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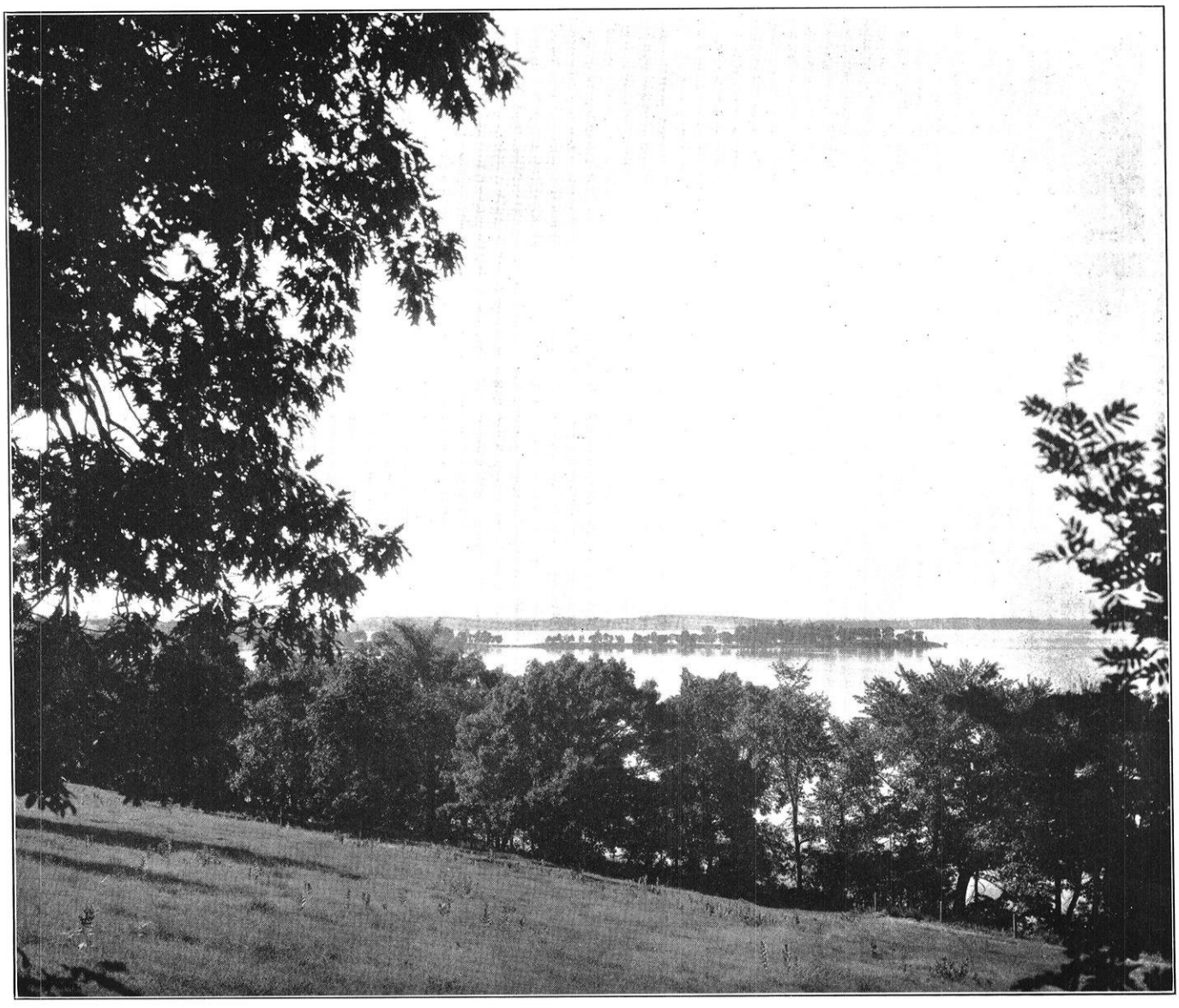

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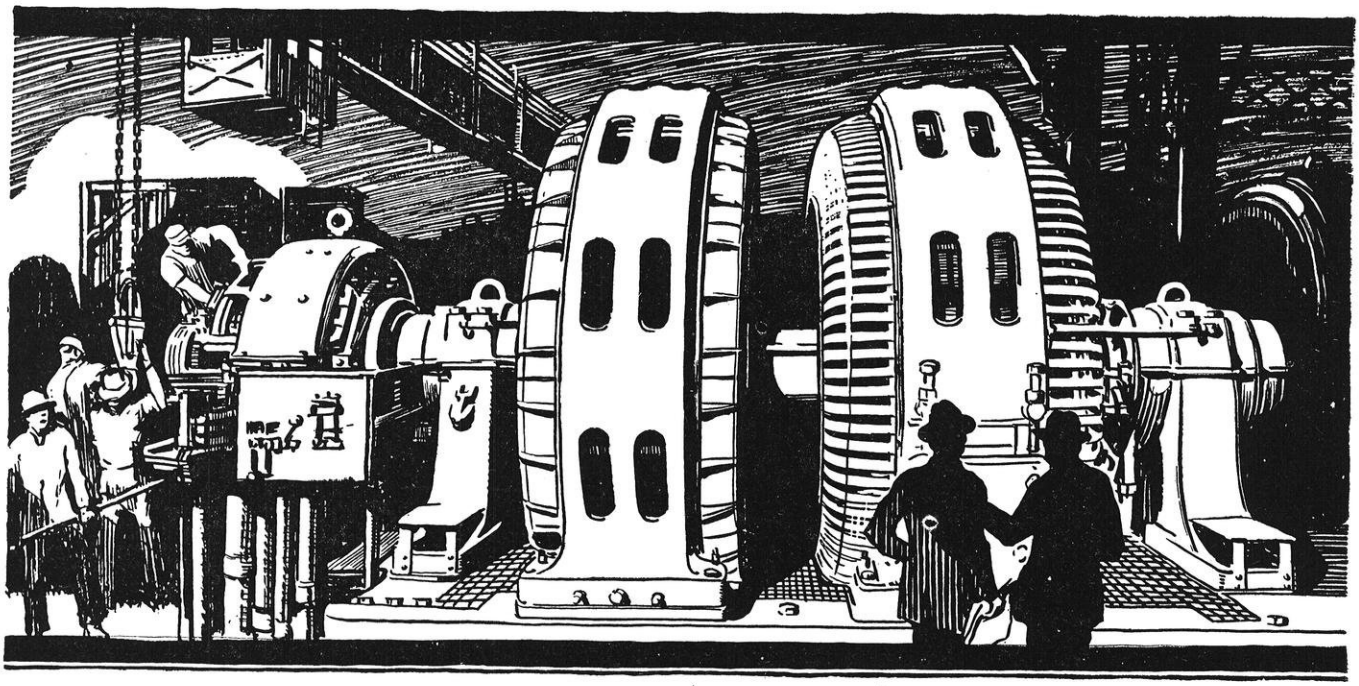


Real Service Must Be Engineered

Many of the men whose names are writ large in engineering history are design engineers; men like Westinghouse, Lamme, Stanley, Hodgkinson, Tesla, Shallenberger. Their inventions have the quality of usefulness, of reliability, of productability; which is an involved way, perhaps, of saying that they have the primary requisite of all really great inventions: *Serviceability.*

Engineering history abounds in instances of near-genius that produced no product, and of great developments that never reached completion; and most of these instances are explained by the lack, somewhere in the system, of that ability to give real Service.

Service, in a machine or a system, or wherever you find it, is not there by accident but because it was incorporated by men who understood what was required and knew how to provide it.

Much more is required of the designer than facility in calculation and mastery of theory. He must have first hand and thorough familiarity with manufacturing operations and with commercial and operating conditions. It takes more than mere ingenuity and inventiveness to design apparatus that will be really serviceable and will "stay put."

The design engineer, in the Westinghouse plan, is responsible for the performance of the finished product. He cannot possibly have the proper understanding of operation unless he operates and tests, unless he spends time and thought in investigation and study, not in the laboratory or drawing room, but right on the operating job. Here, most of his ideas will develop; and here he will see and prepare for all the different things which the product will later have to encounter. Then when he comes to put his creations on paper, his calculations will be necessary and helpful to check the conclusions which he has reached, and this right use of them requires training and a high degree of understanding. This proper balance of the physical and mathematical conception of things is what constitutes engineering judgement.

It should be thoroughly understood that the primary function of the design engineer is the conception and the production of new or improved apparatus, and familiarity with the practical is essential to the proper discharge of this duty.

It is this view of designing that makes this branch of Westinghouse engineering so important, so effective, and so productive of real developments.

The Wisconsin Engineer

UNIVERSITY OF WISCONSIN

VOL. XXVIII No. 2 MADISON, WIS. NOVEMBER, 1923

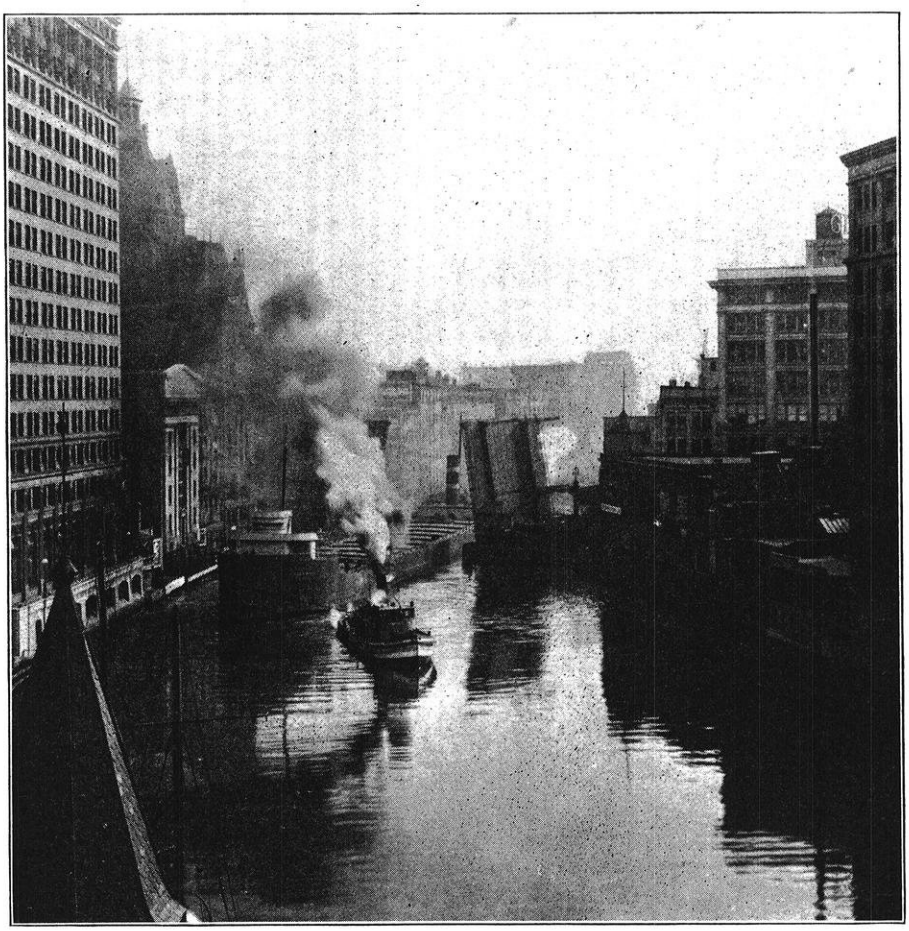
PORT TERMINAL DEVELOPMENT AT MILWAUKEE,

By FRANK A. KAISER,

Senior Engineer, Board of Harbor Commissioners, Milwaukee, Wis.

The commerce of the port of Milwaukee is carried on at a great disadvantage in three rivers which flow through the heart of the commercial and industrial districts of the city. These rivers are too narrow and are spanned by too many bridges to permit the large vessels of today to navigate them without great difficulty and expense. Furthermore, serious delays are caused to down town traffic by the opening of bridges. Milwaukee needs better terminal and transfer facilities elsewhere for its commerce.

The need for better harbor facilities was realized several years ago, and a new location for a harbor was sought. It was decided to take advantage of Milwaukee's natural bay along the lake front, where it is possible, with the extension of the present government breakwater south as far as Russell Avenue, to create a basin of 1300 acres and protect more than two miles of lake frontage for terminal facilities. Into this outer harbor, vessels may come under their own power, and dock at the piers to load or unload with the quickest dispatch.



IN THE HEART OF THE CITY
Coal laden steamer passing up the Milwaukee River.

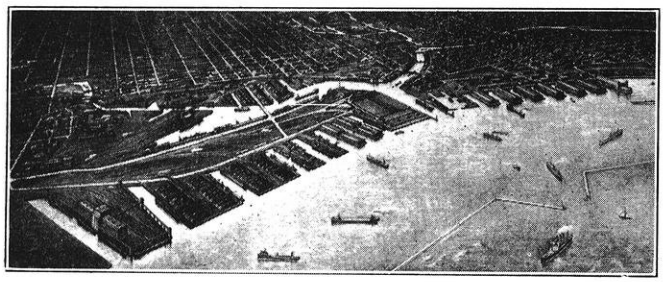
Harbor Authority

The Board of Harbor Commissioners of the City of Milwaukee was created by the Common Council of this city under the laws of the State of Wisconsin of 1919, with power to plan public harbor and waterway improvements, provide for the construction of docks, wharves, warehouses, etc., subject to the approval of the Common Council of this city. The Board has exclusive control over all publicly owned terminals, including railway tracks and belt railways connected therewith, with power to fix and regulate charges for the use of same. The funds for the development are provided by the city through bond issues.

Harbor Plan

The plan that has been accepted and is being followed in its general outline, is known as the Harding plan. It was drawn and submitted in December, 1919, by Mr. H. McL. Harding, a leading terminal engineer of New York City. The Harding plan comprehends the development of an outer or lake front terminal harbor, reaching from Wisconsin Street on the north, to Wilcox Street on the south, a distance of about two miles. This outer harbor is divided into two distinct sections, one north of the harbor entrance and the other section south of the same. The north section although slightly less than one mile in length, has a water frontage, as measured around the piers, of 2.1 miles, and a land

and pier area of 115 acres. The section south has a water frontage around the piers just twice that of the north section, making the total for the outer harbor 6.3 miles (exclusive of the harbor entrance frontage). The north section is designed for the handling of package freight for wholesale and retail merchants, and products of the farm and factory, while the section south will handle the coarser freight, such as coal, grain, iron ore, salt, and building material. The south



MILWAUKEE HARBOR PROJECT

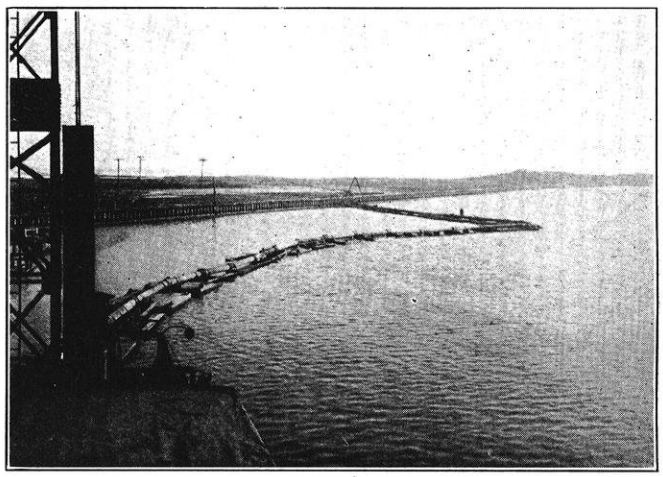
section is designed to be the great trans-shipment location.

Seven piers and seven slips, including one carferry slip, are shown in the north section. Six of these piers are for commercial use, and the other is a recreation pier, which is located at the foot of Wisconsin Street. The piers are 700 feet long, and all except two are 300 feet wide. Five of the slips are 700 feet long by 250 feet wide. These piers are designed to be provided with sheds and railroad tracks arranged for the handling of miscellaneous cargoes. Standard mechanical appliances will promote the greatest speed in discharging and loading. To the rear of the piers, warehouses are provided in which cargoes can be held either for or from merchants in adjoining districts. The plan shows an area extending 1200 feet north of the north harbor entrance pier, reserved for the Federal Government.

The south section provides three large coal piers 800 feet wide by 1000 feet long, for the handling and storage of coal, each pier having a holding capacity of over 400,000 tons. At the extreme south end of the outer harbor is a grain elevator pier, with provision made for two grain elevators of 1,500,000 bushels capacity each. Elevated conveyor galleries extend along the sides of the piers for discharging into the ships. The sewerage disposal plant occupies the north 1,000 feet of the south section. Just south of the sewerage disposal plant, two piers intended for miscellaneous cargoes are disposed. In the rear of one of these piers are oil tanks for supplying fuel oil to ships burning oil instead of coal. Along the westerly or river side of the south section, there is three-fourths of a mile of water frontage. A two-carferry slip is adjacent to the sewerage tract. The balance of this frontage is designed for coal storage and miscellaneous cargoes.

The Government's Share of the Project

The outer harbor and terminal facilities would be of no practical value without the construction of an outer

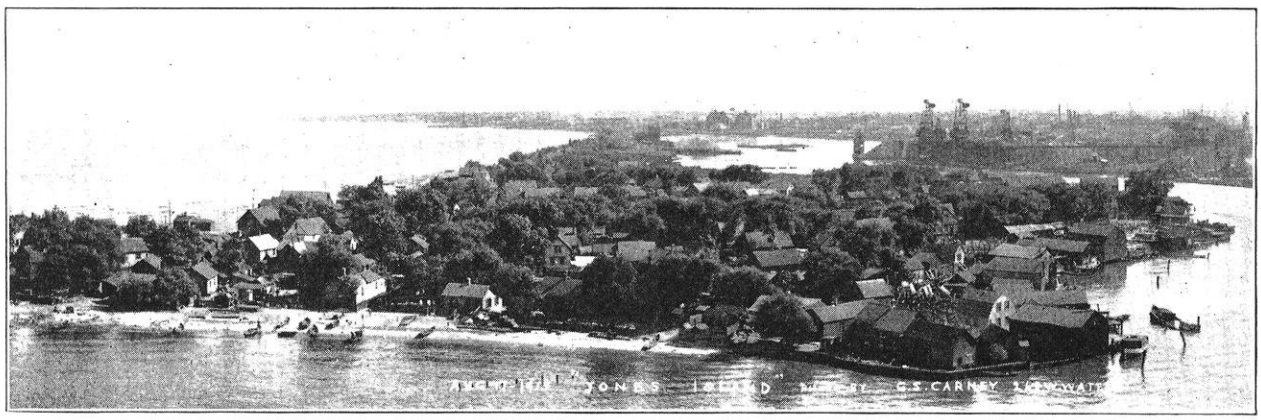


THE HYDRAULIC DREDGE PIPE LINE

This line carries dredged material as far as 2700 ft. from the point where is was dredged.

protection breakwater. This work will be done by the United States Government.

The present breakwater will be extended southerly about 1760 feet and a south breakwater will be built, the main arm of which will be about 6,900 feet long, with a shore connection 2750 feet long.



JONES ISLAND BEFORE HARBOR WORK WAS BEGUN

A fishing hamlet which existed near the entrance to Milwaukee for over half a century

The two breakwaters at their outer or lake ends, will converge for the last 1,000 feet, with an opening of 500 feet between them. This width is believed to be sufficient to permit the largest vessel to enter in severe weather and at the same time not admit seas to such an extent as to cause any serious disturbance in the harbor.

These breakwaters will consist of concrete caissons, placed on foundations of rubble stone and surmounted by concrete superstructures. The average depth along the breakwater is 35 feet, the maximum about 42 feet. Over 200 caissons, each 54 feet long, 21 feet high, with a bottom width of 24 feet will be required. These caissons will be built at the government caisson plant in Milwaukee and delivered to the contractor afloat. Each caisson weights about 500 tons and draws about 16 feet. They will be floated out to the breakwater site, sunk in position by admitting water through syphons and then filled with stone, except for the upper four or five feet, which will be solid concrete. When finally sunk in position, the caissons will project one or two feet above the water, so that the concrete superstructure will be built "in the dry."

The entire work to be done by the government can be completed in about five years at an estimated cost of $4,000,000. Bids have already been received and opened for the letting of 1760 feet of extension of the north breakwater. Work on this part will commence this spring. An initial allotment of $500,000 has been made by Congress to cover this contract.

Terminals To Be Developed Progressively

It is not intended to construct at once the entire system of wharves, piers, and slips outlined on the plan. This is to be a project of progressive development; the most important units will be built and equipped as necessity requires.

In order that the Board of Harbor Commissioners may know just what kind of terminals it will have to provide to take care of the future commerce of the port, it is now conducting a commercial survey of the port and the territory tributary to it. The scope and source of present-day commerce, the trend of its growth, and its probable character and volume in the near future are being determined.

JONES ISLAND AS IT APPEARS AT THE PRESENT TIME

Sewage reduction works under construction immediately south of the harbor entrance. Harbor area in the foreground

Progress of Harbor Work

The first step in the development of the outer harbor was the acquirement of shore lands. South of the harbor entrance is a long narrow peninsula, the northerly end of which is known as Jones Island. This so-called Jones Island was acquired by the city thru condemnation in 1917 at a cost of about $400,000. The southerly end of the peninsula is occupied by the Illi-

(Concluded on page 44)

A HISTORY OF THE 1923 SURVEY CAMP

LAWRENCE L. STEBBINS

Senior Civil

The 1923 camp was officially opened on June 8th, when about forty would-be engineers boarded the early morning train at the C. & N. W. depot to make the short trip to Devils Lake. Nothing exciting happened on the way, but we had no sooner alighted at the two by four station at the lake than we were put to work as baggage men—civil engineers must be a versatile lot— unloading from our special baggage car various instruments, boxes, bags, and trunks. The train was soon on its way, but we were put to work loading the hay rack hired for the occasion, with the equipment

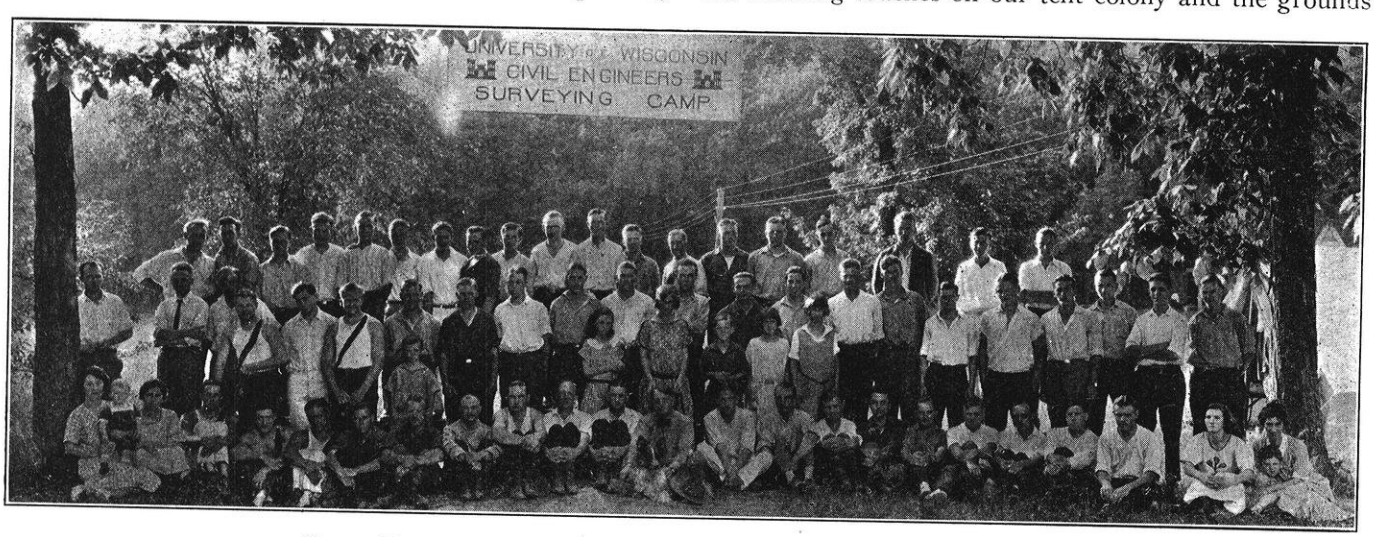
STREAM MEASUREMENT. *The noble Baraboo River gets its annual once-over.*

that but a few minutes before had been traveling on the train. A few of the more fortunate ones managed to get a ride, but most of us got our first taste of the summer's principal pastime,—walking the mile around the south shore of the lake to the camp site.

A few early arrivals had already partly established the camp by leveling the tent floors and constructing a roof to the mess hall. All speed records were broken in this work,—the timbers being placed and the roofing laid before night fell. The tents also had to be pitched, the pipe line from Ryan Spring repaired, the wiring for the lights completed, and the camp generally policed. No time was lost in the starting of field work, two parties being sent on topog areas the first afternoon. Salztein made a good impression on the lady in one of the lake shore cottages by attempting to locate contours in her back yard, but as the lady did not want any contours there, she ordered the intruder off and told him not to come back. Our first evening meal at camp was closed with short talks by Owen, Beebe, and Wesle, in which various phases of the camp life and work were explained.

The daily program was received with different feelings by different individuals,—the sleepy heads being dismayed by the early hour of rising, the "fussers" regretting the apparently small chance to display their accomplishments, and the less ambitious, wondering how they were going to complete all the work required before camp closed. We were told that an electric klaxon, controlled by a clock, would act as camp bugler, and for the first few days the horn and clock performed their duty almost too effectively; the clock however broke down under the strain and left its duties to whomever happened to be around to push the buttons.

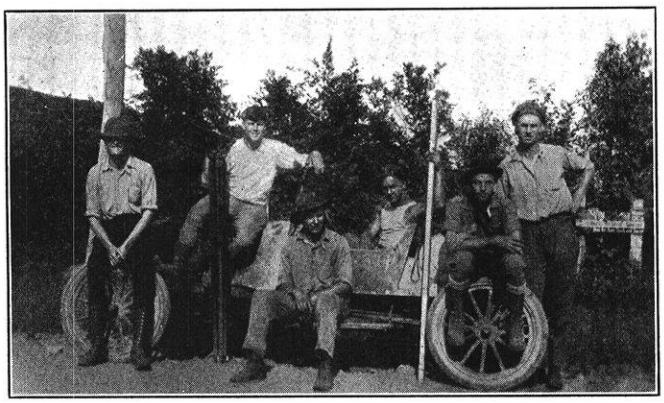
There are few who remember that first night in camp; even tho the steel cots and straw-filled ticks were not the most comfortable things in the world, almost everyone was asleep as soon as he hit the hay. Five o'clock was an unearthly hour to get up the next morning, but there were not many places vacant at the breakfast table. Then work was started in earnest; four parties of eight were chosen to locate the desired railway line, but as only two could be handled conveniently at a time, it was decided to work in three day shifts; some were sent out to do transit and stadia topography; and the remainder stayed in camp to put the finishing touches on our tent colony and the grounds



CIVIL ENGINEERS' SUMMER CAMP AT DEVILS LAKE, 1923

surrounding it. There was no Saturday afternoon off, but as is quite natural, the following day was Sunday, and we were allowed a little extra sleep in order to recover from the effects of our strenuous activity. No work was required or encouraged on Sunday, altho Stebbins and White spent the first Sunday afternoon trying to find a five-foot error in their level circuit. The North Shore and the Hotel shared honors when it came to recreation, but as it was early in June when camp opened, there were not many of the fairer sex at either place; later the tables were turned, for by the time girls did begin to appear at the lake, most of us were burning the midnight oil in an attempt to catch up with our office work.

The camp was soon running smoothly with little trouble of any kind. Our commissary, under Mrs. Owen's charge was able to supply the fellows with everything from slide rules to candles and boot oil. Mrs. Owen also planned the meals and they were always the right kind to fill up fifty or so hungry surveyors; with good food, a good cook, and Betsy, Merle, and Sally Owen to wait on us, we lived in a style fit for kings; ice cream on Sundays and cake or cookies every



A HIGHWAY SURVEY PARTY. *From left to right: Christopherson, Robb, McCoy, Schneider, Stebbins, and Collins.*

day—could you ask for any better? Besides the students, there were in camp the Owen, Van Hagan, Beebe, Wesle, Stack, and Minear families, making in all quite a summer resort. The style of living was not equal to that of Atlantic City, and instead of dancing for amusement, baseball became the popular sport with "Faculty Row", but in spite of these conditions everyone seemed to have a pleasant time and was sorry to leave when it came time to break camp. Mail was delivered once a day a-la-McCoy and the balky Evinrude—when it ran; when it did not, the news from the world outside was carried around the lake shore by whomever happened to be at the hotel.

For entertainment in the evenings and on Sundays, our tastes differed; baseball, horseshoe pitching, music, swimming, and dancing all came in for their share of attention. The great American game, somewhat curtailed into indoor because of lack of suitable grounds, was perhaps the most popular. Under the leadership of shorty Stivers great rivalry developed and was brought to a climax on the Fourth of July when Milwaukee challenged the "rest of the world." There were enough Milwaukeeans to make a complete team, and the "rest of the world" was represented by a team picked from the remainder of the camp. The game was close for the first few innings, but in the fourth Schmitty hopped a balloon and the All-Stars drove in

CROSS-SECTIONING ON RAILWAY WORK: *The slope stakes sometimes come in awkward places.*

six runs and secured a substantial lead. Overconfidence nearly lost the game for the Stars shortly afterwards when Bill Collins undertook to finish the game in the pitchers box; Bill was a better electrician than pitcher and before his team woke up, Milwaukee had secured eight runs and was only two behind her opponents, McCoy again took the center of the field and the game was brought to an exciting finish when "Shorty" dashed back of third base, caught a foul ball and tripped. But instead of dropping his fly, he turned a neat somersault and came up with the ball still in his hands.

Horseshoes became quite popular during our short stay at the lake, and, after a little practice, Bill Collins and Larry Stebbins challenged any other two fellows in

A TRIANGULATION STATION. *Not the worst job in camp.*

camp to a championship match—and then proceeded to lose it. On being granted a return match however, the Bill-Larry combination regained the title and held on to it till the close of the camp.

Our songsters were allowed to try their voices when

accompanied by the camp orchestra composed of Mc Cullough, piano, Millard Smith and Carl Mohs saxaphones, Ralph Smith, clarinet, and Farwell, drums or banjo. A piano was rented in Baraboo and placed in one corner of the mess hall where in the evening it was frequently surrounded by the fellows singing or listening to the music; our repertoire included all the popular songs for the last three years and a few pieces from still farther back than that. Betsy Owen usually voted for "Barney Google" because that was the one piece that she could play on her harmonica.

Swimming was confined to the time between 4:30 and dinner except for the kids, who were in most of the time all day. No camp swimming meets were held, but lots of fun was had by using the diving tower and a raft with a springboard attached as part of its equipment. The water was rarely too cold for comfort and even became warm on the few really hot days we had. Dancing and dates could be found at the North Shore, in Baraboo, or around the south shore at the hotel.

LUNCH. *Eating is an important feature of the camp. We had a good cook.*

Several of the waitresses at the hotel were normal school or university girls, so it was not long before a few close acquaintanceships were made. Dancing was in order every evening in the hotel wine cellar—a relic of bygone days—in name only. Herb Ihling was more fortunate than the rest, for he found a girl from Milwaukee in one of the cottages where he was evidently quite welcome; we saw very little of him in the evenings afterwards.

"Van" founded the 1923 Rattlesnake Club when he killed a goodsized rattler in the bull pasture soon after camp began, but it remained for Bill Hamman to complete the membership roster by roping a live one and leading it into camp. Bill was proceeding calmly about his plane-tabling one afternoon, when he heard a suspicious rattle in the bush near by, and on closer examination discovered our destined-to-be pet. By a little judicious tapping on the head the snake was rendered harmless for the time being, and Bill seized the opportunity to slip a noose around his neck. Shortly afterwards the snake began to show signs of life, so he was securely tied to a tree while the plane-tabling was finished. Bill was the hero and a nine day wonder when he came into camp that evening carrying his live captive. He was unanimously elected president of the Rattlesnake Club and the whole affair was described in the Madison papers. The snake was duly christened "Dynamite," and at the end of camp was presented to the Madison Zoo.

There were not many untoward incidents that occurred at camp during the six weeks we were there. Charlie Holden refused to leave camp one morning without a plumb bob for his level until someone was kind enough to wake him up; we were somewhat surprised to hear a senior pull such a trick, but those dignified gentlemen—or ruffnecks—are apt to do most anything. The camp was unwillingly dragged from its office work one evening by a fire on top of West Bluff. Ray loaded his Buick with twelve eager fire fighters, only to find upon arriving at the conflagration, that a farmer was burning brush piles. However, as we had had our excitement and fun, we were willing to return to our maps and reports for another evening. During an electrical storm one afternoon, "Katy" Farwell and Carl Mohs, experienced the pleasant sensation of being *almost* struck by lightning; they were on East Bluff when a bolt struck the bare rocks just above them and knocked them off their feet. Luckily they were in such a position that they did not fall, and after a short rest, they finished their descent in safety. "Katy" told us that evening that it was the last time he ever wanted to play with "greased lightning." The annual Fourth of July snipe hunt was a complete failure, not even the appeal of tradition causing enough excitement to gather a group of hunters. The weather was ideal too; just warm enough for snipes to be out in full force and waiting to be driven into the bags; there was no moon to confuse them once they spotted the light by the bag. Even Villatuya from the Philippines had been in this country long enough to lose all his desire for snipe hunting, and under such complete refusal the sponsors had to substitute bacon and eggs for breakfast. It was quite a come down, but there was no other alternative. The Fourth itself was quiet in camp, the only noise coming from a few fire crackers exploded by the younger Owens and Van Hagans. It was a hot day, but in spite of the heat, there were several faculty visitors in camp to act as guidance and fans for the Milwaukee-All Stars baseball game; after the game, everyone enjoyed a swim in the lake before the visitors left for home. In the evening rain began to fall and rather dampened the fireworks that had been saved until dark.

Last to be mentioned but by no means the least important of the camp affairs, was the annual Engineer's Prom which was held on Saturday, June 30th. Joe Schudt was our efficient Prom Chairman and under his management, the affair rivaled the one held in the state Capitol at Madison. The mess hall was cleared and appropriately decorated for the occasion with green boughs and crepe paper. Candle wax, used to reduce

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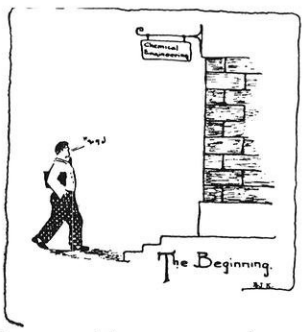
A SUMMER COURSE IN CHEMICAL MANUFACTURE

By W. E. Ouweneel,

Senior Chemical



It was on the thirteenth of last June that about 35 junior and senior chemicals met to begin their summer course in Chemical Manufacture. A varied crowd it was to be sure.

True to tradition the first morning was spent largely in getting organized. Problems, — big, stupendous problems, problems whose solution in the next five weeks would revolutionize the life of generations to come and would remove the difficulties created by the disappearance of our natural resources, were alloted to us, and it was with measured step that each one of us left the building that morning, sworn, with "Dave" Fahlberg, to the advancement of science and impressed with the profundity of our calling and the deep responsibility we had contracted to carry for the nevt five weeks. It was in that state of mind that Donkle suggested to Mooney that he determined the hardness of water with the aid of the scleroscope, and in that state of mind that Fritz replied, "Sure, all I have to do is to freeze some of it and take it up to the Mechanics Lab."

The problems assigned varied greatly in nature. The "Boss"—Professor Kowalke— used keen judgment when he assigned the problem of "taking the nature out of denatured alcohol" to the two prohibitionists, Baehr and Nichol. Other problems covered almost the entire range of the chemical industry and included the rectification of drip oil from gas mains, tests on water softeners, the utilization of pyroligneous acid, the recovery of used engine oil, the manufacture of oxalic acid from sawdust, potash from kelp, potassium chloride from feldspar, the destructive distillation of oil shale, and the manufacture of alumina from bauxite.

Two days were spent in library work, and the class then reported back for duty. The following few days were spent in getting corners on equipment and in doing much amateur pipe-fitting. As evidence of how interested in his work at least one member of the class was it may be noted that when M. Harris was asked if he were working with bauxite, he replied, "No, Bennett."

The first hour of each morning was spent in informal lecture in which the lecturer was seldom interrupted by questions. We were given much information on the organization of large corporations and on some of the practical aspects of plant work. Monday mornings usually were quite blue, but one of them was made especially interesting by a talk from Mr. Schulte, ch '10, who spoke on a comparison of merchandising and engineering. One of the most interesting points cited by him was that an invitation might be entirely practical and feasible but might not be commercially successful if it worked according to principle not understood by the layman.

Ed Bellew did his part for the advancement of science, especially when things were rather dull, by acting as a

(Concluded on Page 44)

THE CLASS IN CHEMICAL MANUFACTURE, 1923

EDITORIALS

L. T. SOGARD

CHANGE OF MANAGERS

Leslie T. Bruhnke, who was appointed last June to the managership of the ENGINEER, has found it impossible, because of serious trouble with his eyes, to assume the duties and responsibilities of the position. Bruhnke, who is a senior in the mechanical engineering course, has been actively interested in the ENGINEER for the past two years. Last year he handled all local advertising and proved himself an able and enthusiastic worker. We regret very much the loss of his services; we regret, too, the illness which not only keeps him from filling the position he justly earned but which will delay his academic work an entire semester at least.

In order to get the ENGINEER off to a flying start, Bruhnke returned to Madison a week before the opening of school; shortly after his arrival an infection developed in one eye that rapidly grew worse, and the first day of classes found him confined to the infirmary. Realizing that the ENGINEER would be at a disadvantage with its manager on the sick list for an indefiite period, Bruhnke unselfishly offered his resignation so that the business staff might have an active head.

The board of directors and the members of the staff wish to express to Mr. Bruhnke their appreciation of his services and their sympathy for him in his misfortune. The ENGINEER wishes him a speedy and complete recovery.

H. G. Holmes, a junior in the electrical engineering course, has been selected to succeed Brunhke as business manager. Holmes has worked with the ENGINEER since his matriculation at the "U"; he possesses real ability and is thouroughly conversant with the manager's job. Holmes is one of the few men to attain to the ranking office on the staff in their junior year.

Don't envy the man who seems to be doing better than you—study him.

MILESTONES

DEARTH OF ENGINEERS

The annual count of noses throughout the University shows a total decrease of thirteen engineering students as compared with last year's figures. This shortage, however, is not caused by any undue flunking out, quitting, lack of freshmen, or any other of the terrible evils to which it might thoughtlessly be attributed, and the College of Engineering is not "going to the dogs."

A review of enrollment statistics, since the war, reveals the fact that this shortage of 1923 has been on its way for at least two years. The freshmen of 1919 totalled 444; in 1920 there were 422 freshmen. The 1921 frosh numbered 402 and last fall the class of 1926 numbered but 316, a shortage of 86 freshmen when compared with the preceding fall. However, this fall there are 55 more purple buttons than last fall. The decrease in the class of 1926 did knock quite a hole in the college enrollment, but one must bear in mind that the class of '23 and '24, as frosh, were largely due to the enrollment of many ex-soldiers who received the state bonus. Today bonus freshmen are nil. Although the freshman enrollment dropped after the main body of the bonus students had entered, it is picking up again as indicated by this year's figures.

The number who drop out between the first and second year has decreased steadily. As sophomores, the class of '23 was shy 131; the class of '24, 117; 1925, 110; and the class of 1926 but 81. This fall the senior class numbers but 23 less than they did last fall as Juniors. Compared with losses of 45, 45 and 50 for the three previous years, this shows that more men are staying with the battle till the end. Since 1919 the total enrollment has varied by only about 80 students; the 1919 enrollment for the Engineering College was 1084; this year it is 1083. The high point was in 1921 with a total of 1249.

This analysis is conducive to optimistic, rather than to pessimistic, predictions for the future of the college; there are more freshmen, just as many seniors, and fewer dropping by the wayside.

The characteristic sign of a mind of the highest order is that it always judges at first hand. SCHOPENHAUER.

OUR FOURTH SUCCESSIVE ENGINEER TRACK CAPTAIN

It is noteworthy that for the fourth sucessive year an engineer has captained the track team. Bill Hammann, Wisconsin's best all-around track and field man, is the fourth engineer and the third civil to receive this honor. Engineers generally have about all they can take care of in the accumulation of the huge mass of credits, grade-points, and knowledge required for graduation, but here and there one is found who does go in for outside activities. Especially has this been true in track; Clyde Nash captained the 1921 team. Following him the late Al Knollin led the team and last year Ralph Spetz, a star sprinter, was captain.

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ENGINEERING REVIEW

H. C. WOLFE

SUPPLY OF PLATINUM

Official returns of the Geological Survey show that in 1922, 929 ounces of platinum were produced in the United States. This is the largest amount that has ever been produced in this country in one year; yet it is less than one third of one percent of the world's annual production. Nearly all the platinum produced in the United States is recovered from the heavy concentrate or black sand collected on dredges or at hydraulicking plants in California, Oregon, and Alaska. Traces of platinum are sometimes found in copper, gold, and silver mines.

The greatest producer of platinum is Russia, supplying about 90 percent of the world's total, or approximately 300,000 ounces per year. Columbia, South America, is second with 30,000 ounces annually. In these countries the platinum is all recovered by dredging or hand washing methods.

The present New York price of platinum is between $100.00 and $120.00 per ounce.

SAVING A CATHEDRAL

Reinforced concrete is to be used to prevent the collapse of the tower of the Strassburg Cathedral, designed by John Hultz in 1439. The original footings were of stone masonry on wood pilings; they were completely submerged in water when constructed. In 1750 the level of the ground water was lowered by a drainage system, leaving the tops of the piles exposed so that they decayed and allowed the building to settle. Columns of the tower were reinforced with concrete and the whole building was jacked and new footings were put in.—*Engineering News Record.*

M. I. T.'s NEW SUMMER SCHOOL

The Massachusetts Institute of Technology has established a summer camp for university engineers near Dover, N. J., not far from the Replogle iron mine. In the past, mining students have gone to the civil engineering camp for six weeks and then spent two weeks in some mine. Recently some difficulty arose in securing a mine for the two weeks' course, and the school was forced to look elsewhere.

An excellent opportunity for constructing a permanent camp was offered when the officials of the Replogle mine gave the school permission to use that mine for practical work. The school corporation made a small appropriation to begin the construction of the camp. The money was spent during the past summer in such a way as to secure the maximum good the first year, and, at the same time, to establish the beginning of a camp which will meet the future needs of the school. The present plans call for the construction of an administrative building flanked on either side by wings which will be used for the dining room and drafting room. Twenty-four 9 x 12 rooms with 6 foot porches will be erected on the ground beyond the drafting room. The camp is provided with electric light and running water. When completed the camp will accomodate 48 students and instructors.

Twenty one students and four instructors were in attendance during the past summer.

A MOTOR-DRIVEN PASSENGER COACH

A means of transferring existing passenger coaches into motor-driven units for branch service has been devised by the Chicago and Northwestern R. R. Two 70-hp. gasoline motors were installed on the underframe of a test car recently equipped and are so arranged that both motors may be operated from either end of the car. On a trial run the car developed a speed of 45 miles per hour without undue vibration and also proved its ability to switch two loaded box cars. One of the chief advantages of such a type of motor car over light specially constructed cars is its safety at high speeds. Another argument greatly in favor of this type of installation on lines of light traffic is its low initial cost.—*Railway Age.*

John Hays Hammond has provided a Mexican Scholarship for a 4 year engineering course at Yale. The scholarship covers tuition, dormitory, meals, books, fees, and transportation. It was arranged through the Yale Club of Mexico, which has headquarters in Mexico City—*Princeton News-Letter.*

To make room for the new State Capitol at Charleston, West Virginia, thirty two houses were moved across the Kanawaha River on barges. The houses were set upon blocking forty feet above the barge floors. The work was done by John Eichleay, Jr. Co., of Pittsburgh.

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ALUMNI NOTES

F. D. BLANCH

Homecoming brought back great numbers of the old grads. Many of them found the time and took the trouble to climb the hill to the Engineering Building and call upon friends in the college. The old timers on the faculty held levees in their offices, and everyone joyously fanned over the days gone by. Among those who returned were:

'89

E. W. Lawton.

'96

Arthur Maldaner.

'98

L. C. Street.

'99

R. T. Logeman

'00

A. R. McArthur, Walter J. Parson.

'03

Courtney Douglas.

'04

C. W. Hejda.

'08

Geo. H. Zeisler.

'10

Geo. G. Crowell.

'14

Godfrey Johnson, E. F. Thomas.

'15

A. E. Cummings, W. A. Goss.

'17

E. R. Brandt, Eugene L. Grant, R. Wood.

'19

Ray E. Behrens

'20

Frank Karger, E. W. Fiedler, A. E. Liebert, Frank K. Quimby, W. J. Rheingans, Lewis Sherburne.

'21

W. E. Erickson, G. H. Head, C. W. Peterson, Paul W. Romig, P. A. Royer, A. Rollin Striegl.

'22

L. C. Auby, Thos. W. Ayton, E. D. Bader, E. S. Birkenwald, T. V. Bittner, Frank A. Buese, Leon E. Chase, M. H. Clark, W. E. Dick, Fred E. Erlach, Geo. A. Hill, H. C. Hubbard, A. J. Huegel, R. N. Kircher, W. H. McKaig, Oscar Pfeffer, Harry Phillips, E. A. Eafeld, R. I. Svitavsky, O. F. Wallman, Walter O. Zervas.

'23

Louis G. Adam, Lloyd G. Becker, R. B. Bohman, J. H. Dieterle, M. E. Hansen, Carl E. Hoelz, R. L. Luening, D. A. McArthur, J. L. Peterson, E. E. Price, John Slezak, J. W. Smart, Gordon P. Spielmann, Geo. W. Tesch, F. L. Webster, Ken R. Wicker.

GENERAL

Merrill, Zadok, g '04, is assistant general manager of the Mountain States Power Co. at Albany, Ore.

CHEMICALS

Brown, Stacy L., ex-ch '18, who has been fighting for health ever since his service in the army, writes from the Cottage Sanitorium at Silver City, New Mexico: "The ENGINEER is the only contact I have with the old school, and I get quite a kick out of it. I wish I could tell you that I'm beating this thing, but the best I can say is that I am holding my own. Wisconsin's victory last Saturday (over Indiana) looked fine from here. Many of the old timers away from school are not expecting much this year, so any unexpected strength will be hailed with joy." Our best wishes go to Brown in his exile. Also, he probably will get a "kick", as he says, out of letters from any of the old gang who find time to write.

Clark, Manley H., ch '22, is assistant chemical engineer in the Underwriters' Laboratory, Chicago.

Erickson, William E., ch '21, is chemical engineer with the Northwest Paper Co. at Cloquet, Minn. Address: 1008 Carlton Avenue, Cloquet.

Head, Guerdon H., ch '21, is chemical engineer with the Wisconsin Gas and Electric Co. at Racine, Wis.

Hubbard, Honore C., ch '22, who held the Gas Association Fellowship at Wisconsin last year, is assistant chemical engineer with the Underwriters' Laboratories at 207 East Ohio St., Chicago.

Luening, Robert L., ch '23, is with the Western Electric Co. Address: 244 N. Waller Ave., Chicago.

McKaig, Willard H., ex-ch '22, is an engineer with the St. Paul Gas Light Co. Address: 1302 Laurel Ave., St. Paul, Minn.

Nixon, Cleveland F., ch '23, is engaged in research in electro-plating for the Western Clock Co., 1504 Second, Peru, Ill.

Tesch, George W., ch '23, is gas engineer with the Wisconsin Valley Electric Co. He gives his address as 302 Ellis Et., Stevens Point, Wis.

Birkenwald, Emil S., c '22, who spent last year in graduate work at M. I. T., is a detailer with the American Bridge Company at Gary, Ind. Residence: 222 Taney St., Gary.

Collins, Sidney R., c '21, was married on October 6 to Alma Claire Terry. They will make their home at 2820 Central Avenue, Kearney, Nebraska.

Gillette, Paul, C. E. '18, has been doing some experimental work in the Hydraulic Laboratory in connection with the Dix River Project in Kentucky.

Grant, Eugene L., c '17, has been granted leave of absence by the University of Montana and is taking a course with the Edison Co. of Chicago. Address: 7041 Crandon Ave., Chicago.

Huntzicker, Paul, c '19, who spent last year in graduate work at Wisconsin, has returned to Boulder, Colo., where he may be reached at the Boulder Y. M. C. A.

Lord, Herbert O., c '20, was married to Claudine Armstrong of Oconto on September 8. Lord is with Mead & Seastone of Madison.

Luckey, Carroll H., '14, is city engineer for Moorhead, Minn.

Moehlman, Wm. F., c '22, has been forced to give up his work temporarily because of eye trouble. He can be reached at 440 W. Johnson St., Madison, Wis.

Price, E. E., c '23, is with the sales engineering department of the Union Special Machine Co., makers of industrial sewing machines, at 400 N. Franklin St., Chicago. Residence: 1554 Juneway Terrace, Chicago.

Steuber, M. C., c '16, is the author of an article which appeared in the September 20 number of Engineering News-

Record. It describes an "auger type" pump used to drain cranberry marshes.

Street, L. C., c '98, is with the Illinois Highway Commission at Dixon, Ill.

Strong, T. Foster, c '22, visited the college during October. He is with the Utah Power and Light Co., in the power department at Salt Lake City, Utah.

Vilberg, Clarence B., c '23, is in the drafting room of the American Bridge Co., at Gary, Ind.

Wheaton, Herbert H., c '22, is salesman for the Grand Rapids Showcase Co., of Grand Rapids, Mich. He covers the whole state of Washington.

Wicker, Ken R., c '23, is working on construction for the Milwaukee Sewerage Commission. Address: 229 Mason St., Milwaukee.

Youngberg, Adolf F., c '22, is in the contracting business with his brother, George (c '14), at Sioux City, Iowa.

ELECTRICALS

Bader, Earl D., e '22, former alumni editor of the Wisconsin Engineer, is copy and contract man for the Kirkgasser Advertising Company, 306 Wrigley Building, Chicago. Residence: 5247 Magnolia Ave., Chicago.

Germond, Hallett H., e '23, is doing research work with the C. F. Burgess Laboratories at Madison, Wis.

Guillemin, Ernst A. (Ernie), e '22, who gives his address at the famous 5 Ivy Street, Boston, Mass., writes a breezy letter that deserves the publicity it is going to get right here and now. Says he, "I was quite agreeably surprised when I hit camp last night after a hard day at the office upon finding the old Wisconsin Engineer on the hall table. That cover page alone is enough to drive away a perfectly good set of blues. Ordinarily the four flights of stairs from the street up to my dugout are a weary climb; but paging thru the Engineer as I went from landing to landing, I found myself under the roof before I realized that I'd gotten well started; and I felt that the hero in Stevenson's "Wrecker" when he returned to his lodgings in Paris late one night, that someone had been monkeying with the place and shifted the roof down three or four flights. Anyway, I'd hazard a bet that if there only were enough Wisconsin Engineers to go around, it would materially cripple the elevator business.

"I really intended to write you sooner and send the $1.50 along so as not to miss any of the numbers, but you know how 'tis when you're trying to get a schedule straightened out. Luckily I came back to room at the same place so that the old address fetched me o. k. I'm back at Tech here doing the same work that I did last year—teaching and studying both (which is a helluva life, take it from me), and expect to get a M. S. degree next June if the Gods and trustees are good and generous. (They don't call 'em regents here, but it comes to the same thing). My last year's room mate, Ralph Abrams, who is a '22 chemical, is out in the cold cruel world finishing his practice course, and so I'm now rooming with my brother, who graduated last June and came up here to do grad. work at Harvard. (They say 'Havud' here because they can't pronounce an "r" to save themselves, but talk as tho they'd got a spud stuck half way down and were like to choke on it.)

"We made the trip from Milwaukee up here in the old tin flivver, and after tightening up a couple dozen bolts and nuts and bending back most of the wrinkles, poor Henry almost looks himself again. But ever since we dropped our Wisconsin colors and added the Mass. license plates, he's gotten a sort of forlorn look to him like a dog with his tail cut off. Don't tell me that a flivver isn't human. I'll bet they get so they'll follow you around and climb into your lap and get real chummy if you keep 'em long enough. (I hope to drive mine into the Charles river before he gets that way.)

"I note your appeal for pictures in this issue and wanted to send you some that we took on the trip but note that they're "out of print" at present; but if you want them bad enough I can order some more. Or you might write to Jimmy Baker or Rudy Heins, both '22 ee's, who are rooming together at 20 Washington Ave., Schenectady. Jim has some pictures of our trip home last June that might be right interesting.

"As to that New York barge canal that "Van" talks about in this issue, I can't agree with him that it isn't being used because when we saw it at the lock at Schenectady (I forgot the number of the lock), they were putting a string of barges thru, and there were several others waiting for a chance. What got me was why they were letting a lot of good water power go to waste while they used gasoline motor-generator sets to get the power to operate the locks. Perhaps Prof. J. T. Rood can explain this on an economical basis—it passes me.

"Well, I can't keep this up forever, so here's where I quit. Tell N. E. French and H. L. Rusch howdy for me, and that if they haven't lost the art of writing they might drop a fellow a line some time."

Herrick, Neal D., e '23, was recently married to Irma Carr of Lawrence, Mass., who is a graduate of Simmons College and attended the University of Wisconsin last year.

Hoelz, Carl E., e '23, is line estimator with T. M. E. R. & L. Co. Residence: 634 Walker Street, Milwaukee.

Webster, Francis L., e '23, gives his address as 150 N. Elmwood, Oak Park, Ill.

Wu, Wei Chou, e '23, writes that he has been doing construction work at Alcona Dam, Owosso Station, Shiawassee Station with the Consumers Power Co. and he expects to be in the electrical engineering department of the company at Jackson, Michigan, in November. He gives his future address as, care Consumers Power Co., Jackson, Michigan.

MECHANICALS

In our story of the Class of 1923 in the October number, we committed the grievous error of marrying a girl to the wrong man. Not only did we give Gordon Spielman a wife, but we also gave him another man's job. **Spielman** is treasurer of the Harrison-Spielman Co. Address: 515 North Prospect Avenue, Park Ridge, Ill. **Edmund P. Strothman,** m '23, is in the steam turbine department of the Allis-Chalmers Mfg. Co. Residence: 835 Summit Ave., Milwaukee. He was married on July 7 to Rella Jeanette Boyer of Duluth.

Hagen, Berger A., m '21, was married to Mabel Stensvad of Stoughton, Wis., on July 30. They are living at 20 North Lavergne Avenue, 2nd Apt. North, Chicago, Ill.

Hinrichs, Chris, m '90, supervised the construction of the new cruiser, Milwaukee, which was recently turned over to the government. A banquet was held in Seattle in honor of Mr. Hinrichs.

Hunziker, Chester E., m '22, who is with the American Blower Co. at Hudson Falls, N. Y., writes, "I haven't moved as yet since I came out here for the American Blower Co. a year ago last July. With the outlook as it has been all the way along, I am very well satisfied to stay with the them. I'm working on an installation now where we are building a special hood for a paper machine with air washers and fan attached to reclaim the waste heat and improve conditions in the mills."

Mantonya, William G. (Bill), m '19, famous campus poet, sends in his annual subscription and adds, "I have no news to report except that business is good and I'm getting fat". Address: 1520 Belle Plaine Avenue, Chicago.

Michel, Rudolph, m '16, is not with Pfister & Vogel Leather Co. as we stated last month. He is assistant professor of graphics at the Virginia Polytechnic Institute at Blacksburg, Va.

Peterson, Julian L., m '23, is in the mechanical dept. of

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ATHLETICS

E. R. SUMMERS

FOOTBALL

Of one thing we shall all agree, — the homecoming game will not be forgotten. However, that is not saying how it will be remembered. Of all games that should not be lost, homecoming has no competition for first place. It is a day when thousands of expectant alumni gather from all corners of the country to obtain visual impressions of their time honored Alma Mater. Unfortunately the loyal alumni have been obliged to receive two consecutive .disappointments Whether the blame should be placed on the fans, the team, the coach, or destiny is a question. Perhaps the latter would be capable of assuming all shortcomings more easily than any of the alternatives. Destiny rules most clearly that is is impossible for two teams to win the same game. The nearest approach to a double win is a o-o compromise. The approach was made most gracefully at the homecoming game.

"IF YOU WANT TO BE A BADGER—"

The salient characteristics of the "what might have been" game were a lack of punch on the part of the team combined with a lack of support from the bowl. Minnesota's comparatively small delegation showed us what cheering really was. Too many of our affectionate ones mistake the football stadium for the drive at moonrise. Come on, fellows, howl as loud at the game as you do when the finals come back. The other team wouldn't have a chance then. For the next homecoming it is hereby suggested that the team be given a shot of ozone, and that a few mice be released in the stadium to get a response from the rouged lips. The gridiron warriers should not be discouraged yet;—the fans will no doubt convalesce before another game. They at least have a good opportunity,—the homecoming booze parties are over.

The band gave the fans one of the biggest thrills of the game. Everyone had to see the new cardinal costumes if he looked in the direction of the field at all. The combined formation of both bands between halves was so impressive that a genuine thrill was sent up the backbone of every loyal Badger. A new meaning could not help but be given to our time revered "On Wisconsin". The human W was also quite a novel idea. It was well received by the team and the Minnesota aggregation.

The game, a nucleus about which all other homecoming activities are centered, was in itself anything but exciting. The field was too heavy and slippery for the display of any clever footwork. The leaden sky did not add to the cheerfulness of the situation. A few minutes of play showed the teams to be evenly matched in all phases of the game. Every play was bitterly contested, every inch of ground was grudged and regrudged. It was entirely unnecessary for the athletic department to drain either end of the field. All of the fighting was done so close to the 50-yard line that the chainman executed simple harmonic motion as he ran back and forth along the side of the field. Both lines held like concrete abutments. The tackles were a hundred per cent. The only way that either team could have completed an end run would have been to chase around the end of the field behind the goal posts. The only fellow that had a soft job was the score keeper. He must have set his alarm clock for 5 P. M.

Both teams had everything at stake. It was most certain that one of the teams would be eliminated from a chance at the Big Ten title. The Gophers had three consecutive defeats to revenge. They did it. A tie was almost as good as a win to them. Coach Bill Spaulding could go home and tell a different story to the northmen. The dope had been spilled. In fact so much dope has been spilled this year that there is very little left. Neither goal was in serious danger at any time. Of course every one stopped chewing gum while Minnesota tried that one place kick. (He should have brought his snow shoes along.) Martineau and Lidburg kept the Wisconsin line busy. Holmes did not break away for long runs as was expected. A 14-yard run by Holmes was the best stuff that the Badgers could show,—Minnesota's runs were equally short. The first half was mostly a duel of punts. Taft bested Martineau in this phase of the game,—his punts averaging well over 50 yards.

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CAMPUS NOTES

E. L. CALDWELL

HOOL AND KINNE EDIT SERIES OF BOOKS

The first two volumes of a series of six books edited by PROFESSOR HOOL of the Extension Division and PROFESSOR KINNE of the Department of Structural Engineering, were published in May by McGraw-Hill. A third volume is just off the press. The three volumes cover the following subjects: *Foundations, Abutments, and Footings; Structural Members and Connections; and Long Span and Movable Steel Bridges.*

ELECTIONS TO ETA KAPPA NU

On November second Eta Kappa Nu initiated the following new members:

Seniors

E. C. BOPF
E. J. THOMAS
D. B. MASTERS
W. E. WHITWORTH
J. H. MICHAEL
C. S. HOOVER
E. N. NELSON
K. F. SUN

Juniors

F. K. LEISCH
H. G. HOLMES

AG ENGINEERING
or
How the Milking Machine was Invented

FRANCIS B. ENGLE, a sophomore civil from Mayville, Wis., died at a local hospital on Sunday, October 28, followng an operation for appendicitis.

CIVIL SOCIETY ELECTS OFFICERS

The election of officers in the American Society of Civil Engineers on October 17, placed the following men in power: C. E. Robb, President; Anton Mathy, Vice-president; George Abendroth, secretary and treasurer; Clement Lindner, chairman of publicity committee; and E. C. Schuman, chairman of program committee. R. S. Jensen, E. N. Otis, and Louis Alk were elected to membership. A vigorous membership drive was carried out immediately following the first meeting and a cider and doughnut fest was held on Oct. 24, for the purpose of welcoming new members. Professors Corp, Kinne, and Mead were present and spoke briefly.

As a contribution to the gaiety of the campus, the society decided to stimulate the invention of yells to be hurled across the greensward at the cane-bearers and has offered three prizes, one of five dollars, one of three dollars ,and one of one dollar for the most original and snappiest yells. A committee headed by Larry Sogard handles the yell contest.

THOSE LAW-ENGINEER YELLS

And here is how the law-engineer yells have evoluted: Original yell, introduced during the dark ages—"Well, well, well! Is that the law school? Oh, HELL!" Response, worked out about 1920—"Pull in your necks, you plumbers." Come-back, evolved after the adoption of the lawyern' canes in 1921—"Lean on your canes, you cripples." Latest nasty cracks from the red-stone cheshoosegow introduced this fall—"Lean on your wrenches, you monkeys" and "Saint Patrick was an engineer, he was, he was. Like Hell he was." They've got us two down as she stands. NEXT.

SENIOR TRIPS

The Mechanicals and Electricals are going East again. About thirty men have signed up for the Eastern trip; this trip will take in Detroit, Buffalo, Pittsburg and Cleveland, and will wind up in Chicago for *the* game. The itinerary is not fixed at this writing, but the general territory is as mentioned. Mighty glad all you chaps are going. Let's have a high old time, even though we do miss the Michigan game.

Prof. McCaffery, of the Mining Department, attended the American Mining Congress which met in Milwaukee September 24 to 29.

NOVEMBER AWARDS

A sophomore electrical has been awarded the set of solid cast-iron cross-hairs for a most worthy exhibition of ingenuity which he gave in his surveying practice. Finding that the world, when reviewed through a dumpy level, is upside down, he suggests that conditions may be corrected by twisting the telescope around in its standards.

A pair of horn-rim specks, equipped with anastigmatic, celluloid lenses goes to the sophomore civil who announced to a palpitating world that his observations demonstrate that the lenses on surveying instruments become clouded with age. Without a doubt his findings will cause the surveying department to order new instruments before old age renders the lenses of the present equipment so opague that they no longer serve as lenses, but rather act as shutters.

THE "HUNDRED ON FOUR FLAT"
Professor Corp and Van Hagan run the jackrabbits ragged every morning in Wingra Park

ROLL HIM A SET OF DUMB-BELLS

Instructor, in Mechanics 51: Are the heated ingots rolled right away?

McCoy: Only when you want hot rolls.

LENNIE! LENNIE!

Prof "Lennie" Smith got devilish last Tuesday, October 23rd, and started to read Fawcetts "Whiz Bang" just before the nine o'clock Roads and Pavements class. Prof. "Lennie" became so interested that he forgot all about the class, which crazily enough waited ten minutes before dispersing. Finally some handshaker went in and shook Prof. "Lennie" out of it, thus spoiling all the fun.

That prompts us to an idea. Why not supply the faculty with La Vie Pariesiene; they would then get more of the students point of view than ever before —and look at the fun they'd have.

THANKS, MY HEARTIES

311 N. Murrray Street wafted us to the heights of ecstacy last week by mailing in six contributions. Good work, Old Top. Baldy will reserve you a splendid harp and a front seat on the fifty yard line in the Heavenly Stadium.

L. T. Logard kicked in with one of the cuts. It was Larrys own idea; but if anybody wants to shoot, don't shoot Larry. Shoot me—I don't care.

Thanks to all the contributors. Listen Frosh. Mail in the wise cracks, and the snappy comebacks, or better still, hand them personally to the chaperone of this layout. I'll do your math for you. On the level I will.

LOCAL ATTRACTION

THIS GOES A WAY BACK!

'26 Who was the first radio engineer?

'27 I dunno. Who?

'26 Adam—because the first loud speaker was made from his spare parts.

—*from Q. S. T.*

ATHLETICS

(Continued from Page 35)

At the beginning of the fourth quarter the Badger squad pulled together for some good gains. Everything was pointing in the right direction until Abramson intercepted a pass to Irish. With only six minutes left there was no chance for a score.

The homecoming crowd of 36,000 football enthusiasts, a new stadium, a new coach, and a new method of play made this homecoming more popular among the alumni than ever before. Never had there been such a scramble for tickets. The eager and expectant countenances of the Badger fans were decidedly transformed as they moved sullenly away from Randall Field. Yes, it was a tie. Another conference title lost at the outset.

Even if we did not win the game, the valuable work of our engineering delegates must not be overlooked. Al Schneider, c '24, did good work at quarter. He received several of Martineau's passes and returned them for fair gains. He also intercepted a pass on Wisconsin's 22-yard line that would have cost the Badgers heavily had it been completed.

Oscar Teckemeyer, m '25, was right on the job at center. The Gophers' renowned backs made no gains in his direction. In addition to holding the line he did some fine work intercepting passes. He has been on the varsity football squad for two years. His other activities include a position on the freshman football squad, captaincy of the freshman crew, membership in the class rush and Memorial union committees.

The right guard position was well taken care of by our own husky Tom Nichols, m '24. He blocked many of the runs of the Gopher backs. He was a real linesman of the good old plumber type. (Hey, you lawyers, not a telephone lineman.)

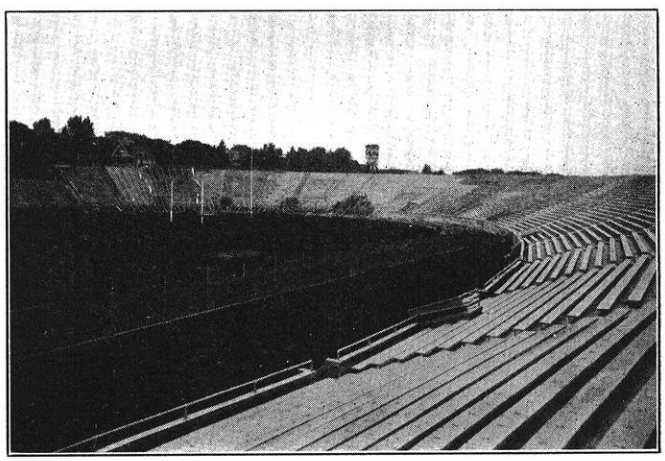
The Indiana game would make a fine story. In fact, the Indiana game and the Homecoming game would average up nicely. Wonder why Jack Ryan didn't think of that before. Anyway, a 52-0 win in a Big Ten game speaks well for any coach's ability. Ryan is working hard. We are all for him. He will bring home the bacon in the Michigan game. Just wait and see if he doesn't. Give Ryan and the team the necessary confidence and support. They will do the rest. Wisconsin is never disheartened and weak in the knees. That is not what "W" stands for.

Be no discouraged all ye who possess a mania for football titles. As longs as there is life, hope is most certain to predominate. The future always holds forth great possibilities. Besides, if we won all of our games, there would be nothing left to fight for. Be an optimist if you can. That's the old punch, team. Smash that line!

CROSS COUNTRY

For the third consecutive time, the Minnesota harriers met defeat at the hands of Mead Burke's cross country team. The race, which was held Oct. 27, gave a further reassurance of the ability of coach Burke. The home team scored 33 points in contrast with the 23 points that were copped by the Gophers. The victory, although not so overwhelming as the one of last year, was still quite decisive. Brown, of Minnesota, was the first man to cross the line, but the remainder of the Gopher squad, with one exception, trailed the Badgers. The time over the 4.9 mile course was 26 minutes, 16 3/5 seconds, which was very good considering the muddy condition of the track.

The Wisconsin squad, which has been cut to eighteen men, worked feverishly in preparation for the meet. Some of the men had to do a lot of training to get back in shape again. Capt. Finkle, the flash of the team two years ago, is back on his old stride again. Finkle broke his leg a year ago last February while running in a conference meet. There are very few instances in athletic annals where a man has made a comeback such as his. As could be expected, Finkle was in bad shape this fall. He had not done any serious training since his accident over a year ago. He is



WISCONSIN'S GROWING STADIUM

Showing the 1922-23 addition of 7000 seats to the north end.

getting back into condition very fast now, and great things are expected of him before the end of the year. Finkle is a senior electrical.

The future cross country schedule includes meets with Chicago on Nov. 3 and with Michigan on Nov. 17. The conference meet will be held at Ohio State on Nov. 24. There is a lot of keen competition ahead. Fight fellows and you will win. The cross country team has an enviable reputation. Keep it up.

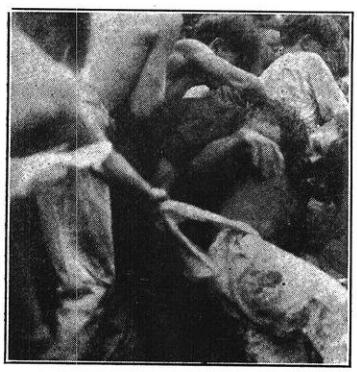
The freshmen, by winning 80 points, ran away with the inter-class track meet that was held at Camp Randall Oct. 20. The sophomores came along second with a total of 29 points. The Junior and Senior classes brought up the rear. Schwarze '27 was the high scorer in the meet. Why do the yearlings always romp away with the interclass meets? Co-educational schools are supposed to develop fast men. Why don't the upperclassmen show some of their speed on the track? Why do fish swim?

CREW

No coach works under a greater handicap than does "Dad" Vail. The shells are about as old as the mother-in-law joke. The shed of a boathouse is correspondingly antique. Therein lies the question. How can Wisconsin expect to compete sucessfully with other schools that run on the twentieth century plan and still buy a new shell as often as there is an eclipse of the sun? "Dad" Vail should be congratulated for his ingenuity and perseverance.

Fall crew practice has been active with at least one

crew on Mendota every afternoon, bending the old spruce. The College of Engineering is well represented in our navy. Howard E. (Howy) Johnson, senior mechanical and ex-captain, is the most promising candidate for stroke. He has been nursing a sprained knee, so coach "Dad" Vail has been having him supervise the work of the crews from on board the Isabel. Harold J. Bentson, another senior mechanical and a football man, is expected to be behind an oar again in the spring. Earl M. Plettner, senior electrical and art editor on our Wisconsin Engineer, pulls a mean oar at number 6 and will make a strong bid for a permanent berth. Everrett C. Schuman, senior civil is out for the first time and is making a determined fight for a place with the elect.



THE CLASS RUSH

The conservative may have their misgivings about the classification of the class rush under athletics. However, anyone being wiser by experience will most readily verify the statement that the class rush is the most athletic event of the school year. Technically speaking, the rush is a sort of a cross between a formal fight and a blocked stampede.

The sophs jumped the gun; the frosh were in each others way. . . . The rest of the excuses will follow later. A 9 to 5 win, however, is not bad accomplishment for the second year men. The casuality list was somewhat low this year; no one had a chance to faint in the nurse's arms.

EDITORIALS

(Concluded from Page 28)

In addition to captains, the engineers have supplied much other good track material. This was especially true last year when at least half of the team was engineers.

Busy as they were, the engineers are "in the swim." Many a plumber has been graduated from here with a "W" in addition to his "B. S."

Within fair limits it is no doubt beneficial to discuss mistakes, but too much ingenuity in looking for them to discuss is very far from helpful.

J. C. Stevenson

ENGINEERS TAKE BOOKKEEPING

Four senior engineers enrolled this fall in the elementary book keeping course in the Commerce Course. Shades of St. Patrick, engineers juggling debits and credits, trial balances and ledgers with a bunch of commerce students! "What next?" you ask.

But why should not an engineer learn to account for his incomes and expenditures just as well as any other business man? It is a sorry, but nevertheless true, fact that engineers are woefully deficient in their knowledge of financial matters. Many a cost estimate is far exceeded when construction has been completed. Experience thus bought is paid for dearly; needless diaster could have been avoided through some knowledge of finance.

It might be worth mentioning that these four engineers are all "civils" and it is the "civils" who most generally go into construction and contracting work. To bid successfully, a contractor must know what other jobs have cost him. Without some system of cost accounting or book keeping how could he know? Cost keeping for any kind of engineering work hinges on accounting and few contractors, especially those just beginning in the game, can afford a book keeper.

Book keeping is exceedingly practical and more or less routine in procedure, but orderliness is the basis of sound finance. An engineering student who ventures into the field of finance will be well paid.

ALUMNI NOTES

(Concluded from Page 33)

the American Bridge Co. at 208 La Salle St., Chicago. Residence: 2129 W. Washington Blvd., Chicago.

Porth, Walter, m '23, who was steel inspector with the A. O. Smith Corp. of Milwaukee during the summer, has shipped as seaman on the S. S. Van Buren of the United States Lines. His forwarding address is 29 East 11th St., New York. He writes, "Just about this time for the last four years my slip stick was beginning to run smoothly in anticipation of a year's hard use. But not so this fall; not a man on this ship knows that I ever saw even the inside of a college lecture room, and it's probably a good thing they don't, too, especially the sailors, for they think that that particular species of male is without a doubt the scum of he earth. My particular title is "ordinary seaman", and it's very ordinary, too,—about as ordinary as one can be and still be in the merchant marine. * * * No doubt, by this time you are asking why I'm here. Well, after working at the A. O. Smith Corp. in Milwaukee for the summer, I decided I had to get out of the middle west for at least a while, and so I came East. I can get into a ship-building company in New York if I want to, and I am taking this method of finding out something about ships to see if I want to go into that game, and, incidentally, I have the opportunity to see something of this world of ours."

Rafeld, Ernest A., m '22, is furnace-practice man for the Illinois Steel Co. Address: 452 Van Buren St., Gary, Ind.

Romig, Paul W., m '21, is with the Sargeant & Lundy Co., of Chicago. Address: 1725 Wilson Ave.

Posz, Howard, m '21, is a mechanical engineer with the American Well Works, Aurora, Ill.

Taylor, Hamilton B., m '21, was married in September to Maria Winne of Schenectady. Taylor is in the research laboratory of the General Electric Co.

MINERS

Turneaure, F. Stewart, min '21, is in the geology department of the Associated Oil Co. at Oil Center, California.

Wolters, Herbert Henry, min '22, was killed early in October while assisting in putting out a fire in Ray, Arizona. He came in contact with a live wire and was electrocuted. He had been in the employ of the Ray Consolidated Copper Company since graduation.

LION GROTTO BUILT AT SAN DIEGO ZOO

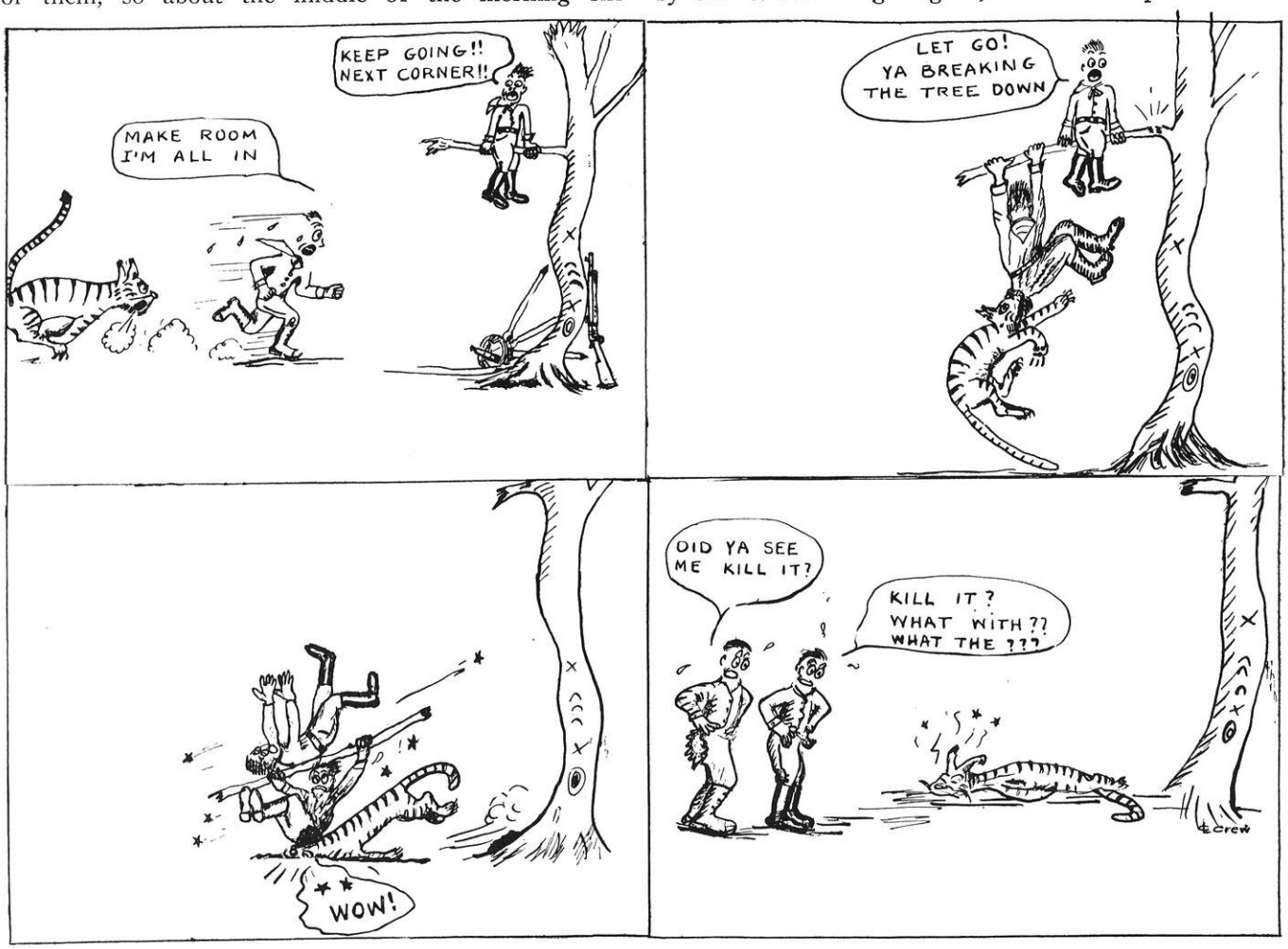
When the lions of the San Diego Zoo became tired of their cages, a concrete jungle was constructed for them. The jungle, or lion grotto, covers 3600 square feet and is twenty to thirty feet deep. It is built on one side of a canyon near the bottom, so that visitors can look up into the Grotto. The work included 1200 yards of excavation and 2500 yards of fill. The total cost was $7,000.

A HISTORY OF THE 1923 SURVEY CAMP

(Continued from Page 26)

the coefficient of friction of the floor, made it difficult to stand, let alone dance. One of Boyd's Madison orchestras was brought to camp to provide the music. The girls were given corsage boquets of wild flowers, which were put on sale by the small fry of the camp. Our partners for the Prom were secured from the four corners of the earth nearly-, Baraboo, Madison, and the cottages all contributing their share, and everyone had a fine time and was sorry when the orchestra played "On Wisconsin" as a finale. A few of the more hardy girls stayed all night in tents provided for the purpose, and despite many misgivings, managed to sleep, but true to form they failed to appear for breakfast next morning. The bluffs held quite an attraction for them, so about the middle of the morning six couples started to climb East Bluff. The trip was made safely, but it was a tired bunch of girls that arrived in camp just in time for lunch. In the afternoon a short boat ride was in order until about 3:30 when it was time to start for the station to catch the train for Madison. This ended the annual social affair of the Civil Engineers, and everyone was unanimous in declaring it "the best ever".

Camp could not last forever—or end too soon, for some—and preparations were made to break camp on the 12th of July. All work was required to be in by the morning of the 19th, so that there would be no delay in striking what tents there were to be taken down, and packing the equipment for its return trip to Madison. Our last meal was a real banquet,—even including speeches. Chief Engineer Robb acted as toastmaster, and lived up to his job by telling stories and calling for speeches from those least expecting to give them. Every member of our small faculty reminisced for our benefit; each one told us how much better off we were than he had been when he attended the camp, and, as the camp was over, we agreed with him and gave each speaker his share of the applause. The next morning we were granted an extra hour sleep, but this did not delay the camp breaking appreciably. Most of the tents were left standing, to be used later by the Wisconsin geologists, but the camp had to be



When The Surveying Camps Are Held In Africa

cleaned, and the equipment checked, packed and carted to the depot where, with half the camp, it was put on the eleven o'clock train for Madison. The remaining half stayed in camp to put on the finishing touches, but as these weren't many, the fellows were soon free to leave, and thus officially closed the 1923 Surveying Camp of the University of Wisconsin.

PORT TERMINAL DEVELOPMENT AT MILWAUKEE

(Concluded from Page 23)

nois Steel Company. This tract of land as far south as Wilcox Street, is now in the process of condemnation. It contains 43½ acres and is approximately 3800 feet long.

North of the harbor entrance, the city has possession of the entire riparian rights along the lake front to Wisconsin Street, being approximately 5,000 feet in length. A rubble-mound breakwater costing $306,000 was constructed along this frontage at a distance of about 600 feet from shore, inclosing an area of nearly 58 acres. This area is now being filled in by the city with ashes, excavated material, and general city waste. A tract just north of the harbor entrance where dumping for many years past was allowed to be carried on indiscriminately, is now being leveled off. It is estimated that 122,000 cubic yards will be handled to level off the area to 6 feet above water level. The cost is 46c per cubic yard.

Along the inner side of Jones Island, 1375 feet of pile and timber revetment was constructed in 1920, at a cost of about $102,000. The revetment is so designed that it can readily be converted into a permanent concrete structure by the addition of extra piles and a concrete cap. It is impervious to the passage of dredged material and provides for water 30 feet in depth.

Along the outer or lake side of Jones Island and about 700 feet from shore, a bulkhead, which is 25 feet at a cost of $213,000. This bulkhead, which is 25 feet inside of the inner end of the proposed slips, is used to retain the fill and will be used as an anchor for the future dock at the end of the slips.

With a revetment built along the inner side of Jones Island and a bulkhead along the outer side, the Kinnickinnic River, which is adjacent, could be dredged by hydraulic means and the material pumped across Jones Island into the water area between the shore and the bulkhead. This work of dredging was started in July, 1921, and was completed in September, 1922. The total amount of material pumped was about 690,000 cubic yards, and cost 24¾c per cu. yd. A lump sum of $10,000.00 was paid for the removal of 19 old wrecks of vessels which were deposited in the river many years ago.

Dredging the Kinnickinnic River, widened the river considerably and the dredged material filled in 20.2 acres of water area to 6 feet above water level. Thus far about $1,500,000 have been spent in connection with the developement of the outer harbor.

The proceedings in condemnation of the lands south of the city's present holding on Jones Island as far as Wilcox Street, have reached the final stage. After the city has obtained possession of these lands, the Board of Harbor Commissioners will proceed to extend the present lake bulkhead southward about 3,800 feet, and connect it with the shore. Kinnickinnic Bay will then be dredged, and the material thus obtained deposited in the area of the lake inclosed by the extension of the bulkhead.

The Problem of Rail Connection

Proper railroad connections are necessary for the success of any port. To provide the port terminal of Milwaukee with rail connection so that it will be open to any and all railroads, is one of the biggest problems confronting the Harbor Board. It has been suggested that the final solution of the problem will be a joint terminal, open to all railroads which would serve not only the harbor, but all parts of the city.

In Conclusion

Milwaukee's outer harbor facitlities when completed, will benefit not this city alone, but the whole State of Wisconsin and the great territory tributary to the port. It is believed by the people of Milwaukee, that by virtue of its advantageous location, and through the creation of this modern harbor, Milwaukee will command a larger share of the future commerce of the Great Lakes. And with a way open to the Ocean thru the St. Lawrence River, a direct traffic with foreign ports will be established.

THE SUMMER COURSE IN CHEMICAL MANUFACTURE

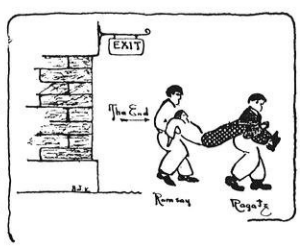
(Continued from Page 27)

leader in a story circle. It was kind of Ed, to relate in colorful language the experiences of his hectic career as the younger ones gathered round his knee.

There was much doubt in the minds of some as to how R. Harris could have become so dirty while taking that course in "Quant" under Chyle, and some one even suggested that he find a cleaner place on the wall to lean against.

Odors, which were most noticed by outsiders, were especially strong several times during the summer. Many of the odors brought back reminiscences rather forcefully and carried ones imagination to places far removed from Madison.

The problems were highly successful. The only failure on record is that of "Emil" Kuhe who, after a week of striving, abandoned his ambition to become a tonsorial engineer. Some said that some picric acid happened to get on his lip and removed the embryo moustache. Near the end of the course large flow sheets were made of many of the problems, especially those having several steps or several products, and these were sent to the State Fair, with samples, as part of the University exhibit.



The last morning of the course was spent in housecleaning, and all concluded that in spite of everything a good time was had by all.

BRINGING MORE DAYLIGHT INTO INDUSTRIAL BUILDINGS.

Dr. George M. Price, writing on "The Importance of Light in Factories," in "The Modern Factory," states: "Light is an essential working condition in all industrial establishments, and is also of paramount influence in the preservation of the health of the workers. There is no condition within industrial establishments to which so little attention is given as proper lighting and illumination. Especially is this the case in many of the factories in the United States. A prominent investigator, who had extensive opportunities to make observations of industrial establishments in Europe as well as in America, states: "I have seen so many mills and other works miserably lighted, that bad light is the most conspicuous and general defect of American factory premises."

"My own investigations for the New York State Factory Commission support this view. In these investigations it was found that 36.7% of the laundries inspected, 49.2% of the candy factories, 48.4% of the printing places, 50% of the chemical establishments, were inadequately lighted. There was hardly a trade investigated without finding a large number of inadequately lighted establishments."

Inadequate and defective lighting of industrial buildings is not confined to the establishments in New York State alone. The same conditions prevail in most sections of the country.

Such conditions as mentioned above are entirely opposed to the laws of health, sanitation and efficiency. Wherever poor lighting conditions prevail, there must be a corresponding loss of efficiency and output both in quality and in quantity. American industry is not using nearly enough daylight and sunlight in its buildings. Every endeavor should be made to use as much as possible of daylight for lighting purposes. To obtain this it is of course necessary that the rays of daylight and sunlight are permitted to enter the interior of the buildings as freely as possible, with the important modification that the direct rays of the sun must be properly diffused to prevent glare and eyestrain. A glass especially made for this purpose is known as Factrolite, and is recommended for the windows of industrial plants. Windows should be kept clean if the maximum amount of daylight is to pass through the glass, but the effort will be well repaid by the benefits secured.

In the presence of poor lighting, we cannot expect men to work with the same enthusiasm as when a well lighted working place has been provided. The physical surroundings have a deep effect upon the sentiments of the employes, and where bad working conditions are allowed to prevail, there is invariably a lessening of morale and satisfaction created thereby. Neglecting to utilize what nature has so bounteously provided, daylight, and which is so essential toward industrial efficiency, we have an instance of wastefulness, but now that the importance of good lighting is becoming recognized, undoubtedly more attention will be given by progressive industrial employers to furnishing the means which are essential for their workers to secure and maintain the efficiency, which counts for so much in the success of any industrial concern in this competitive age.

If you are interested in the distribution of light through Factrolite, we will send you a copy of Laboratory Report—"Factrolited."

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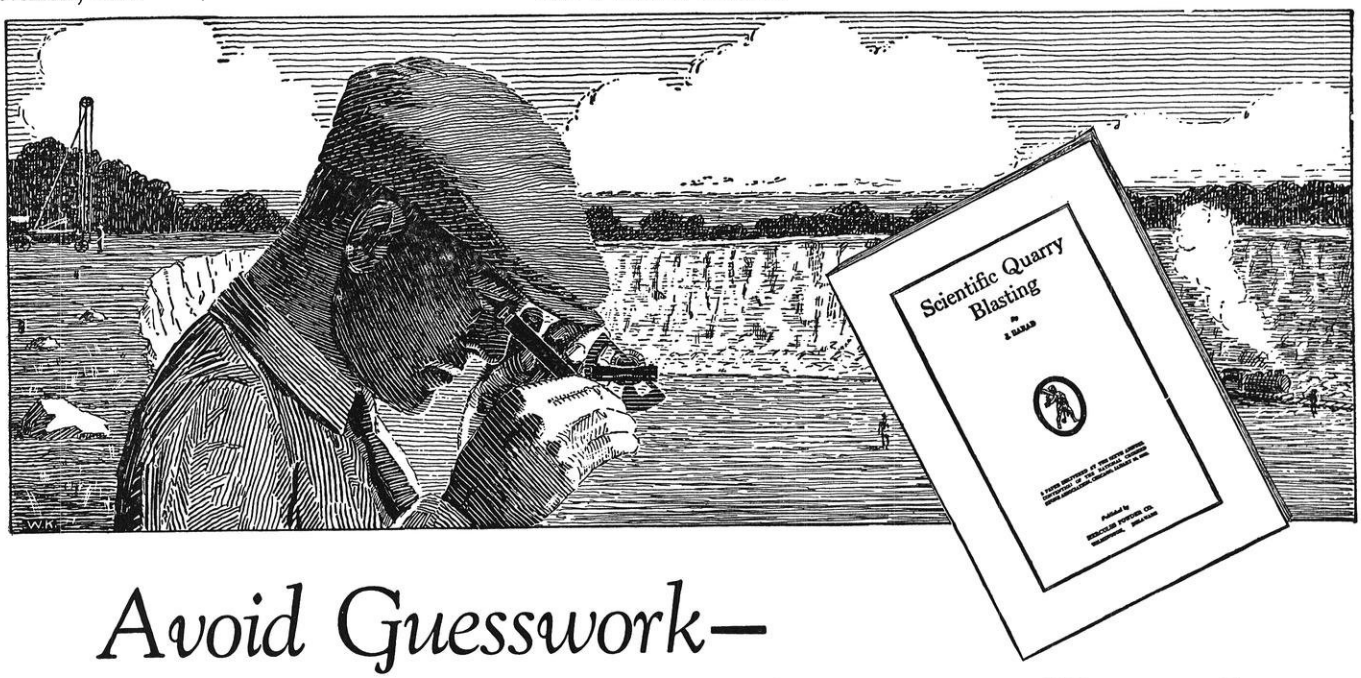

Avoid Guesswork— This Bulletin Will Help

A hand level and a tape are all you need to calculate accurately the correct amount and distribution of explosives for most well-drill shots.

No matter how high or how sloping the face of the open pit or quarry may be, you can find the burden on each hole by a simple method described in "Scientific Quarry Blasting". Once this is known, you can load with much more certainty of obtaining good results.

Guesswork is often relied upon in loading well-drilled holes, but even when the guess is based on long experience, it seldom attains scientific accuracy. A little figuring beforehand will save a lot more than the cost of the time it takes to do it.

Other chapters of this bulletin which is published by the Hercules Powder Co. discuss the comparative effect of different explosives in both pocket and column loading and special methods by which unusual blasting problems have been solved. It also gives record systems used at open pit mines and quarries, and a set of useful tables.

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