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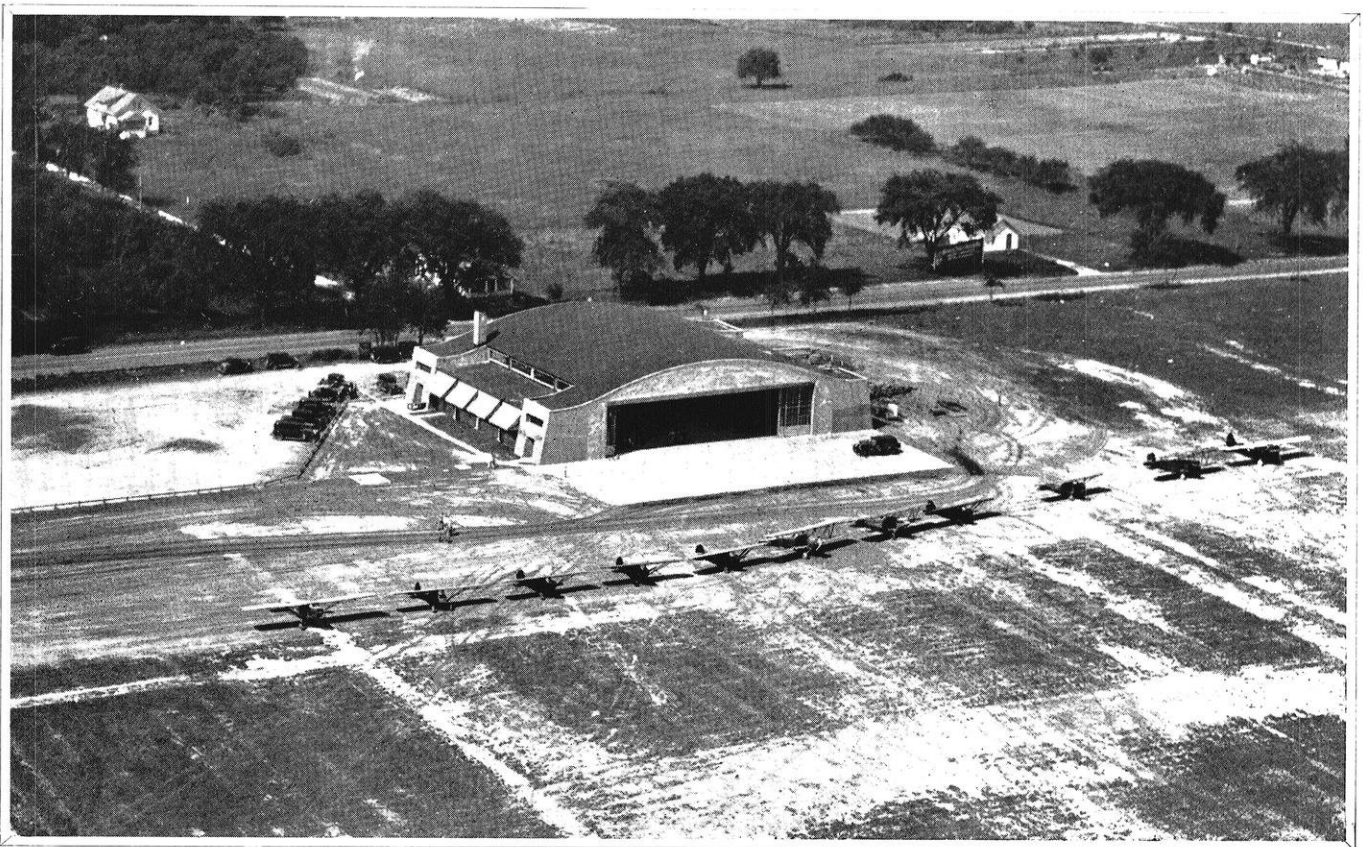
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THE WISCONSIN ENGINEER

VOLUME XXXV

PUBLISHED BY ENGINEERING STUDENTS
UNIVERSITY OF WISCONSIN

NUMBER 1



MADISON ROYAL AIRPORT

OCTOBER

MEMBER OF ENGINEERING COLLEGE MAGAZINES ASSOCIATED

1930

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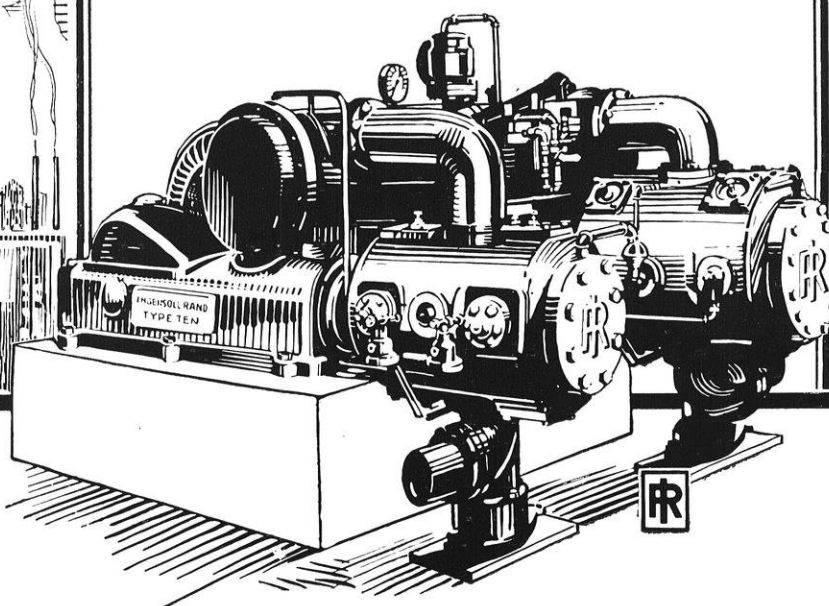
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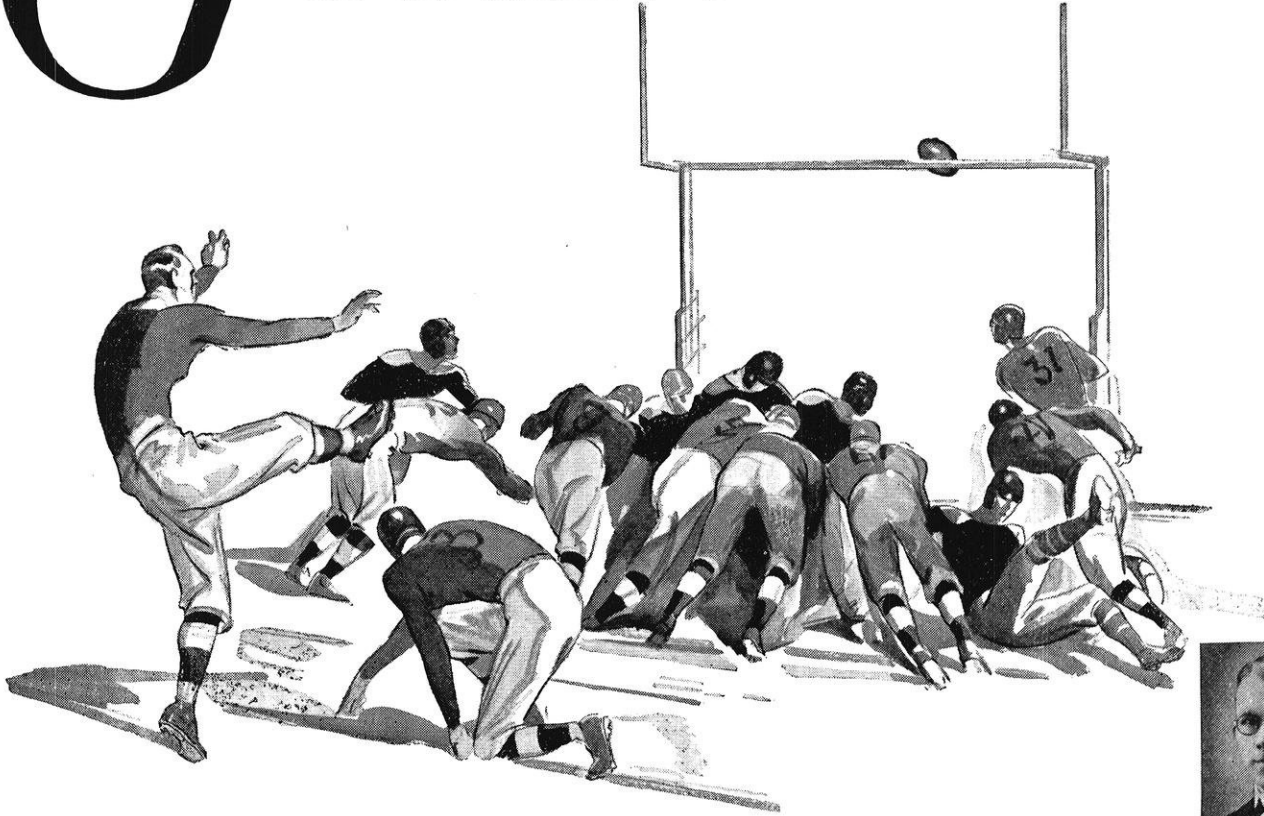
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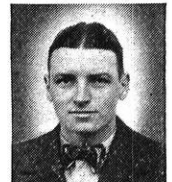
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CONTENTS

VOLUME 35	OCTOBER, 1930	NO. 1
TO THE FRESHMEN ENGINEERS	F. E. Turneure	5
RESEARCH AT THE HYDRAULICS AND SANITARY LABORATORY	A. T. Lenz and H. W. Ruf	6
WEEKEND: THE LEWIS PRIZE PAPER	K. C. Flory	8
THE 1930 SUMMER CAMP	T. H. Perry	10
WHAT THE CLASS OF 1930 IS DOING	W. F. Kachel	11
ALUMNI NOTES		12
EDITORIALS		14
CAMPUS NOTES		16
ENGINEERING REVIEW		18

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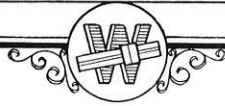
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The WISCONSIN ENGINEER

VOLUME 35, NO. 1

OCTOBER, 1930



To the Freshmen Engineers

By F. E. TURNEAURE
Dean, College of Engineering

I am glad to have the opportunity through the *Wisconsin Engineer* to extend a most cordial welcome on behalf of the faculty to the engineers of the class of 1934. You have come with the definite purpose in mind of preparing yourselves for some branch of the engineering profession, and I think most of you have a very good idea of the the activities belonging to the various branches. To the student, a definite objective such as you have is of considerable advantage, in the matter of interest and enthusiasm, over the student who plans a more general education before deciding on his life work. Such a student, however, has the advantage of a broader preparation along general lines before beginning his specialty. This may count largely to his advantage in the long run, but whether such a long preliminary course is advantageous depends largely upon the individual and the nature of the work which he expects to do.

Your entrance to college is in many ways a quite important point in your career. It not only marks your decision as to your vocation in life, but it involves a great change in the relation between your school and home activities. As President Frank so forcefully pointed out to freshmen at the beginning of the year, you are given here much greater liberty of choice and liberty of action than you have had in your high school days. Your scheduled hours leave a large amount of time at your own disposal for study or for such other activities, good or bad, as you may decide upon. And right here I know of no better suggestion than one strongly emphasized by Colonel Robert I. Rees, personnel manager of the American Telephone and Telegraph Company, in

his address before the engineering students here a year ago. This was the advice to students to *carefully budget their time*. In this respect the first few weeks of the semester is perhaps the most critical period. It is so easy



Dean F. E. Turneure

for students who are good fellows to spend a lot of their time dawdling and accomplishing nothing, either good sport or good work; and a surprising amount of time will disappear in this way if some thought is not given to the matter. The correct budgeting of time will be different for each student, as it depends upon his own tastes and abilities, not only along the line of his studies, but in other activities as well; and while his studies are of first importance, his other activities are by no means unimportant. Such activities should be looked upon as of the same relative value and importance as the outside activities of mature life which every good citizen owes to his community, to his profession, and to himself. To ignore all such outside interests leads to narrowness and a self-centered personality, while, on the other

hand, too great participation will quite surely lead to a dissipation of energy, resulting in a good preparation in those fundamentals which are absolutely necessary to later success. The habit of hard work and concentration on the job in hand is a most valuable accomplishment and worth much effort to acquire.

For a considerable percentage of the students, an important activity is that of earning money to meet part of their expenses. This cannot be avoided, and up to a certain point is likely to be a benefit rather than a hindrance, but the engineering course requires for its successful

(Continued on page 22)

Research at the Hydraulics and Sanitary Laboratory

By ARNO T. LENZ, c'28 AND HAROLD W. RUF, c'28

RESEARCH problems worked on by senior and graduate students in the Hydraulic and Sanitary Engineering Department during the past year have been of much interest and have given some new information on many different subjects. The major experiments in hydraulics included a study of flow over triangular weirs using both oil and water, a study of the hydrology of six Wisconsin rivers and the Lake Superior drainage area, tests of a small reciprocating deep well pump, and tests of a model dam. The sanitary problems studied were the oxygen consumed test, digestion of packing plant sludge, and the efficiencies of small town sewage treatment plants.

Triangular Weir Experiments

An investigation of viscous and non-viscous flow over triangular weirs was made by Mr. S. E. Kotz, Mr. S. A. Witzel, and Mr. A. T. Lenz. Over 1100 runs were made using fuel oil and 500 runs using water. Curves were drawn and a preliminary report written but no detailed study of the experimental data and curves has been made. This study will be completed this year.

Triangular or V-notch weirs are used extensively to measure small flows in open channels. The problem of finding a series of coefficients that might be used to de-

termine accurately the discharge over a weir when other variables are given has been the subject for extended research. The experiments made here last winter differ from those made at other laboratories in that fuel oil was used as the liquid as well as water. Runs were made on sharp crest brass V-notches of 10, 20, 28-04, 45, 60, 90, 120, 150, and 180 degrees, the latter being the ordinary rectangular notch with end contractions. The heads or depth of fluid over the point of the notch varied from 0.02 feet to 0.80 feet. A series of runs were made at a

constant temperature of 70 degrees Fahrenheit over the entire range of heads for each notch; another series was made at 100 degrees Fahrenheit in an attempt to determine the effect of the viscosity of the oil on the coefficient, as the viscosity changes with the temperature of the oil. To determine the effect of large changes in viscosity, a different liquid, water, was used and complete series run at both 70 and 100 degrees Fahrenheit.

The weir plates were bolted to an iron tank set on a platform of steel I beams and pipe columns and held into place by pipe columns braced against the concrete ceiling to get an extremely rigid setting for the plate. The discharge flowed through a diverter to a weighing tank set on a scale or to a sump tank from which it was pumped back to a head tank on the floor above the weir box. A large rectangular overflow weir held the level of the liquid in the head tank steady and hence the flow into the weir box was practically constant.

A series of valves was placed on the discharge line from the head tank and manipulation of these with reference to the level of the liquid at a hook gage permitted the run to be made with as little as one to five ten thousands of a foot variation in head.

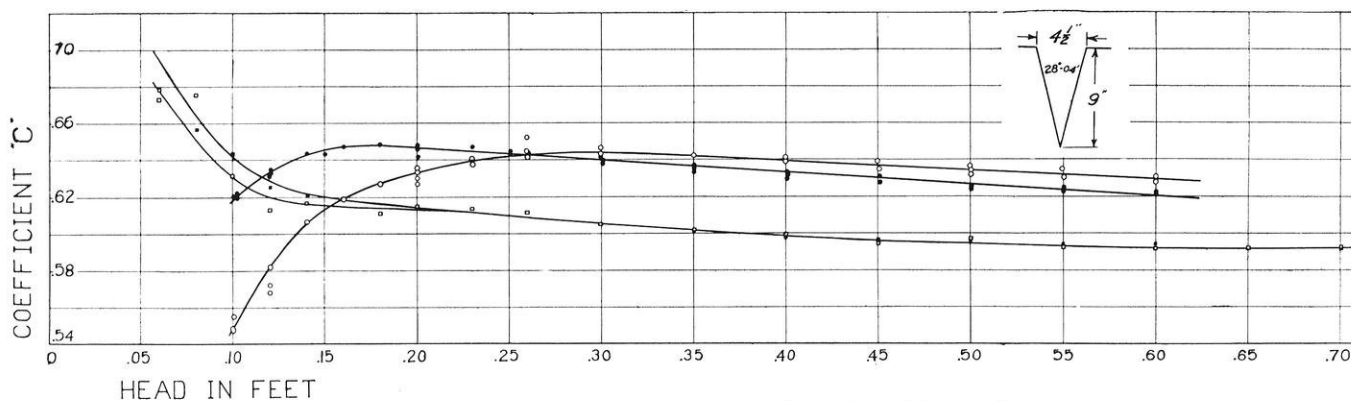


FIG. 1: Coefficient Head Curves with a 28° 04' Sharp Crested V-Notch Weir.

● Fuel Oil 100° F.

□ Water 70° F.

○ Fuel Oil 70° F.

■ Water 100° F.

termine accurately the discharge over a weir when other variables are given has been the subject for extended research. The experiments made here last winter differ from those made at other laboratories in that fuel oil was used as the liquid as well as water. Runs were made on sharp crest brass V-notches of 10, 20, 28-04, 45, 60, 90, 120, 150, and 180 degrees, the latter being the ordinary rectangular notch with end contractions. The heads or depth of fluid over the point of the notch varied from 0.02 feet to 0.80 feet. A series of runs were made at a

The head on the notch was measured by three other hook gages, two fastened to the end of the tank, one on each side of the weir plate, and another fastened to the ceiling. The zero reading was made with a shaft level sensitive to one ten thousandth of a foot. By comparing the three gage readings and averaging the heads, it was felt that the desired precision of one-half of one percent was obtained. The large flows were measured on a scale sensitive to 0.2 pound; the small flows on one sensitive to 0.01 of a pound.

Temperatures were read to one-tenth of a degree and viscosities with a Standard Saybolt Viscosimeter giving the viscosity in Saybolt Seconds.

Coefficients were computed for the formula

$$Q = C \frac{8}{15} \sqrt{2g} \tan \frac{\theta}{2} h^{5/2}$$

where Q is the discharge in cubic feet per second, θ the angle of the weir notch in degrees, h the head in feet, and C the computed coefficient. These coefficients were plotted against the head, four curves for each notch, oil at 70 degrees, oil at 100, water at 70, and water at 100 degrees

large, for, coupled with the difficulty of reading small heads accurately is the sharp break in all the coefficient curves when the head is below .10 to .15 feet.

Hydrology

The hydrology of six Wisconsin rivers and the Lake Superior drainage area was the basis of an investigation by Mr. S. A. Witzel.

The areas selected were the Apple River near Somerset; Fox River at Berlin; Fox at Rapid Croche Dam; Menominee at Twin Falls, Michigan; St. Croix at St. Croix Falls; Wisconsin at Merrill; and the Lake Superior area at Sault St. Marie, Michigan. The drainage areas of the rivers varied

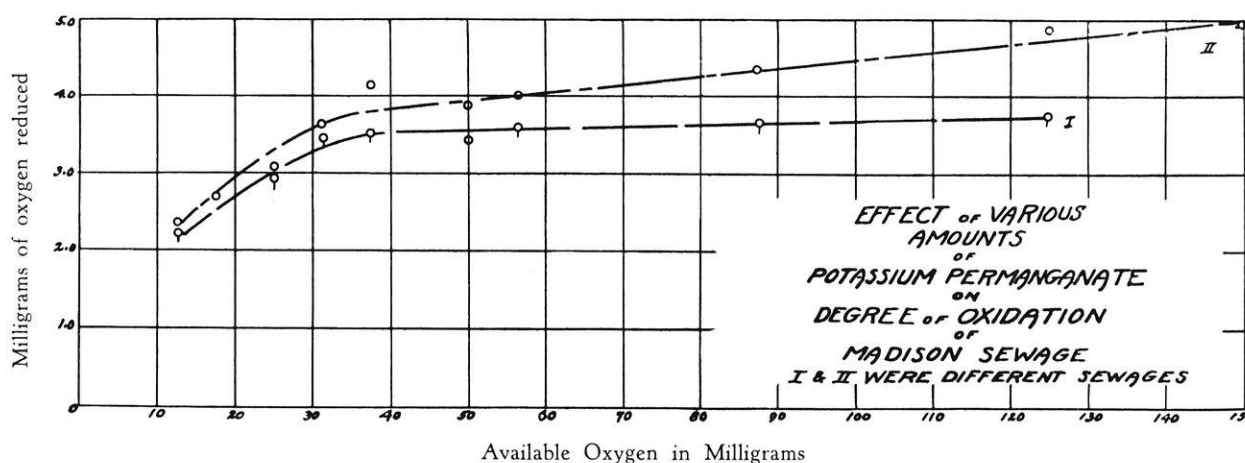


FIG. 2: Graph showing the effects of potassium permanganate on degree of oxidation. Madison Sewage was used in these experiments.

being plotted on the same sheet for comparison. The curves for the 28°-04' notch are shown in Figure 1.

Check runs made months later, after the plates had been changed a number of times, checked well within the required precision at medium and high heads. At low heads, on the flat part of the curve, there was greater variation but further study taking into account the viscosity is expected to clear up these problems.

The data indicated that the coefficient increases for oil and water with decreasing heads until a critical stage is reached at heads of .10 to .14 feet. Below this stage the oil coefficients decrease rapidly while water coefficients increase rapidly.

The oil coefficients varied from .63 at high heads to .655 at low heads. Water coefficients varied from .59 to .625. It is evident that the oil coefficients for the same head were from 6 to 7 per cent higher than the water.

The effect of temperature is more noticeable with oil than with water. Low head coefficients at 100° F. for oil on the narrow notches are much greater than at 70° F. This difference gradually decreases with higher heads until the curves cross at approximately 0.60 ft. The water curves practically coincide for the narrow notches. There is less variation for the wide notches. The 100° F. oil curve for the 90° notch is some 5% greater than the 70° F. curve at low heads and decreases to 1% less at .30 ft. head. The water curves vary from 6% to 1/2% in the same direction.

Most important is the conclusion that the jet must spring free from the plate and the head must be reasonably

from 550 square miles to 6,230; the Lake Superior area being 76,134 square miles.

The river records were practically continuous for twenty-three years, and were supplemented by sixty-three years of record for Lake Superior. Calculation of variation or percent deviation from the mean for various short periods was made for each drainage area, and the maximum error determined that would be encountered if a short time record was used.

Special Pump

A series of tests were made on a small reciprocating deep well pump by Mr. G. E. Waite and Mr. T. Raccoli. The efficiency of the pump and its various units was determined. The most interesting part of these experiments resulted from the discovery that if a check valve of different design than that used by the manufacturer was inserted, much of the loss in the pump could be eliminated and the efficiency greatly increased. The pump tested may be used for small farm installations.

Model of a Dam

The model dam section in the basement of the laboratory was the scene of tests by Mr. C. T. Yuan. These tests were a continuation of those made by Mead and Seastone. No radically different results were obtained and the previous work was verified.

Sanitary Engineering

A new Sanitary Engineering Laboratory is to be installed in the new addition to the Hydraulic Laboratory and Pump House. Work is to begin immediately on new equipment,

(Continued on page 23)

"WEEKEND": The Lewis Prize Paper

By K. C. FLORY, m'33

THE BOY was tired. He was going home and sleep for the week-end, and write the essay that was due Monday. Next to him in the train sat a slovenly boy. He talked with him. The boy was a pre-med freshman, and was going home. The pre-med asked interminable questions. Didn't he think the chem. was too darn hard? He liked to go home week-ends? Did he live in Milwaukee? Whom did he have for English? Oh, that guy. How are his grades? The boy, feeling more tired than ever, took another seat and tried to sleep. No go, too much jolting. He wished he had a drink.

Home town. The boy 'phoned his house. No answer. He suddenly remembered that his father was away and that his mother was probably in Chicago. He walked the half mile to his house and went in. Dirty dishes a week old were piled in the sink. A little sour milk in the ice box. He felt tired. He sat down in the dirty kitchen. He wondered idly if his T. B. was coming back and making him so tired. He remembered that he had to try and write an essay for English. He went into the next room and sat down at the desk.

At twelve his mother came in. She was tired by the long trip home, and was annoyed at his being there. Why hadn't he let her know he was coming? Hadn't he any consideration for her? Why did he have to always be tagging home? She continued her tirade from the kitchen, where she was mixing a drink. She said she was a wreck, and said it as though it were the boy's fault. After a time her tone became more and more maudlin and self-pitying. At about one she complainingly went upstairs. She screamed down the stairs for him to go to bed. Why must he always worry her? Did he want to die on her hands? Why didn't he look pink and healthy? Why — —? The boy shut his ears. He tried to think. His exhausted body sagged onto the desk. His aching eyes burned when he shut them. Ready to scream, he went out and poured himself a tumbler of whiskey, and drank it down in three gulps. His head buzzed, and his face felt flushed. Stupified with the drink he stumbled upstairs and crawled into bed.

He got up at noon the next day. The maid, back on the job, wanted to get the bed made. At dinner he felt fuzzy and as tired as though he had never slept. His mother started in about his grades. Why hadn't he studied? Why did he think his poor father and mother were slaving day after day to send him to school? Why didn't he get grades instead of loafing, and probably running around with women, and drinking—. Had he left that little dago boot-legger's daughter he had mentioned? He had better not go dragging any wop into her family.

He had to drive her out to a friends' place on Green Lake that afternoon — "Well, hurry up and get the car out — don't go so fast — look out! don't bump so much. Hurry up! are you going to take all day? You'll make me late to this —."

They got back about eight; he was very, very tired; she was quite happy. Her friends had been rather liberal with cocktails. She patted him awkwardly and laughed. He was a good little boy — she loved him all right — his good old mother loved him all right, all right. Her eyes dimmed with drunken tears as she sobbed to herself about her great love. She gave him ten dollars and went off to bed.

The boy stuck the money in his pocket and tried to get down to work. He felt an aching ex-

haustion in his whole body. He thought about how he had to have the essay in. He tried to find an idea. He was tired, so tired — needed just one shot to brace him up. He went out and got a good one — felt better now. He picked up a book of poems that he had brought with him, and started to read. Strange how nice and warm and rested and awake a drink made one feel — and the poetry always hit you so much more.

He put down the book and turned on the radio — some cracker company was giving a classical program. He listened in rapture. At ten-thirty the station signed off.

He tried to get back to his work. To his disgust he found he could not think. He was angry with himself; he had always taken great pride in his brain. He remembered his prep-school days — he had never been any good

It is a common illusion that engineers cannot write. These practical minded men are supposed to be void of imagination and the means of creating literature in the form of fiction. It is only an illusion however. Robert Louis Stevenson was an engineer. R. DeWitt Jordan, who graduated in 1927 from the College of Engineering, wrote one of the finest pieces of poetry that has been written about engineers. And there are others. Last year the winner of the Lewis Prize Paper, which is a competition open to all freshmen in the university, was written by a freshman in mechanical engineering.

The subject matter is not at all autobiographical, although it is impressively related in the first person. It is not typical of university freshmen but is a case that is applicable to a very few. The story was first published last year, in a Sunday issue of the Daily Cardinal.

—EDITOR'S NOTE.

at sports, but he had always topped his class. He tried to grip his mind and get down to his task, and again he sat in a daze while his brain wandered along devious paths. He thought about the wasted year he had just spent and of the promises he had not kept, and of the things he had not found. He thought about the money he had thrown away, and he wondered how he could make his proposed trip without it. He thought about how he was soon going to hit the long dusty roads and wander in green hills far away from everything, where the thought of all his wasted opportunities would not follow. He calculated with disgust and almost horror the number of weary days left at the university. His mind revolted at the thought of work, work, work, and exams, grades, dead lectures and staring stupid classmates. He longed for greenness and quiet. He remembered how he had been nagged about his money going so fast. He thought of his father's objections to his proposed trip, and thought about how much he had said he would worry — poor Dad.

The boy awoke when his head hit the desk. The drink had worn off and he felt tired and sick again. His mind reeling with the realization that another night and another day had been wasted, he dragged off to bed.

He had to get up early — had to drive his mother to Illinois to see the boys at prep school. His mother made breakfast an ordeal. Why didn't he work? Look at father. She was rather cross, and looked shot — wrinkles; dirty dressing gown. She went out and got a pick-me-up, and went up to dress.

His mother slept most of the seventy miles. He took advantage of the fact and threw the big car through the heavy traffic and out into the country. Once on the open road he gave her the gun. He forgot his tiredness and reveled in the thrill of the wheels roaring over the gravel. He laughed to himself as he shot by the slower cars; for a little while he was completely happy.

His mother woke up as he jolted down the rough hill into the school. She hastily dabbed at her face and pushed at her hat and hair. They pulled into a parking space and went in. Up trotted the principal. How were the boys doing? Well, wasn't that nice. No, Jimmie didn't like the university. He was a little lazy, maybe? No, the principal didn't think so. Well, well, here comes the commandant. How do you do, colonel? How is your wife? Well, isn't that nice —.

The boy escaped and walked up to his old room. He threw himself down on the hard bed. He suddenly felt old; the tension of the hour of speed left him, and an exhaustion took its place. He thought with amusement that the commandant was fatter than ever.

A few of the boy's old friends came to talk to him. There weren't many that remembered him, now. His brothers were downstairs, being petted and praised by the principal for his mother's benefit. He felt too tired to talk much; and the old bunch just sat around awkwardly and seemed glad when mess call blew and they could say goodbye.

He drove his mother and his brothers to a nearby town, where they ate dinner. His mother scolded the kids for

spending too much. They screamed back at her. The younger one had a fit of temper and refused to eat; an angry, tearful, snarling pair, the boy drove them back to the school and dropped them.

His mother told him with variations all the way home what excellent work they were doing. Why didn't he work like they? Why wasn't he as good as they? The boy felt too tired to argue. He wanted to close his eyes, hold his ears and scream. He felt insane—he drove madly, gritting his teeth and feeling a satisfaction at his mother's ranting and nagging at him as he hurled the heavy car into the dust ahead, and watched the needle climb past the sixty, sixty-five and seventy marks. He slued down a hill and narrowly missed rolling into the ditch as he swung out to pass two cars abreast. He hit ruts and jerked the car down to lower speeds with stiff, angry jabs at the brake-pedal. His mother was almost in tears with self-pity. Did he want to kill her? Why hadn't he some consideration for his own mother? Didn't he know her heart was weak? Finally he pulled up behind the house he knew as home, and walked up the path from the garage.

The maid had some cold meat for dinner. He couldn't eat. He worried down a few pieces and left the table. He threw his clothes into his bag, and fairly ran out of the house followed by his mother's recriminations that rose into a crescendo as he got farther away.

He fell asleep in the dirty smoker and was awakened by the fat conductor. Madison. Dirty, yelling cabbies. Rain. Dark. He was tired. He tossed his bag at the nearest driver, crawled into the cab and tried to sleep. Why in hell didn't the guy let him alone? Oh, here is the house. He put a handful of change into the fellow's palm, waved aside his stereotyped thanks, went into the house and walked down to his room. It was full of smoke and laughing boys. He dropped his bag on the floor and went into the next room — no one there except a friend of his, working.

The brothers in the next room were yelling. The boy felt tired—he wanted to crawl between those cool sheets and just sleep and sleep—sleep until the ache and the dullness left his mind—sleep until the exhaustion left his flesh. He tried to write the essay that must be in the next morning. He could not think of a subject. His head felt stupid. His eyes strayed to a *Popular Mechanics* on the desk. He picked it up and wandered in it almost unconsciously for half an hour. He finally threw it down, realizing that he had been wandering again from his work. He bit his lips. He felt hysteria coming over him; he wanted to cry at his inability to concentrate. He felt tired, so tired. His friend rose to go out.

The boy begged a ride with him down to the "Bush". He was lonely. He felt he was going mad. He wanted someone to talk to. He entered the familiar old room with a sigh of relief—already his cares seemed to be going. He asked for a shot and sat down. Across from him were two red-faced drunks, arguing about the individual versus the mass. The boy threw down his drink, motioned for

(Continued on page 22)

The 1930 Summer Camp

By CAMP HISTORIAN*

AZIMUTH CITY, the summer home of ambitious sophomores, conventional juniors, and procrastinating senior civils, added another successful year to its already glorious past. Good weather and hard work was characteristic of the six weeks of residence. The Owenized settlement in the Devils Lake region was far too serious this summer to continue the famous organizations of the Whoopees and the Waa-joes. In fact even the faculty was surprised at the apparent earnestness of the inmates.



Chief Kesting and his select squad of smoke-eaters who protected the citizens of Azimuth City.

The camp opened after examinations in June, before most of the civils had time enough to erase the crib notes from their slide rules and shirt cuffs. Matthias' notorious Dodge steamed into camp on Saturday morning; by Monday night the city, which stands as a monument to the amount of work that an engineer can do in six weeks if he has to, was established, the mayor was reinaugurated, and the civils were ready for the six weeks' grind.

On Tuesday morning the Bularena Railroad Company sent four parties out on location to estimate the feasibility of building a two mile spur from the Chicago and Northwestern Railroad at the Devils Lake station to the recently discovered outcrop of valuable ore in the bull pasture. Prof. Van Hagan was in charge of the course and was assisted by Walter "Payhaul" Tacke.

At the same time that the railway engineers were swearing their way through the brush in the bull pasture, the newly organized surveying parties were introduced to the worries of T. E. 106. The surveying course covered the following fields: base line, triangulation, hydrography, topography, current meter rating, power and discharge survey, plane table, land lines, and highways. Col. Owen, in charge of the surveying schedule, was assisted by Mr. Wesle, of the Milwaukee extension; Messrs. Matthias, Hamel and Thrapp instructed. Mr. Nelson of the U. S.

Geologic Survey came from Washington to explain the fundamentals of plane table work. Mr. Blake of the Wisconsin State Highway Commission had charge of the highway portion of the course.

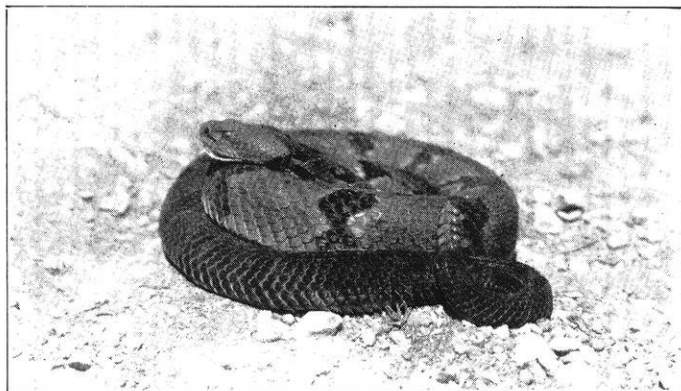
Besides the tedious work (getting up at six proved to be a new experience to many) extra curricular activities proved to be popular at the Devils Lake engineers resort. A Baraboo club was established soon after the camp was opened. It met frequently at a frame house near the railroad station in Baraboo.

Wheeler and Strand became presidents of the Rattlesnake club when they picked up a good-sized reptile in the bull pasture. Later Tacke added a skin to the collection when he mutilated an unfortunate rattler along the mine railroad. Ewald, out on land surveying in oxfords, nearly stepped on a beautiful specimen of the crotalidae. The snake was captured alive, however, and spent a few days in camp before it was taken to the snake farm.

The engineers' party was a colorful event. Prof. Owen and Vern Hamel have conclusive proof that the evening was a success. The band was good, and the mess hall, decorated by a construction crew, surprised most of the civils by its good appearance.

Kesting, with two years of varsity crew to his experience, protected the peace and safety of the camp and cottagers. A perfect record, the fire squad made—possibly due to the able West Virginian assistant and his powerful phaeton. Magee and Hagedsted proved to be exceptional fire horses.

Several lectures were held in the Mess hall in the evenings, and succeeded in breaking up the monotony of



Ewald's pet rattle snake which was a guest of the camp for several days.

the routine life. A lecture on Europe and Asia, illustrated by beautifully colored slides was well received. Mr. Nelson spoke of his various experiences in the geologic service, and was "skyrocketed" by an enthusiastic audience.

(Continued on page 20)

*T. H. Perry

What the Class of 1930 Is Doing

By W. F. KACHEL, JR., c'33

ELECTRICALS

Bailey, Fred N., is with the Westinghouse Electric and Manufacturing Company at Pittsburg, Pennsylvania.

Bartelt, Allan D., is with the long lines division of the American Telegraph and Telephone Company. At present he is out on a field training assignment working on various types of work. His headquarters are at Chicago.

Baumgartner, Arnold J., is starting work with the Public Service Company of Northern Illinois. His headquarters are at Maywood, Ill.

Bolliger, Theo. C., is a student engineer of the General Electric Company at Schenectady, N. Y.

Brown, George H., is a research fellow in electrical engineering at the University of Wisconsin. His address is: 308 W. Emmett St., Portage, Wisconsin.

Canfield, John E., is in the training school of the Ingersoll-Rand Company at Phillipsburg, New York.

Christian, Edwin A., is training for the job of traffic superintendent for the Illinois Bell Telephone Company. Address: 409 Ridgewood Ave., Glen Ellyn, Illinois.

Crowe, Henry J., is with the long lines department of the American Telephone and Telegraph Company at Chicago. At present he is out in the field laying cable.

Decker, Andrew H., is an assistant in the division engineer's office of the Wisconsin Power and Light Company at Fond du Lac, Wisconsin. His address is: 127 Gillett St.

Dickinson, C. R., is with the Allen Bradley Company at Milwaukee, Wisconsin. Address: 1621 Wells St., Apt. 408, Milwaukee.

Fairweather, Robert W., is with the Bell Telephone Laboratories at New York City.

Fosdah, Fritchof, is with the General Electric Company at Schenectady, New York.

Gassner, Aloysius, is with the Public Service Company of Northern Illinois. His position is a distribution engineer. Address: 1000 Grove St., Evanston, Ill.

Guth, Sylvester K., is technical man in the photometric laboratory of the General Electric Company at Cleveland, Ohio. He writes: "Still single, happy and contented with my new job. The work deals mostly with making tests on various types of luminaires." Address: G. E. Co., Engineering Department, Nela Park, Cleveland, Ohio.

Hagon, Thomas H., is with the Wisconsin Bell Telephone Company at Milwaukee, Wisconsin.

Hove, Adolph M., is with the Public Service Company of Colorado as Junior Engineer at Denver, Colorado. He says: "Spent an interesting summer — digging ditches, cutting and threading gas pipe — great stuff for an electrical but it's all in the game." Address: 1244 Columbine St., Denver, Colo.

Howes, Edward W., is in the testing department of the General Electric Company at Schenectady, N. Y. He likes New York State and thinks it is a fine place to live.

Iwert, Carl E., is in the testing department of the General Electric Company at Schenectady, New York. Address: 4 Union St., Schenectady.

Jauch, John, is with the Automatic Electric Company of Chicago.

Jautz, Gilbert T., is working under B. B. Burlin, ch'06, E. E.'14, who rowed with the Wisconsin crew when there were seven engineers in the boat. Jautz is an instructor of Electrical Drafting at the Boy's Technical High School in

Milwaukee. His address is : 3132 W. Pierce St., Milwaukee, Wisconsin.

Johnson, Everett A., is with the A. T. & T. Co. training to be a traffic engineer. He has recently announced his engagement to Ruth E. Hovey, Wis.'30.

Johnson, Stewart L., is with the General Electric Company at Schenectady, New York, as a student in the testing department. He likes New York State but misses the Wisconsin women.

Landa, Henry C., is teaching electricity at the Milwaukee Vocational School day and night. Address: 1050 Washington Street, Racine, Wisconsin.

Loewe, Robert, is with the Western Electric and Manufacturing Company of East Pittsburg, Pa. He is a student engineer at that plant.

Meisenheimer, E. A., is Sales Engineer of the Louis Allis Company, motor manufacturers, at Milwaukee.

Morrison, L. W., is back in school this year as a graduate student.

O'Neill, A. Norman, is working on the test switchboard of the Wisconsin Telephone Company. Address: 1136—12th Street, Milwaukee.

Riebe, Clifford, is a student engineer at the Allen-Bradley Company in Milwaukee.

Schmid, George, is with the Westinghouse Electric Manufacturing Company at Shoivon, Pa.

Schwartz, Everett B., is a radio research engineer of the General Electric Company at Schenectady, New York.

Shafer, A. J., is with the Wisconsin Power and Light Company at Madison, Wisconsin.

Tuffnell, William L., is engaged in telephone transmitter development for the Bell Telephone Laboratories at New York.

Turner, Robert G., is protection inspector for the Wisconsin Telephone Company at Milwaukee. He took a two weeks' cruise on the U. S. S. Hawk this summer in which he saw most of the Great Lakes.

Tyler, Edward M., is doing research with the Bell Telephone Laboratories at New York.

Van Vleet, James G., is taking a test course with the General Electric Company at Schenectady. Address: 13 State Street, Schenectady, New York.

Weber, John, is with the General Electric Company at Lynn, Mass.

Weissappel, Bruno, is a student engineer of the Illinois Bell Telephone Company at Chicago.

CIVILS

Angrick, Roy, is engineer for Klug & Smith, engineers and contractors of Milwaukee.

Arnold, James W., is with the U. S. Engineer Office at Milwaukee. He is recorder for the party on the Kalamazoo River survey. His address is: 316 Breese Terrace, Madison, Wisconsin.

Bielefeld, Richard H., is located in Milwaukee. Address: 938—12th Street, Milwaukee.

Borrudd, Bertram M., is with the Illinois Division of Highways as junior engineer in the design department at Elgin. Address: 363 Fulton Street, Elgin, Illinois.

(Continued on page 26)

Alumni Notes

Successful Wisconsin Engineers *E. D. Steinhagen*

By W. F. KACHEL, JR., c'33

When difficult engineering problems arise along the line of building construction, in the middle west, Ewald Daniel Steinhagen, c'11, is usually ready to work out a solution. Mr. Steinhagen has been practising civil engineering in Wisconsin almost continually since his graduation from Wisconsin.

Mr. Steinhagen was born in Milwaukee on Thanksgiving Day, November 24, 1887. He attended the grade schools of Wauwatosa, Wisconsin, and graduated from West Division High School in Milwaukee. His summer vacations, during his high school days and the year after his graduation, were spent in making land surveys and various lay out work for construction under his father, who had a consulting engineering practice in Milwaukee.

Mr. Steinhagen entered the University of Wisconsin with the class of 1911 and followed the civil engineering course for four years. He specialized in hydraulics and took as much work in the department as he had time for. Although he spent most of his time doing engineering work, he had time to spend as an active member of Philomathia.

After graduation he entered into the design and supervision of trunk sewers in the vicinity of Milwaukee. He followed this work until in the year of 1913 he started the firm of "Steinhagen and Klinger" with W. A. Klinger '10. While with this organization he constructed a number of important buildings in and around Milwaukee.

With the coming of the war in 1918, Mr. Steinhagen was drawn away from the building construction field and enlisted as second lieutenant in the army. He served in this position

for ten months, of which eight were spent in France.

The two members of Mr. Steinhagen's firm returned to private life, after the war, at two divergent dates. This, coupled with uncertain business conditions, led to a dissolution of the firm.

In August, 1919, Mr. Steinhagen associated himself with S. M. Siesel



E. D. Steinhagen, c'11

as field superintendent. In 1922 the business developed into the S. M. Siesel Co., Incorporated, with a home office in Milwaukee and a branch organization in Pittsburg, Pennsylvania. With this reorganization he became a director in the corporation and general field superintendent for all operations through the Milwaukee office. He is still holding this position.

In 1926 the need arose for definite information as to soil bearing values at the site of the new Hotel Schroeder in Milwaukee. Mr. Steinhagen supervised this work and discovered very satisfactory results. Caisson foundations were projected as rock was at too great a depth for carrying the

required load economically. The great loads made a definite knowledge of the soil bearing capacity necessary. Test caissons were sunk to determine the properties of the soil at the various depths. For this purpose a method and apparatus was developed by which test loads of any amount can be progressively applied and maintained upon a concrete footing and deflections and settlements will be recorded to one three-hundredth of an inch. This method has since been used on a number of occasions to test soil bearings and to test the bearing power of concrete piles.

Mr. Steinhagen was the man who engineered the Jung Building in Milwaukee. This is an eight story building and was the tallest reinforced concrete building in the middle west at the time of its construction. Among his other achievements are some difficult underpinning at the Blatz Brewery; the Chain Belt Company's mixer shop, core building, and foundry; the Holton Street Viaduct; the Plankington Arcade; the Boston Store; the Sixth Street Ramp Garage; the Shorecrest Hotel; Mariner Tower; and various theaters and smaller buildings in Milwaukee. He was also superintendent on the Loraine Hotel and its addition in Madison. At present Mr. Steinhagen is busy putting up the New Milwaukee County Court House and the New Warner Brothers Theater in Milwaukee.

Along with his engineering work Mr. Steinhagen is active in the Knights of Columbus and the Associated General Contractors of America. He was married in 1916 to Mary M. Kelly of La Crosse, Wisconsin. They have four children, three boys and one girl, and make their home in Wauwatosa, Wisconsin.

(Alumni Notes continued on page 30)

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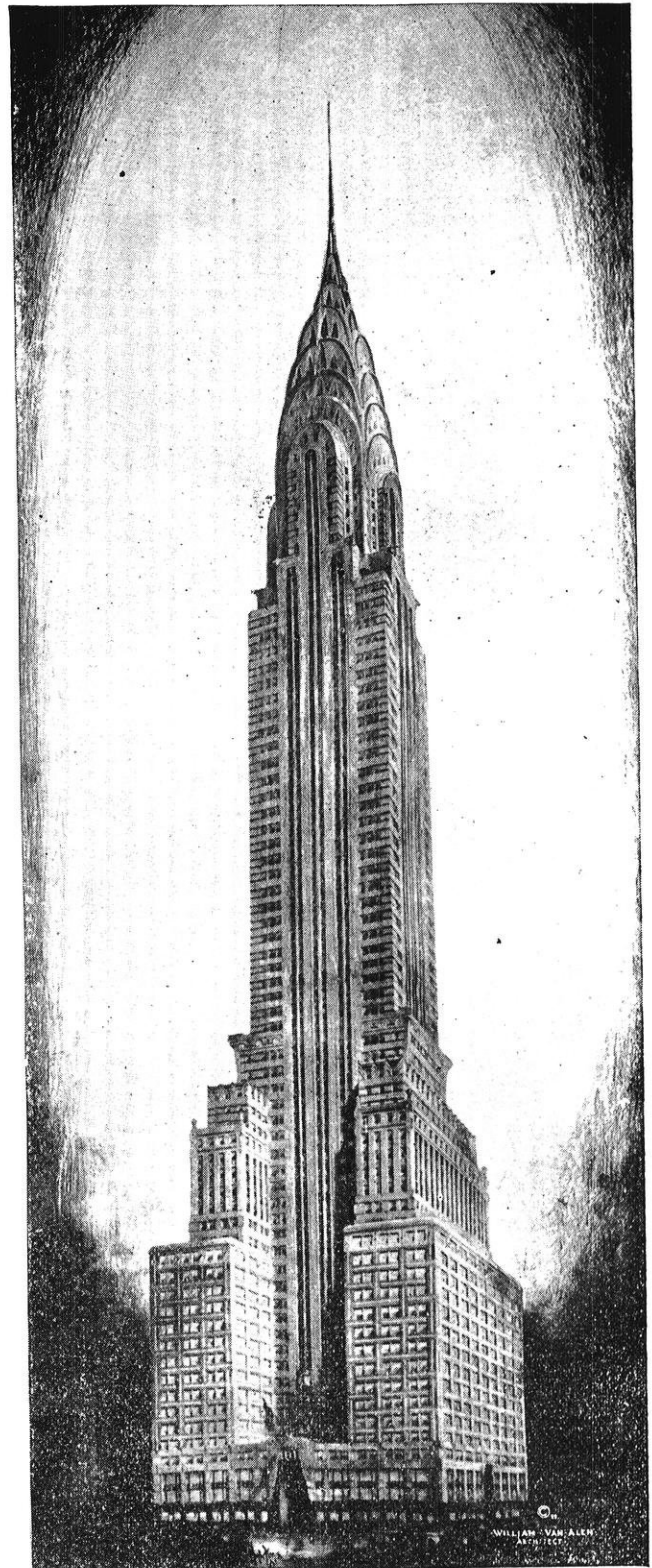
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EXPLOSIVES

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Editorials

BRAIN STORMS

When the brain gets gummy under the heat of an exam, strange ideas find their way into the blue books. The idea of reversible gravitation is presented by a student in masonry, who explains that water will enter a porous stone "by gravitation, the water coming up from below, traveling from particle to particle." He also recommends "a gravel or cinder base for the masonry through which gravitation is very limited." Another man in the same class writes that "non-porous material should not extend to the ground line, thus preventing trouble from abortion of water from the ground."

Millet seed, which is used to stimulate a semi-fluid, is rendered "lintel seed" in one paper and "linnit seed" in another.

Lime mortar should harden rapidly in Pittsburgh if the student was correct in his theory when he explained that "lime mortar takes carbon from the air and the carbonate of lime is formed."

In discussing the projection of a grade line for a railway, one man advises that the engineer should "avoid fills at summits and cuts in jags." Another offers the information that the "reconnaissance engineer would take a hand level (not ordinary kind—one that looks like a compass)." And the use of a "Gregorian knot" is suggested as a way out of a certain difficulty.

ROUGH GOING FOR HOOVER

Our engineer-president has experienced

unusually rough going during the first nineteen months of his administration. Even this early, his political demise is being predicted and he is being classified as a one-term president. Every effort is being made by his astute political enemies to create a defeatist complex in the ranks of his supporters.

The situation is said to be due to a large extent to a rather simple factor: The Democratic Party has established an effective publicity bureau, which is the source of the attacks that are being made on Hoover. This is a new

thing for the Democratic Party to do; in the past it has lain dormant between national elections. The Republican Party, on the other hand, wiped out its publicity bureau immediately after election, contrary to its usual custom. Only recently has the Republican Party, stung by democratic attacks, re-established its bureau.

CONTEST ANNOUNCED

Alpha Tau Sigma, the technical journalistic society, announced last year the plans for a competition in writing. The details of the contest have not been published until this issue of the *Wisconsin Engineer*.

The competition starts now. All engineer under-graduates with the exception of the staff members on the *Wisconsin Engineer* are eligible. The papers shall not contain less than 1200 words nor more than 3000 words. They may be exposition or narration; the subject matter is unlimited. An unusual treatment of a subject not necessarily engineering will be rated well by the judges. The judges will be composed of representative professors from the various departments of the engineering school.

Papers shall be typewritten and fastened in a manila folder. No name shall appear on the folder. Submit at the same time a sealed envelope with your name on the inside. Papers shall be submitted to Prof. Van Hagan anytime before the Christmas Recess. The *Wisconsin Engineer* reserves the right of publication on all submitted material.

The first prize will be a *leather bound engineer's handbook*; the second prize will be a *year's subscription to the Engineering News-Record* or its equivalent. The third prize will be a *set of curves or triangles* made by a reputable firm. In case less than ten papers are submitted only two prizes will be given.

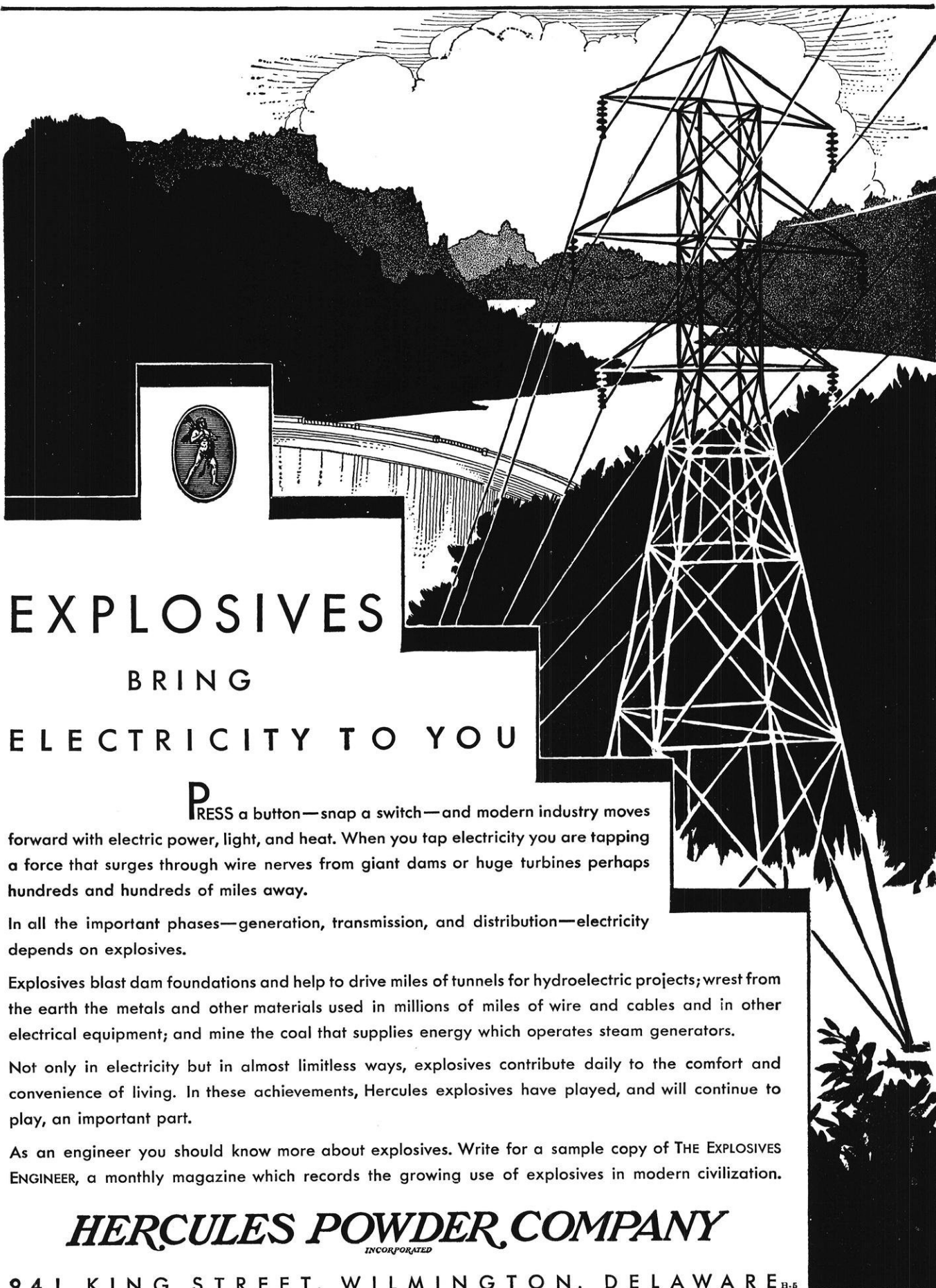
There has been no reason yet for engineers to lose confidence in Hoover. He is the same Hoover who succeeded as a mining engineer; the same Hoover who organized the marvelous relief work in Europe during the war; the same Hoover who entered Coolidge's cabinet in the most insignificant of departments and won his way to leadership in that cabinet; the same Hoover who brought prompt relief to the victims of the Mississippi's rampage in 1927. Hoover hasn't changed; he is as capable today as ever, and engineers rest their confidence in Hoover upon that fact.

Apologists explain that Hoover hasn't had the breaks; that he has faced unusual difficulties. The country is more bitterly divided over prohibition than over any issue since slavery; agriculture is in an economic morass from which it seems unable to escape; the stock market crash has been followed by a severe business depression marked by much unemployment; an unprecedented drought has caused great losses over a large part of the country. Difficulties ruin some men and make others. Hoover has given no indication that he was over-

whelmed by his troubles. On the contrary, he has handled the situations swiftly and capably as they arose. No president before him, with the possible exception of Roosevelt, has been as swift and sure in action as Hoover. The country has been fortunate in having as its president so capable a man in so troubled a time.

The odds favor his re-election, but no one expects that he will sweep the country as he did in 1928. That surprising sweep was the result of political errors that the democrats are not likely to repeat in 1932.

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As an engineer you should know more about explosives. Write for a sample copy of THE EXPLOSIVES ENGINEER, a monthly magazine which records the growing use of explosives in modern civilization.

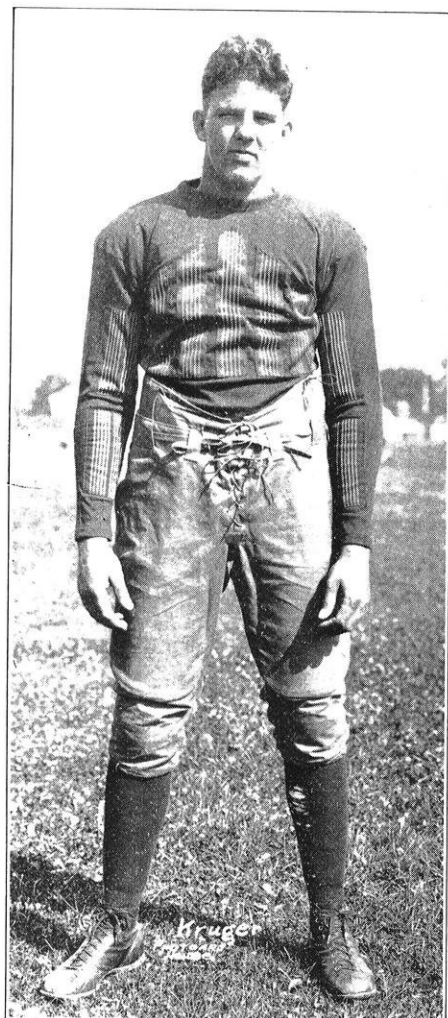
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Campus Notes

FOOTBALL

Although the regular lineup has not been chosen as yet, numerous engineers' names appear on the football roster. Some of these men are sure to have a place on the squad. The civil engineers seem to be the more ath-



Kenneth Kruger, c'32

letically inclined, for there are four of them out, while there is one mechanical, one chemical, and one electrical on the list.

Harold Smith, CE 3, of Freeport, Illinois, is a veteran at tackle, and probably will win a berth on the Badger eleven. Despite injuries, he played a good game last fall. Another civil is Kenneth Kruger, CE 3. He plays center very well, but has not entirely recovered from the effects of an automobile accident which occurred

this spring. If he is able to stand the strain, he will no doubt be seen at the center post. Kruger hails from Madison.

George Thurner, CE 2, of Madison, is a sophomore trying for halfback. Harold Lautz is a sophomore chemical who plays guard. Robert Engelke, ME 4, has shown very good style at guard, and is pretty sure to be in a number of games this fall. Both Thurner and Engelke are from La Crosse. A candidate for halfback, Carl Hand, CE 3, comes from Racine. John Schmeller is an electrical engineer who is able to supply plenty of shocks to an opposing line with his 200 pounds of beef. He lacks experience, however, and will have little chance this year at fullback on account of Tury Oman, who ripped off the ground so well last year. Schmeller's home town is Neenah, Wisconsin.

The Badgers have a somewhat easier schedule this year than last, and it is expected that they will make a better showing than they did last season.

Those engineers who endure the daily grind of football practice on top of hours of laboratory and classes certainly deserve credit for their efforts, and it is hoped that a number of them make the squad this year.

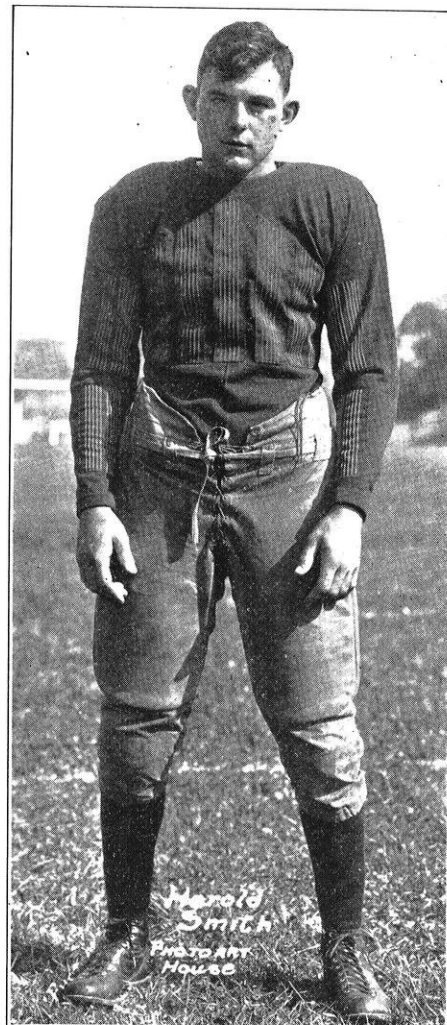
FORMER EDITOR DIES IN WEST

Harry L. McDonald, '04, former editor of the *Wisconsin Engineer*, died at the Sawtelle Army Hospital near Los Angeles, California, on May 23, following an attack of flu. He had been in poor health since the war, but continued active duty with the U. S. Geological Survey until shortly before his death. His brother Nelson was with him at the end and brought the body back to Fond du Lac, his home town.

Mr. McDonald attended rural school in Dodge County, grade school at Waupun. He was graduated from the Fond du Lac high school in 1897. He was engaged in newspaper work from 1897 until he entered the University of Wisconsin in 1900. He made a fine record at the university and was elected to Tau Beta Pi, the honorary

engineering society. In his junior year he was the business manager of the 1904 Badger and in his senior year he was editor-in-chief of the *Wisconsin Engineer*. He was graduated from the course in civil engineering in 1904.

Following graduation he was em-



Harold Smith, c'32

ployed as topographer with the U. S. Geological Survey, doing work in many states and in Hawaii. During the war he served as captain of engineers at the Camp Humphrey school. His health failed in October, 1918, and he was obliged to retire from active duty. He tried homesteading in the Southwest for a time in an effort to regain health, but ultimately returned to the service of the Geological Survey with which he remained until his death.

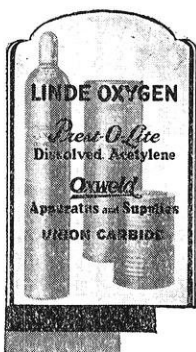
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Engineering Review

SHORT-WAVE HIGH-POWER RADIO TUBE

More Uses for Vacuum

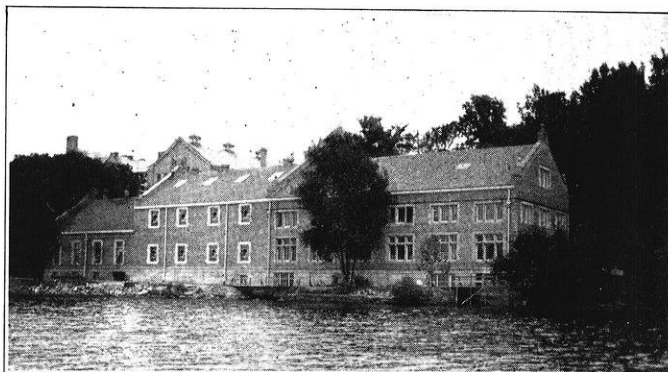
Vacuum tubes have been subjects of research for years. Approximately three years ago scientists in General Electric Research Laboratories succeeded in constructing a radio tube having a wave length of six meters and a frequency of 50,000,000 cycles per second, capable of radiating 10 to 15 kilowatts of energy. This is fifty times as much power as any short-wave tube previously had been able to produce.

Early experiments with this tube were accompanied with some phenomena startling to a layman. Within the sphere of its influence a cold copper bar would blister the hand that picked it up; an incandescent lamp held in the hand, without wire connections with any electric circuit, would light to full brilliancy, similarly a neon tube, upon being touched by anyone, would emit its bright red glow. Electrical instruments, even in rooms other than the one where the tube was, were disturbed or broken. Persons approaching too close to the tube experienced suddenly a comfortable glow of warmth, but if they continued under the influence, increasing pain in limbs and joints. Blood temperatures rose to 100 degrees Fahrenheit in fifteen minutes.

Radio cooking was demonstrated as a possibility. A wire was suspended over a table at a distance of a few feet from the radiating aerial, which was a copper bar about ten feet long. A sausage in a glass container suspended from the end of the wire was soon cooked. Likewise an egg was "fried" in this container, and an apple spitted on the end of the wire was thoroughly baked in a short time. With suitable changes of utensils cookies were baked and water boiled. There were no flames nor other visible evidences of heat accompanying the cooking.

The vacuum tube from which this weird power emanated was only two feet long and five inches in diameter. However, auxiliary to it was a large and complex array of electrical equipment costing so much that the tube will have but little practical utility until researchers and developers shall have accomplished numerous simplifications.

Quite different applications of the capabilities of this tube have also been under investigation. For generations heat has been used to alleviate pain and cure some diseases. Recently medical research has indicated that fever temperatures in the human body are destructive to certain disease germs.



New sanitary building in center where short plumbing course will be given.

Artificial production of fever is not easy, for man has very efficient devices for efficient body-regulating built right in his body by nature. The new vacuum tube affords a highly satisfactory instrument, so far as the research had progressed. Medical researches, to learn more of its curative possibilities and the technic for its proper use, are being conducted.

For therapeutic purposes the apparatus is like a short-wave transmitter, with the exception that the energy is concentrated between two plates of aluminum 28 by 18 inches, $\frac{1}{8}$ inch thick, each covered with two slightly larger hard rubber plates. The patient, lying on his back on a comfortable non-conduction support between the plates, has his body enclosed in a nearly air-tight box, from his neck down. Within the air chamber thus

formed any desired temperature can be maintained. The 10,000,000 cycle tube used produces 30-meter waves and has a power output of 500 watts.

As yet the high-power short-wave vacuum tubes are being used for experimental purposes only. To bring them into practical usefulness at reasonable cost and discover their many possibilities is the task undertaken by many prominent engineers.

SHORT PLUMBING COURSES TO BE GIVEN IN FEBRUARY

The department of Hydraulics and Sanitary Engineering announces a ten-day course in plumbing for plumbing inspectors, master plumbers, instructors,

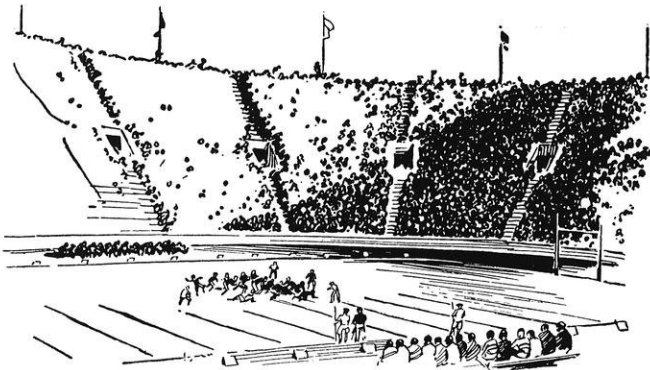
and foremen. The course is to be given from February 9 to 21, 1931. It will consist of lectures, demonstrations, work in the laboratory, and special topics.

The lectures will cover plans, symbols, details, drawing and sketching, water softeners, welding, street main connections, adequate fire supply, special fixtures, pressure regulators and pressure valves, screw thread cast iron pipe, cutting, threading, joining, deflections, stringer joints, and hot water circulation.

One period of two-and-one-half hours each day will be devoted to actual work in the hydraulic and sanitary laboratories. There the students will study such experiments and demonstrations as water hammer in actual installations; friction losses in pipes; back siphonage in plumbing fixtures; electrolysis of pipes and its prevention; corrosion; welding and brazing of pipes; various gauges and their use, and fixture units.

A number of speakers prominent in their fields will deliver the lectures. The University of Wisconsin professors who will lecture are: Prof. D. W. Mead; Prof. C. P. Watts, who will speak on electrolysis; Prof. R. A. Ragatz, who will speak on welding; and Prof. John R. Commons, who will lecture on labor problems.

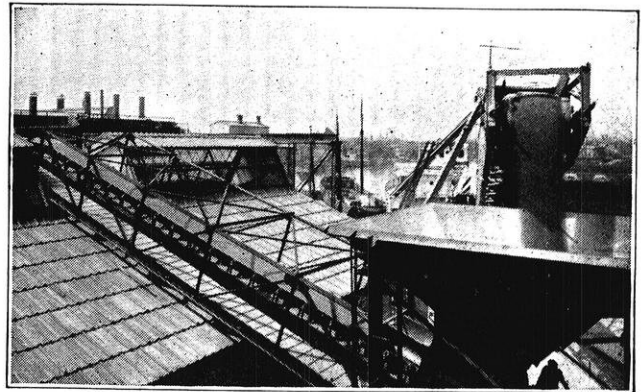
CEMENT & A BIG GAME



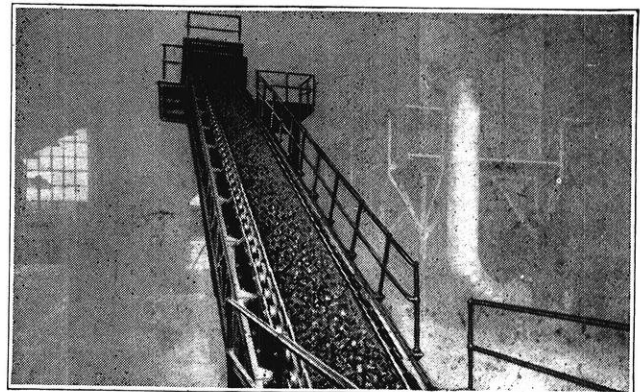
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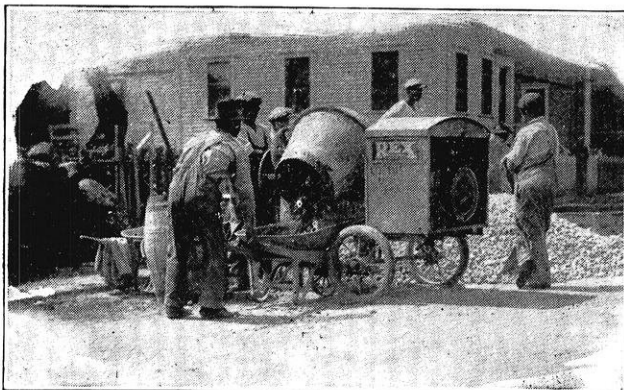
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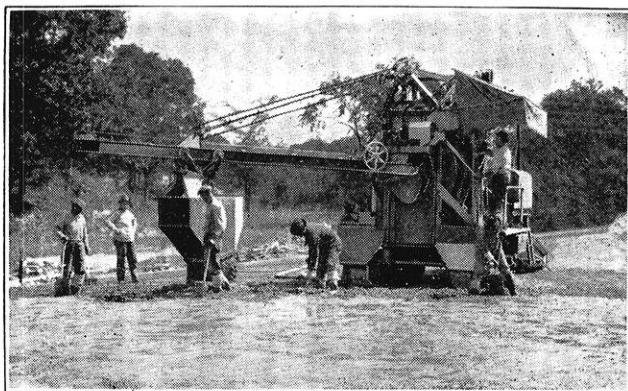
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A fee of \$10 covers all expenses of instruction and laboratory work. Due to lack of accommodations in the laboratory, the attendance will be limited to fifty.

DEFERRED RUSHING ABOLISHED

As a result of having very little success with deferred rushing last year, the interfraternity council has decided that rushing should be allowed immediately after the freshman period. Rushing this year began at eleven A. M. on September 24, the time set by the dean for the beginning of the open season. The dean even offered to supply fraternities with the Madison addresses of prospective rushees, with twenty-four hour service or better.

A. I. E. E.

The first meeting of the Madison branch of the American Institute of Electrical Engineers will be held about the middle of October, the exact date of the meeting being uncertain at the time of writing. At this meeting it is expected that Prof. Warren Weaver, head of the department of mathematics of the university, will give a talk which promises to be very interesting. The organization has also arranged to have an engineer from the Cutler-Hammer Company here on November 19.

LOOKING BACK TEN YEARS

It is interesting to look at some of the back issues of *The Badger* and note the changes which have taken place since they were published. Even the 1920 *Badger* seems

very old. When this issue of *The Badger* was published the country was just emerging from the World War.

In the section devoted to the college of engineering Dean Turneure has a short article on "Engineering During the War" in which he describes how the engineering school helped win the war by training men, and even women, for there is a picture of war-time co-eds learning auto mechanics in the steam and gas lab.

THE 1930 SUMMER CAMP

(Continued from page 10)

The banquet at the end of the camp was the apex of the social life of the summer term. A chicken dinner, ginger ale, and beer, and cigars was an exceptional menu. Art Bright, toastmaster, introduced a select group of speakers which included Dean Turneure and other notables.

Each year the construction crews have built up the camp, enlarged the living facilities, and left the camp a little better and more adequate for the next camp. This year the shed was renovated. A new set of dormer windows was built into the barn attic, and several trails were re-blazed. The dauntless Medler removed all traces of poison ivy from the shores of Lake Owen. Two new triangulation bases were built near Spring and Depot bases for next year's work.

The 1931 camp will be much larger than the 1930 camp. Both sophomores and juniors will attend Azimuth City for railway engineering as well as surveying. Prof. Owen is contemplating topographical work at Camp Douglas. This

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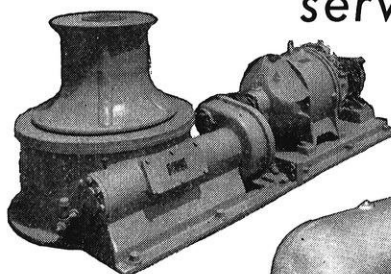
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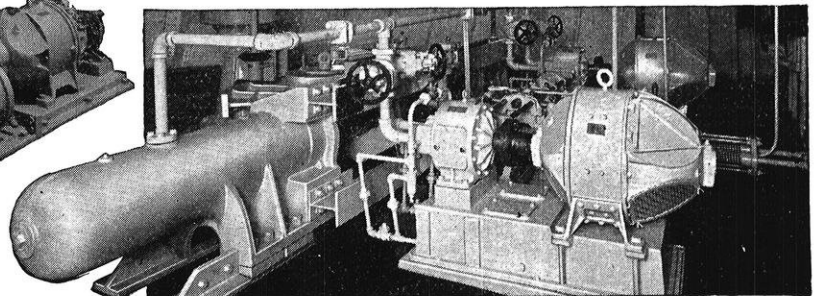
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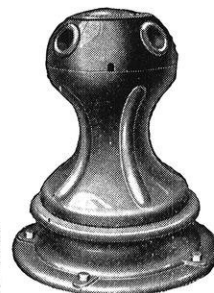


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will permit the transporting of "topog" parties to the military camp, and will reduce the congestion at Devils Lake. Besides this, concrete tent floors are being built as an experiment.

The 1930 camp was, in short, a huge success taking into consideration the amount of work done. The camp motto was "don't put off until tomorrow what you can do today—put it off until day after tomorrow." The theme song for the summer was "Ten Cents a Dance" sung by Ruth Etting.

WEEKEND

(Continued from page 9)

another. He entered the argument, grew heated over the debate. He no longer felt so tired. Another shot—what did he care what everybody said or did? Gee, but it felt swell not to be tired. More drinks. The boy threw himself upon his bed at two o'clock. Someone had taken him home and undressed him —.

Monday morning. The kid was sick, shaking, despondent. Another week-end shot—another vow to work broken—another grade pulled lower. He went back to bed after breakfast, and slept until almost supper. He awoke. He felt fresh. He tried his math—his mind wandered again. Presently he got dressed and went to supper. He felt good. He went to a show. Back at ten, very sleepy. He made a half-hearted attempt at his math. He felt again like crying, but this time it was more of a relaxed feeling—the racked nerves had been quieted by his long sleep. He undressed slowly and went to bed; and fell into an instant slumber.

Another week-end. The boy was tired. He looked despondently upon the same dreary prospect. He would go home tomorrow, and be nagged again. He knew he would never work. He sat up late Friday night, reading poetry. It rested him, relaxed him, made him forget —.

Midnight struck from several distant bells. The boy looked white and tired, and he sank hopelessly into his chair while the blues gradually sifted down on his mind. He was tired—what did he care—he could never concentrate—never please anyone—what did he matter? Oh, if he could only sleep, but always a tomorrow, always a nagging tongue, always a whining, complaining voice, always the leaden despair of unfinished, unfinishable work. He was tired—if he could only sleep without a tomorrow. Quite easily, naturally the idea of suicide came into his mind. He took out his .38 and calmly loaded it. He shoved the cold hard ring of its muzzle against his forehead. Only to sleep. The cool steel felt good. His mind wandered off to his mother. He thought of his mother. He thought how her plaintive, nasty voice would keep saying: Why did he do it? Why didn't he think of me? What will everyone say? Is this the way he repaid me for all my work? Is this all the consideration he had for me? He always was so selfish. Why did he do it?

The boy shivered violently. A raw wind blew in from the open casement across his sweating body. Chills convulsed him. He thought of how warm he would be in bed. He made a move to rise, and hit his cheek with the gun. With a start he remembered what he had gotten it out for. He dropped it into the drawer, undressed wearily and crawled away to his bed—tired—so tired.

TO THE FRESHMAN ENGINEERS

(Continued from page 5)

mastery a lot of time and hard work, and there are many students whose college work suffers to an undue extent because of the amount of time they are obliged to give to earning money. The college work can be almost ruined by such overwork, and students who are obliged to work many hours in employment should reduce their college schedule to a reasonable program in order that their work may be effective.

In examining an engineering program, it may strike the beginner that there is very little of an engineering nature in the first two years of the course. The program is made up almost wholly of mathematics, science, English, and drawing. The Civil Engineers get considerable surveying, and the other groups a small amount of applied work pertaining to their particular course, but the fact that so much time of the whole four-year course is devoted to fundamental mathematics and science indicate the scientific basis of engineering practice, and should impress upon you the fact that preparation for the engineering profession is a serious business and is an intellectual process and not a matter of manual skill. English is as fundamental as mathematics. The engineer who cannot express himself clearly in his written reports and in argument is at a serious disadvantage, and this situation should be avoided by serious attention to this subject in college.

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The Engineering Faculty looks upon the students in its charge as a large office force of young engineers where the problems are those of engineering training rather than actual construction. And it is their desire that there shall exist the same sort of helpful and frank relations between faculty and students as exist among the force in a well conducted office. We wish you to look upon your instructor or adviser as a genial "boss" whose business it is to promote the efficiency of the work of the office. Consult him freely about any matter of importance in your college life. We wish you the best of success in your new work.

RESEARCH AT THE HYDRAULIC AND SANITARY LABORATORY

(Continued from page 7)

offices and a class room. When completed the laboratory will be fully equipped to conduct complete chemical and bacteriological analyses on water, sewage, and industrial wastes. The old laboratory is to be kept intact and is to be used for thesis parties and special research work in sanitary engineering.

Experiments on the Oxygen Consumed Test

Experiments were conducted by Mr. R. T. Homewood and Mr. H. W. Ruf to determine the factors necessary to obtain consistent oxygen consumed values of sewage and industrial waste. The oxygen consumed or permanganate reduction test is used by sanitary engineers to indicate the polluting strength of various wastes, and also to study the efficiencies of the various units of a sewage treatment plant. The test consists of determining the amount of potassium permanganate reduced by a known quantity of sewage or industrial waste in acid solution when digested in a steam bath for a period of one-half hour. It has been generally considered that if an excess of potassium permanganate sufficient to produce a red color remained at the end of the thirty minute digestion period, the results obtained were accurate.

While using the oxygen consumed test on some previous work the investigators noted that the amount of potassium permanganate available at the beginning of the test seemed to have a decided effect on the amount of potassium permanganate reduced. The purpose of the experiment was to determine the nature of the above observed effect and if possible to find a method of eliminating the error.

A series of preliminary experiments showed that the

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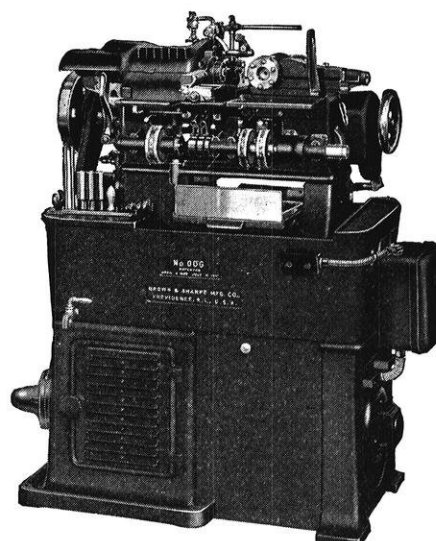
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degree of oxidation of sewage increased with increased acid concentration. After these preliminary experiments were completed a procedure was devised whereby the acid concentration was kept constant irrespective of the amount of waste or potassium permanganate used in the test. Studies were made on the effect of various amounts of potassium permanganate on the degree of oxidation of sewage, milk waste, packing plant waste, and pure forms of some of the common ingredients of ordinary sewage.

The method of procedure consisted of placing known quantities of the substance to be tested in a series of flasks to which various amounts of potassium permanganate were added, the amount varying between 12.5 to 150 milligrams of available oxygen. The samples were then digested for a period of thirty minutes in a steam bath and the amount of potassium permanganate reduced determined. The results obtained using Madison sewage are shown graphically in Fig. 2 which indicates that the degree of oxidation of the sewage increases rather rapidly with increased amounts of available oxygen until about 90% of the original oxygen remains after digestion. After the above described results were obtained, tests were made to determine what constituent of ordinary sewage required this rather large amount of excess oxygen. The materials tested were pure starch, cellulose and cane sugar, these substances comprising a large portion of the organic material in ordinary sewage.

The results showed that the degree of oxidation of cane sugar tends to become rather constant when about 67% of the original available oxygen remains after digestion, starch when about 77% remains and cellulose when about 90% remains. The value of 90% for cellulose tends to explain the rather high excess of available oxygen necessary for fairly consistent oxygen consumed results on ordinary sewage as it contains large amounts of cellulose.

The tests made on packing plant waste indicated that the degree of oxidation was almost directly proportional to the amount of oxygen originally available.

It is common practice to preserve sewage or industrial waste with ordinary chloroform so as to prevent biological activity in the sample during the period between collecting and testing. The effect of ordinary chloroform on the oxygen consumed values of such samples was studied by Mr. R. T. Homewood and Mr. H. W. Ruf.

The investigators noted that samples preserved with ordinary chloroform had a higher oxygen consumed value than the unpreserved ones. The oxygen consumed test was run on various amounts of chloroform in distilled water and the amount of potassium permanganate reduced was found to be proportional to the quantity of chloroform present. Studies showed that by washing ordinary chloroform with distilled water its oxygen consuming characteristics could be removed. The washing process consisted of shaking the chloroform in distilled water, permitting it to settle, and pouring off the water.

It seemed reasonable that a least part of the impurities oxidized by the potassium permanganate might be ethyl alcohol because this substance is used in the manufacture of chloroform. Tests for alcohol were made on the wash water. The iodoform test was positive, crystals of iodoform were identified by microscopic study. The proof of the presence of ethyl alcohol was obtained by the use of the ethyl benzoate test which was also positive. No attempt was made to determine what other impurities were present.

Packing Plant Sludge Studies

During the present year Mr. O. J. Knechtges, Research Fellow in Hydraulic and Sanitary Engineering, is conducting experiments on packing plant sludge. The problem of packing plant sludge digestion has given sewage plant operators trouble. The purpose of the experiment is to determine just how much packing plant sludge can be added to ordinary sludge of domestic sewage without retarding the rate of digestion. Studies will also be made to determine the nature, quantity and rate of gas formation.

The method of procedure consists in placing various known mixtures of domestic and packing plant sludge in five gallon water bottles the outlet of which is connected to a water sealed gas collector. The gas formed by the decomposition of the sludge is periodically collected for analysis. The apparatus is so constructed that samples of the sludge may be removed at various times to determine the degree of digestion.

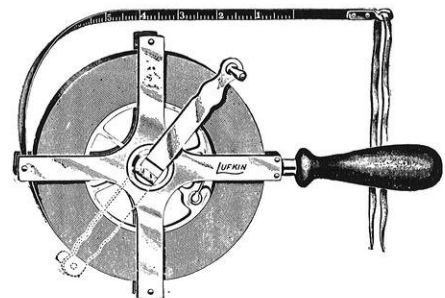
Sewage Treatment Plants

The efficiency of various small town sewage disposal plants was studied by Mr. R. J. Poss and Mr. G. L. Jentz. Samples were collected at the plants at various times and complete analyses were made.

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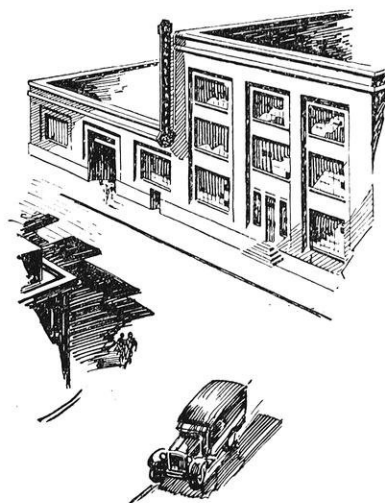
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STATE AND LAKE STREETS

WHAT THE CLASS OF 1930 IS DOING

(Continued from page 11)

Cox, Marvin E., is with the communication department of the American Telephone and Telgraph Company. He spent the summer on maintenance work in Wisconsin.

Cummins, Frank J., is engineer with the Public Service Engineering Company at Lexington, Ky. This firm controls the Central Natural Gas Company which is extending its pipe line from eastern Kentucky to a point a few miles east of Indianapolis. There are seven or eight location parties in the field at present and construction will start within a few weeks. Address: 1045 Fontaine Road, Lexington, Ky.

Druml, Frank J., is with the city of Milwaukee as Junior Engineer.

Egger, Glenn M., is with the Wisconsin Telephone Company in the plant department. He has been engaged in staking out pole lines near Chetek. The lines are being removed from the highways and relocated on private right of way.

Every, Edward M., is chief of party with the Wisconsin Highway Commission, Division 1. He has been in charge of relocating the highway around Lake Monona.

Fiebrantz, Raymond C., is taking a student course with the McClintic Marshall Company of Chicago.

Fulton, Donovan H., is chief of party for the Wisconsin Highway Commission at Rhinelander.

Green, Kenneth H., is with the La Crosse Division of the Wisconsin Highway Commission.

Grupp, Herbert C., is with the Henkel Construction Company of Mason City, Iowa.

Hass, Herbert W., is with the Illinois Division of Highways working out of the Elgin Office.

Heberlein, Edward G., is assistant to the technical manager of the Vacuum Oil Company at Milwaukee, Wisconsin. Address: Sta. C, Route 6, Box 561, Milwaukee.

Held, Chester J., has been appointed to a fellowship in Mechanics at Wisconsin. He has been working out of division 2 of the Wisconsin Highway Commission.

Hornig, Frederick F., is with the A. T. & T. Co. in the Long Lines Department at Chicago.

Hulbert, Edward W., is with the Michigan Bell Company at Detroit.

Hunder, Marcus B., was research assistant in mechanics following completion of his school work in February. He is now with the U. S. Engineer Office at Milwaukee. He has been inspecting construction on a breakwater at Muskegon.

Huth, Alton M., is with the Dravo Construction Company on a Detroit job, working under Dick Remp, Wis. '04.

Hutton, Robert W., is with the U. S. Engineers Office at Milwaukee. He has been designing a means for raising concrete caissons that have been deplacced by storms.

Jentz, Gilbert L., who is with the U. S. Engineer Office at Milwaukee is recorder on a survey party on the Wolf River.

Kesting, Edwin C., after working with the Commonwealth Telephone Company at Madison is now with the La Crosse Division of the Wisconsin Highway Commission.

King, Bernard F., was elected city engineer of Watertown, Wisconsin, at the spring election preceding his graduation.

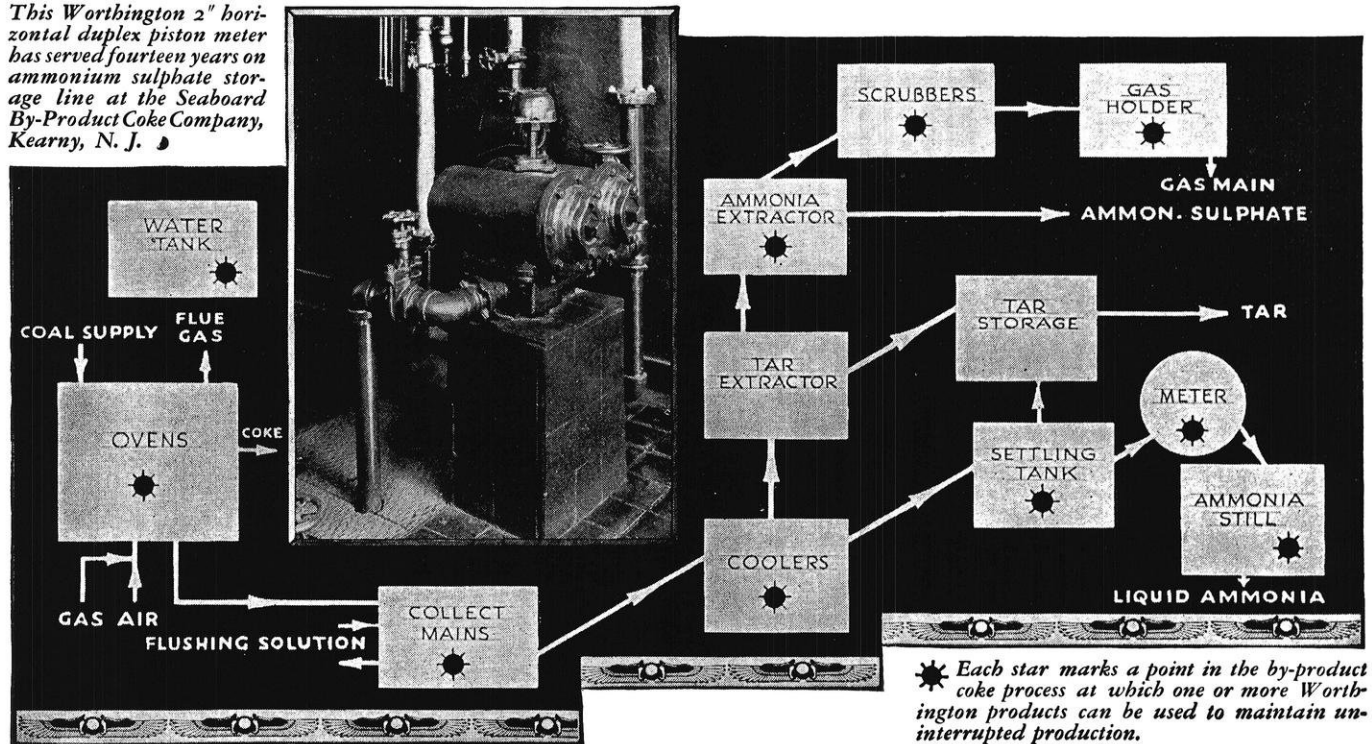
Lenschow, Henry J., is working out of the La Crosse office of the Wisconsin Highway Commission. He is project engineer on a job between Northfield and Hixton.

Mohr, Harvey, is in the U. S. Engineer Office at Milwaukee.

Paschen, Clayton F., is with the Paschen Brothers, constructors of big buildings in Chicago.

Peleske, Leo W., is instructor in drawing at Wisconsin. He was married on June 18 to Ann Comiesky of Superior,

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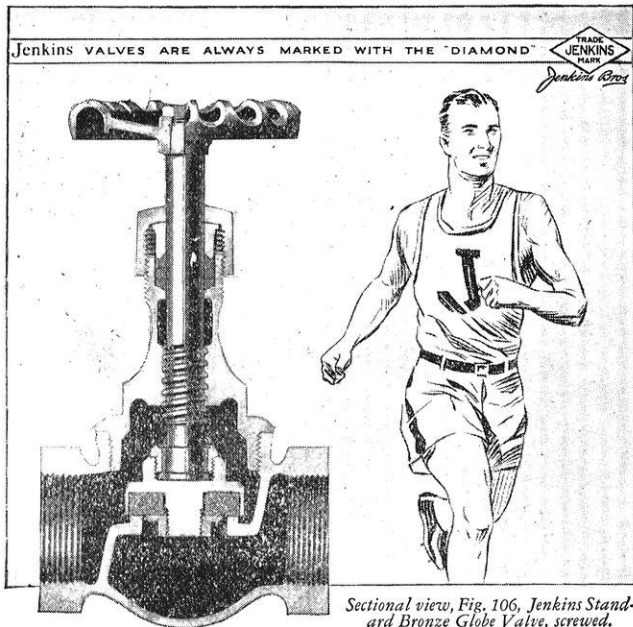
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a former teacher in the Wisconsin School of Music. The honeymoon was spent in the Black Hills.

Plotz, Rezin S., is with the Bell Laboratories in New York City.

Poss, Robert J., is with the U. S. Engineer Office at Milwaukee. His work has included designing a gravity section dam and the tainter-gate piers for the Fox River at Kaukauna, assisting with reports, and inspecting break-water construction at Frankfort.

Raccoli, Theodore, is junior engineer with the Illinois Division of Highways at Elgin.

Roberts, John R., is with the Roberts-Pettijohn-Wood Corporation, 844 Rush Street, Chicago.

Roeming, George C., is with Mr. Balkema, consulting engineer of Milwaukee.

Rusch, Erwin G., is with the Wisconsin Telephone Company in the Milwaukee office.

Schaeffer, Albert C., is chief of party with the Wisconsin Highway Commission. At present he is inspecting a highway north of Tomah.

Stevens, Roger W., who joined the staff of Engstrom & Wynn at Wheeling, West Virginia, in February, is now employed by a Russian Syndicate on the design of a steel mill with a possible chance of going to Russia. He writes: "We are using the metric system and have to make our design correspond to the use of European reinforcing rods and structural shapes. Information is hard to obtain as to size of bricks and also the weights of German cranes and equipment. . . . I've found that the engineering profession is crowded with men who are poorly trained and turn out computations that would hardly do credit to a U. W. man in sophomore mechanics. I was asked to check a man's figures on the design of a counterfort retaining wall. There were some 25 pages of figures, but it was all Greek to me and to the boss besides."

Tacke, Walter H., is instructor in railway engineering, in which department he had been student assistant during his senior year. He instructed in rails during the summer camp at Devils Lake. Following that he worked for the Milwaukee Playground department.

Velasquez, Bernardo C., returned to Columbia, S. A., following the completion of his work in February.

Waite, Gordon E., is with the International Filter Company at Chicago. Address: 154 N. Parkside Ave. He writes: "I am in the service department and have an office, a dictaphone, and whatnot. The course in business letter writing certainly comes in mighty handy."

Washa, George W., is instructor in mechanics at Wisconsin.

Wootton, Clarence J., is in the U. S. Engineer Office at Milwaukee.

CHEMICALS

Casselman, Ralph T., is working on wallboards and acoustic materials for the Celotex Company of Chicago.

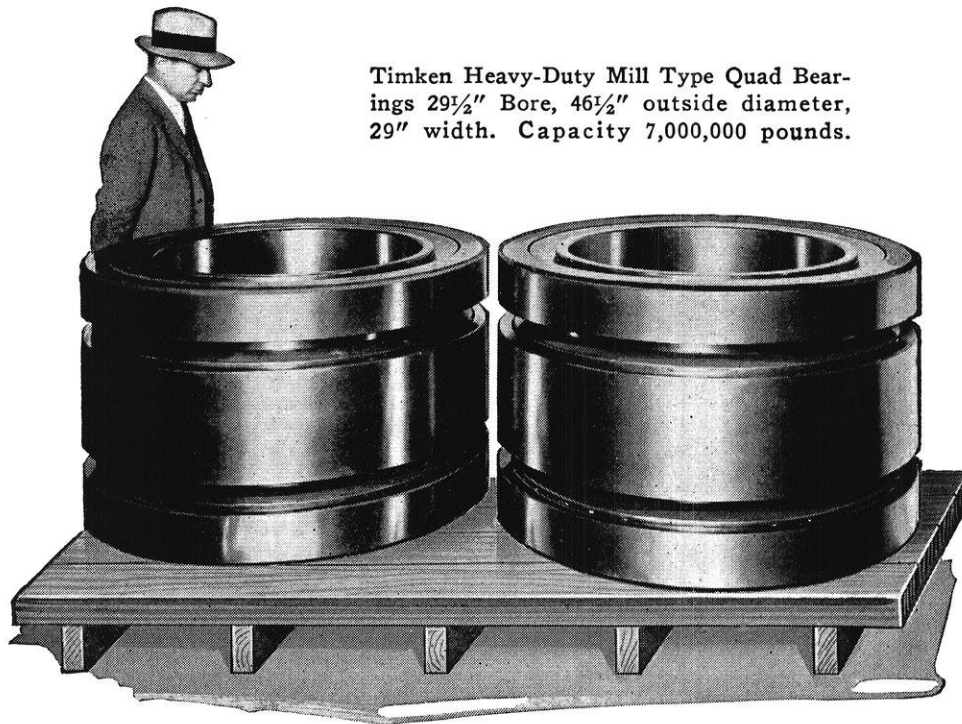
Catlin, John B., is with the Kimberly-Clark Corporation at Kimberly, Wisconsin. He is interested in paper manufacture just at present. His advice to the "frosh" is as follows: "Better training in football should be made available to engineers going into the paper game."

Crane, A. B., is in the coke plant of the Wisconsin Steel Company.

Johannsen, Albert, is working as a chemist in the Azo dye department developing new shades of red for the Sherwin-Williams Company of Chicago.

Popkin, Henry R., is working on the treatment of gasoline and lubricating oils with aluminum chloride for the Sinclair Refining Company at East Chicago, Indiana. His address is 411 Sheridan Avenue, Whiting, Indiana.

Quale, Irving S., is doing a little bit of everything for the Sinclair Refining Company at East Chicago, Indiana.



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Rohn, Robert, is starting work with the Aluminum Company of America at Pittsburg, Pa.

MINERS

Eastwood, L. W., will be back at school this year as a graduate student.

Roden, Philip S., is a mine engineer for the Braden Copper Company at Rancagua, Chile.

Schmedeman, O. C., is back at Wisconsin studying for a masters degree in Geology. He spent the summer making a detailed geological examination of the Isabella mine at Isabella, Tennessee.

MECHANICALS

Breiby, Norman, is with the Proctor and Gamble Company at Ivorydale, Cincinnati, Ohio.

Daniels, Chas. J., is with the Chicago Bridge and Iron Works at Chicago. Address: 10887 Prospect Ave., Chicago.

Dewey, William V., is a Junior Engineer at the Babcock Wilcox Company, Barbertown, Ohio.

Cromer, Orville C., is a fellow in Mechanical Engineering at the University of Wisconsin. Address: 509 W. Lake St., Madison.

Kahlenberg, J. F., is with the Pittsburg Plate Glass Company at Milwaukee. He is a research engineer in the paint and varnish department.

Kraut, Ralph J., is touring around the world trying to complete his education.

Mueller, George W., is an engineer in the design department of the Procter & Gamble Company. He spent several months, since his graduation, in the power department running boiler and gas producer tests.

Pawlowski, John A., is a production engineer of the Cutler-Hammer Company in Milwaukee.

Reed, Russell H., is an instructor in the Farm Mechanics Department at the University of Illinois.

Rosenthal, Paul, is working on chromium plating for the United States Chromium Corporation at Pittsburg, Pa.

Russell, Forrest O., is working in the Concealed Heater Sales Department of the Trane Company at La Crosse, Wisconsin.

Rumpf, Harry, married Miss Paula Frankfurth last June. At present he is living at Okauchee Lake, Wisconsin.

Schroeder, Ralph R., is an inspector of the Wisconsin Telephone Company at Milwaukee.

Stetson, George L., is a student engineer with the Linde Air Products Company at Buffalo, New York.

Way, Edward, is taking a training course with the Automatic Electric Company at Chicago.

Willis, Newton H., is working for the Chain Belt Company, manufacturers of concrete mixers, chain belts, traveling water screens and contractor's equipment, in Milwaukee.

Wilson, Walter, is with the Modine Mfg. Co. at Racine, Wisconsin. His work consists of testing heating units.

ALUMNI NOTES

Anderson, Edward, m'19, has resigned his position in the mechanical engineering department at the University of Nebraska to accept the position of assistant professor of petroleum production in the School of Petroleum Engineering at the University of Tulsa. The school, which is endowed, was established two years ago and is operated on the co-operative basis which permits the students to work and go to school alternately. Professor Anderson was instructor in steam and gas engineering at the University of Wisconsin for several years following his graduation.



Barnes, Ernest M., c'22, is superintendent on the construction of a \$700,000 filtration plant for Erie, Pa. He has **A. G. Oettmeier**, c'27, as his job engineer. They are working for Engstrom & Wynn of Wheeling, W. Va.

32 « THIRTY-TWO » 32

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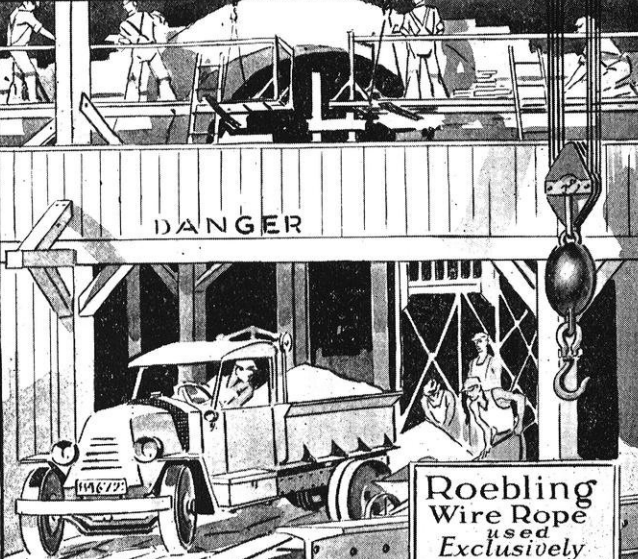
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Bliffert, Wesley P., c'29, former staff member of the "Wisconsin Engineer" and varsity cheer leader, was married on June 16 at Dallas, Texas, to Bonnie Vivian Porter of that city. The bride was a former Wisconsin student.

Buglass, Spencer, c'29, died in a Madison hospital on August 22 of meningitis of the brain following a sudden attack two days previously as he was at work in the office of the Highway Commission.

Burmeister, Wesley J., c'29, was recently married to Viola Wittenberg of Middleton.

Behm, Willard W., c'29, MS'30, instructor in Highway Engineering at Wisconsin last year is instructor at Iowa State College at Ames.

Clark, Selden, c'29, is now in charge of the senior paying and telling window of the savings department of the Bank of America at Los Angeles, California. He writes: "Engineering work is very dull here. All the fellows are waiting for the Boulder Dam project to get started."

Collins, William A., c'24, is again with the city engineer of Beloit.

Daggett, Gordon F., c'24, announces the opening of offices at 2404 Clybourn Street, Milwaukee. He will specialize in sand, gravel, and crushed stone plant design, construction, and equipment. For some years he has been executive secretary of the Wisconsin Mineral Aggregate Association.

Field, Louise, e'28, was recently married to George F. Hanson at Kilbourn, Wisconsin. Miss Field has been working with the Wisconsin Power and Light Company where her husband, Mr. Hanson, was also employed as an engineer.

Icke, John F., c'00, is seriously ill in a Madison sanatorium. His wife died on August 28. Mr. Icke was at one time city engineer of Madison. For many years he has been successfully engaged in contracting.

Kurkdjian, Sarkis A., MS'29, returned to Turkey in April to await an opportunity to return under the quota. He expects to be back in the United States about Sept. 1 and plans to teach surveying, descriptive geometry, and drawing at the Chicago Technical College.

Kurtz, E. B., e'17, has recently completed a new book entitled: "Life Expectancy of Physical Property."

Lidicker, William Z., c'27, MS'28, is with the Management & Engineering Corporation of Chicago. He writes: "At the completion of our survey in southern Missouri, I was called into the Chicago office to prepare from our survey a design and preliminary estimate of cost for the proposed development. This, of course, has taken most of my time for three months. My work has been intensely interesting, and I have enjoyed the past year very much." He plans to take in at least one football game this fall in Madison.

Lovewell, Cecil E., ex-c'29, is with the Common Brick Manufacturers' Association engaged in testing. The headquarters of the association is at Cleveland, but the test work is being done at the Industrial Building of the Bureau of Standards at Washington, D. C. He visited Madison during the summer, apparently fully recovered from the severe injury he received a year ago on construction.

MacArthur, Donald, m'04, died on July 24 at a Mont-Claire, N. J., hospital following an operation. He was vice-president and director of the Seaboard By-Product Coke Company. He was born in Scotland and came to Superior, Wis., when he was seven. He leaves a widow and one son.

Rogers, Walter A., c'88, is president of the Bates & Rogers Construction Company which has recently been awarded the contract for the construction of a tunnel parallel to the Lewis tunnel on the Chesapeake & Ohio Railway, 15 miles west of Covington, Va. The tunnel will be 3186 feet long and is estimated to cost \$1,100,000.

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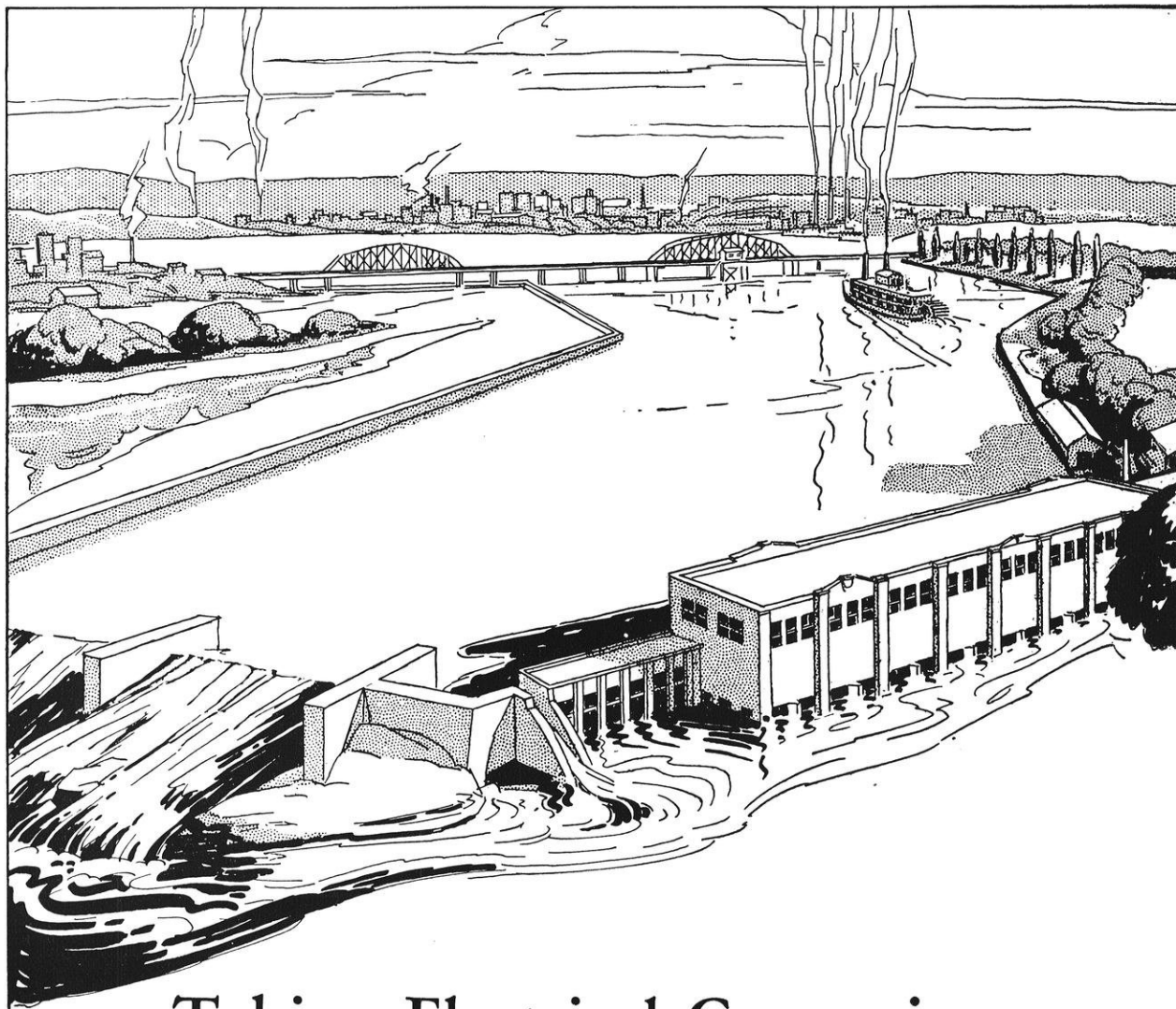
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