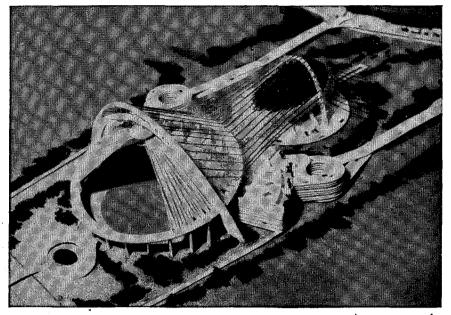
MARS outstanding design SERIES

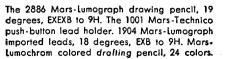


umbrella'd stadia

While it isn't always true, an interesting approach often results in a good design, as in these twin allweather stadia designed by Harry Barone and Arnold Horn, Pratt architecture students. Each bowl would be umbrella'd by its own tentlike roof of translucent plastic, hung from the center of soaring arches. Accordion-pleated, these roofs are planned to fold together out of the way in fair weather, their lower edges riding along the rims of the bowls. Cables that guy the arches form a decorative pattern tying the two stadia together. The big football-baseball bowl would hold 65,000 spectators; the smaller, 20,000.

No matter which of today's bright ideas become tomorrow's reality, it will be as important then as it is now to use the best of tools when pencil and paper translate a dream into a project. And then, as now, there will be no finer tool than Mars—from sketch to working drawing.

Mars has long been the standard of professionals. To the famous line of Mars-Technico push-button holders and leads, Mars-Lumograph pencils, and Tradition-Aquarell painting pencils, have recently been added these new products: the Mars Pocket-Technico for field use; the efficient Mars lead sharpener and "Draftsman's" Pencil Sharpener with the adjustable point-length feature; and—last but not least—the Mars-Lumochrom, the new colored *drafting* pencil which offers revolutionary drafting advantages. The fact that it blueprints perfectly is just one of its many important features.





at all good engineering and drawing material suppliers

Personals

1917

A. R. Kemp, MS '18, is now research associate at the University of Southern California in Los Angeles. He is doing fundamental research in the field of rubber and organic polymers under the auspices of the Tlargi Rubber Technology Foundation. Since leaving Bell Labs in New York in 1948, Archie has been actively engaged in consulting work. For the record: Archie was the first man to get an MS in chemistry at Caltech (which was still Throop in those days).

1918

Eugene H. Imler died of a heart attack on July 30 in Brawley, California. He had been city engineer for the cities of Brawley, Seeley and Westmoreland. Gene was a member of the Alumni Association's board of directors from 1934-36 and served as secretary-treasurer from 1923 to 1924. He is survived by his wife, Hazel.

1922

Robert J. Crissman, general traffic superintendent of the Pacific Telephone and Telegraph Company, died at his home in San Marino after a heart attack on July 7. Bob had been with the telephone company for 36 years. He is survived by his wife, a son and two grandsons.

Hallan N. Marsh and George N. Ramseyer (BS '23) are both celebrating their 35th year with the General Petroleum Corporation this year. Hallan is manager of the company's production engineering and equipment section, with headquarters at Vernon. A former director of the Caltech Alumni Association, he has also been national chairman of several petroleum industry committees.

George is manager of operations in the company's marketing department in Los Angeles.

1924

F. Douglas Tellwright has been appointed executive vice president and director of the Pacific Telephone and Telegraph Company in San Francisco. He had been vice president of the public relations department there.

Joseph E. Mayer, professor of chemistry at the University of Chicago's Enrico Fermi Institute for Nuclear Studies, was the winner of this year's Gilbert N. Lewis Award, given by the California Section of the American Chemical Society. He received it for his contributions to statistical mechanics of fluids and solutions, his successful theoretical and experimental investigations of critical *continued on page 52*

Personals . . . continued

phenomena and his work on the theory of electrolytes.

Rolland Thomas writes that he is starting his 29th year as instructor and head of the industrial arts department of the Woodrow Wilson High School in Long Beach. For about 10 years he has also been operating engineer and president of the board of directors of a mutual water company in Garden Grove.

Tommy has a daughter now living in Hayward, California, who is the mother of three children. His oldest son is the production engineer for the reactor unit of the new U.S.S. Long Beach and works for the Westinghouse Corporation in Pittsburgh, Pa. He is the father of two children. And Tommy's youngest son is a senior at Long Beach State College, majoring in physics.

1925

William F. Aggeler has been promoted to full professor of French at the University of California in Santa Barbara. He has taught there since 1940. He has also had a book published recently— Learning French Is Fun, written in coldaboration with Mme. Yvonne Bardet of Berkeley.

1926

Theodore C. Coleman, president of the Coleman Engineering Corporation in Torrance, has been elected president and board chairman of the Strategic Industries Association, a national trade group of independent defense producers.

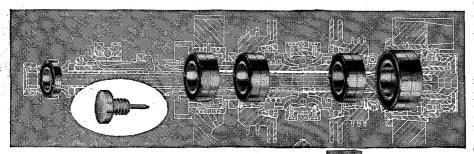
1927

Robert Creveling, staff member of the Sandia Corporation in Albuquerque, New Mexico since 1950, writes that both of his daughters are married now; Letitia in 1953 and Mary Patricia last June.

Alan E. Capon, assistant general manager and chief engineer of the Public Service Department of the City of Burbank, was recently elected chairman of the Burbank Chapter of the American Red Cross and is also serving on the 1958-59 board of directors of the Los Angeles Section of the American Institute of Electrical Engineers. His son, Alan, is taking business administration at the University of California in Berkeley.

1928

Richard G. Folsom, MS '29, PhD '32, was formally installed as president of



7 Seconds From Nothing Flat!

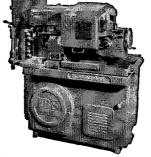
It takes only seven seconds for the new 00 Brown & Sharpe Automatic Screw Machine to produce the brass part shown above. That's a 42% increase in rate of production over the previous B&S model.

One of many new features that contribute to the remarkable performance of the 00 machine is a chain driven ball bearing spindle (diagram). Fafnir engineers worked with Brown & Sharpe in selecting bearings for this application, involving some 208 spindle speed combinations ranging from 34 to 7200 RPM. To assure absolute spindle rigidity and running accuracy, Fafnir super-precision ball bearings are mounted in the positions indicated.

Thousands of similar bearing success stories help explain why design engineers turn to Fafnir for help with bearing problems. The Fafnir Bearing Company, New Britain, Connecticut.

SO YOU WANT A CAREER IN A GROWTH INDUSTRY

Since the advent of the automotive age, Fafnir's record of growth has been inseparably linked with the over-all mechanization and phenomenal growth of industry itself — right down to present-day advances in automation and instrumentation. Fafnir's field of operations is, moreover, industry-wide ...



The New Brown & Sharpe No. 00 Automatic Screw Machine with Fafnir-equipped spindle.



little affected by momentary ups and downs of individual companies or industries. Find out what Fafnir offers you in the way of professional challenge, diversity, and stability in a "growth industry" with a future as promising as the future of America. Write today for an interview. Rensselaer Polytechnic Institute in Troy, N.Y., early this month. He had been head of the University of Michigan's Engineering Research Institute since 1953.

1930

Franklin M. Murphy, consulting geologist, died of a heart attack on March 10, 1957, in Las Vegas, Nevada. He is survived by his mother, Mrs. Estelle Murphy.

1931

A. Carl Tutschulte is now divisional petroleum engineer for the Tidewater Oil Company's western division, with headquarters in San Francisco. Carl has been with Tidewater since 1936.

1933

G. Merrill Berkley, owner of the Berkley Engineers and Equipment Company in Los Angeles, with a home office in Honolulu, spent some time in Europe during the summer on business. He visited Brussels, Paris, Geneva, Zurich, Frankfurt and Copenhagen.

John S. Warfel, manager of the Avionics Division of Aerojet-General in Azusa, was elected a vice president of Avionics in July. This branch of the company is one of the largest infrared research and development activities in the country. John has been with Aerojet since 1946.

1934

John T. Cortelyou, standards engineer for the Southern California Gas Company, writes that his daughter, Dorothy, was married on August 23 in Inglewood. Jack thinks he is probably the first member of the class of '34 to have a married child.

James W. McRae, MS, PhD '37, is now a vice president of the American Telephone and Telegraph Company. He had been vice president of the Western Electric Company and president of the Sandia Corporation, a western subsidiary. He will now serve as coordinator of defense activities for the Bell System.

1935

Alfred Romer, PhD, was promoted to the rank of professor of physics at St. Lawrence University in Canton, New York, this summer. He has been at the university since 1946.

Alan Beerbower, chemical engineer at Esso Standard Oil's Baltimore refinery, has rejoined the staff of Esso Research and Engineering in Linden, N.J. He is continuing research on lubricants and applications of radio isotopes—as he has been doing for various sections of Esso for the past 22 years.

He writes that he will be vice chairman of the Process and Industries Sec-

Personals . . . continued

tion of the Nuclear Engineering and Science Congress next April-and that he has just received his 23rd patent and had his 6th article published. His daughter, Marjory, attends Goucher College in Baltimore.

1937

Walter H. Albach, MS, died of a heart attack on October 15, 1956, according to a recent note from his widow. Walt was a lecturer at the University of Southern California in Los Angeles.

John R. Austen is now assistant superintendent of the compressor division of Ingersoll-Rand in Phillipsburg, Pa. He had formerly been superintendent of the forge division. The Austens, who live in Palmer Township, have two sons-John, 13, and Stephen, 11.

Martin J. Poggi writes that "this year I started my own business as a manufacturer's representative, covering Washington, Oregon and Alaska. I represent five companies and am concentrating on products used in the aircraft, guided missile and nuclear industries in these areas. We built a home in Bellevue on the Lake Washington waterfront last year and hope to stay permanently now."

1938

Saul Winstein, PhD, professor of chemistry at UCLA, presented the annual Edward Mack, Jr., Memorial Lecture at Ohio State University last summer. The lecture is sponsored by the Ohio State chemistry department and by Phi Lambda Upsilon.

Charles F. Robinson, MS, PhD '49, has been appointed chief research physicist at Consolidated Electrodynamics Corporation in Pasadena. He has been with CEC since 1947.

Duane W. Farnham, MS, has moved from Tulsa to the New York offices of Pan American International as operating superintendent in the company's production department. His work in Tulsa had been associated with exploration, drilling and production activities of the company's subsidiaries operating in the Caribbean area.

Frederic H. Moore, senior project engineer at The Texas Company in Wilmington, California, was recently installed as governor of Toastmasters International District 51 for 1958-59. This district comprises the southeastern section of L.A. County from Redondo Beach to Seal Beach and Fred has 40 clubs under his supervision and the assistance of seven area governors.

1939

Andrew A. Fejer, MS, PhD '45, is now director of the department of mechanical engineering at the Illinois Institute of

October, 1958

Technology in Chicago. He had been at the University of Toledo, as professor of aeronautical engineering, since 1949. He is also a member of the research division of the Curtiss-Wright Corporation. Andy used to work as a research engineer in Caltech's JPL, and he was also a member of the committee responsible for the design and construction of the Southern California Cooperative Wind Tunnel.

1940

G. R. Brown, division petroleum engineer for The Texas Company in Fort Worth, has been transferred to New York as staff petroleum engineer to the vice president of domestic production. His wife and their son, Reynolds, will join him in their new home in New Canaan, Conn.

1941

James T. Harlan, Jr., senior technologist at the Shell Chemical Corporation in Torrance, writes: "My family (3 children and 1 wife) are glad to be back in Southern California again after a long absence. In recent years I have been studying various aspects of the nuclear field for my employer-a very challenging assignment-and am now engrossed in work chiefly in the field of radiation chemistry research. One particularly interesting experience was a one-year association with AEC's Argonne National Laboratory. Part of the time was spent with an international group representing some 30 different countries-quite an effective way to gain an international viewpoint."

1942

George P. Sutton, manager of the advance design section at Rocketdyne in Canoga Park, has been named Hunsaker Professor of Aeronautical Engineering at MIT for 1958-59. He is the first man from industry to be selected for the endowed visiting professorship and will conduct a course on rocket engine propulsion at MIT and will also engage in research on the design and development of rocket engines. During the year he will deliver the Minta Martin lecture to scientific audiences throughout the nation.

George joined North American Aviation in 1946 and has been active on all phases of the Navaho, Redstone, Thor, Jupiter and Atlas engine development work conducted at the company's Rocketdyne division. His wife and two daughters, Christine, 13, and Marilyn, 11, are moving with him to Boston.

1943

David M. Mason, MS '47, PhD '49, has been promoted to full professor of chemicontinued on page 56



Thousands of ITT engineers are "space men"

NOT *literally*, of course, but they are engaged in so many electronic activities associated with the vast air world above us that they might well be broadly identified as "space men."

Many have achieved a high record of success in research, design, production, testing, and field engineering of air navigation and traffic control systems...including ILS, Tacan, Vortac, Data Link, VOR, DME, Navascreen, Navarho, and automatic "typewriters" serving the Narcast system for in-flight weather reporting.

Other ITT "space men" are making important contributions to air reconnaissance, inertial navigation, infrared, missile guidance and control, electronic countermeasures, radio communications, radar, scatter communications, and other categories vital to national defense.

These are only a few of the many activities at ITT laboratory and production centers – coast to coast – where challenging problems are constantly opening the way to top careers.

Consult your College Placement Officer for interview date, or write to ITT Technical Placement Office, 67 Broad Street, New York 4, New York.



67 Broad Street • New York



Equipping soldierexplorers

SPACE — like the world's historic frontiers—will be secured by soldier-explorers, using bold, unprecedented equipment.

Astronomers, physicists, scientists and engineers at Chance Vought are hurrying this equipment into reality. Astronautics—in less than two years' time — has become a major Vought effort.

Membership on Boeing Airplane Company's Dyna Soar development team underlines Vought's space qualfications. And, alongside this space glider program are other, original Vought studies—aimed at space.

Multistaging ... space communications ... nuclear and ionic propulsion ... celestial navigation: these are growing components *today* in Vought's man-in-space program. As space research vehicle target dates approach, a need for additional qualified specialists exists in Vought's Astronautics team.

ASTRODYNAMICS SPECIALISTS, for example. Vought offers full challenge to men' experienced in computing space trajectories by means of digital computers and accurate integration techniques. Knowledge of orbit calculations is required.

PRELIMINARY DESIGN ENGINEERS also can turn their talents toward space. Especially needed are designers who can turn thrust, payload and mission approximations into practical configurations; also, designers with field experience, to create orderly, "strcamlined" launch systems.

Astronautics and preliminary design specialists are invited to inquire: A. L. Jarrett, Manager, Advanced Weapons Engineering, Dept. TIC-1

CHANCE OUGHT AIRCRAFT

Personals . . . continued

cal engineering at Stanford University. From 1949 to 1955 he was an instructor and later a research group supervisor at JPL.

1944

Jay R. Borden, MS '47, is now senior instrumentation engineer of Waste King Corporation's Technical Products Division in Los Angeles. He was formerly chief engineer at the Clary Dynamics Corporation in San Gabriel, and before that was senior development engineer at JPL. The Bordens live in Pasadena and have two children—Thomas, 7, and Patricia, 5.

1946

William N. Lipscomb, Jr., PhD, head of the division of physical chemistry at the University of Minnesota, received the 14th annual Harrison Howe Award from the American Chemical Society's Rochester Section. The award, which consists of a citation and a \$500 cash prize, is given annually to recognize achievement in chemistry and to promote discussion of problems likely to be important in the future of chemistry. The first award, made in 1946, went to Linus Pauling, PhD '25, Caltech professor of chemistry.

John W. Sease, PhD, received a promotion to full professor of chemistry this summer at Wesleyan University in Middletown, Conn. Now studying at UCLA under a National Science Foundation Fellowship, John was a research assistant with the National Defense Research Council before joining the Wesleyan faculty in 1946.

Earnest H. Clark, MS '47, has been appointed vice president and assistant general manager of Baker Oil Tools, Inc., in Los Angeles. He has been with the company for 11 years, serving most recently as head of new product research.

1947

Richard C. Gerke, MS, contracting engineer at the Bethlehem Pacific Coast Steel Corporation in Los Angeles, announced the arrival of the fifth addition to the family last spring—a second son, Carl Alexander.

George B. Melrose, Jr., MS, chief of aeromechanics with the space flight and missiles division of the Bell Aircraft Corporation in Buffalo, N.Y., has been appointed president of the Technical Societies Council of the Niagara Frontiercomprised of the local chapters of 40 national professional societies with a total membership of about 8,000. He has also been elected to the advisory board of the Institute of the Aeronautical Sciences. The Melroses, who live in Kenmore, have two children-Mark, 5, and Diane, 2.

1950

Vern Allan Edwards, process engineer at Fibreboard Paper Products, Inc., in Los Angeles, reports that two-year-old Jeanne now has a sister, Amy, born on June 27.

Edsel A. Worrell writes that "I am a senior engineer for Westinghouse Electronics Division in Baltimore, Md., and my major duties consist of mathematical analysis of electronic systems, mostly radar. Since coming to Baltimore in 1953 I have acquired a wife, Louise, (in April, 1955) and 2-year-old Frank Henry. Currently we are buying a house and will move early in the fall."

1951

Leo L. Baggerly, MS '52, PhD '56, formerly senior research engineer at JPL, has been granted an award under the State Department's international educational exchange program to enable him to serve as a visiting professor in mathematical physics at the University of Ceylon in Colombo. He has been serving at the University of Ceylon for the past year on a Fulbright Lectureship.

1952

Randolph G. Moore received his MS in electrical engineering from the University of Arizona in Tucson last May.

Robert E. Stanaway is now manager of the spectron department of the transducer division of the Consolidated Electrodynamics Corporation in Pasadena. Spectron designs, develops and manufactures precision optical assemblies and components for geophysical, industrial and aeronautical needs of companies in the instrumentation field. Bob has been with the company since 1956 and was formerly a development project engineer.

Michel Bader, PhD '55, writes that he and his wife have infectious cases of inflated ego-the probable cause being a new daughter, Annette, born in August. Michel is an aeronautical research engineer at the National Advisory Committee for Aeronautics at Moffett Field, California.

Robert W. Zwanzig, PhD, has joined the staff of the National Bureau of Standards and will be working on the Bureau's free radical research program. Prior to this appointment, he was assistant professor of chemistry at Johns Hopkins University.

1953

George W. Sutton, MS, PhD '55, research engineer in aerophysics at General Electric's Aerosciences Laboratory in Philadelphia, is currently working on projects associated with outer space conditions and space flight, undertaken by continued on page 60

56

Personals . . . continued

the company's missile and ordnance systems department. The most recent research has been directed toward the design and development of a nose cone for the Air Force's Atlas and Thor ballistic missiles. The Suttons and their two children live in Ambler, Pa.

1955

Armin D. Kaiser, PhD, has received a promotion to assistant professor of microbiology at Washington University in St. Louis, Mo.

Stephen L. Stamm, MS, was graduated from the General Electric Company's advanced engineering program in June. The program was established more than 30 years ago to make advanced study in applied physics and mathematics available to young engineers of exceptional promise. Steve joined the company in 1955.

Allen E. Fuhs, MS, is now an assist-

ant professor of mechanical engineering at Northwestern University in Evanston, Ill. He was formerly a lecturer at Caltech's Jet Propulsion Laboratory.

Vincenzo M. Cestari, BS '55, MS '55, writes that he is still working for Consolidated Electrodynamics in Pasadena as a development engineer. "I have been here for the past two years," Vincenzo writes, "and have worked in many projects, all related to D.C. amplifiers of high sensitivity and stability. In August I start on a leave of absence of two years to study at the Harvard Business School. If all goes well, I will have an MBA in 1960.'

1957

Thomas C. Hays, MS '58, writes that "after receiving my MS in electrical engineering in June, I married the former Mary Ann Jergens of Los Angeles. I am now serving with the Air Force as a 2nd Lt. at the Wright Air Development Center at Wright-Patterson AFB in Ohio."

Victor Evtuhov, MS, is one of ten outstanding postgraduate students who will attend Caltech this semester under Howard Hughes Fellowships in Science and Engineering. Three other Caltech alumni will be here as Hughes Fellows: John P. Andelin, '55; Donald C. Forster, MS '57; and John J. Merrill, '55, MS '56.

Edwin X. Berry, student in the education department of Sacramento State College, announced the arrival of a son, Kim, on July 21.

1958

Donald B. Chesnut, PhD, is now on the research staff of Du Pont's Central Research Department as a physical chemist at the Experimental Station near Wilmington, Del.

Anthony Demetriades, PhD, research fellow in aeronautics at Caltech, now has a son, Anthony, born in August.

SIT BACK AND BELAX	ALUMNI ASSOCIATION OFFICERS SECRETARY Edward P. Fleischer, '43 Donald S. Clark, '29 VICE-PRESIDENT TREASURER Frank C. Bumb, '51 George B. Holmes, '38 BOARD OF DIRECTORS Frank E. Alderman, '30 William W. Haefliger, '50 L. Fort Etter, '35 Ralph W. Jones, '38 John E. Fleming, '46 Francis E. Odell, '44 Nick T. Ugrin, '34 ALUMNI CHAPTER OFFICERS NEW YORK CHAPTER Frank F. Scheck, '48 Pennie, Edmonds, Morton, Barrows & Taylor 247 247 Park Avenue Yice-President and Treasurer Dudley B. Smith, '45 Cluett, Peabody & Company, 530 Fifth Avenue Secretary E. Morton Holland, '36 A. G. Edwards & Sons, 485 Lexington Avenue WASHINGTON, D.C. CHAPTER Frank H. Shelton, '49 Armed Forces Special Weapons Project Secretary-Treasurer Richard G. King, '49 Applied Physics Laboratory, Johns Hopkins University Silver Springs, Maryland SAN FRANCISCO CHAPTER President Jules F. Mayer, '40 Standard Oil Co. of Calif., Chemical'Division, Richmond Yice-President Norman Bulman, '52 Shell Oil Company, Martinez Ja
We have the most modern facilities and most complete plant to give you the maximum of service, whether it is a small part, a large part, or a product from your ideas to the shipped article direct to your customers, under your name, from our plant.CALMEC MANUFACTURING CO. Robert A. McIntyre, M.S. '38KImball 6204 S825 District Blvd.	Secretary-Treasurer James A. Ibers, '51 Shell Development Co., Emeryville Meetings: Fraternity Club, 345 Bush St., San Francisco Informal luncheons every Thursday CHICAGO CHAPTER President Laurence H. Nobles, '49 Department of Geology, Northwestern University, Evanston Vice-President Philip E. Smith, '39 Eastman Kodak Co., 1712 Prairie Avenue Secretary-Treasurer Thorne J. Butler, '51 Medical Center, Northwestern University SACRAMENTO CHAPTER President Charles M. Herd, '30 State Division of Architecture, 1120 ''N'' Street Vice-President Kenneth M. Fenwick, '28 State Division of Highways, 1120 ''N'' Street Secretary-Treasurer Joseph A. Dobrowolski, '49 Portland Cement Association Meetings: University Club, 1319 ''K'' St. Luncheon first Friday of each month SAN DIEGO CHAPTER Chairman Maurice B. Ross, '24 3040 Udal Street Frank J. Dore, '45 Secretary Frank J. Dore, '45 Consolidated Vultee Aircraft Corp. Frank J. Dore, '45 Program Cheirman Herman S. Englander, '39 U. S. Navy Electronics Laboratory<

Engineering and Science