TACOMA BRIDGE FALL STUDIED

"Excessive torsional oscillations, due to unforeseen aerodynamic instability," resulted in the much-publicized collapse of the Tacoma Narrows bridge last November. The report reached approximately the same conclusion and embodied much of the same data that were presented by Dr. von Kármán at the Alumni Seminar on April 5, although the official report had not been completed at that time.

The published report stated that the Tacoma Narrows bridge was well designed and built to resist all static forces, including wind, usually considered in the design of such structures. However, the factor of aerodynamic damping was not taken into consideration in its design.

The behavior of the completed bridge showed that at a certain critical wind velocity the aerodynamic damping coefficient changed from positive to negative; that is, the wind tended to increase any small twisting oscillation of the structure. Above this critical velocity, the aerodynamic damping decreased to negative and then increased again with increasing wind speed, usually considered in the design of such structures. However, the factor of aerodynamic damping was not taken into consideration in its design.

During a particularly strong wind exceeding the bridge's designed strength, the vertical oscillations of the bridge, although most of the critical wind velocity at which the bridge would break, were set up.

With the apparatus Mr. Stone has predicted to within a few minutes the time at which the overcast above Union Air Terminal, Burbank, would break.

Heart of the new instrument which Mr. Stone has designed is a photo-tube or electric eye. By measuring the incoming light the device makes it possible to calculate the amount of heat energy that is reaching the earth. It is this heat that evaporates or breaks up a fog or cloud.

FOG FORECASTER

Newton C. Stone, Tech meteorologist, recently announced the invention of a device which predicts with uncanny accuracy the time at which the overcast above Union Air Terminal, Burbank, would break.

With the apparatus Mr. Stone has predicted to within a few minutes the time at which the overcast above Union Air Terminal, Burbank, would break.

Heart of the new instrument which Mr. Stone has designed is a photo-tube or electric eye. By measuring the incoming light the device makes it possible to calculate the amount of heat energy that is reaching the earth. It is this heat that evaporates or breaks up a fog or cloud.

YOU CAN'T CRITICIZE THE EDITOR...

if you haven't paid your Alumni Association dues in addition you'll miss out on a lot of other interesting activities and valuable contacts. Send your 1941-42 dues ($2.50) to —

C.I.T. ALUMNI ASSOCIATION
Pasadena, California

1941 FOOTBALL SCHEDULE

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<td>Oct. 4</td>
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<td>Calif. Poly</td>
<td>San Luis Obispo</td>
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Telescope Progress Outlined

Announcement that the sag in the 200-inch mirror—"eye" for the world's largest telescope on Palomar Mountain—has been conquered was made by Dr. Max Mason, chairman of the Institute's observatory council, at the June meeting of the American Association for the Advancement of Science held in Pasadena. The threat was one of the major headaches to be encountered in the grinding and polishing of the mirror which has been under way since 1936 on the Institute campus.

According to Dr. Mason, "When the surface of the mirror was brought to a spherical form it became clear that the disk when tipped from the grinding table to a vertical position for optical test, sagged slightly under gravity. After months of study, as the polishing continued, this sag was eliminated by installing a system of 24 squeeze levers, operated by counter weights, distributed around the rim of the glass, and thus another major '200-inch headache' was cured. "This supporting system must operate so perfectly that no bending of the reflecting surface beyond one or two millionths of an inch will occur as the telescope moves."

"It is doubtful if the 200-inch mirror will be of advantage for planetary or lunar photography, where air, the 'bad seeing' of the astronomer, may think the service rough. The immediate stage of figuring, or grinding, the mirror has continued for about five years at the optical shop on the Institute campus. The work of figuring, or grinding, the mirror is now finished, during this process more than two tons of glass have been removed by grinding.

"Next, the surface will be changed from that of a sphere to a paraboloid by deepening the concavity at the center by five-thousandths of an inch, and keeping the surface true to one or two millionths of an inch."

At the same meeting, Dr. John Strong, also of the Institute staff, declared that when the 200-inch telescope finally does swing into use, one of its employments will be in the study of radiations from the planets. Planets not only reflect visible light which they receive from the sun; they absorb and reradiate considerable quantities of solar energy, largely in the form of the invisible infra-red rays. These will be caught by the great mirror, and analyzed in a number of specially constructed instruments.

"These instruments," Dr. Strong said, "are now being constructed, and the special techniques necessary for their operation are being developed by members of the Institute staff. Much of the information necessary for comparison of conditions on the planets with those on the earth can be obtained only by a more careful and exact study of physical processes taking place on our own planet's surface and in its atmosphere. Determinations, on an entirely new order of exactness, of what happens to earth raindrops when they pass through water vapor, carbon dioxide, ozone and the major atmospheric gases, are on the program of research at the Institute."

Incidentally, Dr. Strong pointed out, data obtained in these researches will probably have considerable value to meteorologists as well as to astronomers.

POET'S CORNER

THE SERVICE HOWL

By G. Austin Schroter, '28

You may think the service rough
And the non-cons plenty tough,
When you draw a double-duty on the roster.
If you want a lead-pipe cinch
And the duty makes you flinch,
Then a little cussin' is your paternoster.
If you're on the book as sentry
'Stead of minglin' with the gentry
And the cutie waitin' for ya' on a date.
Then your recourse lies in grippin',
'Cause your rifle you are wipin',
It's just a waste of time to supplicate.
If it's bunk-fatigue you seek
To forget some somber critique,
And the Top-kick, with his whistle,
Rolls you out.
Or you hear the bugle's blare,
With its rest-disturbin' air,
And your forty winks of sleep are put to rout.
Why then, this is the consolation,
Mournin' forceful imprication
Of the Army, and your orders to look smart,
When you're makin' up latrines.

In a pair of G.I. jeans,
You can smartly curse the military art.
When the section's on the march,
And the dust is dry as starch,
And your pack-strap multilayer your hide like Hell,
When your tin hat weighs like lead
On your poor, old, aching head,
And you're conscious of the column's sweaty smell.
You can sing your piece around
As your weary feet resound
To a mighty sound of beefin' down the line.
Yes, it's belly-achin' mister,
When you've got a lousy blister
With a fogey when you sign,
For your forty winks of sleep are put to rout.
When enlistment time is up,
And you've had your final sup
It's an effort to define
With a fogey when you sign,
So you sign the dotted line.

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June 1941

THE PROGRESSIVE

UNION PACIFIC
Wants, in order to prepare herself for the final blow that would make for the Nazi conquest of the world. We are fighting against Nazi Germany today. We will be fighting the horrors of unemployment after the war. I would hesitate to say which of the two — Nazi Germany or unemployment — is, in the long run, the greater enemy of democracy."

"I believe that, for our individual and collective salvation, in the postwar years, the United States and the British countries — together with all other countries of good will — will closely work together from the economic, financial, commercial, and many other points of view."

"I believe that the most formidable task of statesmanship with which the world has ever been faced is just ahead of us at this moment. I believe the problems that I have ventured to outline have to be tackled before the war ends — and that it is none too early to tackle them now, if we are to salvage the postwar democratic world — and if democracy and free institutions are not to become mere words in the postwar dictionary."

"We want to banish war from the world. That can never happen. Nazism is the ideal organization of country for waging war. It has but little peacetime significance. Democracy is the ideal type of society but it is a slow, inefficient system for waging war. Let us choose which system we want — and know why we want it."

"Please don't make any mistake about it — we didn't go to war because of some European dispute. We went to war because we realized that if every one of us didn't stand up and make ourselves known as 'the track of this Nazi juggernaut — the writing was on the wall for democracy and for our future.'"

"Given adequate American assistance, I find myself able to be optimistic about the outcome of this war — although we have no illusions about what the future holds for us before the war is won. It will be a long and bitter business."

"But I find myself cast down with doubts and fears about the period after the war — and it is about the postwar era that I now want to speak to you for a little."

POSTWAR PROBLEMS

"It is going to be much more difficult for the American and British people to work together in peace than it is in war — and yet I believe that it will be just as essential, although for quite different reasons."

"We will have problems to tackle that will appear individually to lack the vital urgency of today's problems of war — and they will be complicated by tariffs, vagaries of international exchanges, the bitter struggle between national vested interests, the problems of gold, the problems of depleted purchasing power, the difficulty of disposal of international surpluses, of high and rising costs and prices, of disparity between farm and manufacturing prices, and of problems inseparably connected with the wholesale return of ex-service men to civilian work."

"The real serious part of the business will undoubtedly be that these problems will express themselves in widespread and perhaps universal manifestations of unemployment and distress amongst the working populations — of your country and of ours."

"I believe that neither the United States nor the British Commonwealth of Nations by themselves, and working separately can solve these problems. And if we don't solve them, we are sunk. If we don't go some way toward solving them, I would give the world 10 years at the outside — before we all dissolve in hopeless chaos."

"I believe that many of the previously accepted principles of international contact and international practice will have to be revised, if, having survived the war, democracy is to survive the peace."

"These are some of the problems that you — your generation — will have to face. And probably no generation will have had so much problem of reconstruction and rehabilitation to deal with. Pray God that your backs will be broad enough and your minds sufficiently unharnessed by prejudice and inhibition to enable them successfully. May you not be discouraged or dismayed by the prospect."

LIFE PHILOSOPHY ADVISED

Rev. John F. Scott, pastor of All Saints Episcopal Church in Pasadena, gave the graduates another indication of the things they must strive for in these words:

"The really important things in this world are not the kind of beds we sleep on or whether we eat three or four meals a day; not the degree you are entitled to write after your name, or whether you get a job with a salary or go into the military service for a year."

"The fundamentally important thing is your philosophy of life. Are you here for? What are you supposed to do about it? What's the nature of this universe? Are there any principles and moral laws that underlie it, any motives that constitute the promise of peace and progress? In the long view..."
ADDRESS MISSING

No current addresses for the following men are in the Alumni Association files. Directory cards sent to the last known address were returned marked "No Forwarding Address Known." Information as to the whereabouts of these men will be valuable for the Directory and will assist in keeping the files up to date.

1917
Leo B. Hardiman
Carl Berg
Glen L. Miller
1922
Richard G. Osann
Arthur G. Pickett
1925
Ernest C. White
Georgie Clapp
1926
Burnett Wisegarver
1927
Arthur Robinson
1928
H. A. Campbell
John W. Dalrymple
True W. Robinson
1930
Glenn H. Meyer
John C. Montgomery
Charity Tutschulte
1931
Arthur C. Newby
Jackson Gregory, Jr.
1932
D. E. Marshall
1934
Dana Washburn
Arnold Wilking
1935
Charles A. Dawson
William McFadden
1936
San Francisco
Louis T. Rader
Hersch Levy
1937
Edmund Norris
Newell Potter
Simon Ramo
Walter C. Wong
Chao-Ting Meng
1938
M. A. Dike
William Ellery
Shirley S. Miller
Gordon Wylie
Kneeland Numen
Richard Rowell
Monson W. Dowd
J. Edward Shreve
Donald, Taylor
1939
Harry Major, Jr.
Charles Carestaphen
Cesar Chua-Chung Liang
1940
Dwight H. Bennett
Robert Spiehberger
Carl G. Schrader

Letters To The Editor

33 Walnut Street, Savanna, Illinois, June 15, 1941

Dear Sir:

After a year out of the Association, I have decided to give it another try. In my first year out I was a member and was greatly disappointed in the poor average on the members of the Class of '39, '38 and other classes' whose members I knew.

I believe much more of the space of the magazine should be devoted to short items about many of the graduates rather than long, too highly specialized, technical articles by just a few of the more fortunate, or in some cases more "long-winded" graduates.

There seemed to be far too little mention made of the fellow actually out "doing something." The usual '39 Class news read something like this:

"Pete — — has enrolled at the Harvard School of Business.

"John — — writes he is enjoying the Harvard School of Business.

"Son — — is at the Stanford School of Business.

"John Doe, Jr. has just been promoted to assistant engineer. He is employed by the John Doe (Sr.) Construction Co.

"Bill — — flew back to the coast for the Christmas vacation after a term at the Harvard School of Business. . . . and so on far, far into the night.

"Are we just a Business preparatory school — or an engineering school? One would think the former by reading the Alumni Review!

"Certainly a few of the real points of interest could be brought out. Why with this National Defense Program and you didn't even get in the news that Al Guillou '40 is with the Army Air Corps.

"Also I have failed to see a lot of old school chums of mine because of failure of the Review to report either their or my changes. When I came here I felt it my duty to write a brief note giving a few details on my new position and location—never a word in the Tech Review. My mother reports an occasional Tech fellow still drops by at Bell (Calif.) to "see if I still am with Sterling Electric Motors."

"Wish you'd try to see what you can get in the way of news for the Review on such fellows as Jack Black, Davitt, Herb Strong, Lawson, Russ Anderson, Axtman, Crozier, Green, Matthew, Richey, Richards, Norton, etc.

"In case it's just your inability to get the news I'll start you off by telling briefly about McClellan and myself. We're both still at Savannah Ordnance Depot as operating and plant engineers of this very large ammunition loading and storage depot. Our work consists of developing ammunition loading tools, bomb and shell handling equipment as well as the engineering in connection with plant layout and production methods. Our Engineer Division has grown considerably from the day in November 1939 when I reported as the Civilian post engineer to today where we have four engineers and eight draftsman and other employees in addition to 7 N.Y.A. student-draftsmen. Mac has been directing the division since April when the Chief engineer left. I have been in charge of N.Y.A. training and ammunition tool design.

"Our new shell loading line will probably be the first of the ones of its type in operation in the country. Part of the program of the depot consists in training explosive operators for the bomb and shell loading lines at the new plants such as Wolf Creek, Miss., Burlington, (Ia.), Elwood, (Willimington, Ill.), and Kingsbury, (Ind.), and Ravenna, (Ohio), all of which will be doing the type of work on which we have pioneered.

Sincerely yours,
Frederick C. Hof, '39.

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GENERAL PETROLEUM CORPORATION

Mobilgas SECOWN-VACUUM

Mobilol-Mobilgas
"And enduring civilization must be based on spiritual values: truth, honor, righteousness, justice and goodwill. These are the qualities on which democracy and freedom are built. Unless they undergird our individual lives and the life of our nation, we perish. We can not laugh off that statement today as the raving of a preacher; that is the verdict of history and the voice of experience. It is time we gave heed."

Degrees were presented to the 297 recipients by Dean Frederic W. Hinrichs of upper classmen; Dr. W. R. Smythe, chairman of the committee on the course in science; W. W. Michael, chairman of the committee on the course in engineering; Dr. William V. Houston, acting dean of the graduate school.

The parchments were presented to each graduate by Dr. Millikan.

CHAPTER NEWS

New York

A group of about twenty men of the California Tech Club of New York had the privilege of meeting with Dr. Linus Pauling at an informal luncheon held in his honor at Pappas Restaurant on March 9th. It was also their pleasure to have the company of Mrs. Pauling who accompanied her distinguished husband. Dr. Pauling, head of the Division of Chemistry and Chemical Engineering at the Institute, came to New York to receive the 1941 William H. Nichol medal of the New York section of the American Chemical Society. He was chosen for the honor for his distinguished and pioneer work on the application of quantum mechanics to chemistry in the determination of the size and shape of chemical molecules. Dr. Pauling spoke about recent developments at the Institute. Both the Alumni and invited guests found his remarks highly informative and inspiring.

The annual meeting of the California Tech Club of New York was held Friday, June 13, at Frances Lynx Restaurant. The program included films and sound recordings made at the Alumni Seminar at Pasadena last spring and was greatly enjoyed by the members, some of whom did not recognize the campus with all the recent changes and improvements which have been made. The closeups of Alumni members at the Seminar was also greatly enjoyed. Ed Thayer got quite a kick out of seeing himself billed as the "Alumnus from the most distant point." Both recorded talks aroused much interest from the whole group and the hope was expressed that a similar recorded program from the Institute will be prepared at the Seminar next year.

The following officers were elected for the coming year:

Paul Ames "22 __________ President
Herb Ingham '31 __________ Vice-President
James Davies '35 Secretary-Treasurer
Chester Carlson '30 __________ Director
Frederic Moore '38 continues as a director for another year.

Yours very truly,
Chester F. Carlson '30

San Francisco

On March 31, 1941, our secretary, Francis Wyatt was transferred to Los Angeles and I was asked to assume the duties of secretary-treasurer of the San Francisco Chapter.

This is a rather late report of our activities; however I hope it will be received in time for use in the next Alumni Review.

On March 7, 1941, the San Francisco Chapter, under the leadership of the President, Louis Erb, enjoyed a double feature: a Swedish dinner preceded by cocktails, and lively chatter. After dinner, Dr. J. Scherer gave a talk on the Far Eastern situation, on which he is an authority. The talk was followed by questions and lengthy discussion.

A group of fifty-four members and their ladies, met on May 16th at Howard Vesper's lovely home "Cactus Rock," in the hills of Oakland for an afternoon, supper and evening, the most enjoyable event this Chapter has experienced this year. The soft ball game was the main athletic event of the day, resulting in a score of fourteen to ten in favor of the girls.

After a fine supper, served in the patio and in the house, the group gathered in

Alumni Review

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