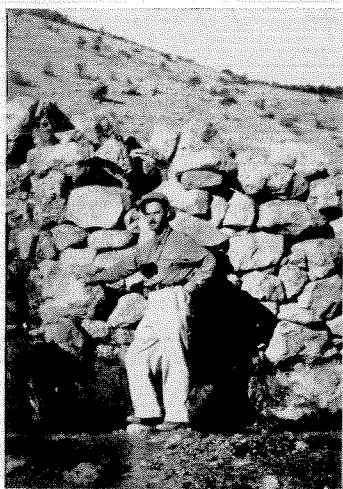


of the trip. One or two other narrow escapes occurred when boats were thrown upon rocks in rapids. It could be easily seen that large flat boats with about a ton of weight apiece were much more difficult to handle in water flowing at six feet per second than a canoe on a quiet lake. At Separation Rapids, where three of Powell's men left his expedition to be subsequently murdered by Indians on the plateau, some understanding was gained for the fears and suspense prevailing during the first expedition when it seemed that the river was one continuous series of rapids and when there was no assurance that the next rapids might not be very much worse than any encountered theretofore.

After successfully running dangerous Spencer Creek Rapids which is now the last in the river, although it too will ultimately be covered by the rising water of Lake Mead, a certain amount of relief was felt by all members of the party and especially by chief boatman Dodge, whose responsibility it was to complete the navigation without mishap. It was, however, a letdown inasmuch as rowing the heavy boats through quiet water became somewhat monotonous. About sixteen miles from Pierce's Ferry, the motor boat belonging to the Grand Canyon Airlines gave the Institute group a tow, and on the evening of Thanksgiving Day the long river trip was officially terminated. The trip had been altogether pleasant and enjoyable, and the entire group immediately began to consider the pros and cons of again going down the Colorado River at another season.

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*A snapshot of Dr. John H. Maxson, author of the preceding article, taken last summer at a spring near Hermis, S. E. Turkey, when he was employed as a petroleum geologist by the government of Turkey.*

## CALTECH GEOLOGISTS ABROAD

Former students of the California Institute have in the past five years travelled over much of the world. Geology is a science which has world wide applications, and searches for petroleum and ores which have been in progress have required the services of numerous Caltech men.

Willard A. Findlay, '29, left the Institute three years ago to work for Oil Search, Limited, in Australia. After spending an interesting year and a half studying the strata of this continent he was transferred to Portuguese East Africa and worked there for a considerable time. Subsequently he went to South Africa to continue the exploration for oil. He is now in London and expects to return for further work at the Institute the first of March, after having visited many countries and encircled the globe.

J. Clark Sutherland, '29, during a part of 1936, carried on mining investigations in Alaska, where he met many adventures including burial under an avalanche.

Francis D. Bode, '30, has spent the last year doing petroleum explorations in Italy and various Italian territories.

Burt Beverly, '26, is engaged in Standard Oil Company work out of Batavia, Sumatra. Ygnacio Bonillas, '33, for the past two years has been working for the Standard Oil Company in various parts of Mexico. Bernard Moore, '27, is going to Venezuela for petroleum work with Sinclair Oil. Willis P. Popenoe, Curator of Invertebrate Paleontology, has just returned from a five months petroleum investigation in the Philippine Islands. Nelson Harshman, '32, is now actively engaged in working for a mining corporation in the Philippines and has offices in Manila.

John Maxson, '27, spent 1936 and part of 1937 as petroleum geologist for the government of Turkey and made various explorations in Asia Minor. He subsequently attended the 17th International Geological Congress in Moscow and crossed through Siberia with the Siberian Excursion to Vladivostok. He returned via Japan and the Hawaiian Islands to Pasadena, where he has resumed his position on the staff of the Geological Sciences.

The great importance of petroleum and mineral resources in our modern civilization, together with the diminishing supplies, have brought about a great deal of exploration activity not only in the United States but also in the great undeveloped areas of the world. Many requests for Caltech geologists to enter foreign service are coming in to the Division of the Geological Sciences, and according to the best information available all men who have graduated in this department are employed.

## LINDVALL DESIGNS A NEW TRAIN

Professor F. C. Lindvall of the Electrical Engineering Dept. is one of a group working under Cortlandt T. Hill, a grandson of the late James J. Hill the "Empire Builder," in the design of a new type of train with better riding qualities at high speeds, and capable of more economical operation than the present passenger trains. According to Lindvall, a marked degree of success is being obtained. A full scale model of two units of these "Hill" trains have been subjected to running tests on Santa Fe lines around Southern California. In recent trials, at speeds up to 94 miles an hour, a remarkably smooth ride, with absence of shocks and jars at crossings and switches, was obtained. The faster the train operates, the smoother the ride seems to become.

The outstanding features of the new train, as described by Dr. Lindvall, are as follows: The springing has been re-designed so that the springs support the car above its center of gravity. This has the interesting effect that the car banks itself the correct way in going around a curve. Furthermore, the springing is made much lighter than in the conventional railroad car. The body of the car is built so that the "skin" of the car itself shares the stresses, leading to a light and very strong construction of the type used in airplanes.

Trials of the new train are being continued so as to include a wide variety of track conditions. One of the most important advantages expected of the new train is that it will bring great improvement in riding comfort on present track-age.



## NOTED SCHOLARS VISIT CALTECH

This year a number of outstanding scholars have been visiting and lecturing at the Institute. Professor Allan Nevins of Columbia served as visiting professor of American History during the earlier part of the current academic year.

For the past two months Philip Guedella, well-known English historian and publicist has been drawing an exceptionally large audience to his lectures on the Methods of Biography, which are given at the Athenaeum. Mr. Guedella is probably the most outstanding living biographer in England having published quite a number of books during the past dozen years. Among his best known works are: "The Duke of Wellington," "Queen Victoria and Mr. Gladstone," "Life of Lord Palmerston," and his most recent volume which is entitled "The Hundred Years."

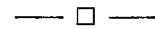
The income from an endowment fund that was given anonymously to the Institute for the promotion of work in the humanities, about a year ago, is being used to bring these, and in the future many another famed scholar, to lecture and teach at Caltech.

## R. W. PALMER HEADS VULTEE CO.

Richard W. Palmer, '25, who has been assistant chief engineer of the Vultee Aircraft Company since its organization in 1931, has just been appointed chief engineer, to succeed the late G. F. Vultee. Palmer has been associated with Vultee in the design of many successful military and transport planes. In particular they have designed a single engined long range bombing plane, which is said to be the equal of the best twin engined bombers. Two years ago Palmer became temporarily associated with Howard Hughes in order to design a high speed land plane for him. This plane, with Hughes at the controls, was able to break the record for the flight from Los Angeles to New York. His time was just under seven and a half hours, giving an average speed of 332 miles per hour.

Although Palmer took his B.S. at Tech, he went back to the University of Minnesota for his graduate work. At that time, of course, the Guggenheim aeronautical laboratory was not yet built and Tech could not offer any graduate aeronautics.

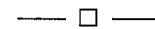
Gerald F. Vultee, the founder of the Vultee Co., attended Tech, himself, for one year. He and his wife were killed last January in an airplane crash in Arizona.



## NAVY ASKS VON KARMAN TO DRAFT PLAN FOR NEW DIRIGIBLE

Dr. Theodor von Karman of Caltech and Dr. William F. Durand of Stanford have been instructed by the United States Navy Department to prepare new specifications for airships. The two scientists will make calculations designed to avoid structural breakdown in lighter-than-air craft. The new airship specifications are due to be presented at a conference in April.

Investigations at the Guggenheim Airship Laboratory at Akron for the navy have developed such important results in connection with the question of airships in gusts of wind that Dr. von Karman recommended that the navy continue the research.



## SLIDE RULE MISSING SIXTEEN YEARS RETURNED

If you have ever lost anything mysteriously, don't give up hope, for Douglas MacKenzie, '22, just got back a slide rule of his that vanished 16 years ago when he was a student at Tech. Doug, Designing Engineer in the Pasadena Street Department, was handed the rule the other day by an out-of-town engineer to whom it had been given by another who found it in the street some years ago. Through MacKenzie's name being on the rule, he was traced down and it was returned to him. The mystery of the rule's disappearance, however, has never been solved.

in your particular field and these departmental seminars will, in most instances, include short discussions by several men of their research work on the campus or reports of other current developments. All of the seminars will give you much specific information and will form a basis for a general discussion and questions on your part.

The program is thus nicely balanced to give you a maximum of information in a most interesting manner, with plenty of choices on your part. For example, if you missed the opportunities now afforded students of learning about the newer subjects now in the curriculum, you will want to attend the talks dealing with biology, geology, aeronautics, etc. For those who have wondered what's going on in the field of medical research, we offer a general discussion of the newer concepts of the treatment of disease by chemicals and X-rays. For those who are having difficulty in orienting their thoughts on the new particles of physics, there will be an outstanding talk which will revise your concepts of atomic physics. For those who want knowledge of chemical advances, general and specific, we will offer presentations which you could not obtain elsewhere. Finally, we will have information for you on Tech's new cryogenic laboratory, the 200" telescope, materials of construction, advances in transportation (including the recently announced non-sway train), and advances in the engineering sciences in general.

Is the plan experimental? Frankly, yes, though based upon the suggestions which many of you have given. The success of this year's program will determine in large measure the possibility of future endeavors to bring you closer in touch with the Institute, all of which is another reason for coming. As time goes on, and as we find out in greater detail just what you want, your Alumni Association feels that the appeal of the project can constantly be enlarged. But, while our program this year is experimental, almost unanimous approval of it in principle and general subject matter has been given by those who have heard of it.

Can you afford to miss this opportunity? If your reservations have not been sent in, mail them today.



## DEVELOPMENT OF LOCAL MADE TALKIE

*By D. Nitta*

(Some excerpts taken from a translation into English by a Japanese of an article appearing in a Japanese motion picture trade journal. The article is said to be authentic by an American sound engineer who has been some time in Japan and has been closely associated with motion picture development there.)

Talkies of Japan of today has shown a remarkable development but before it reached to the present state of development,

there were many difficulties and episodes which I am going to write here.

It was seven years ago when I was working at a laboratory of Minatalkie. At that time, there was no expert or experienced engineer of talkie and when a trifle trouble was found, everybody was very anxious about it and he consulted with other engineers. When we went to Hakodate to project Minatalkie there, we experienced a very queer trouble. The trouble was that no sound was reproduced. As it was winter, we believed that sound reproducing machine was frozen and therefore we heated the machine but it was in vain. We all believed that we were the expert of talkie but no good idea was born. We therefore placed an amplifier on a table and prayed for a help of god. Later we found that cause of this trouble was due to wrong connection of wire and amplifier. . . .

Sound reproducing machine of today can be operated by one engineer but in the former day, it required several. When I equipped a sound reproducing machine at the Denkikan Theater of Asakusa, there was happened a very funny trouble. The machine was "sound-on-disk" system and the disk was rotated by a flexible shaft connected to a flywheel of the projector. The trouble was that the flexible shaft was twisted. If one engineer held one end of the shaft, the other end was twisted, and vice versa. Therefore, five engineers had to hold the shaft during projection. . . .

When I was making a research on talkie on the 4th floor of the Hogakuza Theater . . . Mr. Sasho of Paramount introduced me an assistant manager of Hotel New Grand of Yokohama who intended to project a talkie at the hotel. He came to my laboratory and I tested my machine. However, when a frame which was cut and spliced came in a sound head, very big noise like bang-bang of machine gun was heard and the assistant manager of Hotel New Grand ran away. It is not yet clear why such big noise was heard and due to my lack of knowledge, I missed one of my customers. . . .

When I delivered a lecture at a meeting of talkie engineers, one of the attendants asked me which was stronger, ampere or voltage and I was very much surprised to be asked such a question. As you know, ampere is a quantity of current while voltage is pressure of current and to compare these two units is very silly. It is my regret to find out such an engineer has no fundamental knowledge of electricity although he operates sound reproducing machine every day. Engineers should know Ohm's law at least. . . . However, as a matter of fact, engineers forget this law and they are puzzled when a trouble is found. This is because they do not know a fundamental theory of electricity and they excite when they meet a trouble.

Construction of amplifier is very complicated and its action is very delicate. Therefore, engineers should have a very quiet mind and they should be very careful before they touch on it.



## SCIENTISTS GO TRAVELLING

The winter vacation is the season for scientific societies to hold their annual meetings. This year the American Association for the Advancement of Science held its Convention at Indianapolis. This meeting included gatherings of various member societies, but in addition the Astronomers held a meeting at Bloomington, Illinois, the Chemists went to Cleveland, and a few weeks ago the Aeronauts met in New York. As usual Tech sent a strong contingent East to attend these meetings and share ideas with men from other schools.

At the Indianapolis meeting there was a science exhibition which showed certain recent experiments and discoveries. Tech was invited to make an exhibit showing some of its cosmic ray work. Dr. H. V. Neher and Dr. W. H. Pickering, '32, took charge of this display, and they report that it attracted much favorable comment. Needless to say, it was a gathering point for the Alumni present. Among those who turned up were the following. Ray Binder, Ph.D. '36, who is now married; Everett Cox, Ph.D. '33, now at Colgate; Doc. Hains from Williams; Stu West '30, who is working with an oil company somewhere in Texas; Robley Evans '29, now making a name for himself at M.I.T.; Dick Crane '30, from Michigan; Dick Sutton, Ph.D. '29, now at Haverford; C. Crawley, Ph.D. '34, from Alabama, and Selby Skinner, Ph.D. '33, from Chicago. Of the more recent graduates, Howard '34, and Ribner '35, were present. They are both working at the University of Washington in St. Louis.

Members of the faculty who attended the other meetings include Doctors Pauling and Yost who went to Cleveland for the American Chemical Society meeting. Dr. Pauling presented a paper and then started on a tour of the East which kept him away until the beginning of February.

Although the Astronomical Department at Tech is not as yet very numerous, two of their number, Dr. J. J. Johnson '30, and Dr. Dinsmore Alter, were present at their meeting to present papers.

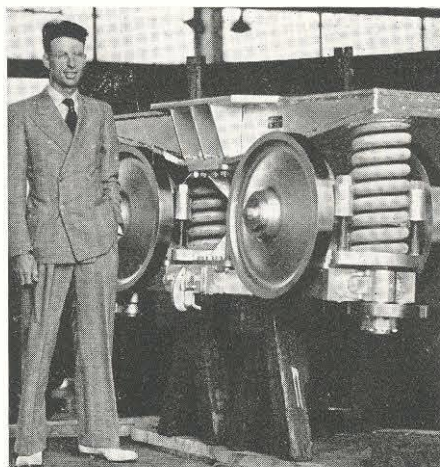
The Aeronauts, headed by von Karman, made national news, to the extent at least of being reported in Time when they presented some rather startling theoretical conclusions. Dr. Clark Millikan presided over the meeting of the Institute of Aeronautical Sciences being the retiring president.

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## CALTECH GRADUATE AWARDED HIGH HONOR

Dr. Sterling Bright Hendricks, Ph.D., '26, has recently been awarded the annual Hillebrand Prize of the Chemical Society of Washington. The award was made for Dr. Hendricks fundamental X-ray research on the properties of crystals, including polarization and index of refraction.

Dr. Hendricks is now with the fertilizer research laboratories of the Bureau of Chemistry and Soils of the U. S. Department of Agriculture.



*Edmund G. Grant, '30, a designer in the Astrophysics Department, stands beside a completed Dome Truck.*

## 200-INCH DOME NEARS COMPLETION

By the time this is published the 137 foot dome which will house the 200-inch telescope will be going around in circles.

The weight of the two million pound dome is supported by thirty-two trucks spaced equally under the periphery. There are four springs per truck, each spring was wound from a 1 $\frac{3}{4}$ " round bar and carries a load of 17,000 pounds. A single spring weighs 150 pounds. The trucks run on a double circular track of approximately 430 foot circumference.

Everything about the 200-inch project is either colossal or infinitesimal. The seventeen foot mirror will reflect from its surface light which has been traveling for as long as six hundred million years, whereas the surface will be accurate to one millionth of an inch. The forty-six foot diameter bearing at the North end of the polar axis will support a load of seven hundred thousand pounds, but can be moved to follow a star with a torque of only forty-six foot pounds.

Soon the shutters will be complete, and work will be resumed inside of the dome to make it a livable laboratory for the numerous scientists who even now have come to do preliminary work at the 200-inch telescope site.

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## WM. H. MOHR '29 ADDRESSES ALUMNI

On Friday evening, February 11, 1938, about eighty alumni gathered at the Los Angeles Athletic Club for an excellent dinner and to hear several interesting talks.

The first talk was by a well known alumnus, Bill Mohr, '29, who told of his experiences as Chief Concrete Inspector on the Yerba Island Tunnel for the San Francisco-Oakland Bay Bridge. Following this Mr. R. B. Southworth of the Columbia Steel Company presented a splendid motion picture showing the erection of the cantilever spans and the spinning of the cables on the San Francisco-Oakland Bay Bridge. The program proved so interesting that the speakers jointly spent three-quarters of an hour answering questions.