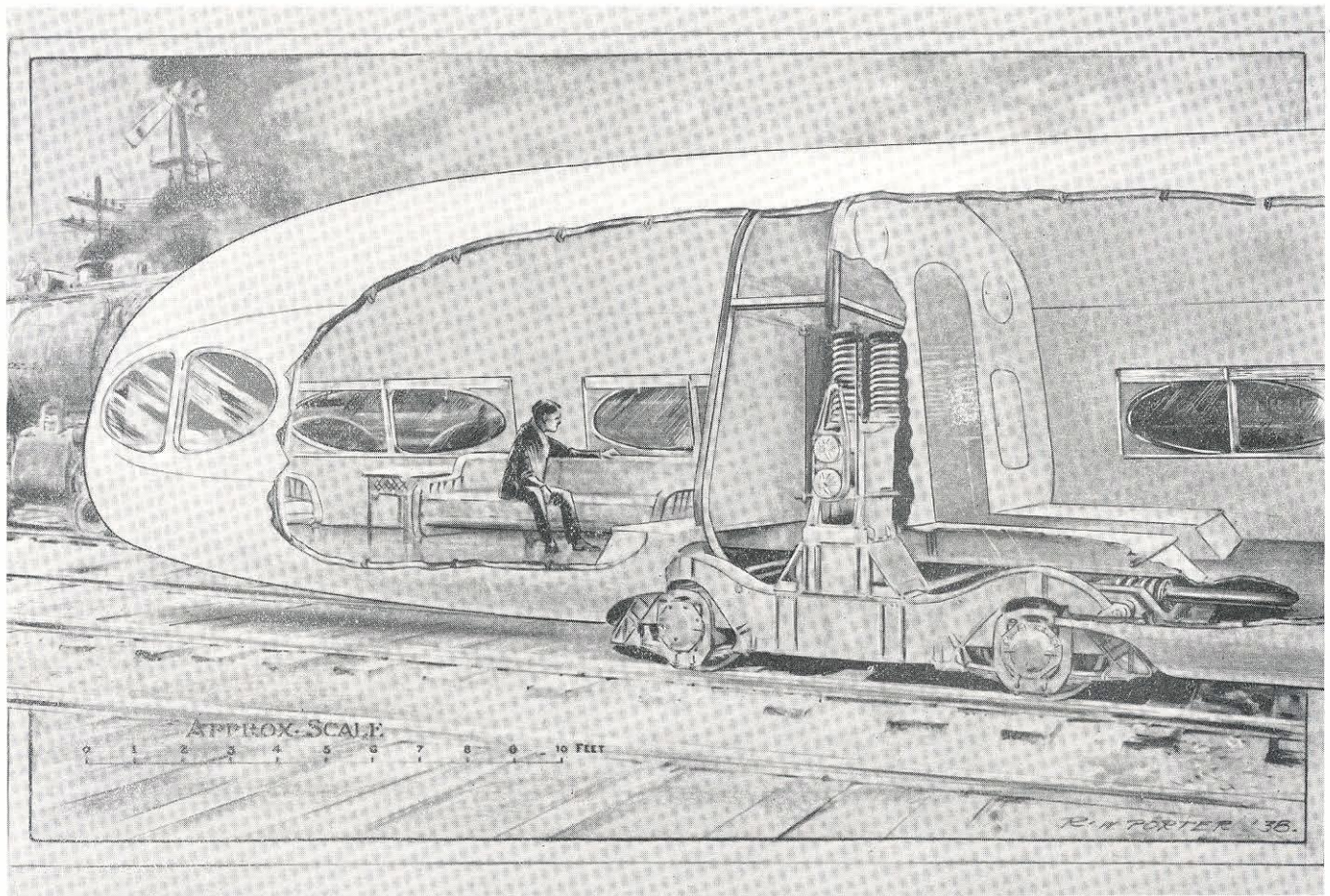


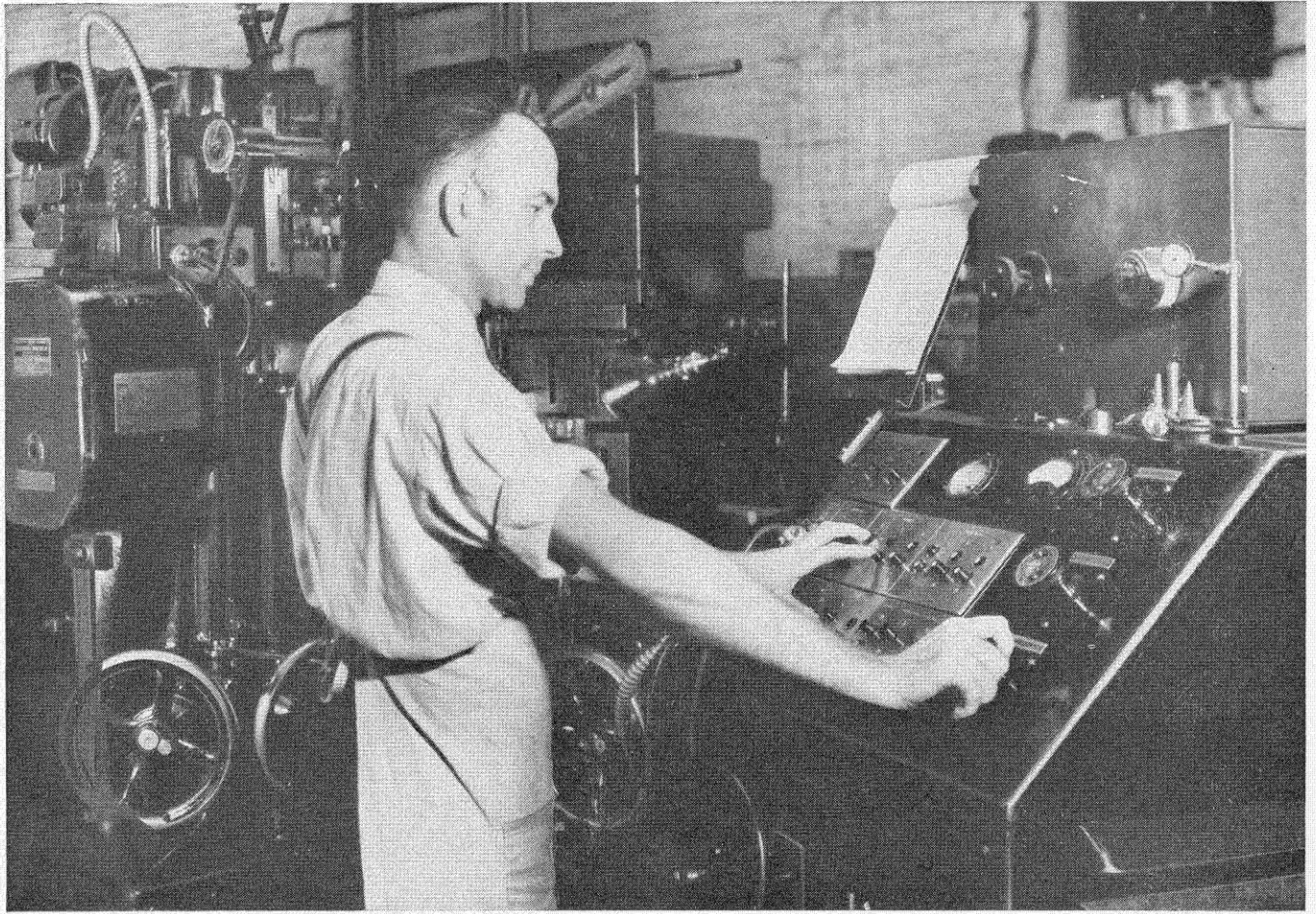
# ALUMNI REVIEW

CALIFORNIA INSTITUTE OF TECHNOLOGY



## A NEW TYPE OF RAILROAD CAR

SEE PAGE 3



## A MAESTRO OF POWER

**S**WIFT and responsive as the strings and brasses of a great orchestra, power moves beneath this man's finger tips. Electric power, varied at his will from the crashing force of ten thousand sledges to the delicate pianissimo that pares a hairbreadth from a piece of steel. And so, from the machine that obeys this man's bidding rolls forth the symphony of American industry—*more goods for more people at less cost.*

This man is typical of the millions of American workmen who, with the machines they direct, set the tempo of American industry. Today the mechanical power in the hands of each factory

worker is four times what it was 50 years ago. As a result, the amount that each worker can produce has more than doubled. And because he produces more, he has more.

That is why five out of six American families own radios, why four out of five have automobiles, why one out of three owns an electric refrigerator. That is why America has today the highest standard of living the world has ever known. And 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**

90-107 D11

# ALUMNI REVIEW

ALUMNI ASSOCIATION, INC.  
CALIFORNIA INSTITUTE OF TECHNOLOGY

VOL. 2 No. 4

JUNE, 1939

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Theodore C. Combs, '27	<i>Publications</i>
Clarence F. Keich, '26	<i>Social</i>

**F**UTURE! The phenomenal growth which our association has enjoyed during the past years must be attributed to some real cause. Certainly we must agree that few of us, if any, have become members for any sentimental reasons. Therefore, our membership must have a genuine basis.

In comparison with other organizations, our association, to my knowledge, offers a great deal more to its membership. The placement service has proved a tremendous benefit to both graduates and employers. (Even more could be accomplished if those desiring to improve their position would register their ambitions with the placement office.) The Alumni Review is a prominent project of our association in that it gives us current information regarding our members along with worthwhile articles. The Directory published this year, and issued to all members of the association, has been received with great acclaim; (Wide use will be made of this Directory for several years, particularly by those ment scattered throughout the United States and foreign countries. Once begun, I am certain we shall find it necessary to revise this Directory from time to time to meet the demands of our members.)

The meetings, in the Southern California area, have ben many and varied, so that each member has been entertained by some

events regardless of his tastes. These meetings included a dance at the Biltmore, with more than four hundred couples in attendance, several instructive lecture meetings and an unusual stag and field day where the boys were given an opportunity to display their latent athletic ability at one sport or another. Outstanding among our meetings again this year was the Seminar week-end. This meeting is gaining in popularity and will, without doubt, reach an attendance of one thousand

or more members and guests before many years. Much appreciation is due the Institute and faculty members for their kind participation and cooperation in making the Seminar week-end so successful, educational and enjoyable.

All of these accomplishments have come because of the intense interest and, may I say, demand of the individual members, rather than because of any ingenious enterprise of your Board of Directors. Nevertheless, the members of this Board and all of the committee members have worked untiringly during the past year and too much credit cannot be given to these men who have answered your demands. Five of the nine Board members are retiring from active service, but the five who will fill these places fully realize the work and responsibility that they must undertake.

Sincerely yours,  
J. E. KINSEY.

**FORTHCOMING EVENTS\***

**Bakersfield Chapter . . . June 6**

**C.I.T. Commencement . . . June 9**

**Annual Meeting and Homecoming . . . . . June 9**

**Special Conclaves of Classes 1934, 1929, 1924, etc.**

General Meeting . . . . . September

For Chapter dates see your Chapter Secretary (listings on page 65 of the Directory).

\* Listings in bold face are definite. Specific data regarding other events will be announced upon completion of plans.



# He's *Carrying* Quite a Load

**T**AXES are necessary—you couldn't run a city, state or government without them. But they do mount up.

Fact is, a considerable part of the money you pay us for telephone service goes right out in taxes.

Bell System taxes for 1938 were \$147,400,000—  
an increase of 56% in three years. In 1938 taxes were:

Equal to about \$550 a year per employee

Equal to \$9.50 per telephone in the Bell System

Equal to \$7.54 per share of A. T. & T. common stock

**BELL TELEPHONE SYSTEM**

You are cordially invited to visit the Bell System exhibit at  
the Golden Gate International Exposition, San Francisco



# A NEW TYPE OF RAILROAD CAR

By

F. C. LINDVALL, Ph.D., '28

*Associate Professor of Electrical Engineering*

High speed in railroad operation is no novelty, nor is the achievement of passenger comfort with leisurely schedules. However, speed with comfort presents problems which have thus far been partially solved by extensive improvement in rail and roadbed, involving expensive track realignment and surfacing. Such changes merely to accommodate high speed with some degree of comfort surely are not economical, and therefore provoke the thought that a study of the riding problem, based on fundamental dynamics, might yield a truck and body suspension system which would provide comfort on ordinary track.

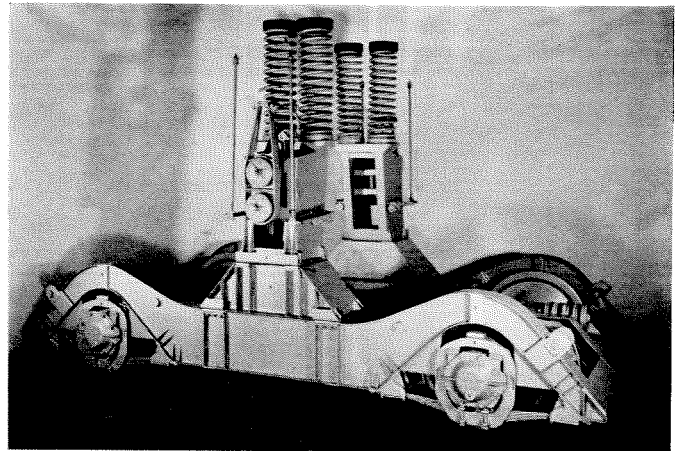
Such a study, stimulated by William Van Dorn, formerly associated with the aeronautics department of the California Institute, and sponsored by Cortlandt Hill, has resulted in a two car experimental train incorporating a new suspension system which has achieved signal success in a variety of road tests.

The suspension system, or method of mounting the car on the track, departs completely from standard practice. As can be seen in the Porter sketch (appearing on the cover of this issue) the car body floats on soft vertical coil springs in a plane above the center of gravity of the body. These springs permit, through horizontal deflection, all of the necessary truck motion relative to the body, this motion being positioned and controlled by a pair of horizontal links, elastically restrained by rubber, acting between the body and the truck frame at a height well above body center of gravity. A horizontal draft connection between the truck and the underbody structure provides the necessary longitudinal stability. Accordingly all of the necessary action of a standard swivel truck is provided without a center plate, side bearing, or swing hangers, thus eliminating lubrication and load concentration difficulties. The principal springing of the body, being above the center of gravity may be as soft as desired, and any tendency for body roll on curves is in the direction to correct for uncompensated side force on curves. This action of "bank" is in direct contrast to the behavior of a standard car and truck which lean outwardly on curves insufficiently superelevated. Likewise the lateral restraint of the car body in this new suspension system may be made to yield as low a frequency, or to be as soft as required since the action is not restricted as in a standard truck by swing hanger length and possible bolster travel within the truck frame. Then, for both the vertical and lateral motion simple shock absorbers are applied to damp resonance or harmonic oscillation.

The truck itself, a substantial fabricated structure, is supported on semi-elliptic springs carried by a journal box hanger which rests on rubber shear pads on the journal box

to permit a small transverse movement of the axle. The rubber likewise is valuable in preventing wheel noise transmission into the frame. Metallic slide guides or other frictional restraint in parallel with the springing system and rubber, have been entirely eliminated. However, the entire journal assembly is provided with guard flanges made like a loose pedestal guide to confine the journal box in the event of failure of rubber parts or springs. Safety, a minimum of weight, and quietness of operation have thus been incorporated in this truck design.

The body structure, in turn, adheres to the fundamentals of light weight, safety, and economy, qualities which are inherent in the monocoque or stressed-skin design employed. A uniform low floor level and low center of gravity add greatly to the stability; while the suspension system of the body, floating the body on soft springs, achieves a high degree of comfort.



*Truck and Towers*

It should be emphasized that this work on these new cars is definitely experimental and as a result many of the details and appointments which are necessary in modern trains have been omitted in order to get to the important work of developing the riding quality and other engineering characteristics of the cars. The weight of the cars is therefore low, only 65,000 pounds for the two car articulated unit complete with the three trucks. The standard steel car provided by the Santa Fe Railway for comparative riding tests weighs 176,000 pounds and furnishes striking evidence of the fact that great mass is not essential to a good ride.

Full trucks have a 9-foot wheelbase. A twelve-foot wheelbase of the articulate truck is possible because the load from the body is carried directly over each axle and thus the frame is subjected to no bending moments due to body load.

The articulate truck frame has been made separable so that cars articulated at both ends could be uncoupled and switched to provide flexibility in train make-up. All truck frames were fabricated from high strength steel arc-welded and stress-relieved. All wheels have a cylindrical tread and a diameter of 30 inches. Axles are hollow-bored and are fitted with ball bearing journals. A standard clasp brake system is employed. On the full trucks one air cylinder operates the shoes on all four wheels through a simple, fully equalized linkage; each half of the articulate truck has its own brake system with an air cylinder operating the shoes on two wheels. A very simple method of automatic slack adjustment is provided.

In the truck photograph it can be seen that the load is carried from the frame onto the ends of the leaf journal spring the center of which seats in a hanger surrounding the journal box. Vulcanized rubber pads at the top and sides of the journal box, by slight shearing deflection, allow the hanger to shift laterally and provide cushioning against side shock loads. Since, in service, there are no moving metallic contacts or sliding surfaces where wear or play can develop, the wheel axle, bearings, and frame are relieved of all shock and impact loads. Brake thrust, but not torque, is carried by the leaf spring which was designed for this duty.

The towers which carry the main suspension system in the body are bolted to the truck frame and form an integral part of it. These towers, like the frames, are fabricated of light-gauge high-tensile steel, arc-welded and stress-relieved.

The coil springs mounted on the towers carry the body with a static deflection of  $8\frac{1}{2}$  inches, softer springing than is usually provided for railroad cars. These springs were specially designed to allow lateral as well as axial movement. The rubber-cushioned lateral restraint arm seen on the side of the tower connects to the body through a link located at a level about 20 inches above the center of gravity of the car body proper. This lateral control system has a very soft restraint at the center of its range and stiffens gradually as it is deflected by sustained side load. Longitudinal positioning of the truck is accomplished by a tubular draft link interconnecting and attached to both the truck and body by means of a new type of rubber buffer, which allows the required angular movement of the link and also provides cushioning for buff or draft loads. At the articulate truck these links carry the train draft load and at the full trucks take only braking and inertia loads. The system thus described incorporates no working joints carrying body loads nor are there any points where slack or wear can develop. These parts replace swing hangers, spring plank, bolster springs, bolster, bolster wear plates, center plate and side bearings in the usual truck construction. The hydraulic shock absorbers seen on the sides of the towers attach to the body through the long vertical links and serve to damp vertical and banking motions. On the top of each tower is

seen one hydraulic shock absorber connected to the lateral restraint arm.

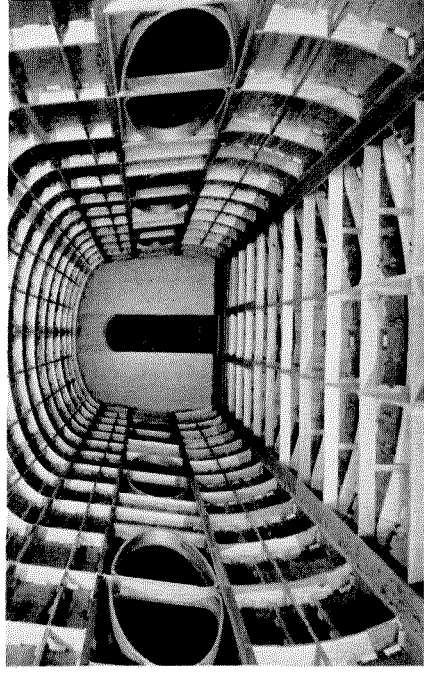
Rubber has been used in a number of important applications because of its well known elastic properties and because automotive and general mechanical applications have shown remarkable life in even very adverse conditions when such applications were properly designed with full regard for the loads and deflections imposed.

It will be seen, then, that a complete break has been made from traditional truck design in the interest of comfort and speed. Equally unorthodox practice has been followed in the car body construction in which the objective has been light weight consistent with strength and safety. The experience of modern aircraft manufacturers in developing structures of very high strength-weight ratios has been used in the design of the true "stressed-skin" or semi-monocoque body structure of these new cars. The characteristic feature of this type of structure is that the outer covering, or "skin", is used as a principal load-carrying element, suitably stiffened and supported. By proper design the skin is able to carry its load without the usual buckles, or "load-wrinkles."

The effectiveness of this type of structure is remarkably demonstrated by the experimental cars which are built of Douglas fir plywood. A static load test to twice the normal gross load has proved the strength and rigidity of these car bodies, which are also entirely free of the creaks and groans usually associated with wooden structures. Wood was used in the test cars merely as a convenient expedient in arriving at suitable means to test the trucks and suspension structure within a reasonable time and at a reasonable cost. The car bodies are thus definitely temporary in contrast to the trucks which have been engineered for permanent service.

Road tests of this new train unit have been made which include a variety of track conditions and operation. Simultaneous records of vertical and lateral ride have been made

(Continued on page 13)



All-wood operable model being built, showing "stressed skin" construction. When completed, this was used for road tests.

# INSTITUTE STAFF MEMBERS RECOGNIZED IN AMERICAN MEN OF SCIENCE

*Comparative Institutional Listings Disclose C.I.T. Is Outstanding. (Continued)*

The March number of the *Alumni Review* contained an article on the starring system which is used in *American Men of Science* to designate outstanding workers in the various fields of science. It was pointed out how the six editions of *American Men of Science* (first edition, 1906; sixth edition, 1938) contain a biographical record of scientific activity in the United States for the past thirty years, and how at the same time they furnish data for a comparison of the institutions in this country which are active centers of scientific research. Such a comparison was made between the California Institute and fifteen other American universities. This comparison was based on figures compiled by Mr. Stephen S. Visher, who, in the October, 1938, number of the *University of Chicago Magazine* published the totals of starred scientists on the staffs of the institutions compared.

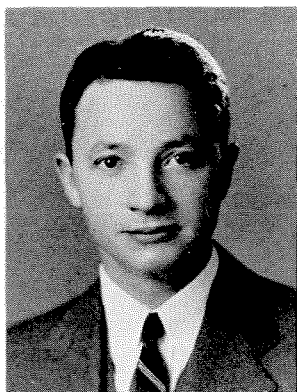
In arriving at his totals, however, Mr. Visher followed a rather intricate system of counting. Where a staff member did not devote his whole time to teaching and research he was counted only a half. Professors emeriti were apparently not counted at all, regardless of whether they were still actively at work. Other restrictions, too involved to discuss here, were also applied. Since presumably the same system was used for each of the institutions involved, Mr. Visher's figures could be used for comparative purposes. Nevertheless, his totals in each case must be considered subject to revision. (1) Consequently, it seemed desirable, in the case of the California Institute, to make an independent count. This was done by checking the staff list of the Institute (excluding all those below the rank of instructor) against the 1928 edition of *American Men of Science*. The final total makes no discrimination between part-time and full-time members

of the staff, since the value of their work in stimulating their colleagues and adding prestige to the Institute bear no necessary relation to the full or part-time status.

The result of this check is gratifying in that the total arrived at is considerably larger than Mr. Visher's (his total was 22½). In all, twenty-nine members of the Institute staff are starred. Two were first starred in the first edition (1906); two more in the second edition (1910); four in the third edition (1921) four in the fourth (1927); four in the fifth (1933); and thirteen in the sixth (1938).

The total number of teachers at the Institute, as given in the current *World Almanac*, is 191. But this figure includes teaching fellows, who have not been long enough in independent work in their various fields to be eligible for starring. Hence, omitting them and revising the faculty total to include only those through the rank of instructor, the figure is 123. This gives the ratio of starred to unstarred as 1 to 4.24; the percentage starred, 23.57. But the figure 123 includes engineers. As was explained in the previous article, while *American Men of Science* includes the biographies of engineers, it applies the starring system only to the sciences. Therefore, to get the ratio between those starred and those eligible for starring, it is necessary to count out the members of the engineering departments. This gives, then, as the total for the science faculty, 85; the ratio of starred to unstarred is 1 to 2.93; the percentage starred, 34.12.

(1) An independent check of Harvard and Princeton gave a total considerably larger than Mr. Visher's. A similar check of the University of California, made by Mr. Harold Ellis of the News Bureau, disclosed the same sort of discrepancy.



H. VICTOR NEHER  
Ph.D., 1931  
Assistant Professor of Physics



CARL D. ANDERSON  
B.S., 1927; Ph.D., 1930  
Associate Professor of Physics



ROSCOE G. DICKINSON  
Ph.D., 1920  
Professor of Physical Chemistry

The table given below shows the distribution, etc., of starred faculty members according to departments. (2)

	No. in Dept.	No. Starred	Ratio	Percent.
Biology	17	4	1 to 4.25	23.51
Chemistry	16	4	1 to 4	25
Geology	14	3	1 to 4.66	21.43
Mathematics	9	3	1 to 3	33.33
Physics	21	12	1 to 1.75	57.14

It should be of considerable interest to members of the Alumni Association that of the thirteen Institute staff members first starred in the 1938 edition of *American Men of Science*, the six men pictured with this article are alumni of the Institute.

(2) The total here, it will be noted, is 26. The other three starred faculty members cannot be classified according to department.



JESSIE W. M. DUMOND  
B.S., 1916; Ph.D., 1929  
Associate Professor of Physics



CHARLES C. LAURITSEN  
Ph.D., 1929  
Professor of Physics



DON M. YOST  
Ph.D., 1926  
Associate Professor of Inorganic Chemistry

— T —

— T —

### COMMENCEMENT

CALIFORNIA INSTITUTE OF TECHNOLOGY  
June 9, 1939, 4:45 P.M.

Processional March Institute Band

Invocation and Chaplain's Address  
MOST REV. JOHN D. CANTWELL, D.D.  
Address

Opportunities in the 'Forties  
WILLIAM C. FULLENDORE, A.B., J.D.  
Presentation of Candidates for Degrees  
FREDERIC W. HJNRICHS, JR., M.A.  
*Dean of Upper Classmen*

WILLIAM VERMILLION HOUSTON, PH.D.  
*Member of Committee on Course in Science*

FRANKLIN THOMAS, C.E.  
*For the Committee on Course in Engineering*  
RICHARD CHASE TOLMAN, PH.D.  
*Dean of the Graduate School*

Conferring of Degrees  
on behalf of the Trustees and Faculty  
ROBERT ANDREWS MILLIKAN, PH.D., LL.D., Sc.D.  
*Chairman of the Executive Council*

The Progress of the Institute

DR. MILLIKAN

Benediction

(The audience will stand for the Academic Procession and the Invocation.)

(ALUMNI MOST CORDIALLY INVITED.)

### LABOR RELATIONS DEPARTMENT

Dr. Robert Millikan, chairman of the Institute Executive Council, on May 10th, announced the establishment of a labor relations department as a division of the department of humanities for the coming school year.

According to preliminary statements, two experts in labor relations will join the staff, one on the campus and one in the field, the men rotating assignments. Labor relations problems will be attacked by scientific methods, much needed information will be secured and disseminated.

— T —

### STOCK FELLOWSHIP

Dr. Chester Stock, professor of paleontology at the Institute, has been awarded a John Simon Guggenheim Memorial Fellowship, which carries a stipend of \$2,500. As a result of the award, Doctor Stock will search for undiscovered caves in northern Mexico in which remnants of human and animal life in early times may be found.

The fellowships are granted to scholars and artists who have shown unusual ability by prior work, a total of sixty-nine being awarded for the current year.

— T —

### ROUSE TO IOWA

Dr. Hunter Rouse, who has been assistant professor of fluid mechanics since 1936, has accepted a position as professor of hydraulics in the college of engineering of the University of Iowa for the coming school year.



# MANY TECH MEN EMPLOYED BY SOUTHERN CALIFORNIA GAS CO.

Twenty-seven Tech graduates have found their places in the business world among the many technical and semi-technical positions available in the Southern California Gas Company. Of these, fourteen are doing various types of work in the Sales Department where an engineering background is helpful if not essential to their duties.

Within this Department several of the executives can be listed as "Tech men." W. M. Jacobs, '28, heads the Sales Department as General Superintendent of Sales. Directing the sales policy for the entire territory served by the Company, from the San Joaquin Valley on the north, to Palm Springs on the south, he heads a department which employs nearly 300 people. The varied activities of this department include the direct sale, and sales promotion, of all domestic gas appliances, industrial and commercial sales, extension of gas mains, home economics work, and consultation service with architects, contractors and prospective home builders.

Edgar M. DeRemer, '25, is in charge of industrial gas sales. Because of the large pipeline capacity necessary to bring natural gas from the various oil fields to metropolitan areas during certain peak periods, it is possible to use this capacity to supply surplus gas for industrial purposes at low rates. DeRemer and the staff of industrial sales engineers sell this surplus natural gas to industries, helping them with design of boiler equipment, operation of plants, and many principles of heat application. Heat for a battery of kilns to bake brick and tile, or for a new process to heat treat small metal alloy pieces — all can use natural gas, and in many cases more economically and better with the properly designed gas equipment.

H. M. O'Haver, '29, Murray N. Schultz, '27, and Arthur F. Michael, '24, are each industrial sales engineers whose territory brings forth new heat requirements every day. Schultz works in the territory from Compton to the beaches, while O'Haver and Michael serve customers in the industrial section of Los Angeles.

Three of the six domestic sales supervisors, one of whom has charge of the sale of domestic appliances for each of the six operating divisions into which the Company's territory is divided, are Institute graduates. A. M. Cramer, '29, has charge of the appliance salesmen in the Los Angeles metropolitan area. Cramer, in addition to directing the salesmen's activity, supervises appliance displays and domestic sales clerical staff.

L. O. Scott, '29, is Domestic Sales Supervisor in charge of sales for the San Joaquin Valley area; while Frank M. Foster, '25, is Division Sales Supervisor in the Kern County Division of the lower San Joaquin Valley. Each of these men directs the sales activity of Gas Company personnel and co-operating gas appliance dealers in his respective district.

Other Cal-Tech men in the Sales Department include Robert Grossman, '33, who is Office Engineer for Jacobs, drawing up all manner of proposals and keeping various records and budgets related to sales activity.

Paul Hammond, '36, represents the many gas appliance dealers in the San Joaquin Valley, reporting to L. O. Scott. An extensive program is carried on with the dealers, educating them to make more and better appliance sales to earn more money for themselves and to add more satisfactory appliances to the gas lines.

Robert G. Smith, '31, is office engineer in the Domestic Sales Department at Los Angeles, keeping records, ordering appliance stocks, and analyzing sales policies and performances.

Harry L. Warren, '24, is research engineer in the Sales Department, coordinating sales activities, preparing analytical studies and doing certain staff work. In cooperation with men from other companies and government officials, he represents the Gas Company in preparing revisions of various ordinances relating to gas appliances and in raising the performance standards of gas equipment.

W. Wayne Wilson, '34, is commercial sales engineer for Glendale, Burbank, and the San Fernando Valley territory, making estimates of cost to install and operate heating plants. He also contacts restaurants, apartments and commercial establishments.

John L. Hall, '30, is in the commercial section of the Sales Department, supervising the promotional selling activities of the men in the hotel and restaurant cooking field. This department recommends proper type of equipment to obtain the most benefit from gas which is almost universally used for commercial cooking.

Besides sales engineers, the many technical problems in collecting gas from wells, preparing it for market, transmission and distribution, require the service of competent engineers. In the oil field territory around Taft we find John T. Cortelyou, '34, and M. Martin McMahan, '36. Their problems are chiefly those of checking large volume gas measurements, metering equipment and those encountered in collecting compression and transmission of natural gas to metropolitan markets.

John E. Michelmore, '26, is division engineer in charge of estimating and designing pipeline facilities in the San Fernando Valley territory from Glendale to Newhall. He also has charge of automotive equipment and is assistant to the general superintendent in that area.

In the civil engineering department at Los Angeles are James F. P. Thomson, '26, Claude T. Scott, '35, and Paul G. Parsons, '32. These junior engineers are doing a variety of work in designing pipelines, pressure regulators and other

equipment. With the installation and maintenance of many miles of pipeline, surveys and mapping work are essential. It is also necessary to secure rights-of-way and permits to lay lines in streets and other public property. These men are getting a taste of all this work rather than being confined to any one particular duty.

Similarly employed in the design engineering department is Robert T. Bard, '35. He is primarily engaged in making maps and studying the layout of pipeline systems in relation to the topography of the country they traverse.

Charles H. Wilcox, '15, is chief steam engineer. He superintends the operation of the boiler plant as steam is used continuously to operate huge gas compressors, and during the winter season steam must be kept available at all times for use in the generators to manufacture gas in case of shortage or damage to the huge transmission lines bringing gas from the oil fields.

Engaged in the research laboratory is Rudolph G. Holman, '34, where he is working on numerous technical problems. Proper pressures, specific gravity and specific heat are important items to be calibrated exactly in determining the characteristics of natural gas in its behavior in transmission and distribution systems.

In other departments are still other Tech men. In the land and tax department are Charles F. Humphrey, '26, who is franchise engineer, and Howard R. Preston, '23, office engineer. The work of these men relates to recording and valuation of Company property for franchise, rate making and taxation requirements.

In the general agents office, Austin Strong, '30, and George Pickett, '33, are office engineers. They are engaged in job classification and cost and time accounting of the many standardized procedures of employees in many different departments where such studies may develop better ways to do the job.

Twenty-seven Cal-Tech men in one organization bespeak the recognition by the Gas Company of the value of a technical training in college. Not only technicians, but other employees are better qualified to handle their jobs when their background has taught them to think and act logically. Opportunity with a gas utility is wide for engineers, as evidenced by the positions attained by the men mentioned above, and Southern California Gas Company will undoubtedly list even greater numbers of Cal-Tech graduates as time goes on.

— T —

## STUDY FOSSILS

Systematic study at the Institute of fossil fish of the Pacific Coast will be made possible by a grant of funds recently made by the Geographical Society of America. The work will be supervised by Dr. Chester Stock, professor of paleontology, and will use fossils already collected and awaiting study, in addition to securing further material.

## SEMINAR WEEK-END

FURTHER REPORTS ON MARCH PROCEEDINGS

### "Inflation on a Balanced Budget"

PROF. PHILIP S. FOGG

Reported by *Robert V. Carey*, '32

By means of a graphic analysis, Professor Fogg demonstrated the tremendous growth in Federal expenditures since the World War. Prior to the War, Federal expenditures amounted to between \$750,000,000 and \$800,000,000 per annum, financed largely by customs and liquor taxes.

The tremendous outlays necessitated by the War jumped expenditures to approximately 13 billion dollars in 1918 and 19 billion in 1919, necessitating the borrowing of 25 billion dollars. As a result of the War, Federal expenditures during the 'twenties assumed a new high level of between 3½ and 4 billion dollars a year.

The emergency spending undertaken by the Roosevelt administration as a means to combat the depression resulted in the borrowing of huge sums of money and a consequent rise in Federal expenditure to a new high level of 7 to 9 billion dollars a year.

Professor Fogg pointed out that this program would result in a permanent level of Federal expenditures of at least 7 billions dollars per annum below which expenses probably could not be reduced. The only method of balancing the budget would be to raise the income of the Federal government to a level commensurate with outlays. He further stated that an unbalanced budget cannot continue indefinitely without drastic price inflation. However, barring another war, Professor Fogg stated that, in his opinion, means would eventually be found to raise the Federal income.

## Aeronautics Seminar

Reported by *Harry H. Canterbury*, '06

Papers presented as follows:

1. Louis G. Dunn—on the design of rocket motors with respect to investigating their thermal efficiency. Object—obtaining scientific data at great heights, possibly 200,000 feet.
2. Frank J. Malina—on monocoque construction and analysis of stresses of the skin and strengthening members.
3. W. L. Howland—monocoque construction analysis. In small structures, factors are well known but large planes now being built require extensive research analysis.
4. Lt. Beardsley, U.S.N.—Studies on impact with relation to failure of landing gear. Repetitive impact testing machine now being designed. This is a vertical drop type machine.
5. Robert S. Schairer—profile and drag measurements. Lantern slides to illustrate the apparatus and curves obtained.

(Continued on page 11)

# ALUMNI YOU SHOULD KNOW

## BUSINESS EXECUTIVE

Herbert B. Holt, '15, is accomplishing a record of blue ribbons among Tech Alumni—one of the two first to receive degrees at the Institute in Civil Engineering and one of the two first of the Institute Associates among the Alumni. He started out as a true Civil—with the Santa Fe Railroad, originally in the Engineering Department, next in a field party and then as Engineer of Construction. This auspicious start was interrupted in May, 1917, when he became a Private in the 18th Engineers, and again changed direction in the fall of 1919 when he emerged from Overseas as First Lieutenant in the Chemical Warfare Service. The Santa Fe again claimed him as Engineer of Construction, following which he located a logging railroad in central California. In 1921 he became associated with Bekins Van & Storage Co. and shortly afterwards progressed to the managership of that company for Northern California. That status continued until early in 1935 when he became Southern California Manager. Bekins is a California Corporation which owns and operates 19 warehouses, 250 trucks and employs nearly 500 people. In Herb's record the Class of '15 has set up a mark for all other classes to shoot at.



*Herbert B. Holt*

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## CHEMIST

It is rare indeed that we find the enviable combination of physical and mental endowments which is "Alf" Stamm's. He is recalled as an above-average, energetic undergraduate student. It is no surprise that we now find Dr. Alfred J. Stamm a brilliant chemist with the U. S. Forest Products Laboratory. His position and success have apparently intensified his talent, vigor and enthusiasm.



*Alfred J. Stamm*

Dr. Stamm received his B.S. in Chemistry from the Institute in 1921. After one year with a local firm he accepted the position of Assistant in chemistry with the University of Wisconsin, combining studies and research toward his Ph.D. which was received in 1925. He then joined the staff of the Forest Products Laboratory, U. S. Department of Agriculture, which is located on the university campus in Madison, Wisconsin, maintained for the study of wood in all its phases.

As recipient of a National Research Council fellowship he worked in the University of Upsala, Sweden, for a year and while there represented the U. S. in the International Forestry Conservation Convention held in Stockholm.

Dr. Stamm is now Senior Chemist at the Laboratory and is the author of a large number of scientific papers. Tech can well be proud of his contributions to the commercial and scientific world.

## JUNE MEETING

*Annual Session Requires Your Attendance*

Your June meeting is planned to particularly welcome the new members to our ranks, start them off with a bang, and remind the rest of us of the time when we were taking the same step. We also have the opportunity to see our own classmates and find out where and how far they have gone—married—how bald—how grey—how heavy—how many children—and so on.

Distinguished guests of the Association will be the eleven Institute Trustees, the Deans, Department Heads and the Comptroller. The newly elected directors will be introduced and retiring directors take a bow with the thanks of the Association. Those retiring are H. C. Hill '11, Allin Catlin '21, Wesley Hertenstein '25, J. Edward Kinsey '26, and Lawrence Gould '33.

### CLASS REUNIONS

According to tradition, classes will sit as groups. Featured classes this year will be '34, '29, '24, etc., for five-year reunions — or would you call them multiquintennials? In any event, here is a get-together which you cannot afford to miss.

Light entertainment will be provided by Miss Markham's string trio during the dinner — and for dinner by the way, there will be a Surprise Menu.

You will be glad again to hear the silver oratory of Dr. Millikan, welcoming you back to the fold, if but for one night.

Principal speaker will be Dr. Henry Boorsook, Professor of Biochemistry at the Institute hence we are assured an interesting and instructive message. Professor Boorsook is a graduate of the University of Toronto and has received several advanced degrees from that institution. He has been a member of the California Institute staff since 1929.

### TINY BALLOON LABS

New experiments with a flying cosmic ray laboratory are under way at the Institute, according to H. Victor Neher, Ph.D., '31, who is associated with Doctor Millikan in cosmic ray studies.

The automatic radio stations used in sending upper air data from rubber balloons to the earth have been adapted to cosmic ray studies. Four balloons bearing tiny radio stations to which electroscopes are attached have already been released. A five dollar reward is paid for the return of the balloons, one of which reached an altitude of 70,000 feet and was recovered in the ocean five miles south of Long Beach. Partial records have been obtained from the flights. This development is still in the experimental stage, however.

### DANISH ROYALTY

Crown Prince Frederik and Princess Ingrid of Denmark and Iceland visited the Institute on April 6th. They were greeted by C. C. Lauritsen, Ph.D., '29, and were treated to a high voltage laboratory display, and visited the optical shop to view the polishing of the 200 inch telescope lens.

## ALUMNI FIELD DAY AND STAG DINNER

It was held at Altadena Country Club on May 6th, was a fine party and everyone said he had a good time. There were ninety who stayed for the dinner and entertainment.

The afternoon started propitiously when the early arrivals found there was a swimming pool, but no water in it. It was much too cold to swim anyway—seems there was a little difficulty with the Health Department as to circulating and chlorinating systems which appeared as a minus quantity. Other sports fared better—golf had thirty-seven devotees out, and the blind bogey prizes were won by Al Kensey '17, Doug Stromsoe '23, and Don Warren '38. Softball was enthusiastically enjoyed by the thirsty who stayed with it almost all afternoon. If there were performers who particularly distinguished themselves, their laurels were not posted so high as to obtain recognition. Tennis was indulged in by a few of its constant adherents, and horseshoes came in for its share of participants.

Dinner was enlivened during and after by ad libs from President Kinsey who also awarded the golf prizes, and a demonstration in pulchritude was presided over by Chairman Shield. Technical proficiency as to timing at least was aptly attained by Bentley Copeland ex'24, who, we trust, made a lasting record of the performance. The assemblage then adjourned to the locker rooms, and various kinds, degrees, and intensities of card games were indulged in until—well, next day was Sunday, anyhow.

### — T — IN MEMORIAM WADSWORTH

Hiram W. Wadsworth, senior member of the Board of Trustees of the California Institute of Technology, passed away on April 12, 1939, at the age of 76, in Pasadena.

Mr. Wadsworth was a man with a high sense of civic responsibility having served as chairman of the board of directors of the City of Pasadena, president of the Colorado River Aqueduct Association from 1924 to 1929, until the Metropolitan Water District of Southern California was assured, and member of the City Planning Commission of Pasadena from 1924 to 1927.

Mr. Wadsworth had been a member of the Board of Trustees for many years. He was very active in the period of the Institute's greatest growth from a single building to the campus of today.

### REED

Jack Switzer, x'26, of La Junta, Colorado, died on April 22, 1939, at Pueblo, Colorado, after an illness of several months duration. He is survived by his widow and two sons.

At the time of his death he was assistant treasurer of the La Junta Finance and Investment Company and had previously been employed by the Pacific Finance Company.

## SEMINARS

(Continued from page 8)

Problems of turbulence of the boundary layer, intimately connected with problems of drag.

6. Irving L. Ashkenas—the problem of removal of the boundary layer from upper surface of wing, by suction, to increase lift coefficient.

7. Peter V. Serrell—a new design for mounting models in wind tunnel study, to give direct readings on all the forces.

Remarks by Dr. Arthur L. Klein—that the primary requirement of design is the lightest weight for the required strength. Discussion was conducted by Dr. Klein.

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### *Civil Engineering Seminar*

Reported by *William W. Aultman, '27*

In the Civil Engineering Seminar three papers were presented on recent research and developments in that field. Professor Franklin Thomas discussed the chemistry of water softening, the relative hardness of Southern California water supplies to other supplies in the United States, and then briefly described the plans of the Metropolitan Water District (of which Professor Thomas is Pasadena representative and vice chairman of the Board) for softening Colorado River water.

Professor Fred J. Converse next described and illustrated with slides, loading tests which were made on a full scale model of a Lamella roof. These tests were under the supervision of Professor Converse and Dr. von Karman and were made by Ed Seaver, '21 and Ben Benioff, '22 and five other Tech men.

The last talk was by Dr. Robert Knapp who presented and described two very interesting motion pictures; one on the wave action of high velocity fluid flows in flumes; and the other reporting model tests on density current studies of suspended material in stratified flow.

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### *Physics Seminar*

Reported by *Fred J. Ewing, '27*

The physics seminar was led by Professor E. C. Watson.

Professor I. S. Bowen discussed his new "image slicer." Hitherto in stellar spectroscopy only 2 to 10% of the light focused by a telescope has been available for spectra because the diameter of the star image greatly exceeds the permissible width of the spectroscopy slit. Professor Bowen reflects the circular image along a path, parallel to the slit face and converging over the slit, and then reflects successive strips of the image into the slit by means of a number of very small mirrors. By means of his device a five-fold increase in speed can be obtained.

Professor A. Goetz discussed his recent work on biological effects at low temperatures. By very rapid cooling, yeast cells may be brought to liquid air temperature without killing

them. By studying the mortality rate for various speeds of cooling, a constant indicative of vitality can be obtained.

Professor John Strong discussed his new radiation pyrometer. By multiple reflection from quartz crystals a narrow band may be isolated, having a wave length in the far infrared, for which black bodies as "incandescent" at atmospheric or subatmospheric temperatures.

Professor W. V. Houston discussed various methods for electromagnetically and electrostatically focussing electron beams. Their application to microscopy was illustrated by showing several pictures taken with an electron-microscope.

Professor W. R. Smythe discussed his recent work on isotopes which served to identify a new isotope as the source of potassium radioactivity.

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### *"Human Engineering"*

In introducing his subject of psychology as applied to studies of intelligence, aptitude and personality, Professor Robert T. Ross described the means whereby valid tests and groupings of individuals are devised and evolved. He pointed out the merits and possibilities of such work and reported indicative and significant current progress. In the field of personality studies, one of the most difficult of psychological investigations, it is believed that meritorious accomplishments can be made in human engineering.

Dr. Ross, '27, followed his undergraduate studies of physics and mathematics with work at Pomona College, U.S.C. and Yale University in education, psychology and medicine, and is now a popular professor of psychology in Stanford University—combined with lectures at the Institute, special research at Pasadena Community Theatre, and clinical studies.

— T —

### *Other Seminars*

Among the most interesting of the seminar sessions, the following are grouped in brief solely because, somehow, our reportorial aspirations failed to materialize. These are:

Mechanical Engineering Seminar. Discussion of work in the hydraulic machinery laboratory and the development and tests of models for Grand Coulee pumps, by Prof. Daugherty. A discussion of the effects of speed of loading upon strength of materials, by Prof. Donald S. Clark.

Humanities Seminar, introduced by Prof. Clinton K. Judy. A discussion of contemporary American literature was provided by Prof. MacMinn and mimeographed lists of recommended reading were distributed. Mr. A. B. Young, lecturer and chairman of the State Relief Administration, spoke on relief and welfare.

The Sunday morning program was opened by Theodore G. Soares, professor of Ethics, who conducted a highly interesting chapel session.

"Recent Developments in Television," by Prof. Stuart Mackeown, involved a discussion of commercial and technical aspects of new television developments.

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## RECENT BOOKS

(An abridgement of the list of "Recommended Reading" offered to members of the Alumni Association at the Humanities Seminar held in March, 1939.)

### Novels

- Dorothy Baker, *Young Man with a Horn*.  
Taylor Caldwell, *Dynasty of Death*.  
John Dos Passos, *U.S.A.*  
James T. Farrell, *No Star Is Lost*.  
William Faulkner, *The Wild Palms*.  
Ernest Hemingway, *To Have and Have Not*.  
Sinclair Lewis, *The Prodigal Parents*.  
Marjorie Kinnan Rawlings, *The Yearling*.  
John Steinbeck, *The Grapes of Wrath*.  
George R. Stewart, *East of the Giants*.  
Elizabeth Bowen, *The Death of the Heart*.  
Aldous Huxley, *Eyeless in Gaza*.  
Virginia Woolf, *The Years*.  
Andre Malraux, *Man's Hope*.  
Thomas Mann, *Joseph and His Brothers*, *Young Joseph*,  
*Joseph in Egypt*.  
Eric M. Remarque, *Three Comrades*.  
Jules Romains, *Men of Good Will*.  
Gladkov, *Cement*.  
Pilniak, *The Volga Falls to the Caspian Sea*.  
Romanoff, *Three Pairs of Silk Stockings*.

### Short Stories

- Ernest Hemingway, *The Fifth Column* (a play) and  
*the First Forty-Nine Stories*.  
John Steinbeck, *The Long Valley*.

### Biography and Autobiography

- Richard E. Byrd, *Alone*.  
Eve Curie, *Madame Curie*.  
Marquis James, *Life of Andrew Jackson*.  
Somerset Maugham, *The Summing Up*.  
Antonina Vallentin, *Leonardo da Vinci: The Tragic Pursuit of Perfection*.  
Carl Van Doren, *Benjamin Franklin*.

### Plays

- Rachel Crothers, *Susan and God*.  
Clifford Odets, *Rocket to the Moon*.  
Robert E. Sherwood, *Abe Lincoln in Illinois*.  
Thornton Wilder, *Our Town*.

### Poetry

- T. S. Eliot, *Collected Poems*.  
Robert Frost, *Collected Poems*.

### Philosophy

- University of California Associates, *Knowledge and Society*.  
Alfred N. Whitehead, *Modes of Thought*.

### Psychology

- L. W. Crafts and others, *Recent Experiments in Psychology*.

Sigmund Freud, *The Basic Works of Sigmund Freud*.  
(Translated by A. A. Brill. Modern Library.)

N. L. Munn, *Psychological Development*.

Mandel Sherman, *Mental Conflicts and Personality*.

L. M. Terman, *Psychological Factors in Marital Happiness*.

### Religion

Theodore G. Soares, *Three Typical Beliefs*.

### General

Eric T. Bell, *Man and His Lifebelts*.

Ralph Adams Cram, *The End of Democracy*.

Philip Guedalla, *The Hundred Years*.

Aldous Huxley, *Ends and Means*.

Oscar Lewis, *The Big Four* (Huntington, Stanford, Crocker, Hopkins).

Lin Yutang, *The Importance of Living*.

Anne Morrow Lindbergh, *Listen! The Wind*.

John Muir (Linnie M. Wolfe, ed.), *John of the Mountains*.

Lewis Mumford, *The Culture of Cities*.

Harold E. Stearns, *America Now. An Inquiry into Civilization in the United States by Thirty-Six Americans*.

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## NEW RAILROAD CAR

(Continued from page 4)

to compare the new equipment with coaches of standard type known to have good riding qualities. These comparisons include operation over fair track at speeds up to 80 miles an hour and on good track up to 94 miles an hour and demonstrate clearly the advantage of the new suspension system. However, no careful instrument measurements are necessary to demonstrate the important points which have been established and which contribute in no small way to passenger comfort. In these new cars, standing and walking about is accomplished with greater ease and with feeling of greater stability than in a standard six wheel truck club car, weighing six times as much as one of the new cars, which is a part of the test train. In fact, walking from one car to the other gives a comparison definitely favorable to the new equipment. Then, as the second outstanding difference, writing at a table in the new car is distinctly easier and the result more legible than that done in the standard car. The improvement is due primarily to the absence of harsh lateral acceleration so characteristic of standard equipment at high speed on indifferent track. Indeed, even in the tail of the new rear car, with its large overhang, objectionable lateral motion, or whipping is not experienced. And finally, a less spectacular but definitely welcome improvement offered by the new cars is the freedom from high frequency vibration or "jitter" so characteristic of high speed trains. Those annoying small vibrations which make reading difficult are not present with the new suspension system, a result which is another important element added to passenger comfort.

# NEWS OF CLASSES

Conducted by George Langsner, '31

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

**Frank B. Jewett**, president of the Bell Telephone Laboratories and member of the Advisory Council of the Institute, has been awarded the John Fritz Medal for notable scientific and industrial achievement. The Award is made by a special board composed of representatives of the four national engineering societies. Doctor Jewett was recently elected to the presidency of the National Academy of Sciences.

## 1902

**James M. Gaylord**, chief electrical engineer for the Metropolitan Water District of Southern California, has been elected vice-chairman of the Los Angeles section of the American Institute of Electrical Engineers.

## 1910

**Richard Bard**, Throop '10, was one of the leaders in the promotion of a harbor at Hueneme, Calif., and donated the site on which construction estimated to cost \$3,000,000 is now under way to provide Ventura County with a landlocked harbor.

## 1920

**Mark A. Sawyer**, who is with the Southern California Telephone Company, will be chairman of the Los Angeles section of the American Institute of Electrical Engineers for the coming year.

## 1921

**Louis Korn** was an unsuccessful candidate for member of the Los Angeles Board of Education at the recent municipal election.

**Harold Fletcher**, x21, was office engineer for the J. E. Haddock Co., Ltd., of Pasadena, on a recently completed paving contract for a U. S. Army airfield near Honolulu.

**Alfred Stamm**, who is senior chemist at the U. S. Forest Products Laboratory at Madison, Wisconsin, spoke at the April meeting of the American Chemical Society in Los Angeles.

## 1922

**Louis H. Erb**, formerly with the Pacific Telephone and Telegraph Company, is now Deputy Registrar of Contractors for the State of California with offices in San Francisco.

**Hallan N. Marsh**, who is production engineer for the General Petroleum Corporation, addressed the Mechanical Engineering Seminar at the Institute on April 26th on "Mechanical Engineering Problems in Petroleum Production."

**Blake Beatty** has been honored by being appointed Foreman of the 1939 Federal Grand Jury for Los Angeles.

## 1923

**Loren E. Blakeley** is the engineer for the Santa Ana Valley Irrigation Company of Orange, Calif., which supplies irrigation water to 17,000 acres of citrus land.

**Dick Seares** has recently developed a novel advertising structure for Signal Gas and Oil Co. The original installation is attracting observers at 7th and Carondolet in Los Angeles.

## 1924

**Robert S. Ridgway**, of the Standard Oil Company of California, addressed the Mechanical Engineering Seminar at the Institute on April 5th on "Operating Problems of Natural Gas Engines."

**James Mercereau** is in the Transformer Engineering Department of the Westinghouse Electric and Manufacturing Company at Sharon, Penna.

## 1926

**Alexander Kroneberg**, who is an electrical engineer for the Southern California Edison Company, addressed the April meeting of the Los Angeles chapter of the American Institute of Electrical Engineers on "Practical Aspects of Voltage Regulation."

**Vito Vanoni**, who is with the U. S. Soil Conservation Service, addressed the Los Angeles Section of the American Society of Civil Engineers at its May meeting held at the Institute.

**Arthur C. Werden, Jr.**, of Southern California Edison Co. fame is living with his family in Boulder City, Nevada.

## 1927

**Willard H. Francis**, x27, who is practicing architecture at Ojai, California, was the architect on a Carpinteria residence described in the March, 1939, issue of the Architectural Forum.

**Carl D. Anderson** delivered the Sigma Xi lecture at Louisiana State University last March in which he discussed the possibilities of future cosmic ray research.

**John D. Shuster** is electrical adviser for the Bethlehem Shipbuilding Corp. on the purchase of equipment for the merchant and naval vessels now being built by the corporation.

**Clarence L. Haserot** is in Seattle opening a new plant for the Pennant Oil and Grease Company.

**James Boyd**, who is assistant professor of geology at the Colorado School of Mines, has recently been appointed a member of the Oceanography committee of the American Geophysical Union and promoted to the rank of captain in the 328th Engineer Reserve. In addition to his faculty duties, he is a consulting mining engineer and geologist for various mining operations in the Rocky Mountain states.

## 1928

**Carl Renz**, M.S., is now with the U. S. Engineer's office at Cincinnati, Ohio.

**A. Perry Banta**, M.S., who is assistant engineer for the Los Angeles County Sanitation Districts, has been appointed assistant professor of sanitary engineering at the Institute, and will continue his work with the County.

**Gunner Gramatky**, of the Los Angeles Paving Company, is in charge of the grading and paving of the site for Wyvernwood in Los Angeles, which is the nation's largest privately financed rental housing project, consisting of 143 buildings with 1103 apartments and flats.

**Frederick C. Lindvall**, Ph.D., was recently elected secretary-treasurer of the Los Angeles section of the American Institute of Electrical Engineers.

**Alex Clark**, M.S., '32, is acting as chief geologist for the Shell Oil Company, Inc., during the absence of Dr. Frank S. Hudson, chief geologist. Alex has given up his home in Bakersfield to take up residence in Los Angeles where he will make his headquarters.

**Hampton Smith**, Ph.D., '34, has been promoted from the position of district geologist with the Texas Company, to assistant chief geologist. Hamp continues to make his headquarters in Los Angeles with Mrs. Smith and their child.

**Ed Joujon-Roche**, geologist with the Shell Oil Company, Inc., has been transferred from the Bakersfield Division to Ventura.

## 1929

**Alphonse Cramer** is the very proud father of a daughter, Susan Carole, born on April 1, 1939, at Los Angeles.

**Beverly Fredendall**, who is with the National Broadcasting Company at New York, has been transferred from broadcasting engineering design to work on the public television broadcasts which started with the opening of the New York World's Fair on April 30th.

**John Daly**, M.S., '31, wishes to point out an error in a recent number of the Review. Daly says that he is no longer a draughtsman with the Shell Oil Company, but has been a seismologist for the past three years.

**George Schild Lufkin** was married to Miss Audrey Jordan on April 14. The ceremony took place in Madison Avenue Presbyterian Church, New York City.

## 1930

**Ralph McLean** is now a structural engineer for the firm of Holmes and Narver of Los Angeles.

**Fred Groch** is now employed by the Imperial Irrigation District.

**L. Sprague de Camp** is the co-author of a book, "Inventions and Their Management," published by the International Textbook Company of Scranton, Penna.

**Edmund G. Grant** is to be married to Miss Myrtle Elaine Kendall of Pasadena, on July 7th.

**Ernest Levine** is vice president and **Philip Cravitz**, '29, is engineer of the Contracting Engineers Company of Los Angeles which is building a 432 foot concrete bridge to carry the Arroyo Seco Parkway across the Arroyo Seco channel near South Pasadena.



Robert C. Ramey, x30, is to be married to Miss Muriel Rolls in San Francisco on June 3rd.

### 1931

Byron Johnson is now a contractor in San Bernardino, Calif.

Howard Smits is the proud father of a daughter, Gretchen, born on March 17th in Los Angeles.

William D. Hacker has just completed a trip through the West Indies and Central America, including Cuba, Porto Rico, Haiti, Dominican Republic and Mexico.

### 1932

E. C. Haynes, of the Meteorology Department of the Boeing School of Aeronautics, Oakland, Calif, recently addressed the Sacramento Section of the American Society of Civil Engineers.

William Shuler, who is a lieutenant in the Corps of Engineers, U.S.A., is now on leave of absence doing graduate work in civil engineering at the University of California.

Al Atwood has been playing an important role recently in the testing and breaking-in of Metropolitan Water District pumps along the aqueduct.

### 1933

Willis P. Popenoe, M.S., will carry on a systematic search for petroleum in the Philippine Islands for the Filipino government this summer, having gone to the Islands by the Philippine Clipper.

Robert L. Smallman, who is an amateur photographer, won a \$200 prize in the Johnson Baby Powder contest with a picture of his twins, which is appearing in the June issue of the women's magazines.

Ray Cripps is the proud father of a son, Dale Edward, born on March 20, 1939, at Los Angeles.

Grover Secord is now a time study engineer for Andrew Jurgens in Hollywood.

Alvin Smith is now employed as an engineer by the Monolith Portland Cement Company at Monolith, Calif.

Thomas S. Terrill has resigned as co-pilot for Pan-American Airways to accept a position as co-pilot navigator for American Export Airlines, which expects to make survey flights between New York and Mediterranean ports early this summer. An unusual feature of the proposed route is that planes will be in constant contact with steamships of the affiliated American Export Lines.

### 1934

W. D. Chawner, M.S., who is chief geologist at Papua for Australian Explorations, Ltd., a subsidiary of the Anglo-Iranian and Socony-Vacuum Companies, was a recent visitor to the Institute.

Horace W. Babcock, who is on the staff of the Lick Observatory of the University of California, read a paper at the recent meeting of the American Philosophical Society in Philadelphia on the measurements of the rotation of the great spiral nebula in the constellation Andromeda.

### 1935

C. F. Thomas is leaving for Europe immediately. He will represent Lockheed Aircraft there for one year, touring all Europe, with headquarters in Amsterdam, Holland.

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Howard P. Gluckman is the proud father of a daughter, Sharon Esther, born on April 16, 1939, at Los Angeles.

Robert Dourson, formerly a chemical engineer for the Union Oil Company, is now assisting Albert Tyler, Ph.D., '29, in biological research at the Institute.

Lawrence Baldwin has opened a dry cleaning establishment in Los Angeles.

Lewis Browder is now employed as a physicist by the Walt Disney Studios.

Charles A. Dawson is a geologist for the Superior Oil Company with headquarters at Bakersfield, Calif.

Leonard Patterson, formerly with the Nevada-California Electric Corporation, is now with the California Railroad Commission at San Francisco.

Gale M. Smith is radio engineer for Pan-American Airways at Miami, Florida.

Victor W. Willits, Jr., is the father of a bouncing baby girl, Aseneth Louise, born on April 21, 1939, at Long Beach, Calif.

Nelson P. Nies has been honored by election to Sigma Xi at Western Reserve University.

### 1936

Robert Gelder is now with the General Petroleum Corporation at Los Angeles.

Martin McMahon was married to Miss Alberta Sanders in Glendale last March and they are now at home in Taft, Calif.

Frank Davis has been commissioned a lieutenant in the U. S. Marine Corps and is now stationed at Quantico, Virginia.

Dick H. Wallman, M.S., is now a meteorologist for the Atlantic division of the Pan-American Airways and is working on forecasts for the proposed transatlantic route and expects to be transferred to Europe.

### 1937

Edward Price has accepted a position as physicist with the Martin-Deker Corporation of Long Beach, Calif.

James W. Daily, M.S., addressed the June meeting of the Los Angeles section of the American Society of Civil Engineers.

Robert Mahoney, with his wife, announces the birth of a son, Robert Vignes, on May second. Bob was student body president during his senior year.

(Continued on page 16)

## NEWS OF CLASSES

(Continued from page 15)

1938

**John Minasian** is now an office assistant for the William Neil Company of Los Angeles.

**Albert E. Jurs** is now employed by the Yale Townsend Corporation of New York

**Robert Custer** is a chemist at the General Petroleum Corporation's Laboratory at Santa Fe Springs, California.

**Peter Goff** is now employed by the Board of Fire Underwriters with headquarters in Los Angeles.

**Jack Johannessen** is now employed by the Imperial Irrigation District.

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## LETTERS

The following is an excerpt from a letter to Charles Schwieso, former Y.M.C.A. secretary at the Institute.

Hong Kong, China  
March 16, 1939

Dear Chuck,

It happened that when your letter reached Canton, the latter had fallen into the hands of the Japanese. However, the letter was forwarded to the Pui Too Girls' School, which is an American owned academy in which there are some missionaries staying to watch over the property.

I was engaged in governmental railroad work the last two years until last July when I came down to Hong Kong to join my family. Since then I've been teaching in the Engineering College of Kuomin University which had also moved from Canton to Hong Kong last September.

Just two weeks ago I was called again to go into the interior to work in Yunnanfu—the southwest border province of China. I am to join the staff members of the Yunnan-Szechuan Railroad, a line of about 800 kilometers. It will be the main road connecting these two big provinces.

I shall leave Hong Kong on March 19. Owing to the fact that living conditions in Yunnanfu are unfamiliar I shall leave the family in Hong Kong for the time being. I know it is hard to leave them, but conditions are so in China in this time of our struggle. I hope that they will be able to join me in the summer.

We have our confidence to win the battle if we will stick it out hard enough with the Japs.

I'm sure you will remember Drs. Woo (Ph.D., '31) and Liu who were with me in Pasadena. Both of them are staying in Yunnan now. I will look them up when I get there and say hello to them for you.

Yours sincerely,

DAVID WONG, '32.

## OMSTED WRITES

Telling of boom conditions in Norway, as well as of much improved outlook for technicians, Harold Olmsted, M.S., '33, writes interestingly to Prof. H. R. Martel of the Institute civil engineering staff.

When he left Pasadena two years ago, after receiving his master's degree, Mr. Omsted expected to spend a vacation of several week in Norway and then return to the United States. He had worked in east and in the neighborhood of Los Angeles for 18 years before being able to afford his graduate tuition as a civil engineer.

### Finds Job Position

However, he writes, he landed a position with one of Norway's prominent consulting engineers, A. L. Hoyer, who is a son-in-law of the famous Dr. Fridtjof Nansen. When he was previously at home in 1930, he had tried unsuccessfully for six months to obtain work.

"The country in general, and Oslo in particular, has witnessed a building boom the like of which it was never my fortune to experience in the United States. It has encompassed all kinds of building as well as highway construction."

The young Norwegian-American engineer criticises much of the new construction he has seen as being "arty" rather than sound basically in engineering. Concrete work is not up to best American standards, he finds.

In a brief reference to the political situation, he says:

"We in the quiet corner of Europe 'view with alarm,' to say the least, the present trend toward barbarism in certain European countries. . . . In recent Swedish papers, Norway has been severely criticised for not arming enough!

### Aware of Danger

"But with gangsters for neighbors we are forced to make a few precautions. Voluntary groups of citizens are drilled for various duties during air attacks. All inhabitants of the larger cities are registered with the bureau for evacuation in case of raids. . . . In short we are constantly being reminded of the situation.

"I am thankful to be an American citizen, and to be able to return if need be to the safety of the United States, behind the world's strongest army and navy. And this is an old-time pacifist speaking!"

— T —

## LINDBERGH

Col. Charles A. Lindbergh, while on his recent tour of active duty in which he was engaged in investigating aeronautical research and production facilities for the Chief of the U. S. Army Air Corps, visited the campus on the afternoon of May 9.

A conference was held in the Guggenheim laboratory in which aeronautics research and problems were discussed. After the conference, Colonel Lindbergh viewed the polishing of the 200 inch mirror for the Palomar Mountain Observatory.

— T —

## PITTSBURGH GROUP ACTIVE

The frequent visits of Tech men provide Pittsburgh Alumni with a close personal touch with the Institute—particularly because they, whenever possible, seize these occasion for get-togethers. Professor Sorensen was feted in January and Professor Maxstadt, Ph.D. '31, was the honored guest in February.

Late in March the presence of Professor Frederick C. Lindvall, Ph.D. '28, was made the occasion for a dinner party. Those in attendance were: Mr. and Mrs. T. E. Brown '36, Mr. and Mrs. Jesse Hobson '35, Mr. and Mrs. A. E. Schuler '26, Mr. P. H. Wyckoff, M.S. '37, Mr. W. E. Stephens, and Professor Lindvall.

— T —

## NEBULAE CONTAIN METALS

The existence of the heavier metallic elements in planetary nebulae has recently been definitely established by Dr. Ira S. Bowen, Ph.D. '26, professor of physics, Lick observatory. This discovery announced in collaboration with Dr. Wyse, at the ed at the recent meeting of the National Academy of Science in Washing promises to be of considerable astronomical importance.

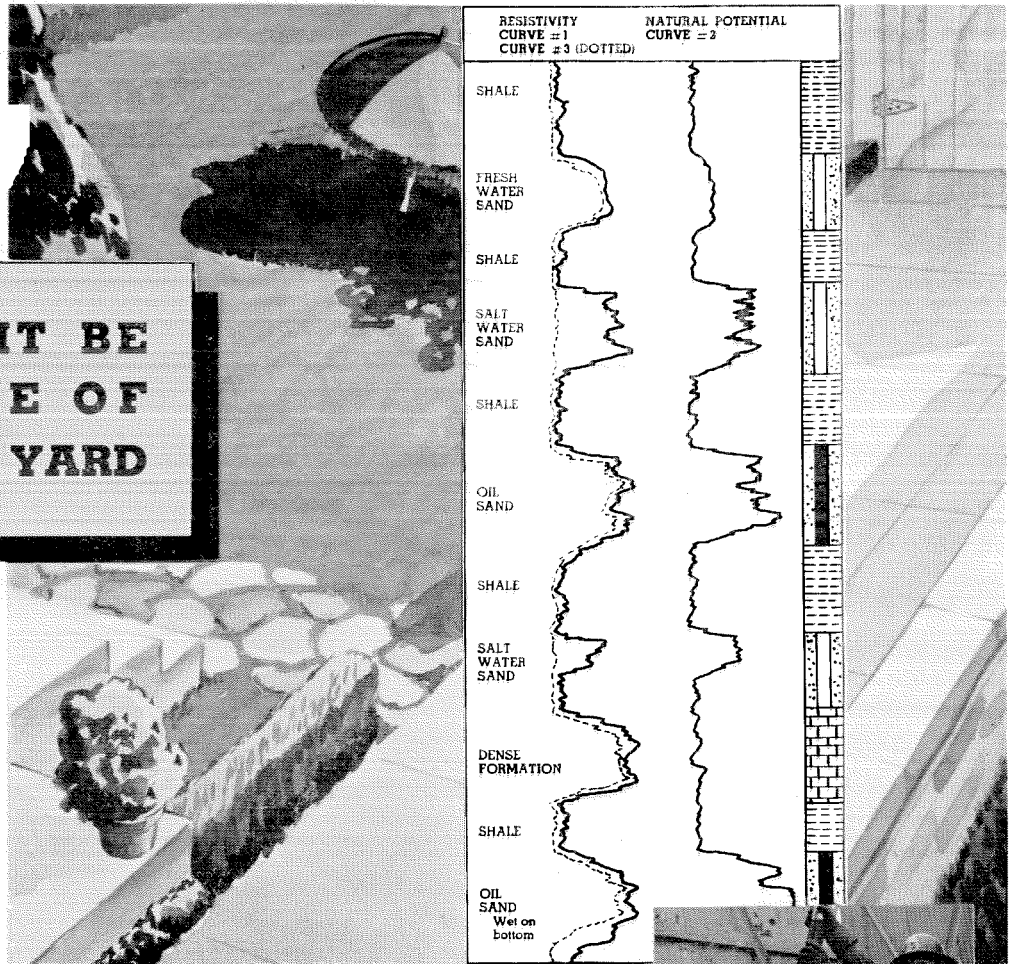
There is now reason to believe that the heavier elements exist in planetary nebulae in about the same proportions that they exist in the sun.

— T —

## CORRECTION

The Alumni Review wishes to make a correction in the biography of the late Dr. Calvin Bridges who spent his summers at the Carnegie Genetics Laboratory at Cold Springs Harbor, Long Island, N. Y., rather than at the Woods Hole Laboratory as stated in the March issue of the Review.

**THIS MIGHT BE  
A PICTURE OF  
YOUR BACK YARD**

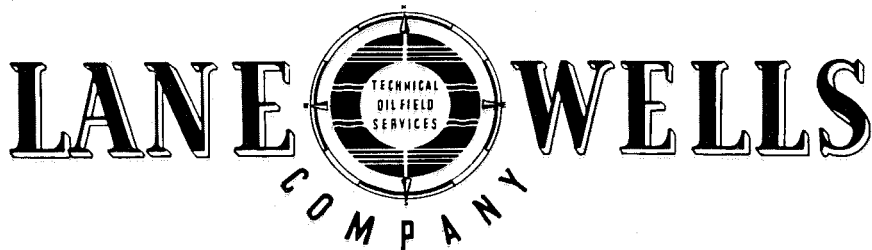


**Y**OUR own back yard might look like this—to a petroleum engineer. It's true the picture isn't beautiful, but it is an accurate chart of sub-surface formations.

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