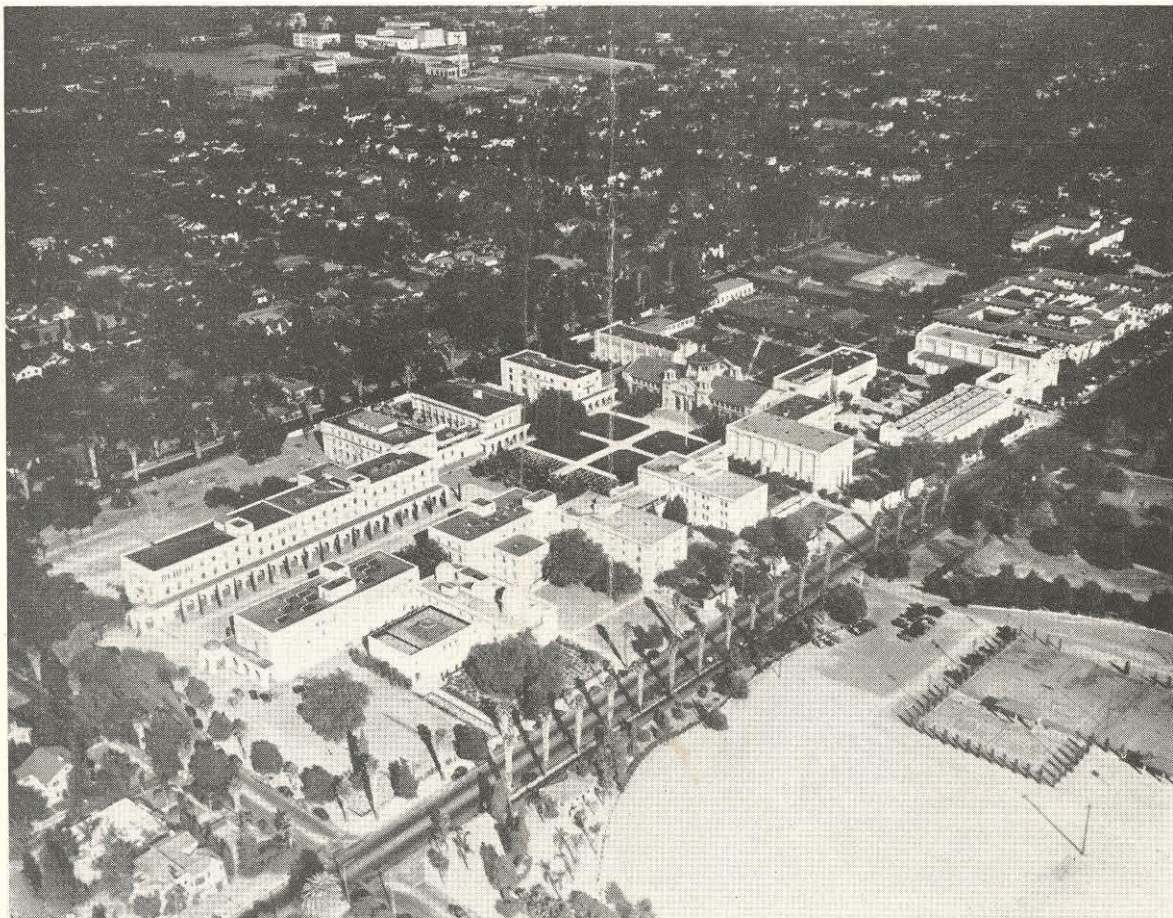


ALUMNI REVIEW

CALIFORNIA INSTITUTE OF TECHNOLOGY



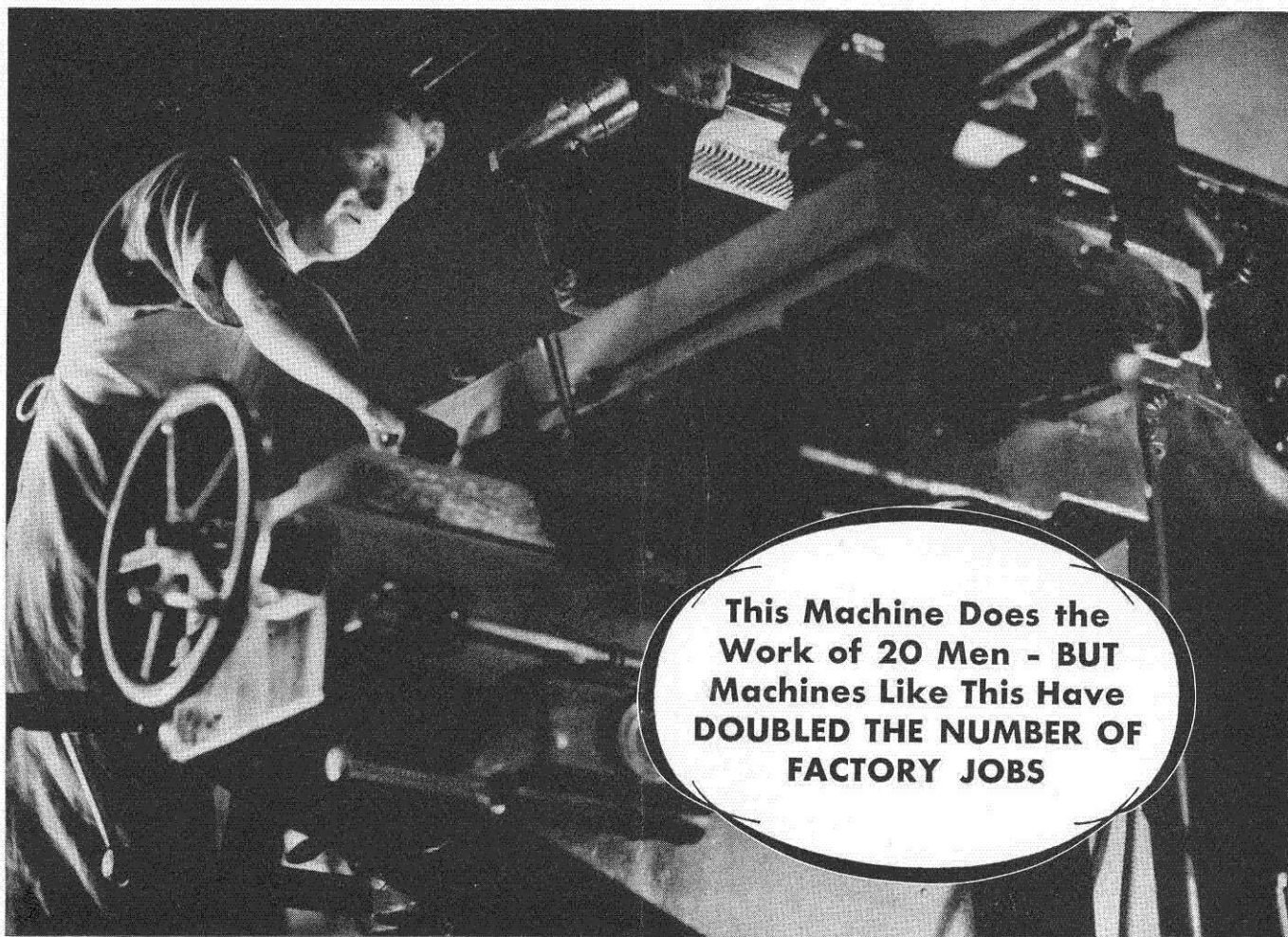
Don Downie

THE CAMPUS OF TODAY

SEE PAGE 3

Vol. 2 No. 2

DECEMBER 1938



**This Machine Does the
Work of 20 Men - BUT
Machines Like This Have
DOUBLED THE NUMBER OF
FACTORY JOBS**

AMERICA'S BENEFICENT PARADOX

MACHINES replacing men—yet more men put to work! This is the startling paradox which is at the root of much of America's progress. For although machines are doing jobs that would require many times as many men to do by hand, yet the number of factory jobs has increased from 4 to 8 million in the last fifty years. How is this possible?

Why has the number of jobs increased so greatly—faster than our population—while the use of machines has increased many fold?

Why? Because machines have multiplied the effectiveness of men's work. Costs of manufactured products have been so reduced that more millions of people have been able to afford

them. And because more people have bought these manufactured products, more men have been employed in making them. That is why there are twice as many factory jobs today as there were fifty years ago, and, in addition, millions of other new jobs selling, shipping, and servicing the new products. Throughout America, machines are enabling men to produce more with less effort, to earn higher wages—to have more of the good things of life.

General Electric scientists, engineers, and workmen, by applying electric power to the machines of industry, have done much to make this progress possible. Their efforts today are directed to the task of bringing about still higher living standards.

*G-E research and engineering have saved the public from ten to one hundred dollars
for every dollar they have earned for General Electric*

GENERAL  ELECTRIC

90-90111

ALUMNI REVIEW

ALUMNI ASSOCIATION, INC.

CALIFORNIA INSTITUTE OF TECHNOLOGY

Vol. 2, No. 2

Published four times a year—September, December, March and June by the Alumni Association, California Institute of Technology, 1201 East California Street, Pasadena, California.

Subscription price included in annual dues of \$2.50

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HAT do you know of tomorrow's weather? Next week's? Next year's? Dr. Krick in this issue presents an imitable treatise on weather predictions. He herewith provides well founded concepts which even a few years ago would have been labeled as fantastic. Such is progress in meteorology. We are proud that the Institute, with its able personnel, is a renowned leader in this field as well as many others.

It appears that weather forecasting can indeed become an exact science. Such, in its practical aspects, would be invaluable to those of us—all of us—whose activities depend so definitely on the state of the elements.

What, then, of weather control? Air conditioning of the great out-of-doors presents an interesting extrapolation of current progress. He who would control phenomena must first master their laws and characteristics. From this standpoint, the future is not discouraging. While thinking of futures, have you paused to consider the "forecast" for Tech alumni? We present, if possible, even more variables than those of the subject at hand. Yet those who have ventured predictions claim that performance date has a gratifying correlation.

FORTHCOMING EVENTS*

San Diego Chapter January 17, 1939
General Meeting • January 20, 1939
Further details later.

Dance February 4, 1939

Blue Room, Billmore Hotel, Los Angeles. Informal. \$1.65 per couple. See particulars herein.

Seminar Week-End March

Plans are progressing in great-tying fashion. The March Alumni Review will contain the full program.

Exhibit Days April

Annual Stag and Field Day May

General Meeting and Commencement June

* Listings in bold face type are final announcements. Other events will be announced in due time, following completion of plans.

These predictions, incidentally, were as optimistic as are the notorious claims for Los Angeles weather. Most Tech graduates are young. The time is approaching when many will have attained sufficient age, with attendant experience and responsibilities, to evidence their full capacities in science and engineering, law and medicine, industry and commerce and many other walks of life. We venture a long range forecast that success, as we are accustomed to measure it, will be theirs.

To complete the parallel, we would examine the "control" imposed by the Institute. It is at once apparent that those who have determined the basic training of Tech students, together with those who conduct the educational and administrative program, are men of great wisdom.

Tech men, we contend, are trained to think. They acquire, during their undergraduate days and years of valuable experience, and adaptability wholly in keeping with men of reputedly high intelligence. These factors undoubtedly are the basis of their success in various fields, many of which are far removed from technology. Wherever they may be, we will rely on Tech men to perform according to prediction.



*"I'm Glad
You Called"*



This very hour, millions of words are being spoken by telephone. Friend talks to friend and two lives are happier because of it.

Greetings and best wishes are exchanged—holiday visits arranged

—affairs of business transacted. A doctor comes quickly in answer to a hurried call.

And day and night, the country over, these oft-repeated words reflect the value of the telephone . . . "I'm glad you called."

BELL TELEPHONE SYSTEM



THE CAMPUS OF TODAY

By *William H. Pickering*, '32

Are you among the Alumni who have not visited the campus within the last six months? If you are, then you must be counted along with the tourists who stand and gape, for you, too, will stand amazed in front of Throop Hall, astounded at finding yourself in the midst of a green quadrangle surrounded by a stately group of buildings.

Ten years ago the active building program commenced with the construction of Dabney Hall of the Humanities. This beautiful building which, with its lounge and olive garden, is still one of the most attractive on the campus, provided sorely needed additional classroom space at the time of its erection. At that time classes were even being held in Culbertson. In 1928 the Seismological Research Laboratory was built on the bedrock of the San Rafael Hills, and the geologists had one outlet from West Bridge.

Nineteen twenty-nine saw the construction of Guggenheim and the first part of Kerckhoff. This building, at the west end of the campus, was connected by a board walk to the more civilized regions around Throop.

In 1930 the Athanaeum was completed, and the small Plant Physiology Laboratory on the corner of Michigan and San Pasqual streets was built.

The four Student Houses were next on the program, and they were ready for occupancy when school started in the Fall of 1931. In the same year the Astrophysical Instrument

Shop, in which the 200-inch mirror was to be ground, was divested of its scaffolding and revealed to the world in all its windowless solidity.

Another astrophysics building, the main laboratory next to Culbertson was built in 1932. That year also saw the erection of Kellogg with its million-volt X-ray tube.

The late lamented depression then seemed to catch up with the Institute, and, with the exception of the Optics Shop which was built in 1933, there was no further major construction until 1936. In that year the soil conservation laboratory suddenly appeared on San Pasqual Street just east of the driveway next to the Old Dorm.

During the last two years the most active construction since the building of the Athenaeum and the Student Houses has taken place. The four large buildings which were started within a few months of each other have effectively completed the west end of the campus. Crellin has more than doubled the facilities for the chemists; the new section of Kerckhoff has given the biologists about twice as much room and a beautiful library. Arms and Mudd have at last provided adequate space for the geologists and paleontologists.

Following completion of the new buildings, extensive landscaping of the west end of the campus has been undertaken. The aerial photograph on the front cover shows the \$7,500,000 Institute of today.



THE WILLIAM G. KERCKHOFF LABORATORIES OF THE BIOLOGICAL SCIENCES
The two main buildings. The West building (to the left) is devoted to undergraduate laboratories, to genetics and to embryology. The East building (to the right) is devoted to biochemistry, plant physiology and animal physiology.

A PHYSICAL BASIS FOR LONG-RANGE WEATHER FORECASTS

By IRVING P. KRICK, PH.D.

Assistant Professor of Meteorology

The economic importance of long-range weather forecasts has long been recognized, and many attempts have been made to solve the problem. Until very recently, however, most of them were rather unsuccessful, due in general to a lack of observational data and to the fact that the methods of attack were not, in many cases, well founded. A method of approach to the problem, which is beginning to yield encouraging results, has been developed by the writer during the past few years. It utilizes the principal that the positions of the air streams in the general circulation of the atmosphere, which controls the long-period weather trends, are predictable for periods of a month or more.

In the latitudes of the United States, the principal storms are the result of a continuous conflict between cold polar air and warm tropical currents along a boundary surface separating these two dissimilar air bodies. The storms are wavelike ripples which progress eastward along these boundaries, causing them to oscillate simultaneously north and south across the country. The storms arise along a boundary of separation between warm and cold currents either from a southward surge of polar air or from a northward thrust of the tropical current. At present it is not possible to determine the weather for long periods day by day. However, if the average positions of the zones of interaction between the air currents are known, regions of maximum storm frequency can be determined, and therefore the trend in the weather for fairly long periods.

Fig. 1 illustrates the normal position of the principal air streams in the atmosphere and the active portions of their zones of separation during the fall and early months. The heavy lines indicate regions where warm and cold streams of air are brought together and, therefore, where storms are most apt to develop. It will be noted that the principal zone of separation between the cold and warm currents at this time of the year extends east and west across a large part of the north Pacific Ocean and through the center of the United States. Whenever a warm current of air from low latitudes meets a cold polar current, it is forced to ascend the forward edge of the cold mass. It is on these occasions that widespread precipitation occurs, for, as the warm current rises, it cools by expansion owing to the reduction in atmospheric pressure encountered aloft. This allows its moisture to condense to form clouds and precipitation. The lighter lines show the average flow patterns of the principal air currents.

The oceans form the principal sources of moisture for precipitation in the United States. The rain-bearing air

currents of the storms occurring at this season of the year in the eastern part of the United States originate over the Atlantic Ocean southeast of the Carolinas and Florida, and over the Gulf of Mexico, while the moist currents producing the major part of the precipitation on the Pacific Coast may either move across the Pacific from Siberia or Alaska, ultimately invading the Pacific Coast, or they may come northward from subtropical latitudes to interact with the colder polar air to the north. These currents have been indicated on the map in Fig. 1, their average flow being shown by the long curved arrows.

Cold waves in any part of the country at this season of the year are the result of the invasion of cold air from Canada. It will be noted from Fig. 1 that this air usually converges with a dry current from the southwestern United States. Owing to their lack of moisture, no important precipitation results from this interaction, thus explaining the characteristic dryness of the Great Plains area and the regions between the Pacific Coast ranges and the Rocky Mountains at this season of the year.

Since the long-period weather trends are obtained by averaging day-to-day changes, they depend primarily upon the air currents which predominate during the period and the frequency of the storms occurring along the zones of separation between them. We may conclude, then, that the determination of the seasonal temperature and precipitation trends depends, to a large extent, upon the correct anticipation of the average position of the zones of interaction between the air currents. Since these are the regions where the storms develop, any shift in their location from year to year can cause significant departures from the normal in the observed weather changes. The position of these zones of interaction appears to be a function of the location and intensity of areas of relatively high atmospheric pressure centered in the subtropical latitudes. Owing to their importance in the control of the weather, these systems have been called the "centers of action" of the atmospheric circulation. They are marked in Fig. 1 by CA. They are the most stable systems in the general circulation of the atmosphere and, although they tend to migrate eastward from day to day, the average position is fairly stationary so that they materially influence not only the location of the zones of interaction between the principal air streams of the atmosphere but also the paths followed by the most important rain-bearing air masses of the atmosphere which normally have their origin within these high-pressure systems.

In a year when the atmospheric conditions illustrated in Fig. 1 prevail, one may expect the precipitation and temperatures throughout the country during the late fall and early winter to closely approximate the normal. However, in a year when the conditions show a deviation from the average, significant departures from normal will be observed in these quantities. For example, this year all of the centers of action are several hundred miles north and west of their usual position at this season, and therefore the paths of the storms controlled by them are north of their usual track. On the Pacific Coast practically all of the precipitation at this season of the year results from storms crossing the Pacific Coast which have developed along the zone of separation over the north Pacific between cool, moist, polar currents and warm, moist, tropical currents. This zone being north of its usual position this year has caused these storms to pass inland several hundred miles to the north of their usual course, and rains are less frequent along the Pacific Coast than in a normal year, particularly in the southern half of California.

In addition to the shift observed in the centers of action, the sporadic outbreaks of cold air from Canada, which invade the Middle West during this season of the year, are developing less frequently than in a normal year and are

moving southward into the United States several hundred miles west of their usual course. This is causing temperatures to remain above normal in the Middle West but occasionally to drop below normal in the western part of the country as the air invades the regions west of the Rocky Mountains. However, since, in the western part of the country, the storm frequency is less than in a normal year and more clear days occur, the temperature averaged over a long period will not show much departure from normal.

Abnormally large amounts of precipitation during the winter season and early spring along most of the Atlantic Coast will be a further consequence of the shift that has occurred in the centers of action this year, since air from the deep tropics will tend to move northward more frequently during the winter season, invading the southeastern part of the country and over-running cold air from Canada in the Ohio Valley. This interaction will produce rather heavy rains which, as they progress eastward, will affect all the Atlantic Coast areas. The heavy snowfall late in November, which occurred along the Atlantic seaboard, was the result of just such an interaction between warm tropical air, heavily laden with moisture, moving northward along the Atlantic Coast, as it converged upon a southward moving mass of extremely cold air from Canada.

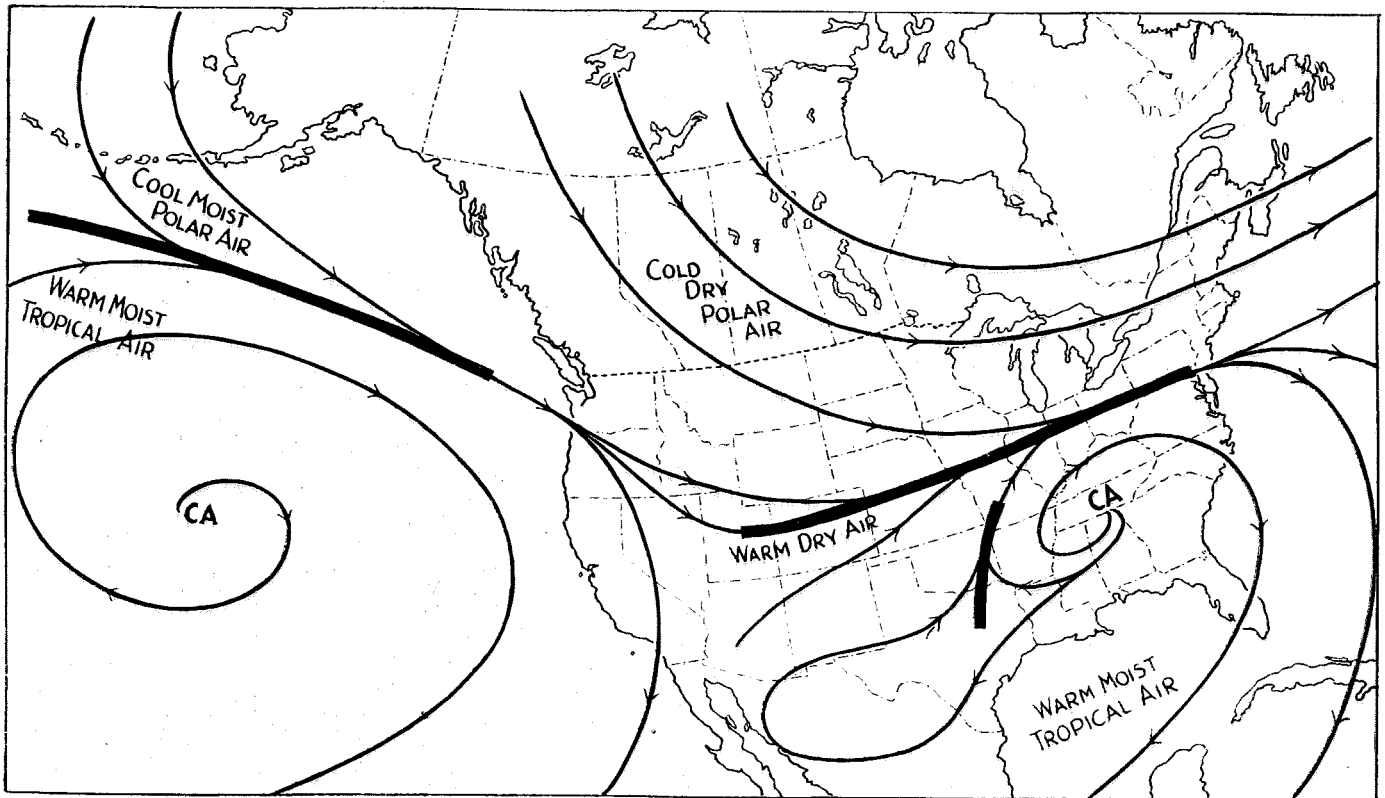


FIGURE No. 1
Normal position of Centers of Action (CA) and principal air currents for late fall and early winter.

ALUMNI MEETINGS

By JOHN E. SHIELD, '22

OCTOBER MEETING

On the evening of September 30 the first Alumni meeting of the year was held at the Clark Hotel, 430 So. Hill St., Los Angeles. Mr. Loys Griswold, '23, acted as chairman for the meeting and the 108 members who attended were introduced to the art and science of flying as it is now done on commercial air lines.

Pilot Allan Barrie of the Western Air Express as chief speaker of the evening took his listeners through the routine of observations and calculations at present required of a pilot prior to and during regularly scheduled flights. His statements were illustrated by lantern slide projection of flight charts and other highly technical aids to blind flying now in common use.

Mr. Barrie's capable but slightly involved statements were leavened by those of Miss Frances Oliver, a stewardess on the same air line. Miss Oliver's presence was apt justification of the reason that flying is now popular and that railroads are installing similar services. She stated that as an air hostess, her main duty was to see to her guests' comfort as she would in her own home.

Mr. Hugh Coburn, District Traffic Manager of Western Air Express, and Mrs. Hazel Griswold, wife of our chairman for the meeting, were also present as guests.

OXY GAME PARTY

The Oxy game has come as promised and has gone—perhaps it is just as well—what did *you* expect anyway?? No practice in open field tackling can't produce positive results in a real game.

After the game an estimated 124 Alumni with their partners gathered in the Atheneum for (as President Kinsey termed it) a "Big Tomato." They gathered in the Hall of the Associates technically for the light fandango but actually spent more time around the punch bowl in the dining room renewing old acquaintances. Music was provided by the Victor Band through one of the new units borrowed from the student houses.

Those in attendance were loud in their praise of the arrangers of the party, Bill Aultman, '27, and Wes Hertenstein, '25. The party broke up at 12:45 A.M.

DECEMBER MEETING

The December meeting of the Caltech Alumni Assn. was held at the Clark Hotel in Los Angeles with a goodly turnout for dinner. In opening the meeting President Kinsey spoke for a policy of hands off in the athletic program of the Institute, the present problems being in the hands of a very competent committee which is well able to arrive at the competent committee who are well able to arrive at the best solution without the interference of the Association.

Howard B. Lewis, '23, introduced Dr. W. Ballentine Henley of U.S.C. who spoke on the subject of Democracy. Dr. Henley's most able and dynamic presentation of the political, social and economic status of the world today was

aptly attended by a delightful sense of humor. His principal points that to insure democracy the technical administration of government must be insulated from political pressure will undoubtedly be seriously considered in the future by his hearers. His talk was followed by a spirited discussion.

—T—

MEMBERSHIP SETS NEW RECORD

By William H. Mohr, 29, Membership Chairman

On the first of December, 1938, there were 920 paid-up active members—an all time membership record for the Alumni Association. The previous high was 870 members at the end of last year as reported by President Ward Foster.

Your officers appreciate this great interest and support; in turn, they are doing their best to give each member the full value of the cost of his membership dues. The first Alumni Directory in eleven years is being compiled after much work by Editor Ted Combs '27, Al Atwood '32, Sid Bamberger '32, Miss Dierkes and all of the class secretaries, and will be mailed to all active members this month. The compiling and publication of this directory has meant a great deal of work but the committee and officers feel that the value to out of town members as well as the younger grads will compensate for their efforts.

The "Alumni Review" is a magazine that all members should enjoy looking through and offers an opportunity for expression of social, scientific, and engineering news for which the Institute and the Alumni have become known. The magazine is for the benefit of all alumni. Active members are urged to stress the value of the magazine and the directory to all those who are now missing these valuable contacts.

—T—

NEW ATHLETIC COMMITTEE

The President of the Alumni Association suggested to Dr. Millikan for his consideration and the consideration of the Executive Council that a committee of Trustees, Associates, Faculty Members, Students, and Alumni be appointed to consider what may be done to increase the athletic facilities of the Institute. Recently Dr. Millikan, as Chairman of the Executive Council, and in accordance with the request of the Executive Council, appointed a committee to consider the increase of the athletic facilities existing at the California Institute. The committee is composed of the following members:

J. Hudson Poole (Chairman),

Harry Bauer Trustee Members

Thomas Fleming and

Leonard G. Strater Associate Members

R. W. Sorensen and

William R. Smythe Faculty Members

William G. Lawson and J. E. Osborn Student Members

Ward D. Foster and Philip Schoeller.....Alumni Members

It is understood that the Chairman is gathering information upon the subject preparatory to calling the committee together for its first meeting.

TECH MEN WIN ARC WELDING AWARDS

By William H. Pickering, '32

The James F. Lincoln Arc Welding Foundation of Cleveland, Ohio, recently announced an award of \$200,000 for papers dealing with the applications of arc welding to industry. Needless to say, the program attracted a great deal of interest throughout the world, and a number of Tech men submitted their best efforts. When the list of prize winners was announced in September, three Alumni were among them. Edmund G. Grant, '30, was highest on the list with an award of \$1526.33 for his paper on the use of arc welding in connection with the 200 inch telescope project; then came C. R. de Laubenfels, M.S., '33, and Fred C. King, Jr., '35. An award was also won by Frank Fredricks who, though not an Alumnus, is at the Westinghouse plant as resident engineer of the Astrophysical Observatory. He wrote his paper on the construction of the telescope tube, horseshoe and yoke.

Ed Grant has been with the Astrophysics department for some eight years, and thus he is thoroughly familiar with the telescope project, at least from the engineering end. His paper gave a brief description of the 200 inch telescope, its location, and the problems encountered in its construction. He described the dome with its two million pounds of steel, 137 feet in diameter, welded throughout. The main part of the paper discussed the construction of the supporting trucks and the drive for the dome. *There are 32 of these trucks to carry the dome, and, by using arc welding in their construction a saving of some \$2300 was effected. Similar large savings were made in the other dome machinery by using welded construction. The paper concluded with a discussion of the importance of welding to design, and to industry in general.

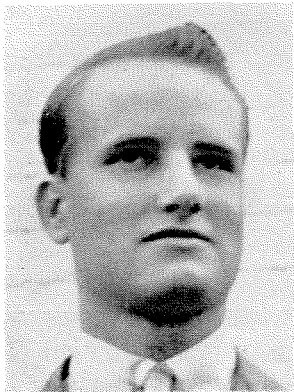
Ed Grant will be remembered by his classmates as an enthusiastic yachtsman. Since his graduation he has built a 48-foot boat which he has sailed to victory in many Southern California regattas. Probably a good fraction of Ed's prize money will go towards making his "Flyaway II" an even speedier craft.

G. R. de Laubenfels is employed at the Lockheed Aircraft factory at Burbank as a research engineer. His paper accordingly dealt with an adaptation of arc welding to an aeroplane problem. A certain oxy-acetylene welded landing gear fork was found to unsatisfactory. Substitution of arc welding proved completely satisfactory, and, in addition saved \$40 per aeroplane.

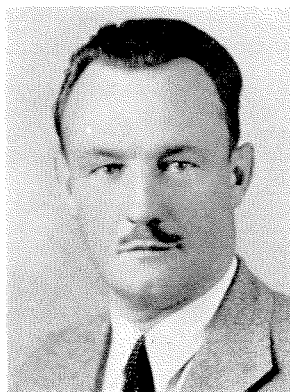
Fred King is with the National Supply Co. at Torrance. He discussed a problem in which a cast iron design had been changed to a welded design with a saving of 900 pounds in weight and 40% in cost.

Many of the prize winning papers of this contest will be published in the various trade journals. In most cases the authors estimated the savings to be made by the use of arc welding in their particular problems. After discounting the most enthusiastic claims, the award committee, which included men such as Professors Ott and Marquis, arrived at an estimated total saving to industry of \$1,600,000,000. It is a startling indication of the present and future significance of arc welding.

*NOTE: An illustration of the dome driving mechanism was shown on page 6 of the September 1938 Alumni Review. This, together with data contained in the pertinent article, was furnished by Ed Grant. James Fassero was photographer.



KING



DE LAUBENFELS



GRANT

CALTECH HONORED

The California Institute of Technology has been honored by being named the "presidential college" of the Association of American Universities for the coming year at the annual meeting in November held jointly at the University of California and Stanford University.

The Association, one of the oldest educational organizations in the United States, is very select in its membership and very strict as to its standards of ethics and scholarship. Previously confined to schools as Harvard and Yale in the East, it now includes a few in the Middle West and on the Pacific Coast.

Instead of naming an individual as president, the Association of American Universities selects annually some one college, which in turn appoints its own presiding officer, usually the president or the senior dean.

The Institute was represented at the annual meeting by Dr. Robert A. Millikan, chairman of the Executive Council, and Dr. Richard C. Tolman, dean of the Graduate School.

ALUMNI AID CHARITIES

During the past few weeks while the civilized world has been gasping at the brutality of man's inhumanity to men, a number of Tech Alumni have been actively giving of their time and efforts toward making this world a happier, healthier and better place for the less fortunate members of society to live in. We speak of course of the Alumni who have been helping in the many Community Chest drives throughout the country. Particularly in Los Angeles do we find a large number of these men assisting in the local Community Chest drive for funds. Outstanding among these men is our alumni president Ed Kinsey, '26, who is serving as Chairman of the Business Section for downtown Los Angeles. Other men who have given of their time and efforts are Stu Seymour, '26, Harold Hill, '11, Al Atwood, '32, Mott Prudames, '32, Bill Mohr, '29, Jack Shield, '22, Bob Bogen, '26, L. E. Morrison, '21, Fred Schell, '27, and Al Laws, '26.

\$103,000 GIFTS

An anonymous bequest of \$100,000 and a grant of \$3000 for special aeronautical research were announced by Dr. Robert A. Millikan at the annual dinner of the staffs of the Institute, the Mount Wilson Observatory, and of the Huntington Library held on October 19th. The grant is to be used for research on miniature radio stations sent aloft to broadcast, at regular intervals, temperature, pressure and relative humidity to aid in weather forecasts.

Doctor Millikan also announced the appointment of Dr. Max Mason as chairman of a special committee to study scientific problems for the United States Army Air Corps. This committee is the result of a conference Doctor Millikan held with the late Maj.-Gen. Oscar Westover on his recent visit to Washington, D. C.

FEBRUARY DANCE AT BILTMORE

The annual Alumni Dance will be held on Saturday night, February 4, 1939, in the Blue Room of Hotel Biltmore, Los Angeles. It promises to be one of the gayest and smartest of all dances to date. The arrangements committee, headed by Paul C. Schaffner, '37, is endeavoring to provide the best possible entertainment compatible with this occasion. Those potential alumni, members of the class of '39, have been invited with their ladies to join in the festivities.

Tickets are now on sale. According to advance reports a gratifying number of reservations have already been made. Those who purchased tickets prior to December 10 will participate in a drawing for complimentary admission to the Rose Bowl football game on New Year's day. Winners will be announced at the earliest possible date.

Make your reservations early, thereby permitting the committee to complete plans with accuracy. Admission is \$1.65 per couple. Dress is informal. Tickets will be mailed out about the middle of January. Meantime, reservations with payments should be forwarded to the Alumni Office. Come on out, meet members of the senior class, have a visit with your classmates, dance a turn or three, and have a good time!

DIRECTORY FOR CHRISTMAS

You may expect to receive your copy of the new Directory in the very near future. Read it, then keep it close at hand for ready reference. You will find it constantly useful. For maximum utility, three complete listings are included: Alphabetical, geographical and classes.

The Directory will contain over 2300 names, with correct addresses for about 95% of these. Try as it did, the committee was unable to locate a hundred-odd alumni. Information of these men, whose addresses are listed as "unknown," will be appreciated. Promptness in forwarding changes of address will aid in the maintenance of accurate files. An average of six changes are received each day by the Alumni Office, hence the magnitude of this task can be appreciated.

At long last, in fact, after eleven years, we now have an up-to-date Directory. The Committee and your Board of Directors are proud of their accomplishment. They would therefore like you to receive your copy as a special Christmas present. The season's greetings to you!

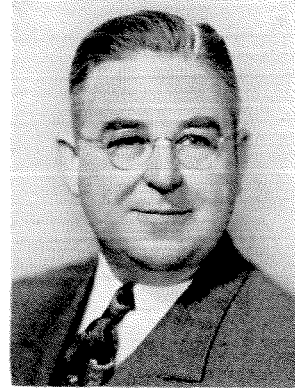
CAMPUS NEWS AVAILABLE

The Alumni Review endeavors to report campus and undergraduate activities from time to time. Our news briefs are necessarily meagre. Several alumni have expressed a yearning to keep up with campus news and otherwise give vent to a four-year habit of reading the California Tech. A special rate has therefore been arranged for alumni subscribers. Merely send 50c to Robert McClung, Editor, The California Tech, C. I. T., and you will receive issues weekly during the entire school year.

ALUMNI SHOULD KNOW

INSURANCE EXECUTIVE

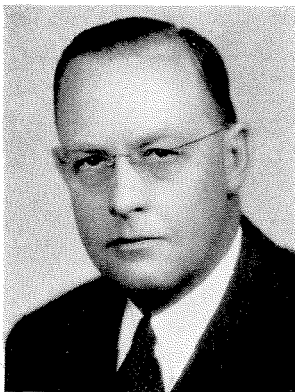
Many people in the contemplation of a technical education are prone to consider the resulting field of endeavor limited to scientific programs suggested by the curricula. Roy O. Elmore, B. S. in C. E. 1924, is an outstanding example of the fact that more times than not a technical education is a stepping stone to success in commercial pursuits. Shortly after graduation, Roy went to work in the policy examination department of the Board of Fire Underwriters of the Pacific—from which he proceeded to the City Grading Department. In 1926 he went to the Firemen's Fund Insurance Company as engineer and was promoted to Special Agent in 1930. He left that position in 1934 to become Southern California Manager of the Pacific National Fire Insurance Company, which position he still holds in addition to being Assistant Secretary of the Company. He instituted and completely organized the Southern California Branch Office—complete with Automobile, Marine, Casualty and Fire departments, the only one, by the way, of any major company in Los Angeles. In addition to the above accomplishments he has found time and energy to head the local pond of the Order of the Blue Goose, (a fire insurance order) and the Special Agents Association.



ROY O. ELMORE

ENGINEER-EXECUTIVE

Earl Mendenhall received his degree in Electrical Engineering in 1918. He immediately joined the staff of U. S. Electric Motors Company in Los Angeles, and later became Chief Engineer. In 1927 he entered a new venture with Mr. Carl Johnson and others in the establishment of Sterling Motors, Inc., also in Los Angeles. He is now vice president and general manager. Mendenhall has a number of inventions to his credit, the most unique one being a submersible motor now being manufactured by Byron Jackson, Inc. He has developed, for Sterling Motors, several electric motors and variable speed units.



EARL MENDENHALL

Manufacture includes squirrel cage polyphase ($\frac{1}{4}$ to 75 H.P.); slow speed, geared ($\frac{1}{4}$ to 30 H.P.); and variable speed, "Speedtrol" ($\frac{1}{4}$ to 15 H.P.), electric motors. Apparatus for special applications is also produced. Distribution is throughout the United States, with approximately seventy per cent on the Pacific Coast. Offices and representatives are maintained in all larger cities.

As could be expected, inventions, engineering and management occupy the bulk of Earl's time. He admits, however, enjoying an occasional game of golf. Class of '18, we join you in honoring an illustrious Tech alumnus!

TECH GEOLOGIST DIES

Last month Lozell C. Hookway, '29, M.S. '30, was drowned while on a hunting trip in Texas. His funeral was held in Pasadena. Dr. Buwalda delivered a fitting eulogy.

Among the pallbearers were G. Austin Schroter, '28, Hampton Smith, '28, J. Clark Sutherland, '29, and E. L. Furlong, curator of vertebrate paleontology at the Institute.

Lozell was one of the first students of the geology department. After his graduation he had charge of field work for the vertebrate paleontology department. Later he went to the Magnolia Petroleum Company in East Texas at office manager and district geologist. He is survived by his widow, Mrs. Hazel Hookway, his parents and a brother.

His many friends will be deeply grieved and shocked by his sudden passing.

— T —

FELLOWSHIPS

The appointment of the first Hale and Noyes research fellows in chemistry were announced on October 26th. Those awarded the initial honors are as follows:

Hale Fellow: Verner Shomaker, Ph.D. '38.

Noyes Fellows: C. S. Garner, '35, Ph.D. '38.

D. W. Osborne, Ph.D. '38.

The fellowships were established under the will of Dr. Arthur A. Noyes, late Director of the Gates Chemical Laboratory, who bequeathed the major part of his estate to the Institute.

— T —

MARTEL ARTICLE

"Effect of Earthquakes on Earth Dams" is the title of an article appearing in the September-October issue of *The Military Engineer*, written by R. R. Martel, professor of structural engineering at Tech. The article is an excellent summary of present day knowledge of the subject by one of the nation's foremost authorities on the design of earthquake resistant structures.

— T —

McKITTRICK FOSSILS

Recovery of important fossil material from the tar seeps at McKittrick, west of Bakersfield, California, is described in a publication recently issued by Dr. Chester Stock and John R. Schultz. Supplementing the La Brea pit recoveries, the McKittrick bone quarry has produced some new forms, as well as some previously recognized ones.

— T —

GRADUATE STUDENT FROM IRAN

One of the students who is farthest from home this year is Ruhollah Y. Karubian from Iran (formerly Persia). He is a graduate student doing work in petroleum geology, having completed his undergraduate work at the Colorado School of Mines.

STUDENT RIOT?

On Monday evening November 21, the radio suddenly started giving news flashes about a riot on the grounds of the California Institute of Technology — police riot squad present in full force — calls for reinforcements — hundreds of dollars damage done — students injured but so far none killed. The morning newspapers proclaimed the gory details with staring headlines.

What was it that was responsible for all of this? As far as we can tell, the story is something like this: On Monday morning a Flag rally was announced at Pasadena Junior College, in preparation for the game with Tech on the Wednesday night. Later in the day this rally was cancelled but apparently not well announced. Consequently, a crowd of students collected and found nothing to do. Finally they got the idea of going down to Tech. They gathered on the lawn between Ricketts and the Athenaeum, and of course a free-for-all was soon started. Eventually, someone got the lawn sprinklers going and peace was restored. Meanwhile the police had been called but apparently stood and watched the fun. The only serious damage occurred when the windows in one room were broken and someone was cut with flying glass. The reason for the stone throwing seems to be that the occupants of the room were attempting to get a fire hose into action.

Estimate of the actual damage done — \$10.

— T —

POTAPENKO OIL DISCOVERER

An announcement was made on November seventh of the drilling of a wildcat oilwell based on a new geophysical method developed by Dr. G. W. Potapenko, professor of physics at Tech. This method is the outgrowth of a long period of study and testing in existing fields, and is reported to be based upon current frequency.

The patents for the method are owned by the Geo-Frequenta Corporation of Los Angeles. The company is unwilling to give any more information other than to say that apparently definite and measurable reactions have been obtained from oil in place in the earth, and that it is believed that the process can be developed to a point where definite electrical reactions will be recorded in areas where oil in commercial quantities exists.

For at least some time to come this process, if proven successful, will be used to supplement the work done by seismographs and other standard geophysical methods. Where such methods have determined the existence of structural conditions favorable to oil accumulation, this new process will undertake to determine whether oil exists in such structures.

If successfully and fully developed, the possibilities are almost unlimited as it is hoped that by means of the process it will be possible to discover the boundaries of a newly discovered oil field without the necessity of expensive edge line drilling.

LAMELLA ROOF TESTS

By Ben Benioff, '22

The interesting summary of an exhaustive series of tests on a full-size Lamella roof has just been published. These tests were conducted on September 15, 16 and 17 of this year in Los Angeles by Summerbell Roof Structures, under the supervision of Professor Frederick J. Converse of California Institute of Technology. The Lamella roof, familiar to all Tech alumni in the construction industry, is an arch type of roof structure and has been built in this country since 1925. Designed by a Dutch engineer and produced initially in Europe, its formulae and calculations were limited to vertical load design only. Following the earthquake of 1933, Summerbell Roof Structures of Los Angeles approached Dr. von Karman, Director of the Guggenheim Laboratories at California Institute of Technology, with the request that he derive formulae to show the application of this roof as a distributing element for lateral forces, inasmuch as the reports of the actions of this structure in the Long Beach quake were all very favorable. These data together with an analysis on vertical load design, also made by Dr. von Karman, were compiled by the company and with the aid of Prof. Converse a comprehensive method for analysis of all types of loading on a Lamella roof was set up and has since been used.

The tests were made to verify by active field measurements the analysis made by Dr. von Karman. To get away from inaccuracies that are inherent in smaller model tests of this

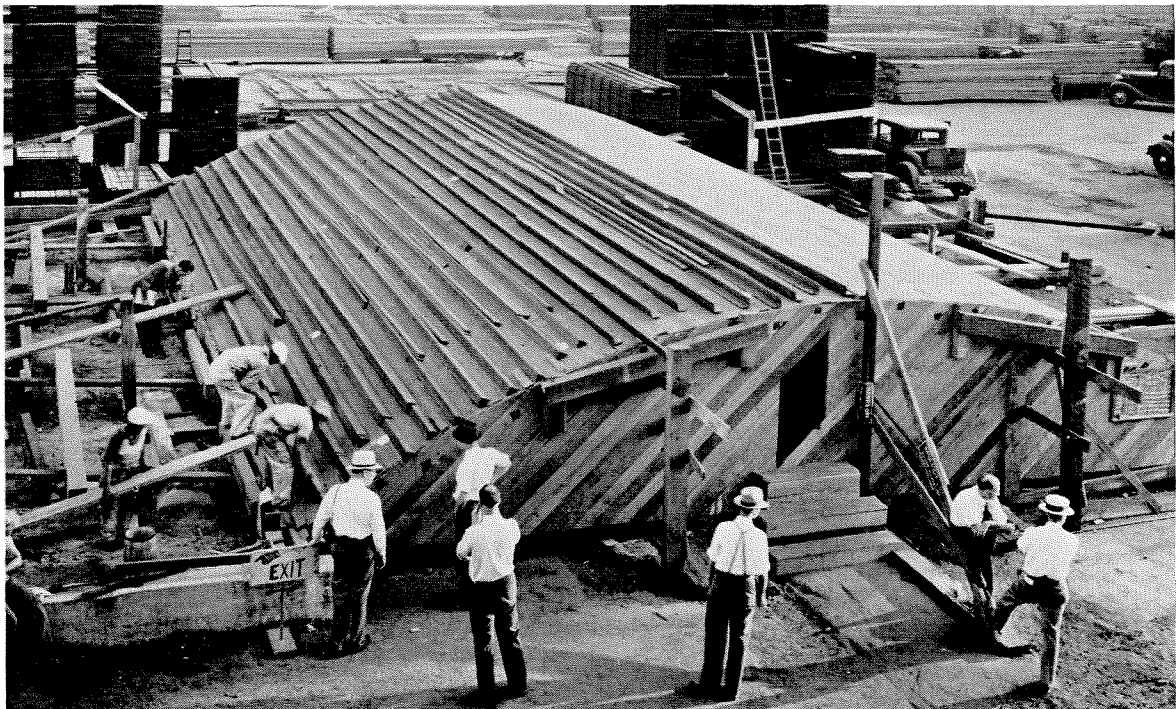
kind, it was decided that the tests should be made on an actual roof.

A roof 40' wide and 51'-10½" long with a rise of 6'-7" from the spring line was constructed in the Los Angeles yards of Hammond Lumber Company. It was designed and constructed in every respect as a normal job would have been and was built to comply with the standards required by the State Division of Architecture for school buildings. The four corners of the roof were held against lateral motion by means of kickers to the old concrete foundations over which the roof was constructed. The building was otherwise unrestrained and the side sills of the roof were supported on steel rollers. Against these sills four high capacity hydraulic jacks were placed to apply lateral loads.

For application of vertical loads, structural steel angles were used and placed in such a manner as to permit a uniform loading or a concentrated loading as the test might require. The roof structure at the beginning of the test was fully sheathed as were the end walls.

In all, eight separate tests were made on the test roof and all were under the direction of Professor Converse, who also had four or five undergraduate students to assist him. The tests included the application of (1) a lateral force on one sill; (2) lateral force on both sills; (3) a concentrated load on one side of the roof; (4) a uniform load over one-

Continued on next page



Engineers and workmen prepare for one of the tests.

half the span and for the last four tests higher applications of lateral loads with part of the roof sheathing removed and last with all the sheathing removed from the end walls.

Evidence of the importance attached to the findings can be seen by the fact that more than 250 architects, engineers, public officials, and construction industry people were present and followed the three days of tests.

Of course, among the alumni of the Institute there are a large number in the construction industry, many of whom were present at some time while Converse and his cohorts were simulating wind forces and earthquakes. Among those present were E. D. Seaver, '21, and Benioff, '22, who are structural engineers for Summerbell Roof Structures and were instrumental in bringing this test about. Among others seen were Wm. M. Taggart, '22, John E. Shield, '22, Robert Moodie, '26, Mott Prudames, '32, Morris Goldsmith, '24, Ernst Maag, '26, T. C. Combs, '27, Al Creal, '36, Julian Stafford, Ex. '22, Sidney Bamberger, '33, and Frank Lowe, '36.

— T —

MILITARY AFFILIATIONS

"Caltech Men in National Defense," by John E. Shield, '22, in the September issue of the Alumni Review, contained the names of many alumni who hold commissions in the various arms and services of the Army, Navy and Marine Corps. Realizing inability, despite a most thorough investigation, to obtain the names and assignments of all men so affiliated, a request was made for additional data. The response has been generous.

On page 16 herein are two letters from men far distant from Pasadena, containing several names. The following were also "reported in":

Kenneth Fenwick, '28, Lt., j.g., U.S.N., C.E.C., Res.

Thomas H. Evans, '29, 1st Lt., Engr. Res.

Carlyle H. Ridenour, '18, Major, Air Corps, U.S.A., Hamilton Field, San Rafael, Calif.

Robert G. Macdonald, '33, 2nd Lt., Engr. Res.

Harold J. Martin, Ex. '25 Capt., Coast Artillery, Res.

Wayland Maxey, '29, 2nd Lt., Q.M. Res; 29th Quartermaster Regiment.

Robert Bungay, Jr., '30, Third Coast Artillery, Res.

Gordon S. Mitchell, Ex. '30, has been assigned to special duty.

The following officers are assigned to the 975th Coast Artillery, Reserve:

1st Lt. M. D. Darling, '27.

1st Lt. Herbert Sawyer, Ex. '26.

1st Lt. Stuart Seymour, '25.

1st Lt. Lawrence Nye, '29.

1st Lt. Harlan Asquith, '29.

1st Lt. Winton Hoch, '30.

SUPERMICROSCOPE

A supermicroscope which uses electrons and a magnetic "lens" instead of light and glass lenses has been designed and built at the Institute by Prof. William V. Houston and Hugh Bradner, a graduate student.

By means of this electronic microscope it will be possible to sidestep the natural obstacle of observing entities measuring less than one wave length of visible light in diameter. The first use for the new microscope will be the study of the surface emissions of electrons caused by bombarding the surfaces with energy of varying wave lengths.

— T —

A.I.M.M.E. PAPERS

The number of fields in which the national preeminence of C. I. T. men is granted is steadily increasing. The National Meeting this fall in Los Angeles of the American Institute of Mining and Metallurgical Engineers listed the following papers:

1. Gravitational Concentration Gradients in Static Columns of Hydrocarbon Fluids, by B. H. Sage and W. N. Lacey, C. I. T.
2. Type Occurrence of North American Bleaching Clays, by Ian Campbell, Prof. Geol., C.I.T., and G. Austin Schroter, '28, Geologist and Mining Engineer.
3. Recent Developments in Clay and Sillimanite, by J. Clark Sutherland, '29, Economic Geologist.

— T —

Buwalda National Park Adviser

Dr. John P. Buwalda is serving on the Board of Expert Advisers to the United States National Park Service, whose duties are to advise on problems of park development, conservation, and administrative policies. At the recent meeting of the Board special consideration was given to a plan for the further comprehensive development of Yosemite National Park.

— T —

IMAGE SLICER

Dr. Ira S. Bowen has announced the invention of an "image slicer" for increasing the efficiency of spectroscopic analysis. The device splits up the image of a star or nebula into a number of thin strips by means of a combination of mirrors which feeds each of the strips through the spectroscopic slit. The slices of light are then recombined into a single band suitable for analysis by a cylindrical lens. By this means it will be possible to use from 50% to 75% of the available light rather than the 5% to 10% of the older method.

The statement made in the last issue of the "Alumni Review" that Dr. Bowen was to leave the Institute was misleading. His off-campus work has not affected his staff functions and the Editors take this opportunity of correcting the statement.

"THE EVOLUTION OF PHYSICS"

By Einstein and Infeld

A book review by *Professor W. V. Houston*

A good popular treatment of a field of science may provide a unifying thread and general view of the subject which is often lost in its detailed study. For those who have studied physics and who have some knowledge of its methods and its terminology, Einstein and Infeld have provided a stimulating book. In non-technical language, interspersed with homely illustrations, they trace the development and growth of the general points of view of modern physics and the allied sciences.

Beginning with Galileo and Newton, they bring out the ideas underlying the concept of a mechanical universe, a universe composed of material particles which exert forces on each other and move according to the laws of Newtonian Mechanics. They next trace the development of the realization of the inadequacy of such a concept, and its replacement, for at least some purposes, by the idea of fields: electric fields, magnetic fields, gravitational fields, etc. In a clear and illuminating fashion they bring out the essential distinction between the idea of particles exerting forces on each other at a distance, and the idea of forces transmitted with a finite velocity through an intervening field.

The treatment of fields leads naturally to the theory of relativity, to which, as might be expected, a great deal of space is devoted. The emphasis throughout is on the ideas, not on the details or the methods, although it is not easy to see how one without some knowledge of the details and the methods could well appreciate the cogency of the ideas. The section on the field theories closes with a mention of the motives underlying the search for a "unified field theory" which has occupied Einstein for so long.

The last chapter of the book contains a discussion of the quantum mechanics, although the space devoted to it seems hardly commensurate with its tremendous importance in modern physics. This chapter is hardly the equal of the excellent chapter on the field theory.

Einstein and Infeld claim to have written this book for an imaginary reader whose properties they have considered at some length. He was to be characterized by a "lack of any concrete knowledge of physics and mathematics," but he was to be "interested in physical and philosophical ideas." From the reported sales of the book a good many such persons must have been found to read it. To what extent they were satisfied it is hard to tell. Perhaps many acquired a few new words with which to flavor their conversation, or at least were rewarded with a pleasant feeling of having mastered difficult matters without much effort. Certainly physics is not to be learned by reading accounts of its conclusions. But, whether or not this book is interesting has some knowledge of the matters discussed, it presents an or instructive to a layman, to the physicist or engineer who inspiring birdseye view of the conceptual basis of physics.

December, 1938

CHAPTER NEWS

By Al Atwood, '32, Chapter Chairman

A salute to the San Diego group of Alumni who under the able leadership of President Dan Mathewson, '33, assisted by Perry Boothe, '31, as Secretary-Treasurer, are off to a swell start in the way of putting on interesting local alumni meetings. Here are some of the things this wide awake bunch have been up to recently.

On September 8th the San Diego Chapter held its first meeting of the season at the University Club at which the returning undergraduates and the incoming freshmen were invited. Mr. B. O. Lary of the San Diego High School who has been responsible for many men attending Caltech was guest of honor. Bob Heilbron, '27, presided and gave the incoming freshmen quite an adequate idea of what to expect at Tech. Heilbron also gave a most informative talk on Polaroid.

On the 17th of November a dinner meeting was held at the San Diego University Club with thirteen members present. Mr. Fred Pyle, San Diego City Hydraulic Engineer gave a very interesting and comprehensive talk on the history and present status of water development in San Diego County. He also explained the projected method of bringing water to San Diego from the Colorado River via the All American Canal.

January 17, 1939, is set as the date of the next meeting so mark this on your calendar all you alumni who live in San Diego or vicinity, for it promises to be a bang up meeting.

— T —

PITTSBURGH ALUMNI

Complimenting Dr. and Mrs. T. Everette Browne, (Ph.D., '36), who were married recently, Mr. and Mrs. Glenn Schlegel, '25, entertained at their home in Mount Lebanon, a suburb of Pittsburgh, Pa. Those who enjoyed the Schlegel's hospitality were:

Dr. and Mrs. Jesse Hobson, '35

Dr. and Mrs. Gilbert McCann, '34

Dr. and Mrs. William Abbett Lewis, Jr., '26

Mr. and Mrs. Alfred E. Schueler, '26

Mr. and Mrs. Edward G. Forgý, '21

Mr. and Mrs. Peter Hines Wyckoff, '37

All those at the gathering, with the exception of Mr. Schlegel, are employed by the Westinghouse Electric and Manufacturing Co.

— T —

CHRISTMAS GIFTS

We are informed that the Institute Bookstore, Throop Hall, has a selection of playing cards which should delight nearly any alumnus. The backs are adorned with an entrance view of Norman Bridge laboratory as viewed from the million-volt laboratory, and a decorative C. I. T. emblem. Backs in either silver or gold are available. Single decks are 50 cents; pairs of decks one dollar, total (no additional for postage or tax). Prepaid orders will be supplied immediately.

NEWS OF CLASSES

Conducted by George Langsner, '32

— T —

Have you any bits of news about yourself or fellow Tech men? Marriages, births, promotions, job changes, papers published, honors received are all items of interest to the rest of us so write your information on a penny postcard and address it to the Editor, CALTECH ALUMNI REVIEW.

1898

Dr. Frank B. Jewett has been appointed a member of the Advisory Committee on Science for the New York World's Fair for 1939.

1918

The members of the war class of 1918 held their twentieth anniversary dinner at the Pasadena Athletic Club on September 15th. Former President James A. B. Scherer attended the dinner, having returned from a five year stay in Japan. A pleasant evening was spent reminiscing and reading letters from those unable to attend. The following is a resume of the present status of the class.

Corliss A. Bercaw has been transferred to Washington, D. C., by the Westinghouse Electric and Manufacturing Company as its representative in dealing with governmental agencies interested in power development.

H. Darwin Kirschman sells science supplies in Honolulu, Hawaii.

James P. Steele is superintendent for the Farm Administration in building a small community to accommodate 600 families near Phoenix, Arizona. The facilities to be provided include water development, sewer system and disposal plant, paving and drainage systems.

Nevin R. Shade is in charge of the geophysical department of the General Petroleum Corporation at Los Angeles.

Clarence N. Ward is employed by the Los Angeles Board of Education at the Los Angeles City College (the old U.C.L.A. campus).

Retla Alter is in business for himself in Pasadena manufacturing supplies for orthodontists.

W. A. Krouss is employed in the Los Angeles office of the General Electric Company.

W. C. Thomas is a toll transmission engineer for the Southern California Telephone Company at Los Angeles.

Robert W. Flory is in the research and development department of the Standard Oil Company of California at Los Angeles.

Eugene H. Imler at present is farming and in private engineering practice at Imperial, California.

Fritz Karge is Engineer of Transportation for the Union Oil Co at Los Angeles.

Joseph F. Hartley is vice president of the North American Paint and Chemical Company of Los Angeles.

Robert C. Sticht is chemist for the Commonwealth Fertilizer Company of Melbourne, Australia.

Edison Hoge is photographic director

for the Mt. Wilson Solar Observatory.

Frank Capra very much in the public's eye as evidenced by the September 19th issue of LIFE.

Walter Weldon lives in South Pasadena and is promoting chemical developments.

William B. Nulsen is professor of electrical engineering at the University of New Hampshire.

1920

Elbridge A. Goodhue is a professor at the Missouri School of Mines at Rolla, Missouri.

1923

George T. McKee attended the annual meeting of Pacific Coast Building Officials Conference, Reno Nevada.

1924

J. W. Piper, who is employed by the Foreign Department of Paramount Pictures and is stationed at Tokyo, Japan, was a recent visitor to southern California after a four years absence.

1925

Harold J. Martin, x25, who is transportation engineer for the Department of Water and Power of the City of Los Angeles was very much in evidence at the recent Los Angeles convention of the Society of Automotive Engineers.

1926

Felix O. Fricker is the father of a son, Evan Norman, born on September 18th, at Santa Monica.

H. P. Henderson is the father of a son, H. P., Jr., born on February 7, 1938.

Ernst Maag, genial senior structural engineer of the Los Angeles County Building Department has recently been delegate to the annual meetings of Pacific Coast Building Officials Conference, Reno; State Structural Engineers Association, Santa Barbara; and Construction Congress, California State Chamber of Commerce, Fresno.

Edgar Peterson Balby was married to Anita Josephine Maurer, on Saturday, December 3, in Hollywood.

William A. Lewis, M.S. '27, Ph.D. '29, has just been appointed Director of Electrical Engineering, Cornell University. We're proud of you, Bill!

1927

William W. Aultman has been appointed an engineer for the water softening plant to be constructed by the Metropolitan Water District of Southern California.

John H. Maxson presented a paper on "The Miocene Pliocene Boundary" at the November meeting of the American Association of Petroleum Geologists, Pacific Coast Section, at Los Angeles. Dr. Maxson recently addressed the Pasadena branch of the American Association of University Women on the "Rise of Kemalist Turkey," and the Pasadena Post

of the American Legion on the geological expedition down the Grand Canyon sponsored by the Carnegie Institution.

Eugene H. Riggs is now employed by the U. S. Engineer's Office of the War Department at Providence, Rhode Island.

Thurman Peterson has accepted an appointment as professor of mathematics at the University of Oregon.

Theodore C. Combs, who is District Manager for the West Coast Lumbermen's Association at Los Angeles, attended the annual meeting of the Pacific Coast Building Officials Conference at Reno, Nevada.

1928

Richard Armstrong (Aussieker) expects to receive his M.D. degree from the University of Michigan this year.

Francis Noel who was employed by the California Division of Highways at Bishop, California, has been transferred to the Bridge Department of the Division at Los Angeles.

Albert Eaton Lombard, Jr., has completed his final doctorate examination at the Institute. His thesis is "An Investigation of the Critical Conditions of Flutter in Aircraft and the Development of Criteria for the Prediction of Critical Speeds and for the Elimination of Flutter."

1929

Donald S. Clark attended the annual meeting of the American Society for Metals in Detroit last October, being a member of the Board of Trustees of the Society.

Lawrence J. Grunder served on the Arrangements committee for the recent convention in Los Angeles of the Society of Automotive Engineers.

Fred W. Bewley, x29, is now the principal of the Killefer Elementary School of Orange, California. He is working towards his doctor's degree at the University of Southern California.

Ernest Hugg was married to Miss Margy Blair in Pasadena on October 1st.

Richard Rofely is an engineer with the Guy Atkinson Company, contractors on the Hanson Dam in Tujunga Canyon, which is a part of the flood control system to protect Los Angeles.

Robert White is with Baroid Sales in Los Angeles.

1930

Clyde E. Giebler was married to Miss Delora Jane Kuerth in Los Angeles on November 19th.

John S. Murray was married to Miss June Albright in Pasadena on October second.

Trent Dames has recently opened an office in the Architects' Building in Los Angeles as a consultant on foundation investigations.

1931

Glen Chamberlain, who is employed in the Bridge Department of the Cali-

California Division of Highways, has been appointed resident engineer on a highway bridge at Weott, California, in the heart of the redwood country.

Aubrey Horn, x31, recently passed the California examination for Registered Architect, being one of the two who passed the test of the 90 candidates. He is employed in the offices of Gordon B. Kauffman, who was the architect on the construction of the Athenaeum and the Student Houses.

George E. Lewis, who has been working on the electrical control devices for the Palomar Telescope, delivered an illustrated lecture on the telescope and observatory before the Pasadena Sunday Morning Breakfast Club in October.

Wendall Humphreys, x31, was married to Miss Dorothy Heidrick in Ventura, California, last September.

Maynard Anderson was married to Miss Helen Louise Cavender of Westwood last September, and they are now living in San Diego where he is employed in the Engineering office of the W.P.A.

1932

Brian Sparks, who is a pilot for Pan-American Airways on the trans-Pacific route from Oakland to Manila, is on leave and is back at the Institute taking sixty units of advanced aviation courses this term.

Chester Keachie is now an instructor in business management at Stanford University, assisting in business organization, industrial management and marketing courses. During the past summer he was a field agent for the California State Department of Employment adjusting unemployment compensation claims.

E. N. Harshman who has been working in the Orient is expected to return to California in December. While employed by Minerals Research, Ltd., he spent most of his time in the interior of French Indo-China. For the past six months he worked out of Manila for Nielson and Company. He is now superintendent of the Hixbar Gold Mining Company, Ltd., on the island of Rafu-Rafu off the southern end of Luzon Island. Being over six feet three inches tall he created great excitement among the native pigmies who came in great numbers to see the "big white man."

Paul Arnerich is working for the Douglas Aircraft Corporation.

Haley Wolfe is with the Walt Disney Studios in Hollywood.

Wendel W. Morgan is the proud father of his second child, a daughter, born November 28th.

1933

Charles Tillman is working in the design division of the Astrophysics Department of the campus.

Louis A. Pipes was married to Miss Inetta Abbott in Cambridge, Mass. in November.

Larry Gould has been appointed a Director of the Alumni Association as listed in the masthead of this issue of the REVIEW.

Moses Widess became the father of a son, Paul Richard, on November 21.

1934

G. F. Rucker, M.S., who is employed as a sales engineer by Leeds and North-

rup was married to Miss Maybelle Butterfield last June.

Nelson P. Nies has been appointed a fellow in Chemistry at Western Reserve University in Cleveland, Ohio.

Lawrence Brockway, Ph.D., is now associate professor of physical chemistry at the University of Michigan.

1935

David Lehmicke is a graduate student at the University of Minnesota.

William Keyes received his master's degree from the University of Illinois last June and is now employed by the Portland Cement Association at Chicago.

Harry Koons is with S. E. Bechtel, at Evanston, Wyoming.

1936

G. Russell Nance of the Fluor Corporation addressed the Mechanical Engineering Seminar at the Institute on "Forced Draft Cooling Towers" in October.

Al Creal is with the contracting firm of De Line and Bowen.

Stuart Ferguson has just accepted a position in the Chemistry Division of the Walt Disney Studios.

Smoot Katow, M.S., is working in the Astrophysics department on the campus.

Donald Eugene Blodgett was married to Miss Alma Kirk in Pasadena on Thanksgiving Day.

Conrad R. Muller has accepted a position in the Navy Department and is stationed at Pearl Harbor, Hawaii.

Neil Snow, who is employed by the Under Form Construction Co., is in San Diego on the construction of the New San Diego Jail.

1937

Ed Price, who is employed by Proctor and Gamble at Cincinnati, Ohio, spent his recent vacation in southern California.

Fremont F. Radcliffe is the father of a daughter, Frances Ann, born on September 26th at Long Beach, California.

Vernon Gevecker, M.S., is on the staff of the Missouri School of Mines, teaching structures, hydraulics and soil mechanics.

William Stackhouse, who is on the engineering staff of the Ryan Aeronautical Company of San Diego, is the father of a son, Lawrence Revelle, born on August 26th.

Carl E. Larson, who was employed as an inspector on the recently completed buildings on the campus, is now doing graduate work at the Institute.

Jay Borens Van der Werff received his master's degree last June and is now working in the Hydraulics Division of the Douglas Aircraft Corporation.

Dan Gerlough is with the Mott-Smith Company at Yoakum, Texas.

John C. Kinley who was formerly employed by the Elliott Core Drilling Company of Texas is now a student at the Harvard Business School.

John Austin and **William Ellery** are employed by the Ingersoll Rand Company at New York.

Charles A. Morse received his master's degree in June and is now employed by Santa Barbara County with Headquarters at Santa Maria, California.

Stanley Feuer after receiving his master's degree accepted a position with the Crane Company at La Crosse, Wisconsin.

John Peter Selberg was married to Miss Helen Mildred Kendall in Los Angeles on October 17th.

1938

Wendell Bower Miller is with the Southern California Telephone Company.

Peter Goff is doing geophysical work for the Texas Company at Coalinga, California.

Stanley Wolfberg is attending the Graduate School of Business Administration at Stanford University.

Richard Rowell is working for the Western Precipitation Company in Los Angeles.

Henry S. Hopkins is in the office of Hugenir and DeKay, Architects, Helena, Montana.

Hank Evans has a fellowship at Yale University.

John L. Merriam, who was with the U. S. Engineers Office, has accepted a position with Duell and Schoeller.

William Althouse is working for the Peerless Pump Company.

Elliot Bonham and **Paul Tilker** are with the Board of Fire Underwriters of the Pacific.

John Minasian is working for R. F. McCune, Contractor, at Visalia, California.

Lowell Hulbirt and **John G. McLean** are attending the Harvard University Business School.

Thomas V. Davis is employed by the Imperial Irrigation District at El Centro, California.

Emanuel Windsor is now a biologist at the Santa Barbara Clinic.

William Thomas Cardwell, Jr., was married to Miss Margaret Elizabeth Todt in September. At the present time he is doing graduate work at the Institute.

TECH GEOLOGISTS COVER THE WORLD

By G. AUSTIN SCHROTER, '28

Since 1927, the first year in which degrees in geology were awarded by the Institute, the dispersion of graduates in the course both territorially and in endeavor has been extensive. Many have gained recognition in mining, petroleum and in the purer scientific phases of geology; and all have by accomplishment spread the renown of the California Institute of Technology.

The profession of geologists calls for field work away from the larger cities, and in addition they are constantly on the move, so that it is difficult to accurately establish the whereabouts of the geologists. The following is a list whose whereabouts are known to the author.

1927

Gazin, Charles Lewis, is assistant curator of Vertebrate Paleontology of the U.S. National Museum, Washington, D. C.
Maxson, John H., is assistant professor of geology at Tech.

Moore, Bernard N., is field geologist with the Sinclair Petroleum Company in Venezuela. Benny was formerly junior

geologist with the U. S. Geological Survey.

Nichol, Frank N., is geologist with the U. S. Bureau of Reclamation, Denver, Colorado. Nick has served on the Boulder dam, Shasta dam and other huge western projects.

Stanton, W. Layton, is district geologist with the Union Oil Company, Bakersfield, California.

Southwick, Thomas S., is a meteorologist with the U. S. Weather Bureau in Washington, D. C.

Turner, Earl, is assistant professor of geology at Texas A. & M.

1928

Bell, Frank, is a micropaleontologist with the Shell Oil Company at Long Beach, California.

Clark, Alex, is now district geologist for the Shell Oil Company at Bakersfield, after an outstanding record as paleontologist for the same company.

Beverley, Burt, Jr., is a field geologist for the Standard Oil Company of New Jersey, now serving in the Dutch East Indies.

Joujon-Roche, J. Edward, is geologist with the Shell Oil Company in Bakersfield.

Schroter, G. Austin, is manager of the Exploration & Mining Departments of the Filtrrol Corporation, Los Angeles.

Smith, Hampden, is district geologist for the Los Angeles basin of the Texas Company. His offices are in Los Angeles.

1929

Bode, Francis D., is a field geologist in North Africa. His address is in care of American Railway Express, Rome, Italy.

Daly, Robert, is draftsman for the Shell Oil Company in Los Angeles.

Findlay, Willard D., after serving in Australia and Portuguese East Africa, has returned to Tech as a research fellow in the geology department.

Lohman, Kenneth, is a micropaleontologist with the U. S. Geological Survey in Washington, D. C.

Lohman, Stanley, is geologist with the Water Supply Division of the U. S. Geological Survey in Washington.

Sutherland, J. Clark, is in business as a consulting economic geologist in Pasadena.

1930

Scharf, Dave, is a geophysicist for the Independent Exploration Company of Houston, Texas. He is currently working near Casper, Wyoming.

Wilson, Robert, is a research fellow in geology at Tech.

1931

Holzman, Ben, is meteorologist with the U. S. Weather Bureau.

Petersen, R. A., is working with United Geophysics as a geophysicist.

Cogen, William, is a field geologist with the Shell Oil Company in Texas.

1932

Harshman, L. N., is a mining geologist in the Phillipine Islands.

1933

Bonillas, Y., is geologist with the Standard Oil in Venezuela, S. A.

1934

Sharp, R. P., Bob is instructor in geology at the University of Illinois, Urbana.

Fleet Air Detachment,
Naval Air Station,
Norfolk, Virginia.
29 September, 1938.

County Engineer,
County of Maui,
Territory of Hawaii.
October 10, 1938

Dear Ted—

I have just read Mr. John E. Shield's article on "Caltech Men in National Defense" and am writing this letter in the hope of adding to the information which he desires to collect.

In writing such a letter I feel justified in first giving an account of my own activities since leaving Caltech. I entered Pensacola for flight training as an Aviation Cadet in September, 1935, after completing a month of elimination training at NRAB at Long Beach, California. In November, 1936, I received my wings and designation as Naval Aviator. Upon leaving Pensacola I was attached to Fighting Squadron Three of the U.S.S. Ranger at San Diego. In June, 1937, the squadron was changed to Fighting Squadron Five and transferred to the U.S.S. Yorktown at Norfolk. In September, 1937, this squadron represented the Navy in the National Air Races at Cleveland.

Since being in this outfit, I have worked in the capacity of assistant engineering officer, assistant flight officer, assistant gunnery officer and athletic officer. The duty has been very interesting and diversified.

There are a number of other Caltech men on active duty in the Navy as Aviation Cadets, and to the best of my knowledge I shall give you their names and present stations.

John S. Warfel, '33,
Scouting Two, U.S.S. Lexington.

Robert M. Stanley, '35,
Instructor, Naval Air Station,
Pensacola, Florida.

Francis F. Hebel, '35,
VO-2-B, U.S.S. Nevada.

Joseph P. Carr, '34,
VP 12, U.S.S. Langley.

William C. Dunn, 'x34,
U.S.S. Vincennes.

Alfred Wilstam, 'x37,
VS 5, U.S.S. Thrush.

John D. Harshberger, '34,
Second Lieutenant, U.S.M.C.,
Fleet Marine Force Aircraft Squadron.

Very truly yours,
Jack M. Roehm, M.S., '35.

1935

Dawson, C. A., is conducting geological investigations in Southern California for the DuPont Corporation.

Jahns, R. H., is teaching fellow in geology at Tech.

1937

Legge, J. A., is in Arizona. No other information.

Lockwood, R. B., is somewhere in California. No other information.

A geographic breakdown of the countries which have been studied by Tech geologists, together with the geologists who have or who are serving there would be:

U.S.A.—All
Canada—

Dear Ted:

I noted in the Alumni review for September, 1938, a list of all Tech graduates associated with the Army, Reserve Corps, etc., and the request for those not listed to write in the information.

Here is mine. I am a Captain, Engrs.-Res. assigned to the Hawaiian Department Service Command, Maui District. I was formerly assigned to the 316th Engrs. in California but on moving to Hawaii was transferred and assigned to the 3rd Engrs., (Regular Army) at Schofield Barracks and more recently to my present assignment. The Service Command is peculiar here in Hawaii in that it was created to function immediately in the event of the military establishment taking control in any emergency. It is concerned with the operation of industry and getting the islands on a self-supporting basis in case of isolation from the mainland by enemy fleets.

I have been County Engineer here on the island of Maui for the past two years. This is the second largest island in the group and the County consists of four islands altogether, namely, Maui, Molokai, Lanai, and Kohoolawe. The only other Tech man on the island is a newcomer, or Kamaina, as we call them—Chester Lindsey. I believe he was '35 and is a chemist for the Maui Pineapple Co. Had the pleasure of meeting Jack Sturgess '30 the other day. He has also just come to the islands, representing Worthington Pump Co. and is working for W. A. Ramsay Ltd. of Honolulu.

Best regards to all the old gang.

Joseph Matson, Jr., '26,

LAST MINUTE NEWS

Election of officers of the Structural Engineers Association of Southern California, for the forthcoming year has honored two members of the class of '22. John E. Shield is to be president, assisted by Ben Benioff as secretary. President during the current year has been Prof. Frederick J. Converse.

Another last minute item of great import appears insignificantly with news of the class of '26—the new responsibilities of William A. Lewis. We want to hear more of you next time, Bill.

Schroter, '28
Clark, '28

Mexico—

Schroter, '28

Alaska—

Sutherland, '29

Central and South America—

Moore, Ben, '27

Bonillas, '35

Celebes, Dutch East Indies, Australia—

Beverley, Burt, '28

Findlay, W., '29

Harshman, L. N., '32

Europe and Levant—

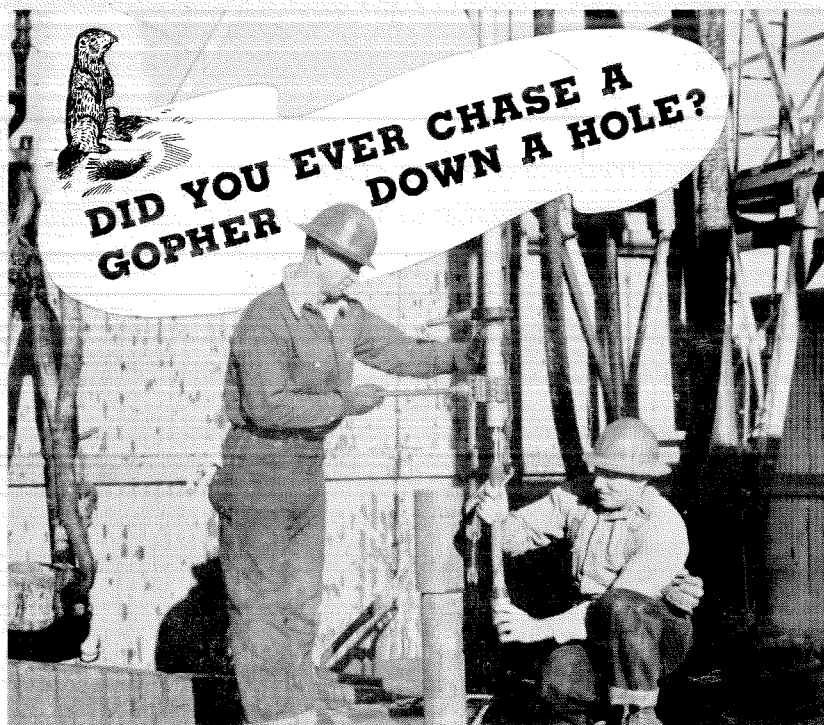
Maxson, J. H., '27

Bode, F. D., '29

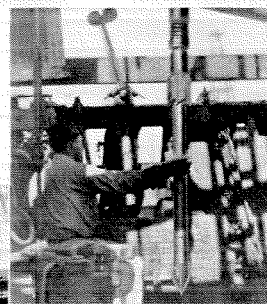
Africa—

Bode, F. D., '29

Findlay, W., '29



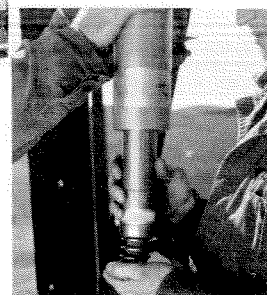
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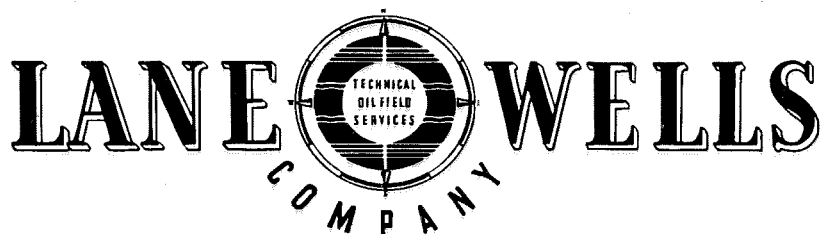
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