

**Successful Engineers  
must know how to cut costs**

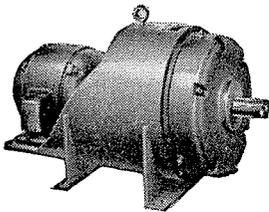
## WELDED STEEL DESIGNS ALWAYS LOWER COSTS

By knowing how to use welded steel in modern product designs, you can lower manufacturing costs up to 50%. Here is how:

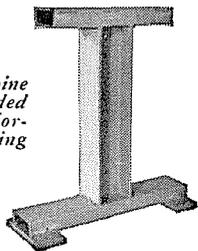
**Material Cost is Less**—It's a fact . . . steel is three times stronger than iron, two and a half times as rigid. Where strength alone is needed, one-third the metal is necessary. When rigidity is important, less than half the material is required. But steel costs only one-third as much per pound. Steel is more easily placed where it can carry more load per pound of metal. As a result, ultimate savings with steel are limited only by the resourcefulness of the designer.

**Manufacture is Simpler**—Fewer man-hours . . . simpler, less costly production tools are needed to manufacture products from steel. By proper design, many operations needed for machining castings can be eliminated entirely. Assembly operations can be simplified . . . finishing and cleaning manhours reduced substantially.

Products designed in steel have a modern appearance to improve selling appeal while reducing costs on an average of 50% according to field reports.



**Welded Design Saves 50% on motor gear housing.** Original cast construction weighed 175% more . . . required 90% more machining.



**Cost Down 57% on machine stand by change to welded steel.** Also eliminates former milling and drilling on former castings.

### DESIGN AIDS AVAILABLE

Back up your engineering training with latest information on low cost welded steel construction. Free bulletins and handbooks are available to engineering students by writing . . .

**THE LINCOLN ELECTRIC COMPANY**  
CLEVELAND 17, OHIO

## PERSONALS

1920

*Roscoe R. Rockafeld*, living in West Allis, Wisconsin, is still with Allis-Chalmers as chief engineer in charge of the processing machinery department. His two sons are married and he has a grandson and a granddaughter. Roscoe advises all other alumni that Wisconsin is "a wonderful vacationland in summer for Californians."

*Harry P. St. Clair* was recently promoted to the position of "Planning and Operating Engineering Manager" for the American Gas & Electric Service Corporation in New York. Harry has been doing some interesting work with the development of some 1300 circuit miles of 330,000-volt transmission, part of which included the Ohio Valley Electric Corporation system. Harry's three children are grown now, and the oldest, named after his father, is employed in the same company—public relations dept. Son Sheldon is now in the Far East after graduating from the Army Language School, and daughter Dorothy recently made Harry a grandpa for the second time.

1921

*Alfred J. Stamm*, a specialist in wood chemistry, is working with the U. S. Forest Products Laboratory in Madison, Wisconsin. As a renowned specialist in this field, Al was recently asked to contribute two chapters to "Wood Chemistry," which is considered the bible of this particular field. Currently he is chairman of the Cellulose Division of the American Chemical Society. Al has four daughters and a son. Of the three in school, one is a junior in the University, one a junior in high school, and one in junior high. Al adds a prideful note—"How's that for scientific precision?"

1924

*William C. Dreyer* writes from Houston that he will have rounded out thirty years with Westinghouse this summer, and that he "seems to get busier all the time." This year Bill and his group are supervising the installation of over 800,000 kw in turbo-generators in Texas, in addition to the electrical equipment in numerous plants and mills.

*V. A. Kalichevsky*, consulting chemical engineer in the refining division of the Magnolia Petroleum Co., Beaumont, Texas, has been mighty busy doing some recent writing. The Italian translation of his book *From Oil Well to Engine* appeared in 1953, and his paper titled *Development of the New Dualayer Gasoline Treating Process* (co-author C. A. Duval) was announced in March at the Western Petroleum Refiner's Association Annual Meeting held at San Antonio, Texas. Another paper, *New Distillate Fuel Oil Treating Process* (co-authors C. A. Duval and R. T. Malin) was presented at the American Petroleum

Institute's mid-year meeting in Houston, Texas, last month.

*Robert E. Foss* moved to Tulsa last year, to continue working for the Sunray Oil Corp., as vice-president and manager of the production department. Bob, his wife and two boys, 14 and 13 years old, had previously lived in Los Angeles.

1925

*William Aggeler*, associate professor of French and chairman of the department of foreign languages at the University of California, Santa Barbara College, has translated and edited a new edition of Baudelaire's poetical work, "The Flowers of Evil." The book is the result of three years of work, begun during Dr. Aggeler's year of sabbatical leave in Paris, in 1951.

Dr. Aggeler majored in electrical engineering here at Caltech, and after graduation he continued in this field for five years. He then went to Paris and studied French literature, art and history at the Sorbonne, which convinced him that this was his real interest. He took his MA and PhD at UC in Berkeley.

1926

*Robert C. Burt*, PhD, and wife have taken off on an extended trip "down under"—Australia, the Barrier Reef, south to Tasmania, over to New Zealand, and south again to the shores of the Antarctic. Sounds like a trip that has just about everything, including exploring the Fiji Islands, and rambling around Australia in a new Australian-built General Motors car. If any envious classmates want to write, Bob's address—until February, 1955—will be c/o The American Consulate General, 7 Wynyard Street, Sydney, Australia.

1929

*Charles A. Bosserman* sends in a short note regarding his family. His oldest son is married and has just finished a two-year stretch as an Army MP. The second son is a physics-math major at St. Martin's College, Olympia, Wisconsin, and his daughter is a senior in high school. Last we heard, Charlie was still a test engineer at Boeing Aircraft in Seattle.

1930

*Donald S. Barnes*, MS, is currently serving a two year term in Rangoon, Burma, as technical adviser to the Prime Minister's Economic and Social Board, a Burmese cabinet group charged with responsibilities for action on various work projects.

Don, a former editor of *Civil Engineering* magazine, was ordered to duty with the Secretary of the Air Force shortly after the outbreak of the Korean War, and he participated in special studies of Air Force installations in the United Kingdom. Later, as colonel, he served as Director of the Ground Defense for the 3rd Air Force, and Director of Security, 7th Air Division.

### 1931

*John R. McMillan* has been elected President of the Fullerton Oil Company in Tulsa, Oklahoma. He has been with Fullerton since 1943.

### 1932

*Robert W. St. Clair* is president of the new Asco Sintering Company, the first integrated powdered metal bearing plant west of the Mississippi. They've just moved the plant to a new location, and to avoid the customary delay in obtaining specialized production equipment, a complete eastern factory was purchased and shipped to Los Angeles! Bob, an active powder metallurgy sales engineer in the Los Angeles area for over 20 years, organized the firm in 1945 under the name of Powdered Metal Products.

### 1934

*Jan G. Schaafsma*, MS, was recently promoted to the post of assistant manager for General Petroleum's Laboratories department in Los Angeles. Jan joined General Petroleum after graduation from Caltech, and has been in laboratory work since that time. A registered chemical engineer, he has invented a patented treating process for petroleum.

### 1936

*Frank W. Davis*, formerly assistant to Convair's vice president, engineering, has been named chief engineer of Convair's Fort Worth division. Frank has been in aeronautics ever since graduation, and joined Convair's Vultee Field division in 1940 as an engineering test pilot. He holds the distinction of being the first pilot in this country to fly a turbo prop plane—the Convair XP81 experimental escort fighter developed for the Air Force in 1945.

### 1937

*Thomas S. Harper* is in private practice in psychiatry at White Plains, N. Y. A wife and two children complete the family picture.

*Robert L. Wells*, MS, writes from Swarthmore, Pa., that he has been made assistant chief engineer of the Aviation Gas Turbine Division of Westinghouse, and is moving this summer with their jet engine division from Philadelphia to Kansas City. More important to this family man, though, is the recent addition of James Weir Wells—which makes three now, with sister Heidi, 5, and Charles, 3½.

*Ernest Chilton*, MS, has been promoted to development supervisor in the mechanical and electrical engineering department of the Shell Development Co. at the Emeryville Research Center, Calif., where he has been since 1947.

### 1938

*Norman B. Dewees*, MS, has just completed a satisfactory first year as advisory engineer in the reactor department of the

Westinghouse atomic power division in Pittsburgh, Pa. *Ted Fahrner*, '36 and *Bill Minkler*, '27, are also in the same division. Norman writes: "Sally and I, the 13-year-old twins Donald and Mary Kay, and Richard, 10, have become strong boosters for the Pittsburgh area. It is no longer the smoky city, but is aggressive in its smoke abatement, slum clearance and civic planning program. Our residential suburb of Mt. Lebanon is a beautiful place to live."

*Howard Seifert*, PhD '38, resigned from Caltech's Jet Propulsion Lab May 10 to become assistant research director of Ramo-Wooldridge Company, the new Los Angeles guided-missile development laboratory.

### 1940

*V. C. Rideout*, MS, is going to spend an interesting summer in India. Professor of electrical engineering at the University of Wisconsin, he has been appointed visiting professor of communication engineering at the Indian Institute of Science in Bangalore, India. Vince, wife, three sons, and assorted paraphernalia will leave this month. He is one of nine engineering pro-

fessors selected to work under the Technical Cooperation Administration of the U. S. Foreign Operations in India during the coming academic year.

### 1941

*Max T. Rodgers*, PhD, was one of seven Caltech alumni awarded Fellowship grants by the Guggenheim Foundation last month. Other alumni on the award list were *Berni J. Alder*, PhD '52, *William N. Lipscomb, Jr.*, PhD '46, and *M. Kent Wilson*, PhD '49, all chemists; *Chia-Chiao Lin*, PhD '44, and *Milton D. Van Dyke*, MS '47, Fellowships in engineering mathematics, and *Sedat Serdengeçti*, MS '52, mechanical engineering.

### 1942

*Edward F. Kelley*, MS, is working with the Corps of Engineers at Ft. Belvoir, developing mobile, industrial gas generators and liquid oxygens—and living "on 20 acres of Virginia brush."

*Arlo F. Johnson*, MS, now has three sons—he writes that they arrive every other April). Arlo is teaching ME at the University of Utah, and building a home in his spare time.



partners in creating

● For many years K&E has pioneered in the manufacture and development of finest quality surveying instruments. K&E surveying instruments are renowned all over the world for their superb performance under conditions of all kinds, for their magnificent workmanship and for special features that come of progressive ingenuity.

**KEUFFEL & ESSER CO.**

EST. 1867

NEW YORK • HOBOKEN, N. J.

Chicago • St. Louis • Detroit • San Francisco • Los Angeles • Montreal

**K+E**

Drafting,  
Reproduction and  
Surveying Equipment  
and Materials,  
Slide Rules,  
Measuring Tapes.

## PERSONALS . . . CONTINUED

*Tom Kirtley*, MS, is now service supervisor at the Hopewell, Virginia, cellulose plant of Hercules Powder Company. Tom and his wife Jean are the parents of two boys: Tommy, 8, and Frank, 5.

1944

*Frank C. Smith, Jr.* will be back in familiar territory in August, when he attends the Western Electronics Convention in Los Angeles, to present a paper. Frank is sales manager of the Southwestern Industrial Electronics Co. of Houston, Texas. The Smiths have a boy, F. C. Smith III, and are hoping for a daughter when the new baby arrives this month.

*Willard R. Scott, Jr.* holds the title of Vice President and Director of Research of the Crest Research Laboratories, located in Seattle. Crest is a privately-owned industrial consulting and research organization serving the Pacific Coast area.

*James R. Freeman* is now a staff member of the Digital Computer Laboratory at the Massachusetts Institute of Technology.

1946

*R. A. Montgomery*, PhD, is working as a senior group engineer in the Pilotless Aircraft Division of Boeing Aircraft in Seattle. In his work he is responsible for ground guidance equipment design. The

Montgomerys have three children—all boys.

*Lyman Bonner*, PhD, technical director of the rocket development department at the Hercules Powder Company's Allegheny Ballistics Laboratory, gave a talk in March on rockets, missiles and space ships at the monthly meeting of the American Society of Civil Engineers, Delaware section.

*Dr. George Humphrey*, MS, became the proud parent of daughter Gail, born in April.

*Ed Dolan* is still working as an electrical engineer for the Bonneville Power Administration in Ampere, Wash. He has been teaching night school at Multnomah College which, as he notes, "curtails any opportunities I might have for getting into trouble. I did find time to try out my power saw on the fingers of my left hand—and the resulting severe injuries leave no doubt in my mind that I am no superman. Still a happy, carefree bachelor without any prospects of being tied down."

1947

*George L. Bate*, MS, was one of five Caltech alumni receiving National Science Foundation post-doctoral fellowships for the 1954-55 academic year. Also included were *James B. Hendrickson*, '50, *Bruce B. Stowe*, '50, *Milton Van Dyke*, PhD '49, and *James A. Ibers*, '51. The fellowships are

awarded for advanced study and research in the natural sciences, on the basis of academic and research records, and recommendations by a panel of scientists.

*J. A. Tvedt*, Air Officer on the U.S.S. Valley Forge, U.S. Navy, is wearing another gold stripe on his sleeve—having just been promoted to Commander.

1948

*Wakefield Dort Jr.*, MS, was married on May 8 to Joanne Church at South River, New Jersey. He is now assistant professor of geology at Penn State College.

*Jack Keuffel*, PhD, another prof from the class of '48, has recently been appointed associate professor of Physics at the University of Utah, where he is busy building up a cosmic ray group. The group will be studying the new unstable particles by using scintillation counters. In addition to cosmic rays, Jack is finding time to enjoy some of Utah's good skiing and riding trails.

1949

*Andrew V. Harris* of Seattle has an eight-month-old son, Andrew Jr., now occupying a lot of his time, when he's not busy as Jr. engineer at Boeing Aircraft.

*William C. A. Woods* is in Richland, Washington, working in the research and development department of General Electric. The work is affiliated with the production of atomic materials, and keeps Bill

## hydraulics

H. W. King, HANDBOOK OF HYDRAULICS,  
Fourth Edition (McGraw, \$12.50)

All technical books are available at

### VROMAN'S

Technical Book Division  
695 East Colorado St., Pasadena  
SY. 3-1171 RY. 1-6669  
Industrial Discount Inquiries Welcomed

## A E C ENGINEERING AND CONSTRUCTION COMPANY

ENGINEERS • CONTRACTORS • DESIGNERS

STEAM POWER PLANTS • PROCESS PIPING  
MECHANICAL EQUIPMENT INSTALLATIONS

Phoenix                      LOS ANGELES                      Las Vegas  
NOrmandy 3-8291  
Merrill Berkley                      Robt. M. Heidenreich

## ALLEN MACHINE & TOOL CO.

Designers and Builders of Special Machinery and Tools  
Also General Machine Work  
13409 S. Alameda Street                      Compton, California  
Phones: NEvada 6-1219 — NEwmark 5-8141

## Oil Properties Consultants, Inc.

Complete Petroleum and Production  
Engineering Service

Subsurface Geology • Micropaleontology  
Reservoir Mechanics  
Secondary Recovery and Evaluation  
Registered Engineers

## Petroleum Engineering Associates, Inc.

Complete Laboratory Service

Core-Analysis • PVT • Fractional Analysis  
Florent H. Bailly, '27                      RenÉ Engel, Ph.D. '33  
709-711 South Fair Oaks Avenue                      SYcamore 3-1156  
Pasadena 2, California                      RYan 1-8141

## Caltech Alumni Association ANNUAL FAMILY PICNIC

Saturday, June 19  
Police Academy, 1880 N. Boylston St., Los Angeles

putting in a fair amount of overtime.

#### 1950

*Harold C. Martin*, PhD, is now professor of aeronautical engineering at the University of Washington, Seattle, and works summers and one day a week throughout the academic year with the structural dynamics unit at Boeing Aircraft. Some of the results of this work were reported before the Institute of Aero Sciences in New York last January.

*James Briggs Hendrickson*, due to get his doctorate at Harvard this month, was recently awarded a National Research Council Post-doctoral Fellowship in the Natural Sciences for the academic year 1954-55. An organic chemist, Jim will spend the year in research at Birbeck College, University of London.

#### 1951

*Harry T. Brackett* is still working as an experimental test pilot for Chance Vought Aircraft in Dallas. He recently finished up a test pilot training course at USNATC, graduating first in a class of 38. Currently Harry is performing structural demonstrations on the FW-3 Cutlass, and is looking forward to flying Chance-Vought's new fighter, the XF8U sometime next year.

*Fred Eisen* hopes to receive his PhD from Princeton next year—and plans to marry Carol Whittingham of Trenton, New Jersey, next fall.

*Capt. Robert H. Ahlers*, MS, returned from Korea in 1952 and is now stationed at Ft. Belvoir, Virginia. Bob adds a note with news of other '51 grads: *Col. John Jannarone*, MS, is believed still assigned to the Corps of Engineers in Oklahoma, *Lt. Col. William Watkins*, MS, is at the Command & General Staff College in Fort Leavenworth, Kansas.

#### 1952

*James K. LaFleur* and Carolyn Gannon, who were married on April 23rd, took a 5,000 mile honeymoon in Jim's MG. They were in Idaho, Wyoming, Colorado, and other states. (Where'd they put the luggage?) Now back on the job, Jim was promoted to development engineer on the Advanced Gas Turbine Project at AiResearch Mfg. Co. in Inglewood.

*Bernard J. O'Neill, Jr.*, MS, resident geologist for the New Jersey Zinc Company in charge of their Littleton, New Hampshire office, is feeling extra happy these days about the new addition to the family. The O'Neills have adopted a little girl, Mary Ann.

*John C. Thompson*, MS, has been leading a rather eventful life so far this year. Not only was he recently promoted to the position of sales manager and asst. general manager of both Peerless Mfg. Co. and Sillers Engineering Co. in Dallas, but he has also received an LLB degree from

Southern Methodist University and was admitted to the Texas state bar!

#### 1953

*Richard Ham* has just completed his first year of graduate work at the University of Texas, where he has also been employed as a part-time research scientist in the bio-chemical institute. Summer plans for Dick include full-time research work at the University, plus baby sitting. Paul Edward Ham arrived on May 9th, and Dick comments: "He was born needing a haircut, just like his father's usual state!"

*William D. Gardner* is planning on a New England summer, working for the U. S. Coast & Geodetic survey in Maine, returning later to Norfolk. *Morgan Ogilvie* is also with the USCGS, taking weekly cruises around Chesapeake Bay with the good ship *Cowie*.

*William D. McCormick* is doing graduate work at Duke University, Durham, North Carolina, and although he doesn't exactly want to devote all his hours to research work in low temperature physics, there's apparently little alternative. "So far as I've been able to determine," says Bill, "Southern belles have been considerably overrated."

*Andrew C. Bousch* assisted Dr. James Noble in Canada during the summer of '53. He is now a graduate student at USC, awaiting those greetings from the Army.

## SCIENCE WRITERS

From May 1, 1954 to May 1, 1955 **Engineering and Science** will pay for all acceptable articles by Caltech undergraduates and graduate students at the rate of \$10 per published text page—or roughly a cent a word.

**E&S** articles should be based on some phase of scientific or engineering research, or some individual, connected with Caltech. They may run from 1,000 to 5,000 words. They should be typed, double-space.

But we are not just looking for more **E&S** articles. Our real aim is to encourage more science writing by the people who are in many ways best equipped to write it.

So—all articles submitted to us by Caltech undergraduates and graduate students—whether they are accepted for publication in **E&S** or not—will be entered in a Science Writing Contest.

On May 1, 1955 these articles will be sent to the editors of **Scientific American**, who will choose a \$100 first-prizewinner, and a \$50 second-prizewinner.

For further information, to register your topic—or even your interest—check the **E&S** office, 400 Throop.

## SIT BACK



## - AND RELAX

Let **CALMEC** Worry About  
Your Metal Parts and Products

We have the most modern facilities and most complete plant to give you the maximum of service. We stand ready to supply small parts, large parts — or products developed from your ideas, and shipped direct to your customers, under your name, from our plant.

## CALMEC MANUFACTURING CO.

ROBERT A. McINTYRE, M.S. '38  
5825 DISTRICT BLVD.

Kimball 6204  
LOS ANGELES 22, CALIF.