The Wisconsin engineer. Volume 41, Number 1 October 1936

Madison, Wisconsin: Wisconsin Engineering Journal Association, [s.d.]

https://digital.library.wisc.edu/1711.dl/7P3DBZ6M5SIJV8I

The WISCONSIN ENGINEER

MEMBER OF ENGINEERING COLLEGE MAGAZINES ASSOCIATED

OCTOBER 1936 to MAY 1937

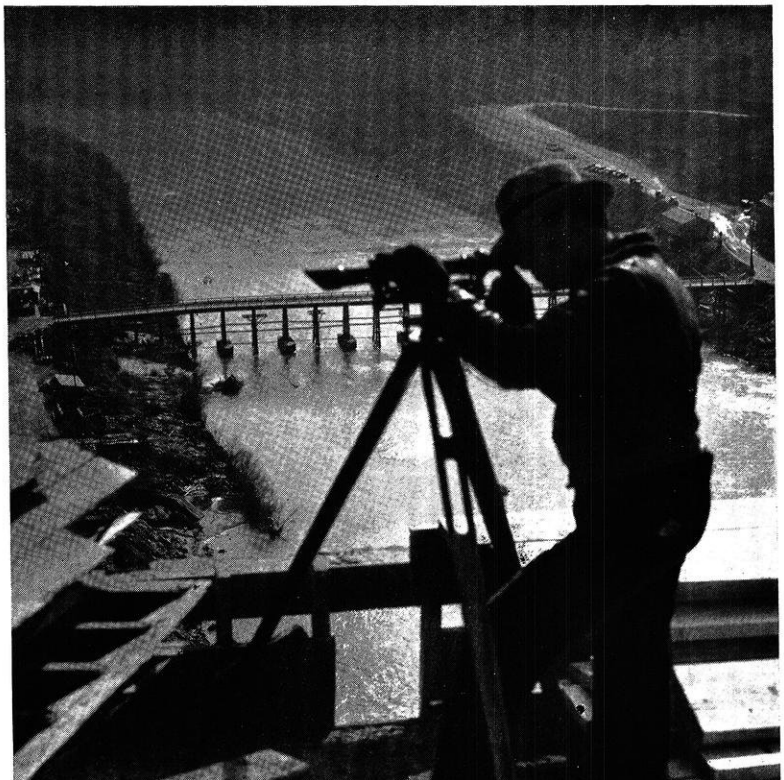
VOLUME XLI

FOUNDED 1896

PUBLISHED AT MADISON, WISCONSIN

BY THE

ENGINEERING STUDENTS *of the* UNIVERSITY OF WISCONSIN



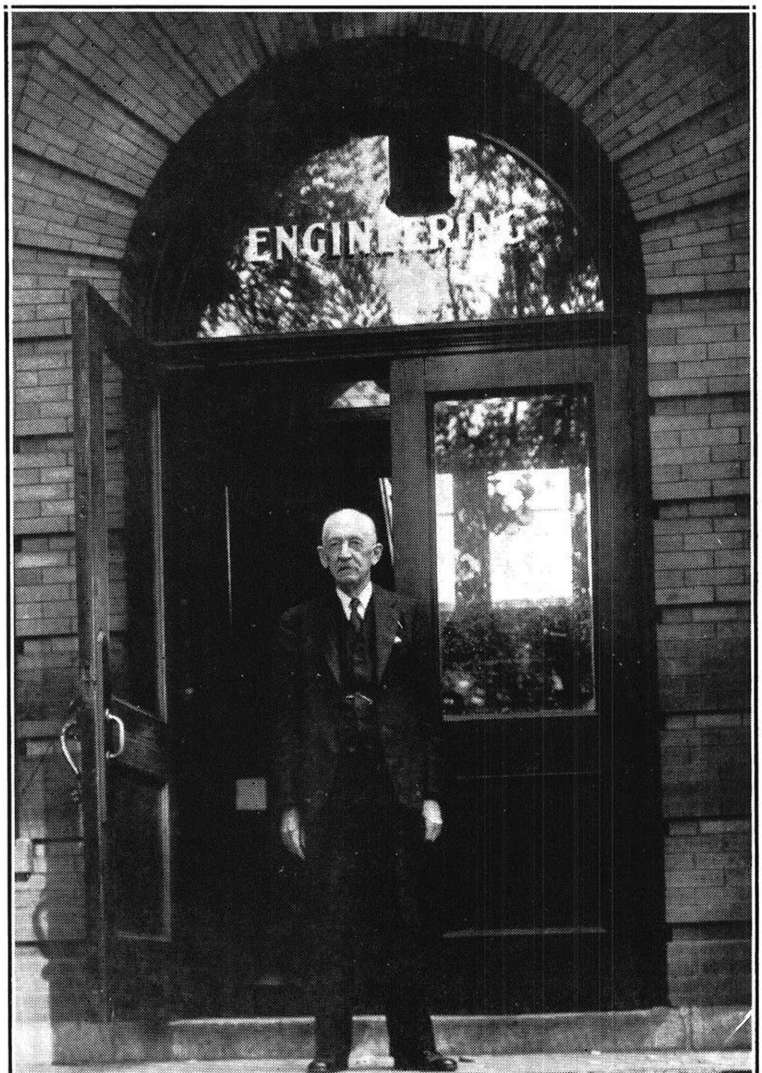
SUBSCRIPTION PRICE $1.00 PER VOLUME OF EIGHT NUMBERS

INDEX FOR VOLUME XLI, 1936-1937

TITLES

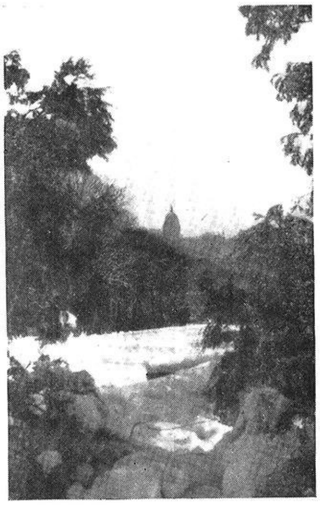
AUTHORS

THE WISCONSIN ENGINEER



OCTOBER 1936

Member, Engineering College Magazines, Associated



The Capitol from the Campus

WITH THE CONTRIBUTORS . . .

△ Our front cover contains the latest picture of Dean Turneaure. Robert Hopkins took it about a week before this issue went to press.

△ You'll want to read the Dean's welcome to the frosh and all other students—see page 3.

△ Mr. A. C. Vobach gives the essentials of modern refinery practice beginning on page 4. We recommend it for your reading.

△ If you want to find out how they oriented Wisconsin's fire-towers with respect to each other see page 7.

△ Our humor editor got back in time to go to work on this issue. See the results on page 14.

△ All summer you've been wondering what Johnny or Jim has been doing since he graduated in June. You can find out by turning to page 16.

The WISCONSIN ENGINEER

Published monthly from October to May, inclusive, by the Wisconsin Engineering Journal Association, 219 Engineering Bldg., Madison, Wis.

△

Founded 1896 **Telephone U 236**

Volume 41 **OCTOBER, 1936** **Number 1**

CONTENTS

MEMBER OF ENGINEERING COLLEGE MAGAZINES, ASSOCIATED

Leonard H. Church, National Chairman
1510 Hanna Building, Cleveland, Ohio.

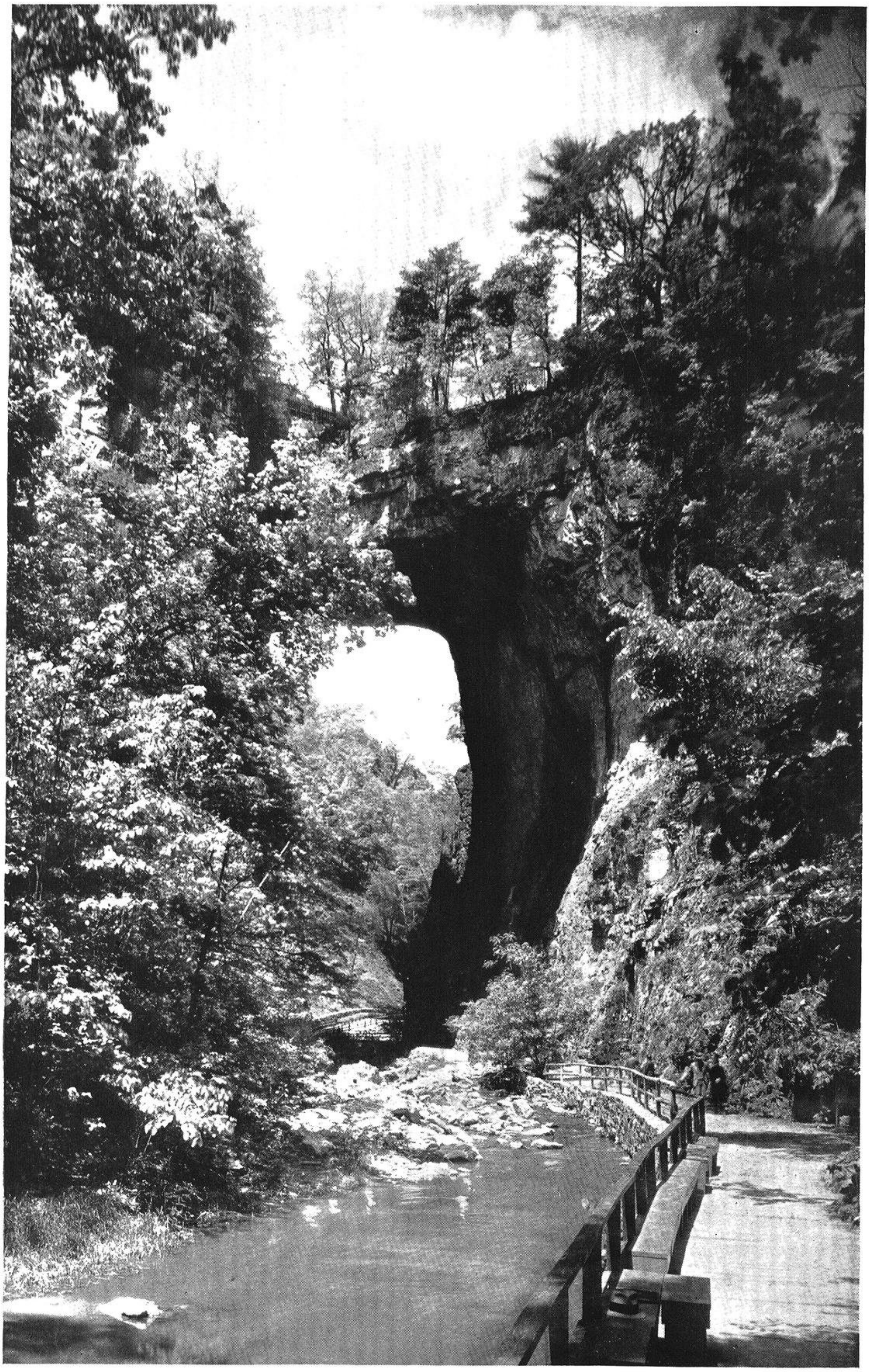
Arkansas Engineer
Colorado Engineer
Cornell Engineer
Illinois Technograph
Iowa Engineer
Iowa Transit
Kansas Engineer
Kansas State Engineer
Marquette Engineer
Michigan Technic
Minnesota Techno-Log
Nebraska Blue Print
North Dakota State Engineer
N. Y. U. Quadrangle
Ohio State Engineer
Oregon State Technical Record
Penn State Engineer
Pennsylvania Triangle
Purdue Engineer
Rose Technic
Tech Engineering News
Villanova Engineer
Wisconsin Engineer
Washington State Engineer

National Advertising Representatives
Littell-Murray-Barnhill, Inc., 101 Park Ave.
New York

Entered as second class matter September 26, 1910 at the Post Office at Madison, Wis., under the Act of March 3, 1879. Acceptance for mailing at special rate of postage provided for in Section 1103, Act of October 3, 1917, authorized October, 1918.

Subscription Prices:

$1.00 per year **Single copy 15c**



NATURE'S HANDICRAFT

The Natural Bridge of Virginia

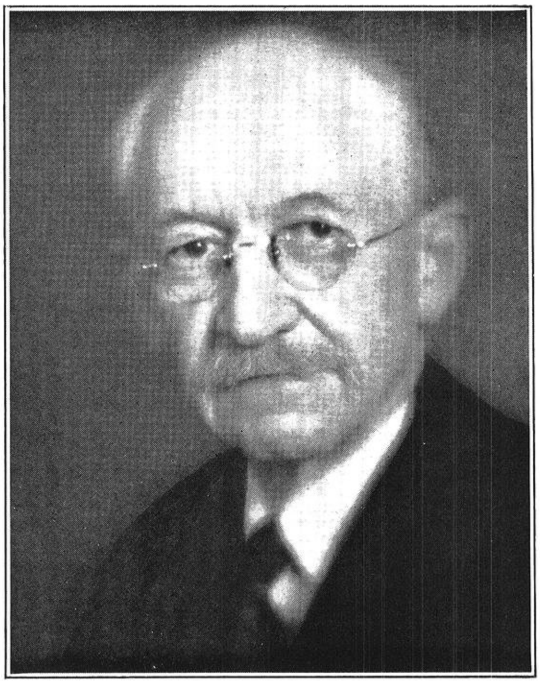
The Road Ahead . . .

by **DEAN F. E. TURNEAURE**

IT HAS been the custom for many years, in the first issue of the WISCONSIN ENGINEER, to extend to the returning students a welcoming message on behalf of the faculty. This I do with sincere pleasure.

To those of us who have seen many classes come and go, the opening of a new year is, in most respects, merely a repetition of many similar occasions. To the members of the freshman class, however, it is a new and undoubtedly very stimulating experience. It is an important point in their school life and I am sure that every freshman engineer has come here with a serious purpose and with the intent to make good use of the opportunities for the cultivation of his talents which the University so generously affords.

The entering class is the largest for many years, and in this respect is perhaps to be congratulated; but a better reason for a feeling of satisfaction at this time lies in the improvement of economic conditions, which has already been such as to lead to opportunities for employment for practically all of the graduates of recent classes. The constructive energy of the people of this country is again showing itself in many new enterprises, involving the development of new products and processes where the trained scientist and engineer is needed. The very great variety of this development opens up fields of employment unheard of twenty years ago, and explains why, in the nature of things, in this scientific and technical age, the number of technical men needed in industry in normal times is constantly on the increase. The notion that the young man of today can have no such opportunity as his father had—a notion which has been frequently expressed—seems foolish from the standpoint of one who has watched the coming and going of student classes on this campus for more than forty years. Students in the engineering school of all classes have every reason to proceed with their work with courage and energy and to do their best to discipline themselves in mind and character so that on leaving the university they will be prepared to make honorable places for themselves as engineers and useful citizens. The engineering faculty is here to aid you in this purpose, and your success is a very great compensation to them for their work. We the faculty of the College of Engineering welcome you to the University and wish you the best of success.



Dean F. E. Turneaure

Petroleum—

Fourteen Years of Progress

by A. C. VOBACH, ch'21

Illustrations Courtesy Oil and Gas Journal.

MANY CHANGES have occurred in petroleum technology during the above period, which covers the author's contact with the field of refinery practice, and when we review the past we are sometimes astonished at the simplicity of improvements which have played a major part in increasing the efficiency of a particular operation.

I shall not attempt to go into detail in explaining the various changes to be described, since the technical publications cover them quite thoroughly, and anyone who is sufficiently interested can develop innumerable references on any particular subject. Primarily, I shall try to describe in simple language major changes which have taken place in the operating practice of petroleum refineries, and how improved products are the result.

Crude Distillation

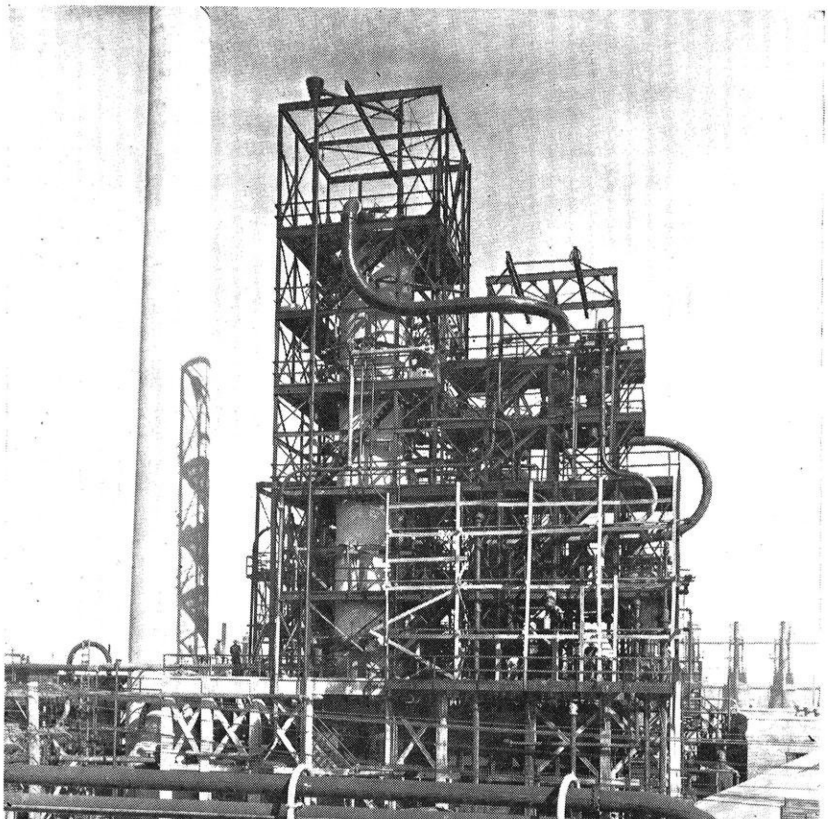
In 1922, crude was being charged to batch shell stills and roughly separated into fractions according to gravity, boiling range, and other characteristics, with the final residue in the still being petroleum coke. The distilled fractions comprising crude naphtha, kerosene, gas oil, wax distillate, and heavy gas oil were further refined by redistillation on stills which might or might not be equipped with fractionating towers. In the case of the crude naphtha, to secure a satisfactory gasoline product, acid treating was resorted to before the redistillation step, and in the case of wax distillate it was felt that some sort of high temperature decomposition was necessary during the rerun operation to produce material from which wax could be separated by filtration.

The use of continuous crude stills and further improvements in fractionating tower design followed the above practice, and it then became possible to take gasoline, kerosene, gas oil, and a rather unsatisfactory type of paraffin distillate continuously from crude, with the residue being coked in the old way on batch coking units. The use of bubble trays to secure still better fractionation represented a third step in crude distillation practice, and with the bubble trays and continuous stills came the adoption of heat exchange equipment on vapors and still bottoms for greater fuel economy.

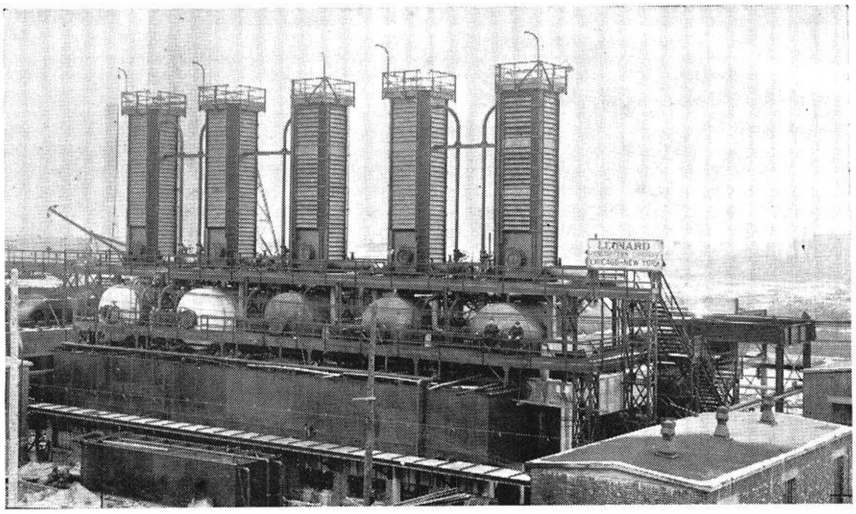
The last step in the history was the adoption of continuous pipe stills, embodying all of the desirable features of previous practice, taking off products in one operation that at the first could be secured only with a multiple operation, and taking off materials entirely free from any decomposition products that always resulted from overheating the stock on the old shell stills. Continuous pipe stills were first run under substantially atmospheric pressure conditions in the fractionating tower, and finally, to go deeper into the residual material, vacuum was applied and still further economies effected.

Light Oil Treatment

The acid treating of crude naphtha was necessary because over-heating and poor fractionation resulted in off-color unstable products. Treatment was carried out in batch agitators until the larger refineries found it economic to go to continuous treating units, with their result-



Modern crude distillation unit



Typical cracking installation of 15 years ago

ant greater daily thruput capacity and lesser losses of light hydrocarbons.

The treatment of gasolines, either from crude or from cracked gas oil, with clay became common and eliminated the necessity of acid treatment and rerunning.

It was found that the formation of gum in gasoline and discoloration could be controlled by the addition of chemicals of the phenolic type, and this fact was of material benefit to the refiner in reducing his expense.

Lubricating Oil Treatment

The production of lubricating oil did not receive a great deal of attention, nor were major improvements made in this field until quite recently. Wax-free oils were treated with acid and neutralized with caustic in batch agitators, similar to those used for light oil treatment, or where acid refinement was found unnecessary filtration through clay to remove coloring matter was the only treatment used.

This practice was followed by that of grinding the clay to a fine powder and contacting the oil, with the adoption of filter presses to remove the spent clay from the oil. Activated clays of much higher decolorizing efficiency than the natural earths were manufactured in large quantities and adopted by the refining industry in some instances. Aluminum chloride and hydrogenation for lube oil treatment were extensively investigated, and in some cases adopted.

The most recent development in improving lubricating oil against sludge formation, and to stabalize against service conditions, has been that of treatment with selective solvents such as nitrobenzene, phenol, furfural, and the like. This separates the raw oil into a more paraffinic fraction and a dissolved material comprising asphaltic and naphthenic components, which latter have a tendency to form sludge in service. In general, the quality of lubricants has kept pace with the growing demand of the automobile industry for products capable of supplying metal protection under the heavier loads and increasingly severe conditions encountered in the modern engine.

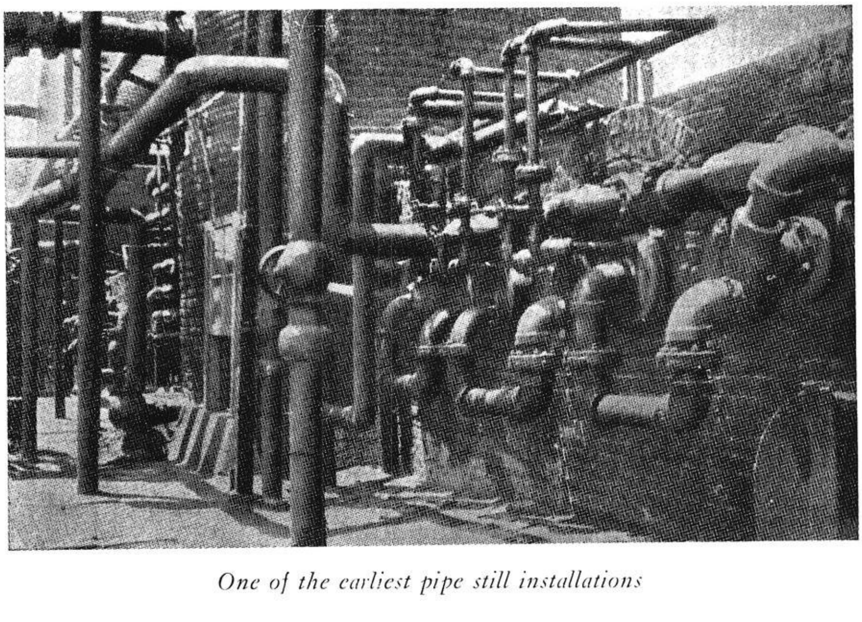
Wax Removal

Separation of wax from light lubricants was developed at an early date, with use of plate and frame filter presses. Improvements in quality of paraffin distillate resulted in greater thruput capacity on given press installations, as well as ability to press raw material of heavier viscosity and lower content of diluent gas oil. In the course of time, to secure lubricants more suitable for winter conditions, pressing temperatures were reduced and products free flowing at 0°F. produced in regular practice.

To remove wax from heavy lubricating stocks, where presses were unsuitable, the old cold settling method was largely replaced by centrifugal machinery and here, too, dewaxing temperatures were gradually reduced until zero pour oils were made.

The latest improvement in dewaxing operations makes use of solvents such as acetone and benzol, or benzol and ethylene dichloride, or liquid propane, with benefits indicated in securing better separation between wax and oil and less loss of good oil with wax than was possible with the older methods of processing. With solvents, raw stock quality is less important and other economies are possible.

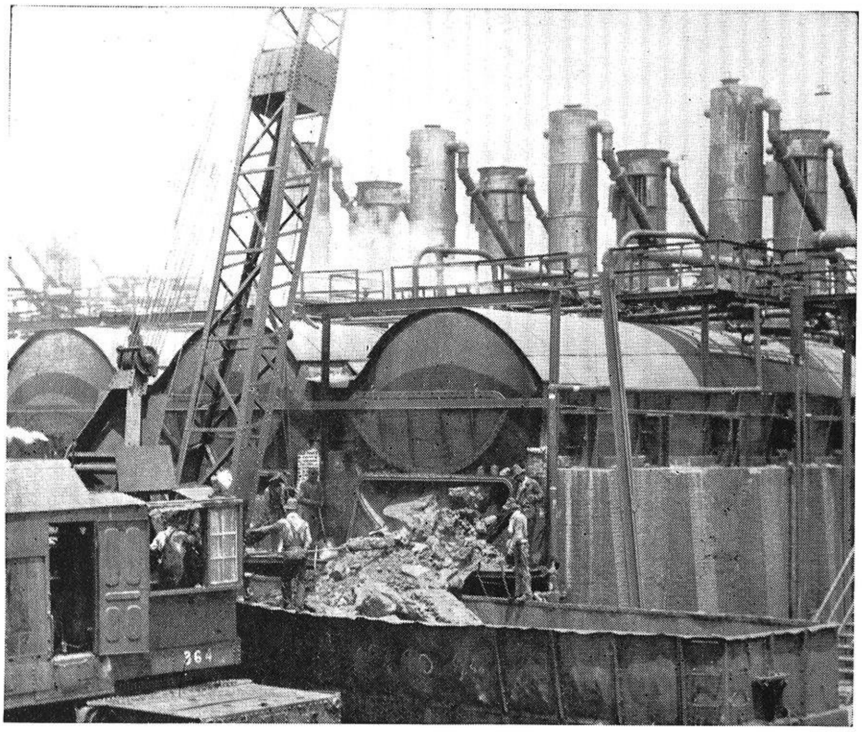
Addition agents are now sometimes used to depress the pour tests on waxy oils, and make them suitable for use under all temperature conditions, even though removal of the wax has not been thoroughly made. In a sense, this development parallels that of the discovery of addition agents to stabilize gasoline, referred to earlier.



One of the earliest pipe still installations

Cracking

In the field of cracking, rapid developments have taken place. Whereas formerly heavy walled pressure vessels with direct firing on the shell, or circulating units with tubes in a furnace and a bulk storage shell attached thereto were employed, modern practice has eliminated the bulk storage tank, and now conditions in a continuous coil heater determine the degree of cracking and type of material produced, with extremely close control of operations being possible.



Typical shell still installation of 15 years ago

The latest type of combination cracking unit will process twenty or even thirty thousand barrels per day of crude rather than gas oil, for maximum gasoline yield, and run continuously for relatively long periods of time without a shutdown for cleaning. This is in striking contrast to the old type of still which charged only a few hundred barrels per day of gas oil, and had to be shut down every other day to clean out the coke or carbonaceous material formed in the cracking operation.

Another development, reforming, consists of partially cracking and changing the nature of the material originally in the gasoline boiling range of the crude. This aids in increasing the anti-knock value of the overall plant output of gasoline to a considerable extent.

Gas Recovery

The loss of the light fractions of gasoline in storage and in handling before the material reached the consumer was a matter to which a great deal of study was devoted, leading to the use of tanks with floating roofs, systems of gas balloons, and rigid control of quality of light natural gasoline used to improve ignition characteristics of the finished product. These efforts finally led to the adoption of pressure fractionation or stabilization of refinery gasoline products to remove hydrocarbons in the boiling range of ethane and propane, which products were found to materially increase the evaporation losses. The light hydrocarbons found to be suitable for inclusion in gasoline could, by this means, be separately handled and carried in pressure storage until blended into the finished material.

Improvement in Properties of Gasoline and Lubricants

It was not many years ago that gasoline produced only from crude was considered a pure gasoline, and that made by cracking looked upon as a synthetic product and a substitute for natural gasoline that the motorist should avoid purchasing if possible. This picture has entirely changed. Many natural gasolines of the same boiling range as commercial gasoline today are entirely unfit for use in the modern automobile. The development of knock testing equipment as a yard stick for evaluating gasoline quality and performance, caused the expenditure of vast sums for greater cracking facilities, so that the public might have a gasoline suitable for use in high compression motors without the knocking under heavy load that we all so well remember. Today, with cracking, reforming, and polymerizing all devoted toward the production of high octane gasoline, it is all the more remarkable that it has been found possible to reduce production costs over what they were in the old days.

On lubricating oils, the tendency has been to meet the old standards of physical tests originally set up to indicate that the refining operation had been properly carried out, supplementing such tests by service tests and laboratory tests approximating service characteristics, so that lubricants will also meet the more exacting requirements of the present day.

Perhaps in no other industry have new developments and changes in operating practice so materially effected economies and necessitated expenditures to maintain pace with competition. In some cases new equipment has hardly been built and put into operation before it is out of date, and made obsolete by some overnight change in the process.

Predictions have been made regarding the future utilization of petroleum for the production of chemicals for which we now depend on the coal tar and other industries. No doubt such predictions will be verified and further broaden the field of usefulness of the chemist and engineer in the petroleum industry. Nor, if we can point to past progress, is there any question but that the quality of the products necessary to operate and lubricate the automobile and machinery of the future will continue to improve and keep in step with requirements.

FIRE TOWER TRIANGULATION

by **M. O. SCHMIDT, c'37**

FOREWORD: During the summer and fall of 1934 the author worked as a recorder with the United States Geological Survey on third-order triangulation in Wisconsin. The specifications for this class of control allow a maximum discrepancy between the computed and measured length of a base or of the adjusted length of a line of first-order work of one part in five thousand of the length of the line, and the satisfaction of this criterion generally demands besides certain desirable forms of figures average triangle closures of not more than five seconds.

As a measure of unemployment relief the United States Geological Survey was allocated in 1934 under the Public Works Administration the sum of $10,000 to be devoted to triangulation control of fire-towers in Wisconsin. This work was done at the express request of the Wisconsin Conservation Commission to furnish that organization with the geographic coordinates of all its lookout towers, used to locate fires, so as to properly correlate each tower with the others and dispense with the necessity of continuing to unsatisfactorily reference them on existing maps to the Public Land Survey System. A second purpose of the project was to furnish control for future topographic mapping operations of the federal organization, or since the economic character of the surveyed regions probably does not justify this degree of portrayal, to control airplane photographs used in the compilation of base maps.

United States Geological Survey triangulation is usually that of only the third-order since its chief purpose is to control the regular quadrangle maps of the Survey which are constructed on field scales where errors of linear control not exceeding the allowable ones of third-order work are not plotable.

It is this order of control that fills in the areas between lines of traverse or arcs of triangulation of higher order. It is of all the classes of precise triangulation the one of greatest and most immediate application and one of the justifications for the great refinement of first-order work upon which it often depends and which stretches for hundreds of miles and is the agent for integrating and the basis for controlling numerous kinds of subsidiary surveying operations. By connecting third-order triangulation to a triangulation system or a traverse line of higher order the relatively-great expense of determining position by astronomic observation and of measuring base-lines is spared.

Work was begun July twelfth in the two, removed, southern fire-protection districts centering about the city of Necedah in the Wisconsin River Valley by a typical party consisting of an engineer as observer and a recorder. Transportation was furnished by a light, fast truck and the instrument used was a repeating theodolite reading to ten seconds. Five or ten repetitions, direct and reverse, usually gave satisfactory determinations of the angles. The southern system started at the eastern end of a spur arc of the United States Coast Geodetic Survey first-order work which was brought in from the Mississippi Valley near La Crosse in 1930 and which was ended near Necedah. The Geological Survey network went south for thirty miles to Wisconsin Dells, north for the same distance to Wisconsin Rapids, and about fifty-five miles in a general northwesterly direction. Since it was not possible to close on any other line, no field check was available; although an office comparison of the two computed positions of station Wilson which is located at the far apex of a single, unsupported triangle into which the northwesterly arc attenuated itself may give some idea of the relative accuracy of the work. The Coast & Geodetic Survey, while engaged in separate

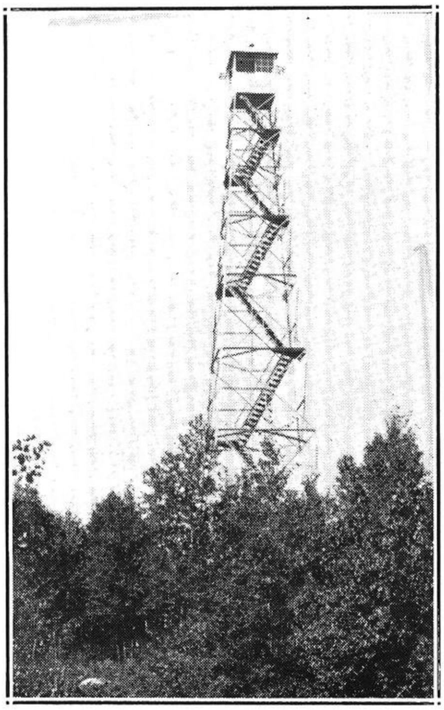
EDITOR'S NOTE

Early in 1934, Prof. Ray S. Owen of the University of Wisconsin civil engineering department arranged with the Federal Forester and the Wisconsin Conservation Commission to start a CWA project, the purpose of which was to locate the fire protection towers in the northern and central part of the state in an accurate triangulation system. Under Prof. Owen's direction several field parties worked up a sighting procedure so that the maximum data could be secured with the minimum measuring of angles. The work was practically completed in the southern section and proceeding slowly in the northern section due to poor visibility through the winter haze when the appropriation was stopped in March, 1934. Later, the United States Geological Survey undertook to finish the job. Borrowing some equipment and the completed field books from the University surveying department they ran quickly over the southern section, found that it checked in good shape, and proceeded to the northern section. The accompanying article deals with the method used in this survey.

Previous to this work the fire towers of the state had been located with respect to section corners, rather than other fire-towers. The section lines, particularly in the northern part, are not always accurately located due to errors in the original surveying. When a fire occurred, the towers which could see it reported its azimuth and these were then plotted on the map —giving the location of the fire. Sometimes it was found, however, that men and equipment would be sent to the wrong location because of the inaccurately located towers. If a natural obstacle such as a river was in the way, it sometimes took the fire fighters several hours to retrace their steps and go to the correct place, where with accurately located towers to correctly locate the fire, the equipment could have been on hand before it gained much headway.

and independent triangulation in the state later in the summer, established a station beside the Wilson lookout tower and the use of the connecting date secured by them will make possible a second and more precise determination of the position of Wilson. (This information recently secured shows a difference in position coordinates of about .4″ in latitude and 1.0″ in longitude.) This organization during the course of the summer used as sites for stations several of the promontories on which fire-towers are situated. The refined quality of its work necessitated, however, independent instrumental and observers' supports and this requisite precluded its use of the fire-towers.

By August eighth the work in the southern districts was completed and a second party was in the field making the starting connection near the Minnesota border south of Superior with the precise net of the United States Lake Survey executed in 1907 and beginning to bring southward and eastward lengths and azimuths to use in controlling the towers in the independently-situated, northern, fire-protection districts. These cover roughly that part of the state between a line joining Marinette on the east and Grantsburg on the west, and Lake Superior and the Michigan border. By October first a third party was observing in the northeastern part of the state and making the closing connection to a line of concurrently-executed triangulation of the Geodetic Survey near Antigo. This first-order arc is parallel to the 1930 one, is about seventy-five miles north of it, and extends eastward from Minnesota to United States Lake Survey work near Marinette. By November sixteenth all field work was completed and a preliminary comparison of lengths as carried for about 150 miles eastward from the starting base-line and then 60 miles southward to the terminal line seemed to indicate that the work was within the allowable limits of error for its class.



Courtesy Wisconsin Conservation Commission

Lookout Tower

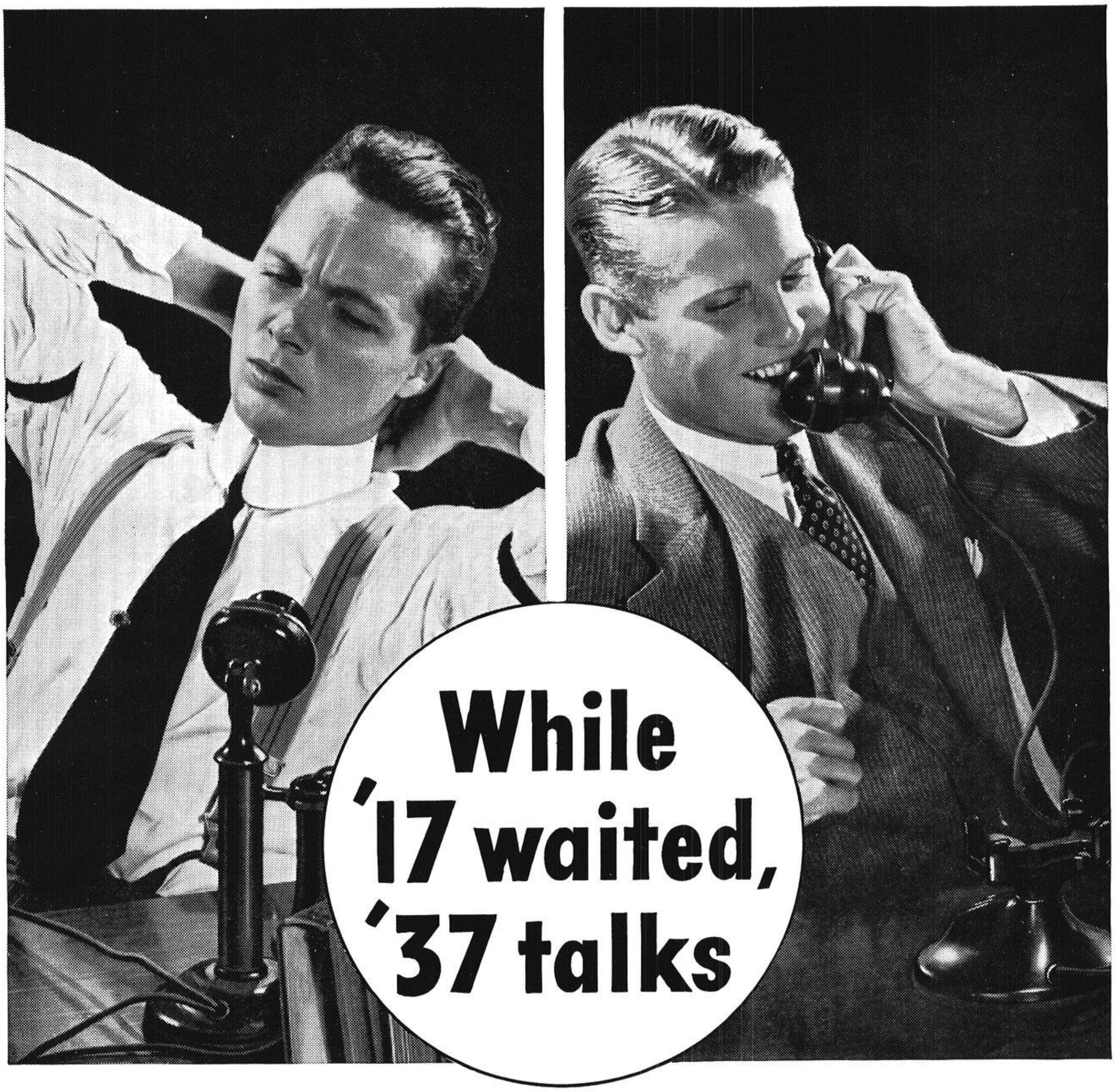
The distinguishing characteristics of this triangulation are two in number. They are the predetermined position of all stations without a consideration of accessibility, density and uniformity of distribution, character and strength of figure, length of line, and certainty of intervisibility, all of which condition the value, accuracy, or cost of a triangulation network; and the use without separate instrumental support of existing steel frame towers ranging from sixty to one-hundred feet in height to elevate the theodolites. All the towers have enclosed observation cabs with sliding or swinging windows.

The lookout towers or the stations beneath them had a definite position before any of the work was begun and there was therefore no need for a reconnaissance. It must be distinctly understood that this is not an orderly arc or belt system but rather an immediate areal control system; for it dealt with a large expanse covering almost one-fourth of the state, had large dimensions in the northern districts in all directions, and contained within its borders an assortment of indiscriminately-selected stations. Since the towers were built without regard for their use in a triangulation scheme, there naturally existed such a framework of stations that would hardly be formed by a reconnaissance officer. Figures were poorly formed and ocasionally dwindled into single, unsupported triangles; and stations at the end of some important lines were not intervisible. No other single item contributed more to the total cost of the field work than the long delays in observing due to inability to sight quickly over lines which for the types of background in this region of wooded ridges and prevalent cloudy skies were economically too long. They varied considerably in length; the longest and shortest were about thirty-seven miles and four miles respectively, and the average about twelve miles. In several instances it was necessary to occupy or point on temporary, intermediate stations in order to provide a connection between a single, outlying tower and the main body.

Almost all of the observing was done in the cabs of the towers and there always without an independent instrumental support. This meant that care had to be taken to prevent any shifting of one's weight since the level of the instrument was very easily disturbed. The time to do the actual observing was relatively small when distant towers could be picked up easily and remained quite visible. It was early found that a day or two of excellent visibility attended the end of a good rain. One day after a heavy rain four towers were occupied by a single party with the securing of good results although the average distance between stations was twenty miles and the nearest one almost sixty miles from town.

It is interesting to note that only a stiff wind prevented the attainment of satisfactory results in the newer and more stable towers and that a judicious and patient use of the tangent screws during the periods of mild wind that cause perceptible vibration of the instrument, and during cloudy weather made possible a profitable utilization of days which upon a first observation would be thought to be lost ones. No special kind of signal was used; the tower cabs being bisected as well as possible by the observer. When the angle to be measured made necessary a swing in azimuth so large as to cause the observer to shift his feet or to twist with difficulty, it was found

(Continued on Page 19)



WHEN the class of 1917 was at college, a long distance telephone call took (on the average) more than ten minutes to be put through. ¶ This time has been whittled down gradually, so that now the connection is made in an average of 1.4 minutes—nine out of ten of them while you hold the line. ¶ But this is only one phase of the relentless effort to improve. Your service is better today because voice transmission is clearer—interruptions and errors less frequent than ever before. ¶ America demands fast but sure telephone service—and gets it.

College men and women find after 7 P. M. a convenient time for long distance calling. Moreover, most rates are lowest then.

BELL TELEPHONE SYSTEM

ON THE CAMPUS

ENROLLMENT STILL INCREASES

The ever increasing enrollment in the College of Engineering during the last few years seems to indicate that interest in the field of engineering has not, and will not, lag. Freshman enrollment has climbed steadily during the depression, reaching the new high of 377 at the beginning of this semester. This is almost double the number of freshman enrolled during the term of 1933-1934.

Or for those more technically minded:

1936-37

	C.E.	M.E.	E.E.	Ch.E.	M.E.	Tl.
Freshmen	74	127	70	88	18	377
Non-Prom. Freshmen	10	25	9	10	2	56
Sophomores	67	99	75	68	18	327
Juniors	43	75	65	42	11	236
Seniors	46	55	29	44	9	183
	240	381	248	252	58	1179
Graduates	10	3	8	8	11	40

THEY MUST BE GOOD

If the number of men to qualify for Sophomore Honors and High Honors is any criterion, the engineering class of '38 is really an extremely intelligent group. Forty-two of their classmates qualified for either high honors or honors by obtaining well over a two-point average for their sophomore year in the school of engineering. Reinhardt Nils Sabee, mechanical engineer, led the list of eleven men to receive high honors with a grade-point average of 2.900; while William Newton Wright ran him a close second as a mining engineer with 2.890. The complete list of honor men is as follows:

SOPHOMORE HIGH HONORS

	Cr.	G. P. Ave.
Civil Engineering		
Krejchik, Glenn C.	69	2.650
Mechanical Engineering		
Boettcher, Richard A.	69	2.780
Sabee, Reinhardt N.	60	2.900
Voight, Henry K.	76	2.750
Electrical Engineering		
Berg, Robert H.	75	2.706
Ketchum, Paul M.	83	2.735
Chemical Engineering		
Herning, Leo A.	69	2.768
Marston, John W.	74	2.743
Sarocka, Peter S.	70	2.842
Mining Engineering		
Krenzke, Frederick J. G.	68	2.720
Wright, William N.	73	2.890

SOPHOMORE HONORS

	Cr.	G. P. Ave.
Civil Engineering		
Alexander, Frederick C.	70	2.500
Bienderra, Howard H.	63	2.570
Johnson, Herbert E.	74	2.081
Sheerar, Lewis L.	71	2.324
Van Sickle, Norman E.	68	2.279
Yerges, Lyle F.	65	2.353
Mechanical Engineering		
Brindley, Richard B.	68	2.162
Gunther, Frederick J.	68	2.191
Harker, Ralph J.	68	2.632
Krumhaus, Arthur H.	70	2.414
Laughnan, Thomas G.	68	2.573
Lohr, Richard E.	68	2.206
Sharp, Robert A.	65	2.492
Stanley, Roger U.	68	2.471
Vea, Matthew J.	72	2.292
Electrical Engineering		
Hopkins, Robert B.	62	2.629
Lingard, Aldro	76	2.250
Mitchell, Wayne T.	70	2.486
Neumann, Fred C.	71	2.267
Ross, Alan K.	72	2.277
Walter, Carl P.	76	2.447
Zamsky, Joseph	69	2.318
Zawasky, Lee M.	67	2.462
Chemical Engineering		
Beals, Kenneth M.	74	2.283
Eckmann, Clarence M.	70	2.285
Fiedelman, Howard W.	74	2.554
Haufe, Ted B.	74	2.324
Roshar, Myron T.	70	2.357
Mining Engineering		
Grange, Howard L.	73	2.273
Grignon, Andrew O.	77	2.441
Yarnutowski, John L.	72	2.277

ENGINEERS SWAP RIFLES FOR SHOVELS IN NEW ROTC UNIT

In order to afford students in the College of Engineering who are interested in military training an opportunity for training in the branch of the service for which their academic work and profession best fits them, an Engineer unit of the ROTC was established here at the beginning of the school year. It was one of several new Engineer units established in various universities and technical schools throughout the country.

The enrollment is much like the other ROTC courses in that it is divided into the two year basic course and two year advanced course. Enrollment in the advanced course is limited to forty students. Upon successful completion of the advanced course, students may be recommended for commission as 2nd Lieutenant in the Engineer Branch of the Officers Reserve Corps. Because of the nature of the subjects taken up in the advanced course, it was impossible to establish a second year, advanced course class this year. Students for the second year, basic (sophomore) and first year, advanced course were obtained by transferring engineers previously enrolled in the Infantry and Signal Corps units. Interest in the unit is shown in the fact that 93 freshman engineers have enrolled in the course.

Work covered in the basic course covers much of the same ground as the Infantry and Signal Corps courses. In addition to these subjects map making, aerial photographic mapping, military sketching, and rigging are taken up. In the advanced course the engineering subjects of field fortifications, military roads, military bridges, demolitions and construction in war are covered. Advanced course students also attend a six weeks camp at Camp Custer, near Battle Creek, Michigan, where they receive practical instruction in field engineering.

WITH THE SOCIETIES

A. S. M. E.

The largest turnout in many years marked the opening of the current semester's activities for the student branch of the A. S. M. E. as better than 150 men completely filled room 106 of the Mechanical Engineering Building. The president, Eugene Kirtland, opened the meeting and introduced Mr. Colbert who gave a short talk on the advantages of membership in the national society. He presented several excellent reasons, but the one of which most note was taken by the audience was the fact that there are cash prizes offered in several national competitions sponsored by the national group.

The principal entertainment of the evening was furnished by Professor Larson, head of our Mechanical Engineering School and president of the American Society of Heating and Ventilating Engineers. He showed some extremely interesting colored motion pictures which he took during a trip around the United States last summer. Scenes of the Grand Canyon, Huntington Library in Los Angeles, the San Francisco-Oakland Bridge—which is being built by W. A. Rogers, a graduate in 1888 of our Civil Engineering College—were particularly well received by the group. As an interesting sidelight, he mentioned that geologist-lecturers in the Grand Canyon claim 1,000,000 tons of silt are carried toward Boulder Dam through the Canyon every day. At this rate, the lake created by the dam will be filled up in 150 years or so.

The evening was brought to a close by the serving of cider and doughnuts. Eugene announced that while the eats were pretty scarce this time due to the unprecented attendance, next time there would be more than enough for all.

A. I. Ch. E.

The first meeting of the A. I. Ch. E. was held on Oct. 7, 1936 at the Ch. E. Building. Officers were elected and the year's activities were discussed. Ralph Goetz was chosen president to succeed Neal Olson who was made this year's vice-president. John Heuser was elected secretary and Ed Anderson, treasurer.

Peter Sarocka was made the junior Polygon representative, and it was voted to give a Chemical Engineer's Handbook to the highest freshman in the Ch. E. School. Leo Fuchs stood high with an average of 2.89.

The next meeting will be held on the first Wednesday in November, the fourth.

MINING CLUB

The prize for student interest among the organizations goes to the mining club this month for, with an enrollment of only 58, they had a turnout of 52 men. Their president, Wayne Hunziker '37, who is carrying over from last year's elections, took charge of the meeting and had to use all his faculties in keeping it under control. While there was no definite attempt at disorder, opinions were strong and discussion vigorous.

The office of secretary-treasurer was the only one left vacant and George Schmidt '39 was elected to fill it. After his election, the question was raised as to whether one man or several should have charge of the year's activities.

Following a sharp discussion, the club decided to follow last year's custom and have one man take the responsibility. Larry Simon '37 was elected for this job.

After these heated verbal battles, refreshments were served and the club disbanded for the evening.

ALUMNI NOTES

Mechanicals

DERLETH, CLARK F., '29, has a position as a designer of dairy equipment with the D. F. Rusel Company at Watertown, Wisconsin.

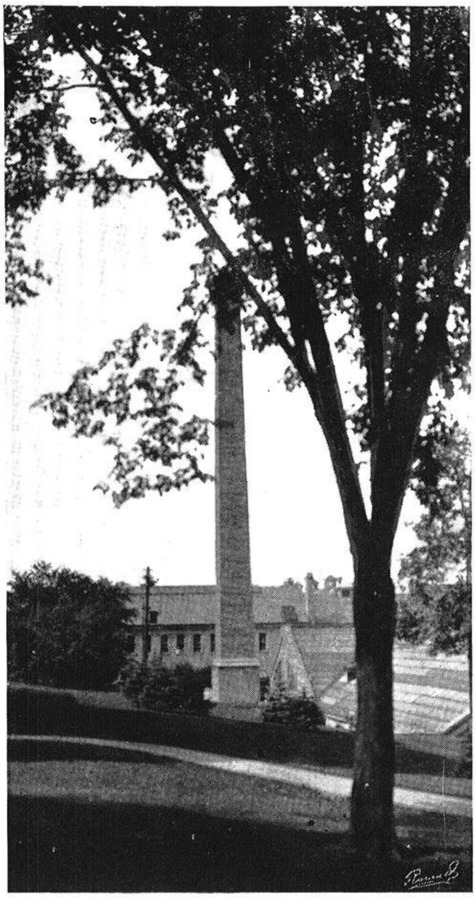
EGGERT, ERWIN H., '29, as plant engineer, is in charge of all engineering problems at the Baltimore plant of Proctor and Gamble.

FELTEN, HOWARD A., '29, is engaged as an estimator at the Ladish Drop Forge Company of Milwaukee.

GERLACH, H. W., '29, is a special representative in the agriculture sales department of the Caterpillar Tractor Company.

KEHL, RALPH H., '32, is superintendent of the department compounding, manufacturing, and finishing "Kimflex," a leather product, at the Kimberly-Clark Corporation of Neenah, Wisconsin.

KRATSCH, A. E., '29, in the capacity of chief engineer, designs paper, textile, and woodworking machinery for Curt G. Joa, Inc., in Manitowoc, Wisconsin.



Electrical Lab. and Radio Hall

KUEHLTHAU, HUGO L., '28, is employed in the machine design department of the Whiting Corporation at Harvey, Illinois.

McCREARY, RAYMOND A., '33, has recently been promoted to checker of detailing, layout, and design of air conditioning systems at the Gardner Machine Company of Beloit.

McLANE, JOHN D., '29, is working for the Bell Telephone Company at River Grove, Illinois. Mr. McLane holds the rank of second lieutenant in the Illinois National Guard.

McKIVETT, KENNETH, '32, has the position of claim adjuster for the Employers Mutual of Wausau, Wisconsin.

MILLER, DONALD J., '31, is connected with gas distribution for the Public Service Company of Colorado.

REED, RUSSELL H., '30, teaches and does research work on the design of farm machinery at the University of Illinois at Urbana, Illinois.

SCHROEDER, RALPH R., '30, does installation work in the field for the Wisconsin Telephone Company of Milwaukee.

STECKLER, NORBERT, '31, is designing high pressure fat processing equipment for Proctor and Gamble, Ivorydale, Ohio. Mr. Steckler after leaving Wisconsin studied at Yale and at the Technische Hochschule in Hannover, Germany.

STEINKE, CARLYLE J., '30, is doing industrial engineering work at Cutler Hammer Inc., Milwaukee.

STEUDEL, GEORGE, '11, superintends the blast furnace operations at the South Works of the Illinois Carnegie Steel Company at South Chicago.

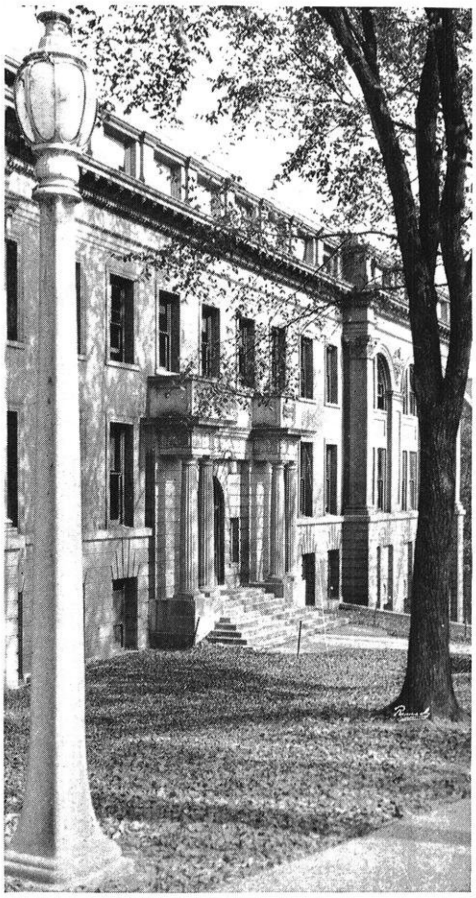
STOLZ, FREDERICK W., '32, serves as designer of paper making machinery at the Fort Howard Paper Company, Green Bay, Wisconsin.

WOODWARD, CLIFFORD B., JR., '31, is employed in air conditioning design, installation, and service by S. S. Fretz Inc., Philadelphia, Pennsylvania.

Chemicals

BAMBAS, LOUIS, '32, was married August 5 and now lives in Pittsburgh, Pennsylvania. He will get his Ph. D. the coming semester, and is now doing full time research at the Western Pennsylvania Hospital. At the September meeting of the American Chemical Society, he gave a paper on the Respiratory encymes of Pncumococci.

BOGEN, JACK, '36, is a research engineer engaged in diesel fuel analysis for Waukesha Motors, Waukesha, Wisconsin.



Illustrations Courtesy Wisconsin Alumni Assn.

Engineering Building

CEAGLSKE, NORMAN, '32, has left Wisconsin this fall for the University of Iowa, where he will be an instructor in metallurgy under Dean Dawson.

DARBO, HOWARD, 32, has a position in the patent department of Burgess Battery Company, Madison.

ELLIOTT, GEORGE C., '35, and **HASLANGER, R. V.**, '35 are with the Marathon Paper Company of Wausau, Wisconsin.

FRITZ, NICHOLAS H., '33, has a son, Karl, born August 31 at Manistee, Michigan.

JUSTL, OTTO, '32, is on the Wisconsin Power and Light Company staff, at the gas works, Fond du Lac, Wisconsin.

ROSTEN, PHILIP W., '35, is engaged in plant development work for the National Enameling and Stamping Company of Milwaukee.

WINK, KENNETH R., '35, is working in the research department of the Kimberly-Clark Company at Kimberly, Wisconsin.

Miners and Metallurgists

ARCHIE, GUS, '31, has employment as exploitation engineer for the Shell Petroleum Corporation, McPherson, Kansas.

BEMIS, REGINALD S., '29, a mine foreman for the Cerro de Pasco Copper Corporation at Morococha, Peru, is the proud father of a child.

CRAWFORD, HOWARD D., '31, holds the important position of chief chemist of the United Verda Copper Company, Clarksdale, Arizona.

DOLLMEYER, WALKER G., '24, is employed as a metallurgist for the Brill Company, manufacturers of trolley cars, located in Philadelphia, Pennsylvania.

ERDMAN, EDWARD A., '36, is engaged in metallurgical work at the Cutler Hammer Company of Milwaukee.

FRITSCHE, OSCAR O., '25, acts as an engineer in the unemployment insurance department for the Industrial Commission of the State of Wisconsin.

HAAS, OSCAR A., '26, is now the chief engineer of the Oklahoma Iron Works at Tulsa, Oklahoma.

HAVARD, J. F. R., '35, has recently been appointed mine superintendent of the U. S. Gypsum Company at Southard, Oklahoma.

JONES, E. W., '23, has the position of executive director of the Albany Hospital Union Medical Center of Albany, New York.

KEMLER, HERBERT J., '22, acts in the capacity of general manager of the Shell Petroleum Corporation at McPherson, Kansas.

>□<

Civils

CURTIN, JAMES H., c '07, died on July 1.

HALVERSON, GERRY M., c '35, started work in June with the Wisconsin State Board of Health as sanitary engineer with headquarters at Neilsville, Wisconsin.

KRASIN, LAWRENCE L., c '32, MS '36, has joined the staff of the Armin Elmendorf (Wis. '19) organization at 2245 South Crawford Avenue, Chicago, Illinois.

PELESKE, LEO W., '30, is doing municipal engineering work for the city of Superior, Wisconsin.

REINHARD, LOUIS F., c '07, of Milwaukee, died on June 2, 1936.

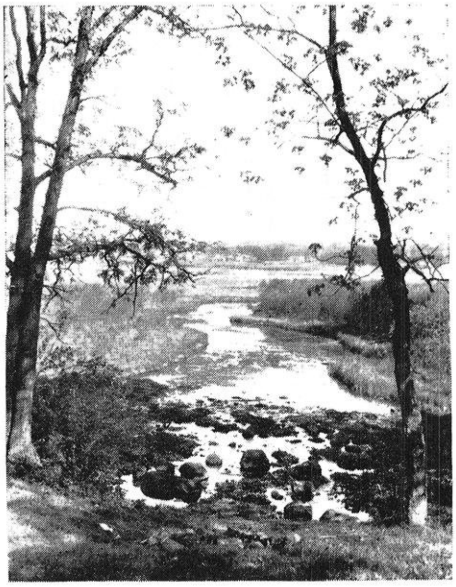
SHOREY, EDWIN ROBERT, '35, has the position of exploitation engineer with the Shell Petroleum Corporation located at Lyons, Kansas. Shorey has been with the Soil Conservation Service and has completed the training course of the Shell Oil Company since his graduation from the University.

SUTTON, F. MICHAEL, '35, after being laid off by the highway commission, went to Los Angeles for a visit and landed a job with the Truscon Steel Company shortly after he arrived.

TUHUS, KENNETH, c '33, was appointed late in August as state hydraulic engineer for PWA work in South Dakota, with headquarters at Pierre, South Dakota.

VAN HAGAN, ROBERT L., c '32, joined the TVA staff at Knoxville last May as structural designer.

WHITNEY, EDWARD N., '13, whose father was Prof. N. O. Whitney, head of the department of railway engineering at this university, has married Penny Warwick of San Francisco. He is employed on construction work for the city of San Francisco.



University Arboretum

"STATIC"

By ENGIN EARS

Back from the farm, the machine shop, and the neighborhood taverns we come. The campus looks pretty good to us. The bell tower still squats on its hill, a modern Sphinx. Lincoln does likewise, a smile of scorn on his homely pan as he turns his back on the Bascom Bums and eagerly watches for the return of the Engineers. From the way some of our neighbors hike across the lawns one can easily see that they haven't yet gotten used to sidewalks after their summer on the farm. The new Civils are sharpening their brush hooks for an assault on the forest primeval out west of the ski slide (moral; always take T. E. in the Spring). Book stores have those shiny (and expensive) slide rules in the window again. It gives us a bit of a bounce to come back to it all. Yep, the cornice above the doorway of the E. B. is still crumbling, the drinking fountains still spout a pre-heated bilge that tastes suspiciously like condensate feed water from the Hydro Lab., the classroom seats are as hard as ever. Wind and rain have succeded where a whole shyster population could not—the green flag atop the Law roof has disintegrated, but its pole still clings at a wierd angle on the pinnacle to which Engineering daredevils wired it one dark and memorable nite last Spring.

Old friends, old sights, old report files—but we'd better stop. Who ever heard of an Engineer going sentimental?

» » « «

They're telling the tale of Jack Heuser, ChE.2, who attended a Congregational dance and picked up a comely babe (blonde). While they danced the conversation turned to (of all things) the N.S.L. and communism. When she found he was an old line Republican quoth she "I only spoke to you because you looked like a young campus radical. I'm a member of the Young Communist League, you know." Which rather set our personality boy, Comrade Heuser, back on his heels.

» » « «

Among the crop of frosh engineers is one Orlando Garcia of Havana, Cuba. You should hear that boy swing to La Cuccaracha sometime.

That man is back again. You know—the twerp who calls himself "The Voice of Experience." We wanted to wastebasket the whole works but the editor said no, we had to fill space—there's nothing else worth putting in this issue anyhow (Ed. Note—That's a lie.) so help yourself:

ADVICE FO' FROSH

or

How to Look a Campus Smoothie Tho You Ain't

October hath come and with it the frosh, in herds, mobs, and noisome gobs. They nauseate; they turn our stomachs; we've never seen a poorer collection of greenies. It's all very depressing. It hardly seems that even four years of good associations can whip them into the fine, smooth creatures that we upperclass Engineers see in our shaving mirrors each morning. Not, of course, that all of 'em will attain this goal. There are some hopeful Engineers destined to flunk out, transfer to L & S and make Phi Bete. Still others there are who, because of moral and social deficiences, will be thrown out, to sink lower and lower in the mire until—heaven forbid—they end up in the Law School. Those of you who, by our Herculean efforts of help, survive may become halfway good Plumbers at that. But you've lots to learn, so follow closely:

Lesson I—Dress

One of the most distressing things about frosh is their tendency, the sissies, toward becoming fashion plates. It generally takes about two months over a drawing board and in the wierd murk of the Chem. Lab. to convince Joe Esquire that Oshkosh B'gosh has the inside track over Spoo and Stefan. Neckties, incidently, are archaic, especially around the shops. Or, if tolerated, they must be of hue as violent as a Watrous sunrise. The frosh must also learn to revere the blessed corduroy which, like the reservoir of a Carnot engine, has an infinite capacity for absorption and wear. In fact, it takes a full semester for a pair of same to reach a point of mature comfort and ripeness. The common garter was found to be an offense against the laws of Mechanics 1 and consequently outlawed, allowing the gravitational constant, g, to assert itself in the matter of socks. Shoes ARE being worn to class this season (Ag. students please take note). Amongst Civils, it is considered treason to be found without the old hi-tops on. Civils, it is said, always die with their boots on. The slide rule, be it Mannheim or Decitrig, completes the ensemble. An Engineer, remember, without his slip-stick is practically undressed and in no condition to appear on a public thoroughfare.

Lesson II—Deportment

Freshie caps have gone the way of the Newcomen engine but that matters not for the blackest night cannot conceal the yearling's greenness. He fairly goons all over our fair campus; he skips and minces, swaggers, blocks entrances, falls over people—it's pitiful to watch. So listen closely, my pin-feathered friends. Take life leisurely. If you're late for your 8 o'clock, at least you're on time for your 9. Soak up the scenery, botanical and feminine, as you go. An Engineer must learn to make quick estimates and to judge construction (though he may get his face slapped if he mis-estimates), but we'll leave that subject for a later lesson.

The Engineer does not—emphatically not—walk up the Shyster side of the Hill, nor does he loiter in front of Bascom (with all the dolls roaming the Engineering Building these days that form of relaxation is unnecessary.) Between classes he may sit on Engineering steps and block the entrance to the best of his ability but, more frequently, he spends those precious 10 minutes in his next hour's classroom copying his neighbor's problems.

The Engineer in class may sit on the back of his neck and stare out the window, if he so chooses, but he does keep both ears open and his yap shut. This modesty in the matter of recitation is for the most part strictly necessary and saves much embarrassment. Apple polishers must remember that they pay off on quiz averages in this school. Still, a tentative swipe with the polishing rag, we have found, does no harm now and then. The Engineer's disillusionment begins the moment he discovers he's to get none of his Chem Lab. "deposit" back. By the time he graduates he believes nothing except the formulae in his handbook, and respects no human beings except his parents and (strangely enough) his Engineering instructors. His conversation is unique, being 63% gripe, 24% dirty stories, and the rest shop talk. He pays his Polygon fees (note to editor: Was that a smooth plug?) chiefly in order that he may gripe about the way Polygon is run.

The crucial test of a true Engineer is to stop him on the street and ask him to multiply 2 by 3. If he thinks a moment and says, "Six"—phooey, he's still a frosh at heart. But if he whips out his battered guess-pole and jazzes the result off that—hats off to a real Engineer.

» » « «

From an old Chinese proverb: Engineers create happiness wherever they go, lawyers whenever they go.

» » « «

Add definitions: Two pints make one cavort.

PROBLEM

Krejchik and his date drive due North at an average speed of 45 m.p.h. for 1 hour. Alexander and his date start from the same point 10 minutes later and drive SSE. for 27 minutes at an average speed of 20 m.p.h. At the end of two hours Alexander has gotten further than Krejchik. Explain.

» » « «

Now we know why the A.I.E.E. chapter always has such quiet meetings. They have a wild animal trainer in Mr. Tracy, their advisor. While he was holding a conference in his office the other day, a rabbit calmly hopped up on his window ledge and proceeded to make faces at conferees.

» » « «

Then there was the history stude who asked us for the definition of a "privy council." The Sewage Disposal Commission, of course.

» » « «

The cellophane loving cup for this month goes unanimously to Mr. Bird of the Math dept. who's been puzzling ever since school started as to how his Calc. studes know all the right answers. The other day someone broke the news to him that there were answer books for that sort of thing.

"Oh," cried he, "And all this time I've been working out each day's assignment by hand myself so that I can check your answers." Ignorance is not always bliss.

» » « «

Then there was the forestry student who bought himself a log-log slide rule.

CLASS OF '36 HAS

"MEN AT WORK"

This article gives the occupations of the senior engineers who graduated in June as far as we know them. Most of the men not listed have jobs, but we have not been able to find out enough about them to publish. We will appreciate any information on these men.

OETTING, ROBERT L. has been working in the General Electric Lighting Institute, Nela Park, and is now at the G. E. Lighting Exhibit at the Great Lakes Exposition, Cleveland, Ohio. His address is 2111 Abington Road, Cleveland, Ohio.

PERSCHBACHER, HOWARD V. is working in the system engineering division of the distribution department of the Milwaukee Electric Railway & Light Company. His address is 2855 N. Murray Avenue, Milwaukee, Wisconsin.

HENRY, J. E. has been resident engineer for the Wisconsin Highway Commission in the Green Bay division and was transferred to the Superior division September 1. His address is 1701½ No. 22nd Street, Superior, Wisconsin.

YEAGER, KEEHN E. is doing estimating and design work at the Yatevy Radiator Company in Racine. His address is 840 College Avenue, Racine, Wisconsin.

SWANSON, MAURICE C. is a special engineering apprentice with the American Locomotive Company, Schenectady, N. Y. He is in training in the locomotive shops for locomotive sales and service work on steam and diesel-electric motive power. His address is 108 Collins Avenue, Scotia, N. Y.

WELKER, OSCAR L. is employed as a cadet engineer with the Connecticut Coke Company. He is being shifted around to different departments but has been mainly doing electrical maintenance work. He can be reached at 201 Park Street, New Haven, Connecticut.

WRIGHT, JOHN F. is with the Standard Oil Development Company, a division of the Standard Oil Company of N. J. which does the research and development for all branches of Standard Oil, the world over. His address is 643 Park Avenue, Elizabeth, New Jersey.

PFANKU, HARLAN D. is with the Aluminum Company of America doing permanent mold designing. He was married June 28 in St. Peter's Lutheran Church, St. Peter, Minnesota, to Miss Gretchen Menke. His address is 3864 W. 38th Street, Cleveland, Ohio.

SHACKTON, J. E. is employed by the Howell Electric Motors Company at Howell, Michigan. He is now going through their training course with an ultimate job in the sales department in view. His address is 202 N. Walnut Street, Howell, Michigan.

HOFFMANN, ROBERT W. can be written to at 3402 N. 41st Street, Milwaukee, Wisconsin.

RODERICK, HARRY E. is employed with the Ken-Rad Tube and Lamp Corporation in Owensboro, Kentucky, as a junior engineer in the assembly department. He says that he enjoys living in Kentucky and that southern hospitality is all that they say it is. His address is 412 W. 9th Street, Owensboro, Kentucky.

KOLLER, HARRY is getting extensive air-conditioning training at the Trane Company, La Crosse, Wisconsin.

PFISTOR, EDWARD A. is employed as an engineer at the Bayside Steam Plant of the Wisconsin Public Service Corporation. He is rooming at the "Y" with **HANK CARLBERG,** '36, who is working for the same company in the engineering department. Their address is Y. M. C. A., Green Bay, Wisconsin.

AHRENS, LES G. is employed by the Proctor and Gamble Company at their Ivorydale plant in Cincinnati. His address is 4646 No. Edgewood Avenue, Cincinnati, Ohio.

HOUGEN, J. O. earned a fellowship in the Ag School here.

LEFEVRE, MILTON A. is with the Ray-O-Vac Company of Madison.

McCALL, JOHN I. is an assistant in the Process Control Department of the Illinois Steel Company in South Chicago, Illinois.

MAYLAND, HARRISON C. is with the Universal Oil Products Company at Riverside, Illinois.

PHILLIPS, D. C. has taken a position with Parker, Carlson, Pitzner, and Hubbard in Chicago.

RAPP, ROBERT went to the Hoberg Paper Mills, Green Bay.

RIEGLER, W. L. is working for Carnegie-Illinois Steel Corporation, Chicago.

STUBBINGS, RUSSELL H. is employed by the Universal Oil Products Company in Riverside, Illinois.

THEUNE, J. O. is with the Harnischfeger Corporation in Milwaukee.

WILLIAMS, T. J. is also working for the Universal Oil Products Company at Riverside, Illinois.

CROSSETT, JOHN is working in the heat treating department of the Gisholt Machine Company, Madison.

GORDON, DONALD H. is an instructor in chemical engineering here.

HEAD, BERT L. is at the Hawthorne plant of the Western Electric Company in Chicago.

PAGEL, LAWRENCE C. is working for the Mautz Paint Company, Madison.

HERTEL, R. F. is connected with G. E. in Schenectady.

WHITESIDE, R. E. is with the Westinghouse Engineering and Manufacturing Company, located in Pittsburgh.

DAVIS, R. E. is employed by the Oil Gear Company at Milwaukee.

JOHNSON, K. is working for the Ken-Rad Company at Owensboro, Kentucky.

KRAEMER, W. F. is enrolled in the Medical School here.

SCHEER, W. P. has taken a job with the Milwaukee Gas Specialty Company at Milwaukee.

KUEHN, F. J. went to General Electric Company in Schenectady.

KOPENITSI, C. T. is with the Oil Gear Company in Milwaukee.

RICE, J. B. took a position with A. O. Smith Company, also in Milwaukee.

PETERSON, D. W. is working for R. C. A. in Camden, New Jersey.

WILSON, H. H. is enrolled in the Graduate School at Wisconsin.

DAVIES, R. L. is with the Oil Gear Company in Milwaukee.

KNOPOW, J. is also continuing his work in the Graduate School here.

FOSSUM, H. went to Sinclair Oil Company in Chicago.

WOLFE, A. R. is working for the Burgess Battery Company.

SUTTER, R. L. was employed by Harnischfeger Corporation at Milwaukee.

PARKER, R. S. is working for Kimberly-Clark Company at Neenah, Wisconsin.

WOLFE, E. C. went to the Chicago Transformer Company.

CARLBERG, H. A. is connected with the Wisconsin Public Service Corporation in Green Bay.

MICKELSON, CEDRIC, M.S.'36, is junior metallurgist with the American Rolling Mills Company, Gary, Indiana.

ANDERSON, BOYD G. is with C. S. Whitney, consulting engineer of Milwaukee.

BENDER, JOHN S. is with the James A. Crosbie Construction Company of Bluffton, Indiana, engaged in general contracting.

BLANCHAR, JOHN E. is with the U. S. Army Engineers at Baton Rouge, Louisiana.

BLERSCH, JOHN A. is setting building stakes for the Greendale Resettlement Project at Hales Corners, Wisconsin.

BOGOST, MEYER S. is sanitary engineer for the Cedarburg Canning Company.

CRANDALL, LEE W. is instructor in topographic engineering in this college.

DITHMAR, EDWARD U. has returned to the university to complete the law course.

DRESSER, J. GILBERT has been engaged privately in tree-trimming during the summer. He will go to the Carnegie-Illinois Steel Company in Chicago on November 1.

FENNO, JOHN C. is engineer with the Chicago, Milwaukee, St. Paul and Pacific Railroad at Milwaukee.

HAMBRECHT, ALBERT H. spent the summer visiting in California. He began work late in September with WPA in Madison as designer.

HARVEY, STANLEY T. is with the Wisconsin Highway Commission at Lancaster.

HAWLEY, ROBERT E. is with the Youngstown Sheet and Tube Company at Youngstown, Ohio, as assistant engineer in the waterworks division.

HOERIG, CURT E. has returned for a master's degree in mechanics.

JANDACEK, EMIL J. is with the TVA at Knoxville, Tennessee.

KABAT, FRANCIS J. is with the Allen Bradley Company of Milwaukee, manufacturers of electrical goods.

KESTER, WILLIAM H. is with the American Bridge Company at Gary, Indiana.

LEOPOLD, LUNA B. has a federal job at Santa Fe, New Mexico.

WOLFF, GEORGE L. is employed by the Underwriters' Laboratories in the Gases and Oils department. He works on fire extinguishers, domestic oil burners, and oil burning stoves. His address is 207 E. Ohio Street, Chicago, Illinois.

MOHAUPT, ALVIN is working for the Interstate Drop Forge Company at Milwaukee.

CASIANO, LOUIS J. is working as a draftsman for the Carnegie Illinois Steel Corporation. His address is 129 Superior Street, Youngstown, Ohio.

SICKERT, GENE D. is working in the heating division of the Perfex Radiator Company, Milwaukee. His address is 2178 N. Sherman Boulevard, Milwaukee, Wisconsin.

WELCH, R. L. is employed as an assistant electrical engineer at the Underwriters' Laboratories, Chicago. His address is 1226 N. State Street, Chicago, Illinois.

NIKORA, LEO S., editor of the WISCONSIN ENGINEER last year, is working for the Shell Oil Company at St. Louis. His address is Downtown Y. M. C. A., St. Louis, Missouri.

HALAMKA, GEORGE L. is with the U. S. Army at a C. C. C. camp at Eddyville, Illinois, constructing water towers, laying hardwood floors, and teaching classes besides.

GURDE, ARTHUR B. is employed by the Caterpillar Tractor Company of Peoria, Illinois.

HALAMKA, CHARLES J. is working with the Wisconsin Highway Commission at Madison.

LEWIS, WAYNE C. is with the Wisconsin Highway Commission at Madison.

LIEBMANN, JOCHIM E. is a fellow in mechanics at this college.

LINCOLN, FRED W. is with the Chicago, Milwaukee, St. Paul and Pacific Railroad at La Crosse.

LISKA, JOSEPH A. is instructor in mechanics at this college. He was with the Wisconsin Highway Commission at Green Bay during the summer.

LUBINSKY, RICHARD G. is with the Wisconsin Highway Commission at La Crosse.

MATTHIAS, CARL D. is with the U. S. Engineers office at Milwaukee. He has been stationed at Leland, Michigan.

PETERS, REINHARDT E. is with the U. S. Engineers at Milwaukee.

PETERSON, VERNON O. is with the U. S. Army Engineers office at Milwaukee. He has been stationed at Green Bay.

RHODES, JAMES A. is with the National Resources Board at Madison.

ROHLICH, GERARD A. is fellow in hydraulics at this college. He spent the summer in the U. W. hydraulics laboratory in a study on water-hammer for the Fleming Manufacturing Company of Chicago.

SHIPMAN, JOHN L. is with the Chicago, Milwaukee, St. Paul and Pacific Railroad at Milwaukee.

SIMANDL, CHARLES J. is with the N. S. Mackie Company of Chicago, engaged on a job at Michigan City.

SMITH, JEROME J. is with the Wisconsin Highway Commission in the materials laboratory at Madison.

SPERLING, ARTHUR F. is with the Wisconsin Highway Commission at Milwaukee.

STIEMKE, ROBERT E. is with the U. S. Army Engineers at Milwaukee as inspector on dredging.

STREWLER, GORDON J. is reported to be teaching.

TER MAATH, BERNARD H. is with the U. S. Army Engineers at Rock Island, Illinois.

VAN HAGAN, CHARLES E. is with Engstrom and Wynn, engineers and contractors of Wheeling, West Virginia.

VOGEL, RALPH H. is with the Wisconsin Highway Commission at La Crosse.

WILD, HARRY E. is with the U. S. Army Engineers at Milwaukee.

FREEMAN, HARRY is an apprentice in the maintenance department of the Carnegie-Illinois Steel Company, South Chicago, Illinois.

KAUFMAN, HERSCHEL is blast furnace apprentice with the Carnegie-Illinois Steel Company, South Chicago, Illinois.

EASTERLY, JOHN is employed by the Republic Steel Company, Cleveland, Ohio. His work is in the metallurgical sales field.

GALLISTEL, ALBERT F., M.S.'36, is in training with Leeds and Northrup Company, Philadelphia, Pennsylvania.

HOLM, HOWARD G. is research fellow in metallurgy at the University of Wisconsin.

RUNDE, O. F. has been working with the government on the Richland County Rural Electrification project at Richland Center.

MIEDANER, W. H. went to Swift and Company in St. Paul, Minnesota.

NAYSMITH, S. R. is employed by the Miller Company, located in Meriden, Connecticut.

LEHRKIND, A. went to the Burgess Battery Company.

BABBITT, J. K. is also with the Burgess Battery Company. The location is Freeport, Illinois.

THIELE, P. F. returned to continue his studies in the Law School here.

BACHHUBER, R. A. went to the High Grade Sylvania Corporation at Emporium, Pennsylvania.

BOLDT, R. was employed by the A. O. Smith Company of Milwaukee.

HAMANN, R. H. is the coach at the Kimberly High School in Kimberly, Wisconsin.

GLANZER, FRANZ is employed by the Claus Manufacturing Company in Milwaukee.

COLE, ALAM W. is connected with the Carbide and Carbon Chemical Corporation. He is located in Charleston, West Virginia.

CADWELL, J. J. went to the Carnegie Steel Corporation in Chicago, Illinois.

GROSS, EDWARD W. is working for Allis-Chalmers Company in Milwaukee.

MERCER, ROBERT is with the Sturtevant Company in Boston, Massachusetts.

MORTENSON, ROBERT has been working for the Consolidated Water Power Paper Company in Wisconsin Rapids, Wisconsin.

THOMAS, JOHN P. took a position with the Federal-Huber Company in Plano, Illinois.

STUEWE, HERBERT A. has been employed by the Carbide and Carbon Chemical Company at Charleston, West Virginia.

DOW, HERBERT is with the General Electric Company in Schenectady.

BEYER, ARNOLD T. is connected with the Carnegie Steel Company at Gary, Indiana.

TRASKELL, TONY is with the Douglas Aircraft Company in Santa Monica, California.

STANEK, JEROME has been with the Johnson Service Company in Milwaukee.

SAUE, REGINALD T. is working for the Babcox and Wilcox Company in Barberton, Ohio.

MURPHY, THOMAS C. has been engaged by the Sheboygan Construction Company in that city.

KLUGE, BURNETT is with the Bayley Blower Company, Milwaukee.

KOSTER, A. L. is connected with the Four Wheel Drive Company in Clintonville, Wisconsin.

GARMAGER, HENRY took a job with Fairbanks-Morse Company at Beloit, Wisconsin.

BANKS, CHARLES is also employed by the Kimberly-Clark Company at Neenah.

SCHOENHOFEN, LEO went to Chain Belt Company in Milwaukee.

BUXTON, E. B. went to the Boeing Company in Oakland, California, where he is getting flight instruction.

BARNEY, EDWARD is with the Chain Belt Company of Milwaukee.

VAN VLEET, JAMES G., M.S.'36, has a position with the Linde Air Products Company at Buffalo, New York.

KOLB, J. K. went to Sun Oil Company in Detroit.

MEYER, ARNOLD has been employed at the Heil Company in Milwaukee.

COOK, EUGENE is with A. O. Smith Company in Milwaukee.

FULLER, HENRY is employed by the same concern, the A. O. Smith Company.

STREKEWALD, PAUL has gone to the Wrought Washer Company and is located in Milwaukee.

VAN VLEET, JOHN has been employed by the Shell Oil Company in St. Louis.

GUENTHER, LAWRENCE has returned to do graduate work at the University.

SEVERSON, LLOYD M. is junior mining engineer with Patino Mines and Enterprises, La Pas, Bolivia, S. A.

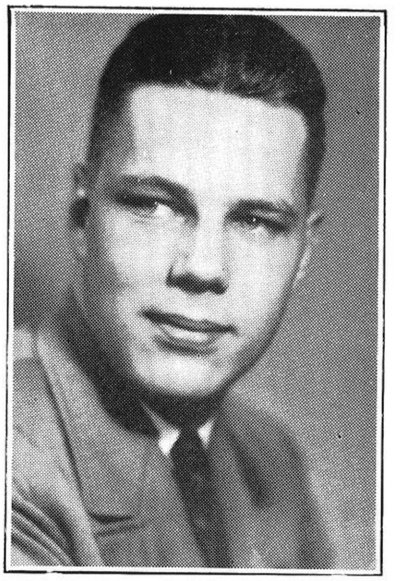
NIEMAN, GILBERT O. is mining engineer with the National Zinc Company, Shullsburg, Wisconsin.

OCKERHAUSER, THOMAS is in the training department of Shell Petroleum Corporation at Oxford, Kansas.

BEECHEL, GRAYDON R. is junior mining engineer with Mountain City Copper Company, Mountain City, Nevada.

An Engineer Directs Homecoming

It was while toiling in the "glory hole" of a trans-Atlantic liner that J. Gordon Fuller, General Chairman of 1936 Homecoming, decided to take up mechanical engineering. Two summers spent working as a wiper with the "black gang" in the engine rooms of the Baltimore and Maryland Company's ships aroused in him the urge to be an engineer. There our Homecoming chairman got his first taste of steam turbines, pumps, and condensers, his introduction to steam and gas. Among his achievements was that of acclimating himself to the steady 130° F. heat of the fire-rooms.



Gordon Fuller

Fuller, who graduated from Wisconsin High, has spent his last six summers either at sea or touring the United States. This summer he voyaged to Norway and England, then returned to spend the remainder of his vacation with the Ag. Engineering department testing (of all things) the pulling ability of draft horses at various county fairs. Nor has Gordy loafed during the school months. He sets out this fall for his third year of varsity basketball at the forward post on Bud Foster's squad, yet finds time to serve on the Student Athletic Board, Orientation Week Committee, and keeps things humming at the S.A.E house. In recognition of his outstanding work on the campus, he has been elected to Iron Cross, White Spades, and made vice-president of the "W" Club. Fuller comments (diplomatically?) that he likes all his engineering professors but admits that his favorite is Pat Hyland.

Under his leadership, Homecoming will be bigger and better than ever. As Gordie says, "I want to give all the

Engineers a break at Homecoming this year. I expect their help in selling buttons, erecting the bonfire for the pep rally, turning out en masse for the same, and taking a prominent part in the program. With the aid of the Engineers Homecoming can't help but be a success."

FIRE TOWER TRIANGULATION - -

(Continued from Page 8)

better to have one man make the initial pointing and the second the final one.

Since the increased cost of night work is generally prohibitive for Geological Survey triangulation even when the day observing conditions are poor, observations were made in any kind of weather in which it was possible, at all, to make out, however faintly, the distant towers. In spite of the occasional necessity of reoccupying towers to secure better triangle closures, to sight towers previously not found, or to correct blunderous pointing, it was found that the results were, in general, better than were expected under the adverse climatic conditions. When it is realized that most triangles closed within three seconds and few above six, there seems to be no need to wait for a particular kind of weather for work of this order.

The only computations made in the field were those of lengths without considering the spherical excess which for the size of the triangles was for the most part only a few tenths of a second and in general less than the uncertainties in the angles due to errors of observation. When at the close of the season's work the computed length of a line on the southeastern border of the area was compared with its more precise length from the 1934 Geodetic Survey arc, it was found that there was a relative difference of 1-10,000.

In all the positions of 137 state and federal fire-towers was determined at a total field cost of $4,500, or at an average cost per main scheme station of $33. In addition the geographic coordinates of 56 intersection points suitable for plane-table control was determined. Since the Conservation Commission furnished the materials and the labor for setting the concrete posts, each of which had imbedded in it a standard bench-mark tablet, the costs of the field program are attributable only to salary of personnel and maintenance of trucks.

EDITORIALS

COMPONENTS OF SUCCESS Not long ago, several of us were discussing different men under whom we had worked and the conversation, naturally enough, soon came to the point where we began to express our wonderment that certain men had succeeded so well while others, apparently more gifted, had not gone nearly as far. After some time, four main reasons for the success of the men under consideration seemed to emerge, and furthermore these reasons held good in regard to most of the successful men we knew.

We decided that the first quality which starts a man on the upward path is that he has some trait which sets him apart from those with whom he is working. Sad to say, it is not always knowledge but may be almost anything—quite often it is that by hook or by crook he can cajole his fellow workmen into following his desires.

The second quality concerned the advancement of those who had gone beyond the first few steps but were still far away from the top. These men all had the courage to stick to their jobs, sometimes year after year, even when there was no prospect of advancement. Some of us felt that they oftentimes stayed because they didn't have the courage to go elsewhere. Nevertheless, whatever their reasons for staying, they remained until openings came and were slowly advanced on the basis of seniority until at last they were very near the top.

The third quality seemed the most remarkable to us—the men at the very top had a tremendous fund of knowledge which was entirely extraneous from that concerning the business in which they were engaged; it appeared to have been acquired as a result of being interested in everything that life offered. These men at the top could dig up the most surprising facts about the most unexpected subjects. Whether this knowledge helped them, or how, we did not know. The fact remained that they had it.

The fourth quality was not definitely alone, but ran through all three. It was the knack of not making others unpleasantly aware of one's self. To avoid being unpleasant, we did not mean that the man had to have an ingratiating, boot-licking type of personality, but we did mean that he avoided cultivating the habit of speaking and acting in the most disagreeable way possible, as so many people do when advanced beyond their contemporaries. While they did not always display positive good qualities, they were very careful not to show traits which would be detrimental to their progress.

These four qualities of individuality, perseverence, intellectual curiosity, and tact seem to stand out among others in successful people. How do **you** stack up?

"Habit is a cable; we weave a thread of it every day, and at last we cannot break it."—Horace Mann.

"The darkest hour in any man's life is when he sits down to plan how to get money without earning it."

—Horace Greeley

SUPPORT THE POLYGON PLAN Benjamin Franklin once said, "A penny saved is a penny earned." Long before Franklin's day, another good man observed, "A word to the wise is sufficient." Everyone has heard these quotations, but how many of us act accordingly?

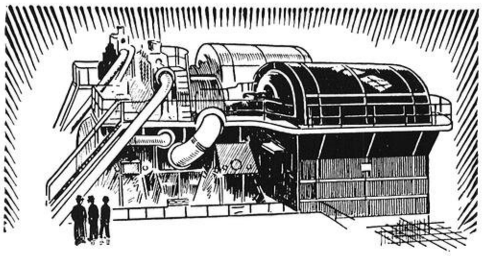
Take for example, the Polygon plan. It was inaugurated two years ago as a means of saving the engineering students actual money while also giving them a better and more unified program of activities. Each year Polygon has sponsored two dances, admission formerly was one dollar for each; given a year's subscription to the WISCONSIN ENGINEER, which would have cost another dollar; arranged for two smokers which would have carried a small admission charge; paid in part for materials used in floats in the St. Pat's Parade; paid local chapter dues for the members of the local student branches, or paid 60c toward the national dues of any one joining the national society. It doesn't require higher mathematics to see that the cost of all these things before the Polygon plan came into being was two or three times the present **yearly** fee of two dollars.

You may wonder how Polygon can offer so much for so little. The answer is simple—the members of Polygon can make up a budget and plan for each activity in advance. This eliminates much of the waste that comes about from not knowing how many to expect at a dance, smoker, or any other function. The business staff of the magazine need not worry about soliciting subscriptions from the students, and the student societies know they have a definite income coming in and can make expenditures accordingly. Furthermore, by receiving the whole-hearted support of a majority of the students the cost of each function per man can be greatly reduced. In short, it puts all of the activities of the college of engineering on a sound, business-like basis, and thereby strengthens them.

Last spring you overwhelmingly voted to collect one two dollar fee in the fall to take care of the **entire** year. That means that there will **not** be a Polygon fee collected at the beginning of the second semester. A goodly number of students have paid; but the number is far from what it should be.

The student societies have started a drive among the men who should be their members and who have to date neglected to pay their Polygon fee. If **you** have not paid your fee, do so when you are approached by a member of your society. Better yet, don't wait for him to find you. Treat yourself and help the Plan by paying your fee **now**—where and to whom? The librarian in the Engineering Library in the Engineering building or Miss Lindergren in Prof. G. L. Larson's office in the Mechanical Engineering building.

G-E *Campus News*



BIGGER AND BETTER TURBINES

The new 110,000-kilowatt turbine-generator, built by General Electric and recently placed in service in the River Rouge plant of the Ford Motor Company, sets several new records in turbine construction.

It is the first large unit in the world to operate at 1200 pounds pressure and at 900 Fahrenheit. Although the weight is approximately 2,000,000 pounds, it is so compact that it occupies less than a cubic foot for each kilowatt of output. Because of its extremely high efficiency, less than a pound of coal is needed to generate a kilowatt-hour of electric energy.

The new turbine is a vertical compound machine with the high-pressure turbine and generator mounted directly above the low-pressure unit. Superheated steam enters the upper unit at 12 pounds and 900 degrees. After producing 55,000 kilowatts, the steam flows directly into the low-pressure unit where it produces another 55,000 kilowatts before it is exhausted to the condenser. This is the first 1200-pound turbine in which the steam enters the low-pressure stage without reheating.

The work of designing, constructing, testing, and installing great turbines, such as this, is the accomplishment of hundreds of graduates of technical colleges and universities—men who are also graduates of the G-E Test.

ELECTRIC HEAT FOR SOILLESS GARDENS

California nurserymen are growing tomatoes, strawberries, and sweet peas in chemically treated water heated by electricity. The method, developed by Dr. W. F. Gericke, of the University of California, has been extended to commercial installations. Tomato plants, grown in this way, produced unusually high-quality tomatoes. The yield was large, and they matured ahead of tomatoes grown in soil.

Nourishment for the plants is provided by special chemicals dissolved in the water. Because the water temperature must be accurately maintained, a controllable heat source is required, and General Electric engineers have supplied heating cable and thermostats both for the experimental installation and for commercial installations which have followed.

COFFIN FELLOWSHIPS

This fall eight young men will be carrying on advanced research in seven American universities under fellowship grants from the Charles A. Coffin Foundation. The recipients and their research problems:

George E. Boyd, U. of Chicago '33. At Chicago. Study of surface energies.

Lyman R. Fink, U. of California '33. At California. Phenomena in synchronous machines. Second grant of fellowship.

Alvin H. Howell, U. of Kansas '29. At M.I.T. Insulation problems in d-c transmission.

Russell A. Nielsen, Stanford '33. At Stanford. Electron mobilities.

Richard W. Porter, U. of Kansas '34. At Yale. Transients in the monocyclic network. Second grant.

Julian S. Schwinger, Columbia '36. At Columbia. Theoretical investigations in nuclear physics.

Chauncey Starr, R.P.I. '32. At Harvard. The pressure coefficient of thermal conductivity. Second grant.

Harold G. Vogt, U. of Buffalo '31. At Harvard. The nature of the neutron.

Since 1922, when the General Electric Company established the Charles A. Coffin Foundation in honor of the Company's first president, 113 fellowships have been awarded for advanced work in electricity, physics, and physical chemistry.