Edward S-P Hsi
Gary M. Johnson
David Kabat
York Liao
Gary W. Little
Zachary Martin
David J. McCloskey
James A. McGill
Robert T. Menzies
William B. Miller
Reagan W. Moore
Richard S. Naylor
John D. Norgard
Martin Y. Oiyee
Douglas D. Osheroff
James E. Pearson
Joram P. Piatigorsky
Michael S. Pollock
Jonathan D. M. Romney
Zoltan A. Sarkozy
Donald E. Schmidt, Jr.
Robert C. Schoenwiesner
James M. Seybold
Stephen C. Smith
James M. Soha
James H. Strauss, Jr.
Edward G. Trachman
David W. Vahey
James G. Wetmur
Eric D. Young

1968
Charles E. Dean, Jr.
Richard T. Eakin
Kirby W. Fong
Jeffrey A. Gorman
Ronald H. Knapp
Gregory N. Kourilsky
Richard B. Larson
Ernesto R. Martin
Thomas R. McGetchin
Alan H. Osterheim
Philip R. Perry
Richard S. Rose
Earl G. Whitehead, Jr.

Parents
Dr. and Mrs. Bernard L. Abrams '70
Mr. and Mrs. Gerson J. Abramson '67
Mr. and Mrs. Carlo E. Anderson '71
Mr. and Mrs. Charles H. Anderson '57
Mr. and Mrs. Lawrence B. Anderson '66
Robert S. Arenton '71
Mr. and Mrs. Adam Baillie '68
Mr. and Mrs. Maurice S. Bell '68
Rabbi and Mrs. Samuel A. Berman '71
Mr. and Mrs. Halsey J. Blair '67
Mr. and Mrs. Oliver T. Blaschko '71
Mr. and Mrs. John W. Bloom '68
Mrs. Ann Speed Booth '68
Mr. and Mrs. Wayne V. Brandon '68
Mr. and Mrs. Leonard B. Britton '71
Mr. and Mrs. Louis M. Brown '61
Mr. and Mrs. Paul G. Brown '67
Lt. Col. and Mrs. Ralph M. Brown '68
Dr. and Mrs. Howard G. Bruenn '62
Mr. and Mrs. Lester Y. Bruner
Mrs. Edwin R. Buchman '52
Mrs. Henry M. Burton '71
Dr. and Mrs. Harvey R. Butcher '69
Mr. and Mrs. John M. Caywood '63
Mr. and Mrs. Irving B. Chaikin '66
Mr. and Mrs. Ellis F. Coles '70
Mr. and Mrs. Oran T. Cosand '64
L. G. Cramer '59
Mrs. Yetta D. Cramer '59
Mr. and Mrs. Joseph T. Cullen '64
Mr. and Mrs. Stanley B. Dauger '62
Mr. and Mrs. Harold T. Davisson '65
Col. and Mrs. William M. Delaney '71
Mrs. Philip L. Devin '67
Mr. and Mrs. C. F. DeVoe '71
Mrs. Bella Diodati '64
Mr. and Mrs. Griffith B. Doyle '70
Mr. and Mrs. Willis K. Drake '70
Irving Drucker '68
Mr. and Mrs. David G. Drummond '62

Edmond duPont '57
Dr. and Mrs. Sylvan H. Eisman '71
Mr. and Mrs. John L. Engleman '70
Mr. and Mrs. Walter R. Evans '69
Mr. and Mrs. Herman S. Feinberg '70
Mr. and Mrs. Colman Fisher '68
Mr. and Mrs. Jack L. Fisher '71
Mr. and Mrs. Harold Friedland '71
Mr. and Mrs. Tsugio Fujimoto '70
Mr. and Mrs. George T. Fujimura '67
Mr. and Mrs. Harold B. Gordon '61
Mr. and Mrs. W. W. Gowen '64, '65
Mrs. Hilda K. Grano '70
Mr. and Mrs. Richard L. Green '64
Mr. and Mrs. Edward J. Groth, Jr. '68
Mr. and Mrs. Gerald F. Grove '69
Mr. and Mrs. Raleigh S. Hales '60
Mr. and Mrs. C. M. Harrington '59
Mr. and Mrs. James S. Harris '66
Mr. and Mrs. Charles R. Henerey '69
Mr. and Mrs. Samuel J. Henry, Jr. '69
Mr. and Mrs. Sylvester Hermeyer '70
Mr. and Mrs. J. Ernest Hill '64
Mr. and Mrs. Edward L. Hilton '62
Mr. and Mrs. Collis H. Holladay '56
Mr. and Mrs. Wendell Horning '70
Mr. and Mrs. Hyman Horwitz '70
Mr. and Mrs. Gayle R. Hosack '63
Mr. and Mrs. Frank Insana '71
Mrs. Dora M. Jaegers '67
Mrs. Doris Jeffrey '69
Col. and Mrs. H. E. Johnson '70
Col. and Mrs. Clarence E. Jordan '69
Mr. and Mrs. Horace M. Joseph '70, '71
Mark Y. Kamii '56
Mr. and Mrs. Gerald L. Karski '66
Dr. and Mrs. M. L. Kauffman '62
Mr. and Mrs. William G. Kells '70
Mr. and Mrs. Leo E. Kelm '67
Mrs. Doris Kline '68
Mr. and Mrs. August J. Kling '71
Mr. and Mrs. Neil R. Kochendorfer '65
E. F. Koerner '59
Mr. and Mrs. Eugen Koffman '71
Mr. and Mrs. Kiso Kosai '66
Mr. and Mrs. Reuben Laderman '60
Mr. and Mrs. Charles E. Ladner Grad.
Mrs. Clara R. Lain '61
Mr. and Mrs. Meno T. Lake Grad.
Mr. and Mrs. Gerard Laurent '71
Mr. and Mrs. Leo Lederman '71
Mr. and Mrs. D. M. Lehman '68
Mr. and Mrs. Hung-Yu Loh '69, '71
Mrs. Milton Ludwig '65
Mr. and Mrs. James MacAnally '59
Mr. and Mrs. James D. MacNair '70
Mr. and Mrs. Byrne Marshall '62
Mr. and Mrs. Milton Matthews '62
Mr. and Mrs. Raymond A. McCreary '65
Mr. and Mrs. David Milstein '66
Mr. and Mrs. Charles Minichiello '63
Mr. and Mrs. Wallace Miyata '69
Dr. and Mrs. Milton E. Mohr Grad.
Dr. and Mrs. Robert R. Monahan '70
Mr. and Mrs. Marshall M. Mosher '69
Mr. and Mrs. George Muenich '61
Mr. and Mrs. Lee E. Munsil '71
Mr. and Mrs. Harold S. Murata '65, '70
Donald T. Nielsen '66
Mr. and Mrs. Harlan J. Nissen '60
Mr. and Mrs. Jacob B. Noble '62, '71
Mr. and Mrs. Fred F. Norman '68
Mr. and Mrs. Michael Odlyzko '71
Mr. and Mrs. James T. Ogawa '53
Mrs. Stephen Okada '69
Mr. and Mrs. Lawrence B. Oliver '65
Dr. and Mrs. Byron J. Olson '65
Mrs. John A. O'Pray '67
Mr. and Mrs. Nathan A. Orr '70
Dr. and Mrs. William Osheroff '67, '72
Edward A. Overman '69
Mr. and Mrs. Onni W. Paavola '69
Mrs. Edna M. Parker '67
Mr. and Mrs. R. W. Parker '61
Mr. and Mrs. David R. Patterson '70
Mr. and Mrs. Oliver P. Pearson '70
Mr. and Mrs. Joseph Pendergast '70
Mr. and Mrs. Cedric W. Petersen, Jr. '71
Dr. and Mrs. James S. Petty '59
Mr. and Mrs. Victor H. Pinneo '71
Mr. and Mrs. Emil T. Pockey '70
Mr. and Mrs. Aaron L. Pool '61
Mr. and Mrs. Leslie F. Porter '67
Mr. and Mrs. Henry B. Pratt '56
Mr. and Mrs. Albert Preston '64
Mr. and Mrs. George D. Prestwich '70
Mr. and Mrs. Louis Putterman '66
Mr. and Mrs. George C. Rayner '63
Mr. and Mrs. Richard P. Reul '70
Mr. and Mrs. David Reynolds '70
Mr. and Mrs. Morris Richstone '71
S. Brandt Rose Grad.
Mr. and Mrs. James S. Ruhoff '71
Mr. and Mrs. Roland R. Ruth '70
Dr. and Mrs. T. W. Saam '63
Albert W. Samuelson '70
Mr. and Mrs. Stewart F. Sando '71
Mr. and Mrs. Edward H. Schaaf '66
Mr. and Mrs. Walter R. Schmid '51, '55
Mr. and Mrs. Norman J. Schofield '68
Mrs. Edward Schroeder III '70
Mr. and Mrs. Robert P. Seguin '68
L. E. Shepard '50
Mr. and Mrs. Robert A. Shirley '69
Mr. and Mrs. Harry Shubert '61
Mr. and Mrs. Charles P. Silverthorne '71
Mr. and Mrs. Chester Sipkin '71
Mr. and Mrs. J. H. Stephens '69
Mr. and Mrs. W. A. Stuart Stevenson '70
Mr. and Mrs. Mahlon C. Sweet '65
Mr. and Mrs. August Tammaru '59
Dr. and Mrs. George Tarjan '69
Mr. and Mrs. John W. Teal '59
Mr. and Mrs. Hugh Templeton '71
Mr. and Mrs. Willard M. Thompson '68
Mr. and Mrs. Russell Turner '71
Mr. and Mrs. Thomas P. Turner '61
Mr. and Mrs. Joseph J. Tymczyszyn '66
Mr. and Mrs. Alfred F. Tyrrell '64
Mr. and Mrs. William V. Victor '71
Dr. and Mrs. Richard Vogt '61, '64
Mr. and Mrs. Elwood C. Walker '70
Mr. and Mrs. Robert P. Walter '66
Mr. and Mrs. Russell Waterland '70
Mr. and Mrs. Richard W. Weaver '71
Mr. and Mrs. Edwin L. Weis '64
Mrs. Marie J. Westervelt '71
Lt. Col. and Mrs. Mason Williams '64
Mr. and Mrs. J. Edgar Wise '65
Mr. and Mrs. Edward K. Yano '68
Mr. and Mrs. Joseph Yoh '62
Mr. and Mrs. Ah Mun Young '64
Mr. and Mrs. Roy Young '67
William Zimmerman '58

Coming Events

Sunday, Jan. 11, 8:15 p.m. Dabney
LOU MAURY ENSEMBLE. Music for piano, flute, and clarinet by R. Frank, L. Maury, C. Debussy, and J. Brahms. Free.

Sunday, Jan. 18, 3:30 p.m. Beckman
COLEMAN SERIES. Netherlands Chamber Choir, an 18-voice a cappella choir under the direction of Felix de Nobel. \$5-4-3.

Monday, Jan. 19, 8:30 p.m. Beckman
THE IMPACT OF CZECHOSLOVAKIA ON EASTERN EUROPE. A lecture by Dennison I. Rusinow, D. Philosophy, American Universities Field Staff and visiting lecturer, Caltech. Caltech lecture series. Free.

Sunday, Jan. 25, 8:15 p.m. Dabney
VALLEY STRING QUARTET. Two quartets and a quintet by J. Brahms, P. Senia, and W. A. Mozart. Free.

Monday, Jan. 26, 8:30 p.m. Beckman
MATERIAL STRENGTH—A LIMIT TO HUMAN INVENTIVENESS? A lecture by W. G. Knauss, Ph.D., associate professor of aeronautics, Caltech. Caltech lecture series. Free.

Tuesday, Jan. 27, 8:30 p.m. Beckman
KINETIC ART SERIES I. A series of the best short film subjects from all over the world. Series: \$6, Single: \$2.50.

Saturday, Jan. 31, 8:30 p.m. Beckman
MISHA DICHTER. Virtuoso pianist. \$5.50, \$4.50, \$3.50.

Alumni Calendar

Feb. 6, 6:00 p.m. Hong Kong Bank Bldg.
SAN FRANCISCO CHAPTER DINNER.

Feb. 16, 6:30 p.m. Athenaeum.
ALUMNI DINNER. Followed by Beckman Lecture at 8:30 p.m.

March 6, 13, Athenaeum.
ANNUAL WINE TASTINGS. I, II.

April 25
BARN DANCE.

Chemist Saul Winstein Dies

Saul Winstein, PhD '38, professor of chemistry at UCLA, died November 23 of an apparent heart attack. He was 57.

A leader in physical organic chemistry, Winstein had done research as a graduate student at Caltech with Howard Lucas and devised a remarkably perceptive interpretation of the complex molecular motions that must be involved in some superficially simple chemical reactions. He continued his early promise and became one of the world's premier geniuses in creating and testing models for the complex pattern of motions and bonding interactions that must occur during the reactions of complex molecules.

He combined two rare characteristics, a truly creative imagination and an ability to design sharply discriminating tests for his own and other theories. The impact of his work has been felt throughout a wide spectrum of chemical science and technology.

In addition to his direct contributions to research, Winstein established a viable style of work that has been adopted by many other workers in the field. Several hundred people—graduate students, post-doctoral research fellows, and visiting faculty fellows—came to UCLA to be associated with him during the past two decades. Without exception, these associates derived lasting stimulation from the experience.

He went to UCLA in 1941 as an instructor, and was a full professor by 1947. A member of the National Academy of Sciences, his awards included the ACS Pure Chemistry Award in 1949, the ACS Richards Medal in 1962, the McCoy Award in 1966, the Norris Award in 1968, and the Franklin Memorial Award in 1968. He also won distinguished alumni awards from both UCLA and Caltech.

He leaves his wife, Sylvia; a son, Bruce, a physics graduate student at Caltech; and a daughter, Carolee, a sophomore at UCLA.



MUDEO

Although support for the Mudeo—a Caltech tradition for 55 years—has waned in some quarters of the campus, these freshmen and sophomores go at it with enthusiasm on November 25. The freshmen won.

CHAPTER NOTES

SLASCIT

Frank Fujimura, '67, and Larry Shirley, '69, both teachers with the Peace Corps in Africa, have formed "SLASCIT," the Sierra Leone Alumni Society of the California Institute of Technology. The constitution of SLASCIT states that the chapter's purpose is to "greet and welcome Caltech visitors to Sierra Leone," and to "provide fellowship and exchange of information between Caltech alumni (consisting of Fujimura and Shirley) in Sierra Leone." The Alumni Association's board of directors has mailed them a charter.

Chicago

The Chicago chapter of Caltech's Alumni Association held a meeting at Northwestern University's Faculty Club on November 19. Twenty-five members attended the cocktail and dinner party at which William Corcoran, Caltech's vice president for Institute relations, talked about "Caltech Today." The chapter also elected new officers: Bob Kieckhefer replaces Larry Nobles as president; Wally Swanson was elected vice president, replacing Phil Smith; and Howard Jessen is the chapter's new secretary-treasurer.

ADDRESS UNKNOWN

The Institute has no record of the present addresses of these alumni. If you know the current addresses of any of these people, please contact the Alumni Office, Caltech.

1906
Norton, Frank E.

1907
Miller, James C.

1911
Lewis, Stanley M.

1921
Arnold, Jesse

1922
Cox, Edwin P.

1923
Neil, W. Harvey

1924
Carr, John
Gridley, Horace V.
Tracy, Willard H.

1925
Waller, Conrad J.

1926
Chang, Hung-Yuan
Huang, Y. H.
Yang, Kai J.

1927
Peterson, Frank F.

1928
Chou, P'ei-Yuan
Martin, Francis C.

1929
Briggs, Thomas H., Jr.
Espinosa, Julius Nelson
(now Nelson, Julius)
Kibort, Leon
Lau, Kam H.
Robinson, True W.
Uyterhoeven, Willem

1930
Chao, Chung-Yao
Moyers, Frank N.
White, Dudley

1931
Ho, Tseng-Loh
Oaks, Robert M.
West, William T.
Woo, Shu-Chow
Yoshioka, Carl K.

1933
Downie, Arthur J.
Koch, A. Arthur
Larsen, William A.
Mical, Edwin B.
Murdoch, Keith A.
Plank, Dick A.
Rice, Winston R.
Shapell, Maple D.
Smith, Warren H.

1934
Harshberger, John D.
Liu, Yun P.

1935
Antz, Hans M.
Bertram, Edward A.
Evans, M. Harrison
Huang, Fun-Chang
McNeal, Don

1936
Chu, Djen-Yuen
Dunn, Clarence L.
Meng, Chao-Ying
Tan, Chia-chen
Van Riper, Dale H.
Young, Larry L.

1937
Burnight, Thomas R.
Cheng, Ju-Yung
Easton, Anthony
Fan, Hsu T.
Jones, Paul F.
Lotzkar, Harry
Maginnis, Jack
Servet, Abdurahim
Shaw, Thomas N.
Shuler, Ellis W.
Yin, Hung C.

1938
Goodman, Hyman D.
Gross, Arthur G.
Gutierrez, Arnulfo G.
Li, Yuan-Chuen
Lowe, Frank C.
Rhett, William
Tsao, Chi-Cheng
Wang, Tsun-Kuei
Watson, James W.
Woodbury, William W.

1939
Burns, Martin C.
Jones, Winthrop G.
Liang, Carr C-C
Wilson, Harry D.

1940
Akman, M. Seyfi
Compton, Arthur M.
Gentner, William E.
Gibson, Arville C.
Green, William J.
Hsu, Chang-Pen
Karubian, Ruhollah Y.
King, James L.
Lovoff, Adolph
Menis, Luigi
Swain, John S.

Tao, Shih C.
Torrey, Preston C.
Wang, Tsung-Su

1941
Clark, Morris R.
Easley, Samuel J.
Geitz, Robert C.
Harvey, Donald L.
Kuo, I. Cheng
Robinson, Frederick G.
Standridge, Clyde T.
Yui, En-Ying

1942
Emre, Orhan M.
Go, Chong-Hu
Ip, Ching-U
Levin, Daniel
Martinez, Victor H.
Widenmann, John A.

1943
Angel, Edgar P.
Brown, James M.
Bryant, Eschol A.
Burlington, William J.
Daleon, Benjamin A.
Eaton, Warren V., Jr.
Hamilton, William M.
Hillyard, Roy L.
Johnsen, Edwin G.
Kane, Richard F.
King, Edward G.
Koch, Robert H.
LaForge, Gene R.
Leeds, William L.
Leonard, James H.
Ling, Shih-Sang
Lundquist, Roland E.
Mampell, Klaus
McNeil, Raymond F.
Mowery, Irl H., Jr.
Nesley, William L.
Neuschwander, Leo Z.
O'Brien, Robert E.
Patterson, Charles M.
Rivers, Nairn E.
Roberts, Fred B.
Rupert, James W., Jr.
Scholz, Dan R.
Shannon, Leslie A.
Smitherman, Thomas B.
Stirling, Cedric W.
Sweeney, William E.
Tindle, Albert W., Jr.
Vicente, Ernesto
Washburn, Courtland L.
Weis, William T.

1944
Alpan, Rasit H.
Amster, Warren H.
Barriga, Francisco D.
Bell, William E.
Benjamin, Donald G.
Birlik, Ertugrul
Burch, Joseph E.
Burke, William G.
Cebeci, Ahmed
Cooke, Charles M.
De Medeiros, Carlos A.
Fu, Ch'eng Y.
Harrison, Charles P.

1945
Ari, Victor A.
Gibson, Charles E.
Ho, Chung P.
Jenkins, Robert P.
Loo, Shih-Wei
Rice, Jonathan F.
Swanson, Don R.
Tseu, Payson S.
Turkbas, Necat

1946
Allison, Charles W., Jr.
Austin, Benjamin L.
Behroon, Khosrow
Bowen, Mark E.
Brinkhaus, Harvey H.
Burger, Glenn W.
Chen, KeYuan
Dyson, Jerome P.
Esner, David R.
Fateh, Hassan F.
Freire, Luis E.
Halvorson, George G.
Hoffman, Charles C.
Ingram, Wilbur A.
Lewis, Frederick J.
Maxwell, Frederick W.
McConaughay, James W.
Prasad, K. V. Krishna
Salbach, Carl K.
Shepard, Elmer R.
Sledge, Edward C.
Smith, Harvey F.
Srinivasan, Nateson
Tung, Yu-Sin
Webb, Milton G.

1947
Asher, Roland S.
Atencio, Adolfo J.
Chung, Ta-San
Clarke, Frederic B.
Clements, Robert E.
Collins, Hugh H.
Dagnall, Brian D.
Hsu, Chi N.
Huang, Ea-Qua
Lall, William G.
Leo, Fiorello R.

Hu, Ning
Johnson, William M.
Labanauskas, Paul J.
Leenerts, Lester O.
McBreen, Kenneth L.
Onstad, Merrill E.
Pi, Te-Hsien
Preston, Floyd W.
Ridlehuber, Jim M.
Shults, Mao G.
Stanford, Harry W.
Stein, Roberto L.
Sullivan, Richard B.
Sunalp, Halit
Tanyildiz, R. S.
Trimble, William M.
Unayral, Mustafa A.
Wadsworth, Joseph F., Jr.
Wight, D. Roger
Wolf, Paul L.
Writt, John J.
Yik, George

1948
Agnew, Haddon W.
Au, Yin C.
Bunce, James A.
Chu, Tao-Hung
Chuang, Feng-Kan
Clark, Albert R.
Collins, Burgess F.
Crawford, William D.
Herzog, Leonard F., II
Holm, John D.
Hsiao, Chien
Hsieh, Chia L.
Latson, Harvey H., Jr.
Mason, Herman A.
Oliver, Edward D., Jr.
Slusher, John T.
Stein, Paul G.
Tang, Yu-Wei
Voelker, William H.
White, Richard S., III
Winniford, Robert S.
Woods, Marion C.
Yanak, Joseph D.

1949
Baumann, Laurence I.
Bottenberg, William R.
Brown, John R.
Bryan, Wharton W.
Cheng, Che-Min
Cooper, Harold D.
Dodge, John A.
Foster, Francis C.
Hardy, Donald J.
Heiman, Jarvin R.
Krasin, Fred E.
Krauss, Max
Leroux, Pierre J.
Lowrey, Richard O.
McElligott, Richard H.
Mitchell, Max O.
Parker, Dan M.
Petty, Charles C.
Ringness, William M.
Solomon, Salim
Yu, Sien-Chiue

1950
Bryan, William C.
Forrester, Herbert A.
Li, Chung H.
McLellan, Albert E.
Pao, Wen K.
Paulson, Robert W.
Schneider, William P.

1951
Arosemena, Ricardo M.
Davison, Walter F.
Goodell, Howard C.
Lafdjian, Jacob P.
Li, Cheng-Wu
Lo, Shih-Chun
Padgett, Joseph E., Jr.
Summers, Allan J.

1952
Arbo, Paul E.
Arcoulis, Elias G.
Bissett, Charles F.
Bucy, Smith V.
Harrison, Marvin E.
Lunday, Adrian C.
Luo, Feilin
Primbs, Charles L.
Robison, William C.
Roy, Nikhilesh
Schaufele, Roger D.
Shelly, Thomas L.
Sutton, Donald E.
Wilson, Howard E.
Woods, Joseph F.

1953
Dirickson, Luiz H.
Lennox, Stuart G.
Mishaan, Alberto P.
Peters, Alphonse P.
Takahashi, Nobuyoshi

1954
Biles, Shelton B., Jr.
Guebert, Wesley R.
Henry, Irvin G.
Jimenez, Heriberto
Schalin, Pehr H. B.
Scott, Francis F.

1955
Barrios, Alfred A.
Huber, William E.
Myers, Henry R.

1956
Bradford, Robert E.
Edwards, Robert W.
Feige, Jacques
Garnault, Andre F.
Kelly, James L.
Kontaratos, Antonios N.
Lins, Antonio P. C.
MacDuffie, Duncan E.
Spence, William N.
Srinivasan, Prabandam
Tang, Chung-Liang

1957
Constanty, Michel J.
Edsforth, John F.
Slizeski, Robert S.
Taylor, Stanley G.
White, Ray H.

1958
Stenberg, Gunnar E.
Wille, Milton G.

1959
Baekelandt, Victor
Bailey, John S.
Byun, Chai B.
Cheng, Hung
Gray, Michael T.
Guillemet, Michel P.
Hamel, Armando
Hemmingway, Richard E.
Roth, Stanley

1960
Cauley, Joseph M.
Cisternas, Armando
Funada, Albert T.
Lagarde, Jean B.
Tucker, David L., Jr.
Widess, Paul R.

1961
Dowty, Earl L.
Emmett, John L.
Kitten, Roland
Richter, Rolf
Wilkinson, John F.

1962
Cousin, Michel M.
d'Arbaumont, Michel
Dorlhac, Jean-Pierre
O'Riordan, Padraic D.
Pines, Barry N.

1963
Facon, Pierre J.
Hendry, William L.
Peterson, James M.
Russo, Joseph E.
Woo, Ying-Bun
(now Wu, John Y.)

1964
Angel, Edward S.
Chang, Tzu-Ching
Marley, Robert R.
Puhl, Andreas
Skalbania, Nelson M.
Ts'ao, Hsueh-sheng

1965
Aimelet, Bernard A.
Aperghis, Gerassimos G.
Chalier, Philippe R.
Clark, Peter K.
Ryback, Wayne H.
Solelhac, Bernard C.
Stephens, Melvin M., II

1966
Couch, Harold T.
Eklof, Cary B.
Eris, Altan K.
Feroz, Shaikat H. M.
Street, Donald R.

1967
Blondy, Philippe J. M.
Cross, Peter N.

1968
Colson, Steven D.
Lehman, John M.
Fowler, William G.
O'Sullivan, Michael J.

PERSONALS

1902

KIRK W. DYER, Caltech's oldest living alumnus, traveled from his home in Cromwell, Conn., to Pasadena for the inauguration of Harold Brown on October 30. Dyer, whose last trip to the West Coast was in 1967 for his 65th class reunion, says he is looking forward to his next visit to Pasadena in 1972 when he will celebrate the 70th year since his graduation from Throop University.

1928

JOHN THATCHER, MS '30, manager of JPL's deep space network systems, is the new vice chairman of the Los Angeles Council of the IEEE.

1929

MORRIS MUSKAT, PhD, received the Lester C. Uren Award from the Society of Petroleum Engineers. Muskat, a technical adviser for the Gulf Oil Company, is recognized for his work and publications in the field of petroleum engineering technology.

1931

RAYMOND A. PETERSON, PhD '35, director of research for the United Geophysical Corporation, was elected to honorary life membership in the International Society of Exploration Geophysics.

1932

GLEN W. MILLER, vice president of Randolph, Johnson, Miller and Associates, is president of the California Society of Professional Engineers for the year 1969-70.

1936

HUGH F. COLVIN, president of Unitek Corporation, recently became a member of the National Council of the National Planning Association.

1938

PETER R. KYROPOULOS, MS, PhD '48, technical director of the General Motors styling staff, was elected a fellow of the American Society of Mechanical Engineers.

1940

ABE M. ZAREM, PhD '44, senior vice president for corporate development of the Xerox Corporation, received the Albert F. Sperry Medal given by the Instrument Society of America in Pittsburgh. Zarem was recognized for "distinguished achievement in the field of optical and electronic measurement for ultra high-speed transients; systems for silicon solar cells for space power, and ion beams for space propulsion; and use of solid state materials technology in pressure and temperature transducers."

1941

ROBERT B. LEIGHTON, MS '44, PhD '47, Caltech professor of physics, gave the fourth annual John H. Tinlot Memorial Lecture, November 14, at the University of Rochester. Leighton spoke on "The Mariner VI and VII Television Experiment."

ROBERT L. NOLAND, executive vice president of AMETEK, INC., was elected a director of the corporation.



Noland, '41



Pfeiffer, '49

1942

JOHN SPIZIZEN, PhD, chairman of the department of microbiology at Scripps Clinic and Research Foundation and resident professor of biology at UC San Diego, has been appointed to the microbiology training committee of the National Institute of General Medical Sciences, a component of the National Institutes of Health.

ROY C. VAN ORDEN is one of six new partners of the architectural firm Albert C. Martin and Associates. Van Orden, division manager, has been with the firm since 1950.

1943

WILLARD M. HANGER, MS, AE, who has practiced law with the Washington, D.C., firm of Browne, Beveridge and De Grande since 1960 when he retired from the Navy, writes that he was made a full partner last May.

RALPH M. WILLITS, assistant manager at Mobil Oil's Paulsboro, New Jersey, refinery, is a member of a task force engaged in the design and construction of a new grass-roots refinery to be built in Joliet, Illinois. Willits is currently in residence at the Los Angeles office of the Fluor Corporation, which is contractor for the project.

1944

ALFRED G. KNUDSEN JR., PhD '56, formerly a professor of medicine at Stony Brook Medical Center in New York, is now an associate director of education at the University of Texas' M. C. Anderson Hospital and Tumor Institute in Houston.

JOHN B. McNAUGHTON, previously vice president of the Jeffrey Manufacturing Co., Ltd., in Montreal, is now manager of manufacturing for Westeel-Rosco Limited.

RUBEN F. METTLER, MS '47, PhD '49, executive vice president of TRW Inc. and one of Caltech's new trustees, has been appointed by President Nixon to be chairman of a task force on science policy.

CHARLES R. RIKEL, MS, manager of the Southern California Gas Company's northeast division, is the new president of the Pasadena Rotary Club.

1947

WILLIAM F. BALLHAUS, PhD, president-director of Beckman Instruments, Inc., was elected to the board of trustees of Harvey Mudd College.

ARNOLD A. JENSEN, MS, AE '48, PhD '51, previously assistant manager of the aerothermodynamics department of TRW Systems in Redondo Beach, reports that he is now manager of the department.

1948

JAMES R. DAVIS, MS '49, president of Converse, Davis and Associates, is the newly elected president of the Consulting Engineers Association of California.

KEITH W. HENDERSON, staff engineer at the Stanford Linear Accelerator Center, is now the national director of the California Society of Professional Engineers.

DAVID B. WILFORD, MS '51, is now a full-time teacher of mathematics at Grossmont High School in La Mesa, California. Wilford, president of the San Diego chapter of the Caltech Alumni Association, is also working with Comp-Time, a computer services company in San Diego associated with Remote Computing Corporation of Los Angeles.

1949

ARTHUR R. BENTON JR., BS '50, a commissioned officer in the Commerce Department's environmental science services administration, received an appointment as commanding officer of the USC&GS ship *Surveyor*.

WILLIAM N. HARRIS, MS '50, is now working for the Guy F. Atkinson Co. in San Luis Obispo as quality assurance manager in the construction of the Diablo Canyon nuclear power plant.

HEINZ G. PFEIFFER, PhD, is one of 47 leaders of business and education who will serve on newly formed visiting committees for Drew University in Madison, New Jersey. Pfeiffer is manager of the educational technology branch at the General Electric Research and Development Center in Schenectady, New York.

1950

WILLIAM F. JONES, MS, is the 1969-70 vice president of the California Society of Professional Engineers. He is principal of Gribaldo, Jacobs, Jones and Associates.

C. JAMES BLOM was named senior vice president and coordinator of Libyan affairs for Occidental of Libya, Inc.

1951

FREDERICK W. HARTWIG, MS, AE '52, PhD '57, has joined Electro-Optical Systems, Pasadena Xerox Company, as a vice president and corporate chief scientist. Hartwig was formerly with TRW Systems in Redondo Beach as manager of advanced military systems.

R. STEPHEN PARDEE, MS '52, formerly the supervisor of the engineering applications group at Bell Telephone Laboratories, will now head the machine aids development department.



Pardee, '51



Sutton, '53

1952

ALAN G. FLETCHER, MS, is the new dean of the College of Engineering at the University of North Dakota, where he has been an associate professor of chemical engineering.

THOMAS W. HAMILTON, previously the manager of the systems analysis section and acting assistant manager of the systems division at JPL, succeeds Clarence Gates as manager of the laboratory's navigation program.

ROY A. KEIR is now an associate professor of electrical engineering in computer science at the University of Utah. His field is digital computer logical design.

1953

GEORGE W. SUTTON, MS, PhD '55, former chairman of the aerophysics committee for Avco Everett Research Laboratory, has been appointed chairman of the company's strategic defense committee. Under Sutton's direction, the committee will be responsible for making and implementing policies in reentry research and all other areas of strategic defense.

1955

JAMES P. LEWIS is chief engineer at the Torrance division of Cosmodyne Corporation.

1956

EDWARD M. DAVIS JR., MS, has been promoted to division director of development of IBM's components division. He had been director of memory development for the division.

FREDERIK ZACHARIASEN, PhD, Caltech professor of theoretical physics, received a Guggenheim Fellowship for studies in elementary particle physics.

1957

ROBERT E. AYERS, MS, major in the U.S. Air Force, is attending the U.S. Army War College at Carlisle Barracks, Pennsylvania.

ROY A. JENSEN, MS '58, manager in the direct access storage development area at IBM's systems development division laboratory, has been promoted to senior engineer for the division.

RICHARD J. KERR, PhD, former marketing manager in plastics intermediates for the Union Carbide Corporation, has been appointed vice president of the coatings intermediates division and general manager of the materials department.

1958

GLENN L. CONVERSE, MS '59, formerly a postdoctoral fellow at the Earthquake Research Institute of the University of Tokyo, is now working on the research staff for Physics International in San Leandro, California.

HUGO B. FISCHER, MS '63, PhD '66, assistant professor of civil engineering at UC Berkeley, received the J. James R. Croes Medal from the American Society of Civil Engineers in Chicago for his paper on "The Mechanics of Dispersion in Natural Streams."

1960

GERALD B. JOHNSTON, Captain, U.S. Air Force, received the U.S. Joint Service Commendation Medal at Davis-Monthan Air Force Base, Arizona, for his service at Tan Son Nhut air base in Vietnam.

1961

JAMES F. HAYS, MS, is now an associate professor of geology at Harvard University where he has been an assistant professor since 1966.

DAVID C. KUBRIN, assistant professor of history at Dartmouth College, received a Guggenheim Fellowship for a study of 17th century English cosmogony and Newtonian metaphysics.

ANN MASSAR, PhD, formerly Ann Roller, was married to a Belgian geologist last March. He is now working in the geology department for Luanshya Mines Ltd., Zambia, Africa, and she is writing an elementary textbook on molecular biology.

1963

GEORGE A. SEIELSTAD, PhD, a senior research fellow in radio astronomy and staff member of the Owens Valley Radio Observatory, received a Guggenheim Fellowship for study in extragalactic radio astronomy.

1964

ROBERT D. BRUNER is an assistant professor of biology at Rice University in Houston. Bruner received his PhD in molecular biology from UC Berkeley in August.

JOSEPH TSU CHIEH LIU, PhD, was promoted in June to associate professor of engineering at Brown University.

1965

WILLIAM M. HARDHAM, PhD, with the Dupont Corporation since 1965, was promoted to research supervisor in the research and development division of the chemicals department.

GEORGE A. REPASY, Captain, U.S. Air Force, graduated from the training course for electronic warfare officers at Mather Air Force Base, Calif. He is assigned to Takhli Royal Thai Air Force Base in Thailand for duty with a unit of the Pacific Air Forces.

1967

GREGORY R. SHUPTRINE, a process engineer for the Caltex Petroleum Corporation, has been transferred to an Australian affiliate of the company, the Australian Oil Refining Party, Ltd., Cronulla, New South Wales.

1968

SAMUEL DIGIROLAMO, MS, a 1st lieutenant in the United States Air Force, received his silver pilot wings upon graduation at Vance Air Force Base, Oklahoma.

THEODORE W. LAETSCH, PhD, writes that he has resumed teaching mathematics at Illinois State University after spending the summer doing research at Wright-Patterson Air Force Base in Ohio.

DAVID J. SHIRLEY has completed basic training at Lackland Air Force Base, Texas, and is now assigned to Sheppard Air Force Base, Texas.

EARL GLEN WHITEHEAD JR., a graduate student at USC and consultant for education in Hollywood, California, now has his own business, Wimco, which manufactures educational toys.

1969

TIMOTHY S. AXELROD won a Fannie and John Hertz Foundation Fellowship for his study toward a doctoral degree in the applied physical sciences at Stanford University.

PETER B. LYONS, PhD, is a member of the staff of the Los Alamos Scientific Laboratory in New Mexico where he is working in the testing division.

AUGUST L. SCHULTZ, an engineer at JPL, has been awarded a Daniel and Florence Guggenheim Fellowship for outstanding technical ability and promise in the fields related to the flight sciences.

ASHLEY D. WILLIAMSON, MS, private in the U.S. Army, is a chemist with the research laboratories at the Edgewood Arsenal, Maryland.