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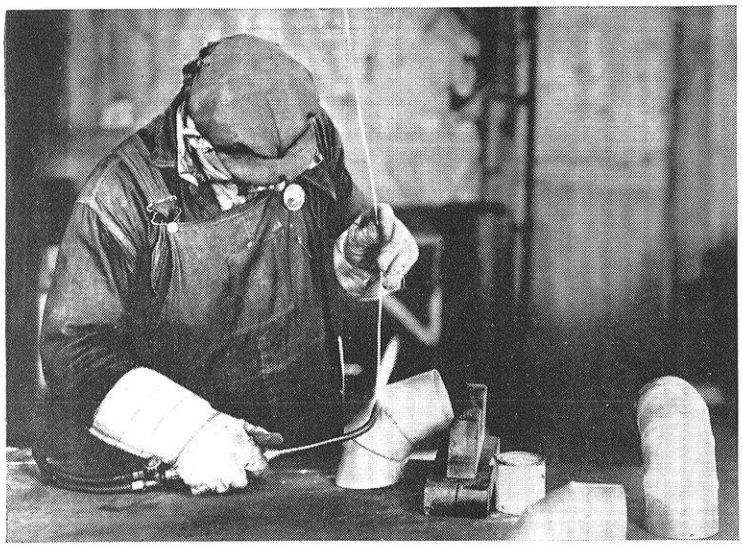
THE WISCONSIN ENGINEER

OCTOBER 1934

MEMBER, ENGINEERING COLLEGE MAGAZINES, ASSOCIATED



FEATHERWEIGHT PIPING—made by welding aluminum tubing. These fittings are to be used in a chemical plant.

If Your Product Must Weigh Less

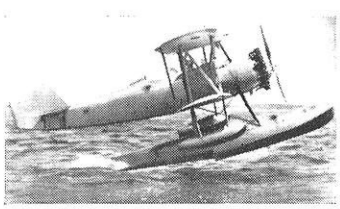
Oxy-Acetylene welding will eliminate heavy joints and give throughout—greater sturdiness with less weight and bulk.

By F. J. KING*

The trend in modern product design has been toward lightening weight. Manufacturers wishing to make their metal products lighter are building them of light weight alloys and metals with welded joints. Products so fabricated utilize the superior features of welded joints to attain lightness with strength, ruggedness, and attractive appearance.

Welding Is Strong

Lightness is gained in welding because each joint is a smooth union of two metal parts into one. No lapping or flanging is needed for making the joint. Corners are not bulky or cumbersome. Invisible seams give a smooth surface for painting and enameling. And in strength the joint is 100 per cent efficient—as strong as the metal it joins.



BAFFLING CORROSION—resistance to the action of salt water can be effected with special alloy metals. Welding is used to give light weight joints in all commercial metals and alloys.

In Modern Automobiles

In automobiles, for instance, lightness has been attained by designing many motor and body parts for welding. The resulting light weight car has less tire wear, less gas consumption, fewer repairs. Its welded seams have smooth contours and streamlines, offering less wind resistance and providing an even surface for fine finishes.

On the Airways

Safe, speedy flying was next to impossible until the aircraft industry adopted the welded joint for airplane fuselage construction. With other means of joining it would hardly be possible to carry a profitable pay-load. Welded light alloy fuel tanks for aircraft are safer, lighter, stronger and more compact.

In the chemical and food industries, also, welding contributes to lighter weight. Light alloy piping and containers can be used—welded to give a smooth, even surface inside and out. Welding leaves no rough spots for corrosion or germs to attack.

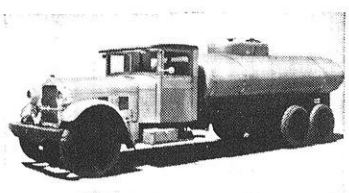
Saves Tons of Weight

A prominent example of weight saving is in the use of welded piping on the new treaty cruisers. Reduction in tonnage through the use of welded piping made it possible to mount an additional 8-in. gun and still conform to treaty weight limits.

These many cases drawn from actual experience show the advantages of building products from light weight metals and alloys by welding. Welded joints are most efficient and economical for modern metals and designs.

For The Future

Industrial executives interested in making their products lighter can obtain further data on the use of welding in their own operations through The Linde Air Products Company. This company, in addition to utilizing the facilities of Union Carbide and Carbon Research Laboratories, Inc., has had wide experience drawn from over 20 years in pioneering and developing oxy-acetylene applications. Advice and assistance to manufacturers on how best to use oxwelding and cutting for their needs is available without charge through sales offices of The Linde Air Products Company located in Atlanta, Baltimore, Birmingham, Boston, Buffalo, Butte, Chicago, Cleveland, Dallas, Denver, Detroit, El Paso, Houston, Indianapolis, Kansas City, Los Angeles, Memphis, Milwaukee, Minneapolis, New Orleans, New York, Philadelphia, Phoenix, Pittsburgh, Portland, Ore., St. Louis, Salt Lake City, San Francisco, Seattle, Spokane and Tulsa. Everything for oxy-acetylene welding and cutting—including Linde Oxygen, Prest-O-Lite Acetylene, Union Carbide and Oxweld Apparatus and Supplies—is available from Linde through 126 producing plants and 859 warehouse stocks.



BIGGER PAY-LOADS—are possible when welded aluminum truck bodies and chassis are used. By welding the body the useful load of a 10-ton truck is increased on the average 1500 lb.

*Chief Engineer, The Linde Air Products Company, Unit of Union Carbide and Carbon Corporation.

—This being a Business-News Advertisement.

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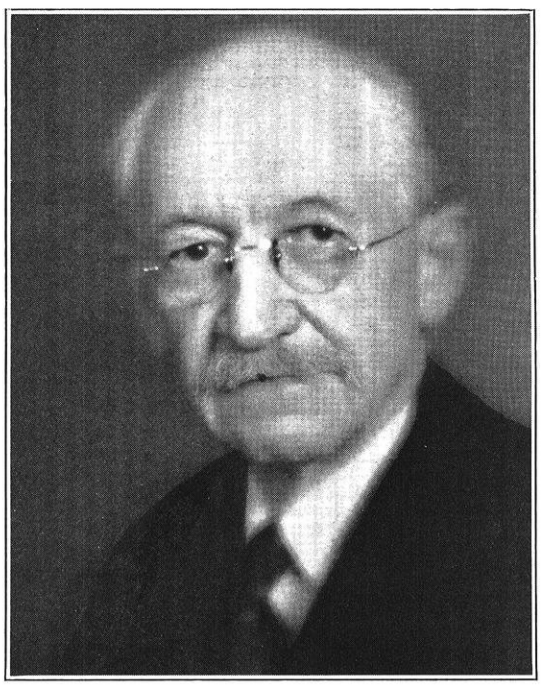
An Optimistic Outlook

By Dean F. E. Turneaure

At the opening of the year we sense an increased enthusiasm among the students. The freshmen registration has increased about 55 per cent over that of last year and two years ago, and the upper classes are larger than predicted. A high degree of earnestness is manifest, and we venture to predict that the work of the year will be above the average.



Dean F. E. Turneaure

In this first issue of the *Wisconsin Engineer* it seems appropriate to comment upon a new and interesting plan with respect to the outside professional activities of the engineering students. After a careful canvass of the student body a very large majority voted to combine the support of these activities into a unit and ask each student to contribute $1.00 per semester to their support. The faculty approved this plan, as it was felt that from a strictly educational standpoint every student will get more than value from the expenditure. The *Wisconsin Engineer,* the activities of the *Polygon,* and the student branches of the professional societies the faculty believe to be of great service in promoting that *esprit de corps* characteristic of live engineering organizations. The *Wisconsin Engineer* is a non-profit organization, and where operations have shown a surplus, it has been contributed to the student loan fund for engineers. During the past few years, this publication has had difficulty in keeping alive, but the new plan, it is hoped, will restore its former standing and give it more value than heretofore to serve as a medium for student expression. It is an activity which is thoroughly approved by the faculty.

The student engineering branches are similar in their purpose to the national professional societies and the benefits derived from such society activities are regarded as an important element in the professional growth of the members. We anticipate valuable results from the new plan, and believe the students as a whole will join in its active support.

The WISCONSIN ENGINEER

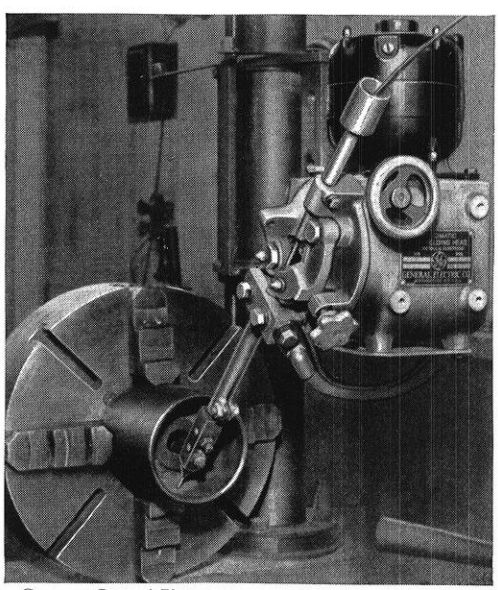
VOLUME 39, NO. 1 OCTOBER, 1934

Arc Welding --- An Ominous Competitor of Riveting

By BURTON J. ZIEN, m'35

THE design of tomorrow must take cognizance of an infant engineering tool — welding. The increased efficiencies of streamlining, the compactness of machine bodies and frames, and reinforcement of old structures are greatly enhanced by the use of this tool.

The American Ship Building Company early this year completed an arc-welded streamlined rudder, 10′ 3″ high, 8′ fore and aft, and a maximum breadth of 19″, which was much superior to the ordinary single plate rudder. Propulsion, efficiency, and maneuvering qualities increased; the torsional strain was taken as a complete unit instead of depending only on the main piece and forged arms of an ordinary rudder; and the air-tight rudder, reduced in weight 15%, was self supporting, reducing the load on the bearing and steering engine to a minimum.



—Courtesy General Electric.

Automatic Arc Welding Machine used in repairing Chuck.

In redesigning 3 inch anti-aircraft units at the Watertown Arsenal, designs were created which would have been impossible if cast components had been used. In 1930, the U. S. Navy authorized the construction by an all-weld method of a number of small seagoing vessels and it was found that along with a saving of 17% of the weight and a subsequent gain in carrying capacity, the welded construction cost $127,000 and the riveted, $142,497.

A bridge built in 1899 for a load of 12 tons was strengthened without the use of false work and without being stripped, to carry loads of thirty tons. Worn rail wheels and steel rolls are re-trued with the metallic arc weld. The wheel or roll is placed on a spindle, an arc is struck between the weld rod electrode and the rotating object, and after sufficient metal has accumulated, the object is turned down to size. Still another feature of the process was utilized in the alteration of a Bell Telephone Exchange. The use of riveting hammers would have impaired service for several days; but the noiseless operating of the process made the discontinuation unnecessary.

But to-day, a number of important structural fields strongly cling to rivet inter-locking. The erection of buildings, the marine industry, and the boiler factories are limited in their use of welding by the identical skeptism which has met every important structural development. In the case of welding, the reluctance of the designers is caused by the lack of a simple test to assure the soundness of a welded joint. To understand the reason, it is necessary to look into the actual procedure and the effects of this process on the base metal.

Of all the methods of welding, the automatic arc weld offers the greatest possibilities. In general, this type of welding is a fusion operation in a reducing atmosphere, which completely eliminates oxide inclusion and other impurities from the weld. One theory of the transmittance of the metal across the arc is that of distillation. The high temperature of the arc vaporizes the weld rod, which then condenses upon contact with the steel being operated upon, the vapor forming the conductor. A more recent hypothesis points out that the metal

electrode could not be vaporized entirely at the temperature of the arc, and is carried across in the form of metal globules. Much more research must be done before the correct answer is found. However, the heat of the arc results in certain phenomena, the control of which determines the value and character of the steel deposited.

The automatic machine itself consists of a continuous electrode of approximately the same composition as the base metal, fed to the arc at a constant rate. The apparatus has a device which automatically re-establishes the arc if the line is shorted or broken. The power is obtained from specially constructed arc-welding generators and transformers for D. C. and A. C. current. These generators are built to give a high initial voltage for striking the arc, and an automatic reduction of voltage and an increase in current for the continuous operation.

The electrode feed is a small constant speed D. C. motor which drives a pair of opposed feed rollers. The weld wire is fed by the rollers through a changeable nozzle, pivoted off center. The electrode feed can be adjusted by means of a relay system to synchronize with the movement of the machine relative to the work.

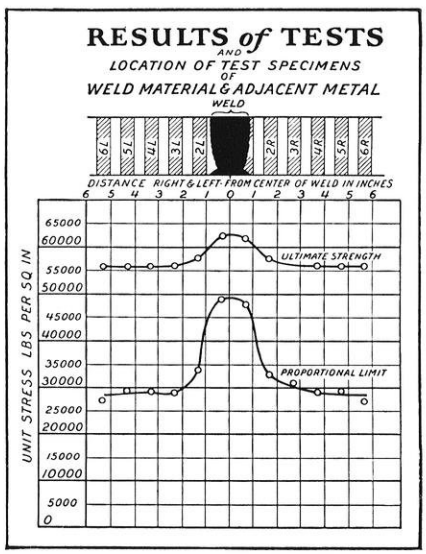
Two important considerations cannot be neglected. An incorrect induced magnetic field has the effect of causing a noisy arc, an unsatisfactory weld, blowing the arc backwards, or even breaking down the arc. This effect is neutralized by setting up strategic opposing fields.

The weld rod holds the secret of the reliability of the automatic metallic arc weld. The metal while hot is subjected to vitiation by the oxygen and nitrogen of the surrounding atmosphere. The presence of oxides and nitrides in any welding process would cause a porous and weak weld. Because in wire drawing enough lubricant remains on the wire, to furnish the flux, this contamination is avoided. In some cases the lubricant is not of sufficient protection. The welding of stainless steel requires the coating of the wire with a special fluxing which produces a reducing atmosphere to prevent oxidation. A number of eligible arc enclosures that are used commercially are:

Paste covering — evolves a reducing gas.
Slag coating — mechanical exclusion of atmosphere by slag.
H_2 shield — hydrogen atmosphere.
Enclosed arc — metal vapor in confined space.

The machine as described above offers a simple, speedy, and reliable tool for large scale production.

The problem is a wide one. The high temperature of the arc causes a modification in the structure of the base and weld metal. How this change affects the contour, strength, ductility, resistance to fatigue, machinability, corrosion, and internal stresses is a matter of detailed and comprehensive test.



—Courtesy A. O. Smith Corp.

Test results on specimens from welded construction, showing weld and adjacent metal stronger than original plate. Specimens were cut at 1" intervals parallel to the weld and pulled in same direction.

Photomicrographs have indicated the effect on the contour. The weld metal (2732° F.), is of fine structure; the adjacent region, the fusion zone (1800-2730° F.), a coarser crystalline appearance. Bounding the latter region in the base metal is a refined area (1300-1800° F.). The temperature variation, as given, is approximately correct. The total affected welded metal lies about one-eighth of either side of the weld. Will this area be capable of transmitting high stresses under various possible conditions?

Tension tests, as illustrated, have been convincing. A Wisconsin manufacturing concern has fabricated 3,000,000 automobile rear axle housings which have withstood continuous vibration and torsional stresses without failure by fatigue. The smooth exact threading of over 80 miles of ¾" welded plate, casing couplings has demonstrated the ease and certainty of machineability. The carefully controlled weld is impervious to corrosion. As a matter of fact, because of the lack of sudden ridges and flanges, as in riveted construction, embrittlement is greatly decreased. This consideration alone would increase the life of boilers an appreciable period. Residual strain cannot be eliminated from all structures by annealing. In building structures such procedure would be impossible. However, by certain not-too-difficult experiments, the fiber stress can be calculated and thus accounted for.

Arc welding has become stabilized and definite in the laboratory. All mechanical tests have proven its superiority to riveting. The demand today is for a simple test to assure the reliability of the weld. Especially in the presence of the human element, does the need become more apparent. An inspector tapping rivets with a hammer knows that for the purpose of the rivet, it has a sufficient margin of safety. The most promising test, today, is the use of the X-ray. Yet application, say in an Empire State building, would be prohibitive because of the cost.

However, in view of the success of welds in the high pressure vessel field, in the automotive industry, and in a small portion of the marine industry, field confidence is being developed. The Hartford Steam Boiler Inspection and Insurance Company, in a bulletin published a few months ago, admits this wavering of skepticism. They are still very cautious about insuring welded vessels, but their action is significant.

Another indication in the recent past has been the adoption by the Boiler Code Committee of the A. S. M. E. of a classification of fusion welded vessels, and a welding code.

Because of these signs, it is safe to predict that in another decade welding will have become the principle structural key. As we accept an automobile delivered to the door without any test of its ability to meet service requirements, so shall we accept a forty story completely welded super-structure.

FIG. 1 — *View showing type of country traversed from Lake Winnipeg to God's Lake. Practically one-third of the area of Manitoba is water-covered.*

Scanning Manitoba By Airplane

By FRED W. TREZISE, C. E., M. S.'34
In Charge of Engineering at Lawrence College

AS the railroad has been the largest factor in the development of our west, so the airplane is gradually becoming an influence in raising the commercial center of gravity from the wheatfields of the south to the mineral fields of northern Manitoba.

Manitoba has an area of more than a quarter million square miles, or more than double that of the British Isles, and approximately equal to the combined areas of Wisconsin, Minnesota, Michigan, and Illinois. The vastness of this area and the undeveloped timber and water-power resources of the province are strikingly apparent from a plane. Agriculture, principally grain farming, was first introduced to these great western plains by Lord Selkirk and his ill-fated Red River Colony in 1812. The grain fields of Manitoba are a most inspiring sight, centering about Winnipeg, the metropolis of the Canadian Northwest. A city of some 300,000 on the Red River, it is the railroad hub of western Canada and one of its yards is the largest in the world. The Winnipeg grain market controls the world supply and as an industrial and distributing center it is destined to grow with the demands of the new mineral industry now developing.

The outlet to the mining areas is by water or plane from Winnipeg. Regular steamer service to Norway House (Fig. 2), some 275 miles north on the north shore of Lake Winnipeg, is maintained during the open season. Norway House, one of the many Hudson Bay trading posts in the north, founded almost 150 years ago, is the northern getting-off-place and is establishing itself as a base for the pioneering into unknown riches of the Laurentian Shield which covers about three-fifths of the area of the province.

Manitoba is a maritime province of Canada, the main seaport being Churchill, on Hudson Bay about 993 miles from Winnipeg by steel. The construction of the Hudson Bay Railroad from The Pas to Churchill (Fig. 2), is one of the outstanding achievements of the railroad engineer of the past decade. The character of the terrain traversed, muskeg swamps, peat bogs, Pre-Cambrian outcrops, together with a number of large rivers to bridge, placed resourcefulness at a high premium. The construction of this railroad has shortened the shipping distance from western Canadian cities to Liverpool between 400 to 1200 miles and shipment from rail to tidewater is direct without the necessary transfer at Montreal and other Great Lake ports. Nature has provided magnificent breakwaters at the entrance to Churchill harbor, which is open, free of ice, from August 10th to the end of October each year.

Manitoba as a metal producer, first gained attention in 1911 when gold-bearing claims were staked out in the east-central part of the province near the Ontario boundary. In the following year larger areas northwest of The Pas in the northwestern part of the province, were found to be highly mineralized in copper and zinc, the present Flin Flon, Sherritt-Gordon, and Mandy mines. Within the past few years the first gold areas have become the rich producing Rice Lake area. Prospectors, since 1931, have opened up, with exposures of gold-bearing quartz, horizons at Island Lake, God's Lake, and Elbow Lake and already in production. The possibilities of much of the area have been unde-

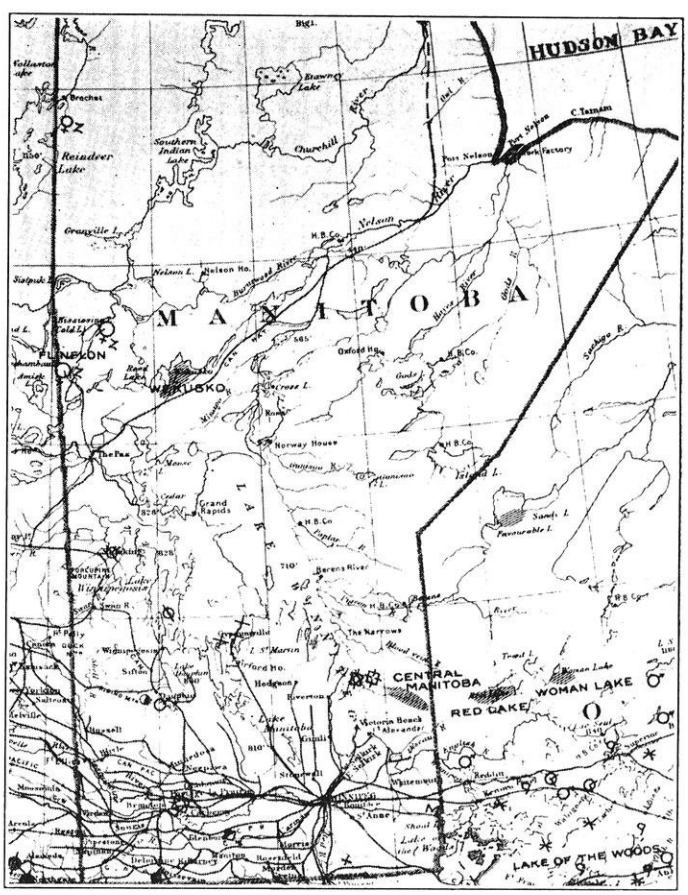


FIG. 2 — *Manitoba — Land of water and gold.*

termined but a visit to these centers will indicate the feverish activities of the modern Rock Houn' Bills.

It was the first week in June when we had word radioed from God's Lake, informing us that the ice had sufficiently cleared the north shore of Elk Island so that we could land (or whatever you call it), on pontoons, far from the final exams and other forms of heat at Madison. The take-off from Red River in one of the many FC2W2 Fairchilds giving direct service to the gold fields, passes unnoticed. We follow the trend of the meandering channel of the Red River until the alluvium-covered southern shore of Lake Winnipeg creeps into sight. Soon we realize the size of this body of water, a partial remnant of prehistoric Lake Agassiz; it is larger than Lake Ontario and almost as large as Lake Erie, but very shallow.

The spell of being in the north soon overtakes us — the squared-off patches of multi-shaded green in mosaic disappear with the northern limits of the public land surveys, ribbons of water twist and unknot themselves as they finally stretch out to the lake — off to the east a swath has been cut to the northeast reaching as far as the eye can see; we consult the splendid aerial maps of the Department of the Interior to find that it is the Ontario-Manitoba boundary, stretching on to Hudson Bay. Myriads of waterfalls flash in the afternoon sun, as they tumble over Pre-Cambrian outcrops and faults, a striking contrast in the dark greens of the conifers. These are a portion of the 5,400,000 estimated available horse-power in the province, of which some 400,000 has been installed. It is no small wonder that Winnipeg claims the lowest power rates in America at .638c per kwh.

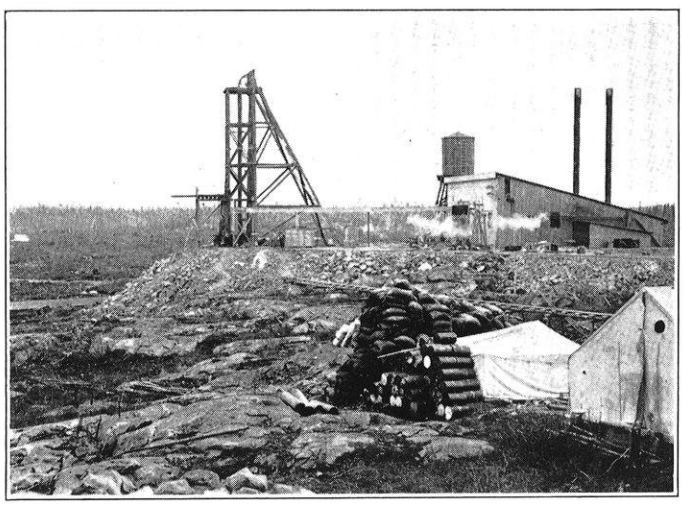


FIG. 3 — *Shaft or headframe of God's Lake Mines, Ltd., on Elk Island. This camp has been entirely constructed within the past 18 months.*

After some two and one-half hours of air travel we drop at Island Lake Mine, which camp, unknown two years ago, has shipped its first gold bricks, three at $10,000 each since June first. Associated with the gold in this formation is stibnite, a sulphide of antimony, which can be mined economically. About seven cords of spruce per day furnish the fuel for power, rafted to the power-house in small booms from an unlimited supply.

Fifty miles further north a decided change in the terrain is noticeable. Small lakes cover a large portion of the area, larger surfaces are denude of forest cover, granitic outcrops are bleached a deadly white in the sun, muskeg and tundra on the flat lying and undulating plains are evidences of the proximity of the timber line, and large fields of ice almost cover the lakes. Our ears tell us that we are losing altitude as we dip from 5500 feet to skirt the edge of the ice on God's Lake and dock at the Elk Island camp of the God's Lake Gold Mines, Ltd.

We marvel at the foresight and planning necessary to establish and maintain such an enterprise so far removed from the source of supplies. We are almost a month by canoe from Winnipeg with more than a score of portages, and some 150 miles via a circuitous route from the "steel" at Ilford, 768 miles from Winnipeg on the Hudson Bay Railroad. Airplane service is necessarily limited and practically all equipment used in this camp was brought over ice roads by caterpillar and trailers during the past winter — 70 to 80 tons per train. In June we can still trace the road across the ice, over lakes and through slashings as far as visibility permits. The extreme difficulties of this premiere in northern adventure are gripping stories in themselves—speeds at one to two miles per hour, one crew resting or at least off duty in the caboose at the rear of the train while the other "cat-skinners" keeping 'er crawling along the two or three day trek.

We are to make the camp our headquarters during our investigations to the east and west ends of the island, to enjoy its running water, sanitary sewer conveniences, electric lights and central district steam heating, all engineering problems in themselves, well solved. It took some imagination to plan a soft-ball diamond in the muskeg, a little more to lay out a golf course, and the maximum courage to announce plans for a badminton court. Well, perhaps it's a mighty good thing that they can play at this time of the year, when the sun sets at 11:00 P. M. and twilight melts into dawn at 1:30 A. M.

Elk Island is about 18 miles long and of varying widths, the entire island being fairly well staked out, each mineral claim in Canada being, theoretically at least, 1500 feet square or containing about 51.6 acres. These lands remain in the possession of the Crown, but may be leased at the end of five years if assessment work to the amount of 25 days per year has been done to hold the claim.

Angle diamond drilling on an intensive scale has proven value with depth. God's Lake Gold Mines, Ltd., has sunk a shaft some 300 feet. No cross-cutting or drifting through or along the mineral veins has been attempted. These operations await the erection of a 300 ton per day mill as soon as it can be hauled over next winter's ice. Preparations are being made to build a 6000 kw. hydro-electric plant 25 miles away on the Kanuchuan River of which 4500 kw. will be available for other enterprises in the area.

In the United States, Manitoba has been synonymous with wheat but now it appears that the statement attributed to Father Burke on the shore of Hudson Bay 130 years ago will bear its true weight, when he asked that the banks of the Nelson River be acquired for the gold they contained.

A SLICE OF "PI"

CALL B. 3.1416

● The only qualification I have to offer as to my fitness for this position, is that I have been a constant reader of the humor section in *Pathfinder* and *The Daily Cardinal.*

The selection of a title for this page cost me many months of concentration and bucks for that mood-getting fluid, beer. I even went so far as to have the Editor and Business Manager of the *Wisconsin Engineer* bore me for an evening suggesting supposedly novel and humorous titles. As a final and desperate resort I chose the above title which I hope will only be temporary. The plan of choosing a title which I am about to suggest has all the earmarks of a brilliant idea. The gist of the plan is somewhat as follows: A title choosing contest will be sponsored by this department, open to Freshmen only. Each week the Freshmen spend an hour at Freshman Lecture. The first few lectures, according to this plan, will be spent in discussing possible titles for this page. After a careful study, the student then picks his title, puts it in a sealed envelope, and hands it to his adviser who will inspect it as to legibility, neatness, clearness, and novelty. After passing the Dean's inspection, the surviving titles will be passed to a committee of fifty students, selected from those senior Chemical Engineers who have flunked Organic Chemistry. If this committee can get away from their aromatic compounds for a short time, we'll soon have a title.

A contest usually has a prize as its objective and so has this one. The prize offered is very unique in some respects. *The first and only prize offered in this freshman contest will be full and immediate promotion of the winner to Sophomore standing.* This prize (chosen after a careful study of the New Deal) will save the lucky Freshman a year's tuition and fees and will enable him to resume his residence at his Father's home a year earlier.

A contest usually has rules and so has this one.

1. The title must not contain more than one hundred words.

2. The winning Freshman, in order to be eligible to receive the prize, must have thirty-four credits and an equal number of grade points in the engineering school. (Note: This rule was put in despite the protests of the faculty.)

This last rule may be a trifle hard to take for some of you Freshmen, but remember you are engineers and therefore can surmount any difficulty, no matter how insurmountable.

* * * *

● Blaine Seaborn and Horace "Slide Rule" Norton were a trifle surprised to hear that they had been given four credits in Speech instead of in Chem. Engr. 114 this summer. Each received an "A".

* * * *

● Skogstrom, one of the chemical engineering department's charter members, returned to school this semester to complete his education.

● FOUND — A FRESHMAN LETTER

Dear frend;

I am writing to you about the time I had in Madison my first week. The first thing they learned us was orientation week. I think I got lost the first day, because our advisor was asked to talk to us about engineering in the engineering building. I got to a building and walked in. It seemed like my Pa's barn. While wandering around lost like, I asked a fellow who came along. He said, "whereas and heretofore the engineering building is across from this building." He looked so funny I coulda laffed. I still don't know what he was. My advisor called me in for a personal interview to talk over currant engineering activities. When he asked me why I took up Electrical Engineering. I told him how handy I was with the screw driver, mentioning a few cases such as fixing our neighbor screen door and fixing a plug on our floor lamp etc. I could see how this impressed him. When he looked at my High School grades he didn't say much, but he must have realized that I didn't have much time for studies because of athaletics and other things. Boy! Was I ever red one day when we took our medical examination. Remember that time when some tourists caught us swiming in the old swiming hole—was our faces ever red that day? The doctor said I had Athalete's foot and B. O. I don't see how he could deduct that I had Athalete's foot unless he noticed my barel chest and muscles. I thought I was supposed to have Chemistry lecture last Wednesday. We all got together and when all of a sudden when a man came in they all started to give sky-rockets. I thought this was a pep meeting like back in High School and the guy coming in was the coach. He sort of grinned but he had quite a fiery look in his eye. Instead of yelling coach at the end they yelled Louie, so I knew right then that it wasn't a football meeting. So far we have had one Freshman Lecture, and all I have done in it so far is to work for a prize offered by the humor section of the Wisconsin Engineer. The prize is darn good but I think the rules are pretty strict. A few of the other fellows think so too. Well I must close now as I have to study for Shop 1 because the guy teaching it knows at a glance from a hundred feet away whether the pattern you are making is 1/64 or 1/32 of an inch off. He shaves with a plane because he is so good at sharpening them. At least that is what he told me. Write soon and tell me how much the High School football team misses me.

Your frend.

* * * *

● "Green Bay" Schink, a senior, learned who Dean Turneaure was just the other day at the T. V. A. lecture. "Green Bay" must lead a charmed life to have survived so long in this school of radicalism and this age of fast moving traffic.

* * * *

● This column is for the exposing of all engineering students and their friends so place your contributions on the desk in the *Wisconsin Engineer* office.

Faithlessly,
SKUTERBOTCH MERINGUE.

« CAMPUS NOTES »

The editor of this column has taken it upon himself to dedicate each contribution for the next five months to one of the Engineering Colleges on this campus. The ever present problem, which had the possibilities of becoming an obsession, was, "Which college should be favored first?" The Civils because they were the pioneer engineers, the stalwart explorers who led the trek of civilization across America? The Miners who, succeeding the surveyors, crawled down into the earth to bring up the gold and iron? The Chemicals who converted the raw materials to usable forms? The Mechanicals because, with the practical structure made possible by the Chemicals, they transformed static power into dynamic forces? Or the Electricals—who added the refinement and polish to civilization? Which one has performed the most for society? Which has made the most important contribution to existence?

After profound consideration, the Mechanicals were chosen as the esteemed. Perhaps the contributor of this column was a Mechanical.

CLASS OF 37, TAKE A BOW

High Honor Rate

	Crs.	*Pts.*
Eppler, John F.	34	102
Olson, Neal D.	34	101
Parrott, Frank W.	34	101
Simon, Lawrence E.	34	100
Mayland, H. C. (3 sems.)	55	161
Luecker, Arthur R.	32	93
Burroughs, C. W. (3 sems.)	46	129
Risser, Gerald J.	34	94

Honor Rate

Fontaine, Francis E.	34	93
Schulein, Art. E. (1 sem.)	17	44
Wefel, Ellison L.	34	87
Norris, Spaulding A.	34	86
Durdell, Wm. R.	36	90
Ingersoll, Hugh D.	36	88
Rudolf, Chester D.	34	82
Luoma, Herbert	34	81
Pryor, Wm. A.	34	81
Riggert, Marvin C.	36	84
Carlson, Lawrence W.	34	78
Heinrichsmeyer, E. F.	36	82
Storck, Norman C.	36	82
Wallace, Everett	33	75
Schuele, John J.	34	77
Wilson, Francis C.	39	88

PROFESSOR GUSTUS L. LARSON

Over in that new, well equipped M. E. building, up two flights, through a door, to the left, and through a second doorway, behind a large desk sits fair-skinned, calm, modest Professor Gustus L. Larson, the key man in the college. Born in Sweden . . . awarded B. S. E. E. at the University of Idaho . . . a real student . . . member of Sigma Xi, Tau Beta Pi, Phi Kappa Phi, Pi Tau Sigma . . . also National President of the latter

G. L. Larson

. . . a man's man . . . played four years of university football and captain two years . . . member of All Northwest team . . . still a sport . . . spends every summer trout fishing . . . favorite place is the unchartered region beyond Hudson Bay . . . usually accompanied by Prof. Price of the electrical engineering department . . . keen on moving picture camera hunting . . . took five hundred feet this summer . . . is a model man . . . doesn't smoke, but cherishes an occasional pilsener von brau . . . besides the number of technical magazines, Saturday Evening Post, Literary Digest, Readers Digest . . . plays ringer horseshoe . . . when paired with Prof. B. Elliot generally brings back the pearl handled jack knife . . . appreciates good music . . . but says he can't carry a tune in a basket.

His first enjoyment is his family . . . has a boy and a mechanically-minded daughter . . . drove seven thousand miles this summer with them . . . enjoys driving . . . it is rumored the car travels eleven or twelve miles per gallon . . . Such is the picture of the Senior adviser of the Mechanicals.

A COMPARISON OF THREE TYPES OF HEATERS FOR INDUSTRIAL SHOPS

Professor G. L. Larson, Assistant Professor of Steam and Gas, D. W. Nelson, and John James, a research fellow, have been testing three different heating systems in the Heating and Ventilating Laboratory of the M. E. building.

An important factor in heating a room is the method of distributing the heat. The ideal condition is to maintain a desired, uniform temperature in the occupied area and a minimum temperature outside that area.

Of the three methods tested, the first was a direct radiation system with radiators and piping along the walls and just below the sawtooth roof, with 4,431 square feet of heating surface. The second was a series of suspended heaters with blowers, of an equivalent heating area of 4,676 square feet; and the third, a pair of floor unit heaters with 3,790 square feet of radiation.

The saving of the suspended unit heaters over direct radiation, the heaters operating at 70° F. for twenty-four hours, was over 13.5%. The advantage of the floor unit heaters over direct radiation under the same conditions, as stated above, was 9%.

The detailed story of this research will appear in the Journal Section of the November A. S. H. V. magazine.

DEATH TAKES A HOLIDAY

"*Ubi latet mors ferimus.*" "Death lurks where we strike." This curt epitaph emblazoned on the side of the suspended plane in the lobby of the M. E. building has long lost its militant fervor. Now it is but an inscription on a lifeless, useless, inefficient shadow of the admirable, roaring monster it once was.

The plane, a single seater fighter, was built shortly after the war and used by the 9th Naval District Training, Squadron 7—this explains the notation 9R-N7 which appears under the cockpit — of the Naval Reserve Squadron at Detroit. Manufactured by Curtiss of wood and wire construction, it was powered with a Wright J4 engine. Modern developments have

replaced this construction with welded steel.

While in running condition, the plane was the particular favorite of V. W. Randecker, m'28. However, in 1930 the daring boast bit back. The plane crashed.

Einer Hanson, '28, at the present time an instructor in the Steam and Gas department, and a friend drove to Detroit, picked up the remains, and carted the plane back. Here, the body was repaired, the canvas mended, and the result suspended—already a relic in the progression of heavier-than-air machines.

AN ENGINEER WITH SOCIAL VISION

"Only by a yardstick, in the form of government power developments, can abuses existing in some private power developments be eliminated," Dr. A. E. Morgan, chairman of the board of the Tennessee Valley Authority and president of Antioch College, declared before the engineering students assembled in the Engineering Auditorium on Monday, October 1, as he spoke on the far flung program of the TVA for hydro-electric power developments, improvement in fertilizer manufacture and agricultural methods in general, and for replacing the old rugged individualism in Tennessee with a planned social program.

Some popular misconceptions as to the power program were dispelled. Although some critics say that water power is too expensive compared to steam power and that the country has more power facilities than needed already, these same critics are secretly endeavoring to buy up the best water power sites in the country in preparation for expansion of their own plants. Competition in the TVA power distribution is to be avoided with its waste; instead, certain areas are to be served by TVA, which is buying developments from private companies, while private companies will serve other areas. Due to the increase in use of power, in Tupelo, Miss., the consumption has more than doubled, and the income of the private power companies is greater today than it was a year ago. The cooperation of electric utensil manufacturers, consumers, and power distributors is to be evoked to raise the standard of living of all who live in the area.

After pointing out the social irresponsibility of the engineers who had gone into this area to strip the natural resources of timber and oil and then had left the inhabitants with no opportunity to earn their livelihood, Dr. Morgan said in concluding, "If you engineers are in school solely for the purpose of securing a greater earning power and greater profits for yourselves, you will be disappointed when you get out. But, if instead, you try to be effective in raising the standard of living of all of us, of increasing the use of the comforts of life, you will be more satisfied with the results you achieve."

The highest commendation is due to Prof. Mead and to Dean Turneaure for their foresight in bringing Dr. Morgan to this campus from his position as chief of one of the greatest engineering projects of this age.

THE MEN WHO FORGET

During the summer session, Professor F. M. Dawson of the Hydraulics Department conducted a six day short course for plumbers, and those interested in public sanitation. The course was based on the idea that the plumber is no longer a mere handy-man, but that his future is directly dependent on his understanding of the fundamentals of hydraulics and sanitary engineering. The time has passed when the extent of this public servant's knowledge is the wiping of a good joint.

The session included such courses as the design of plumbing drainage systems, cross-connections, water hammer, friction losses, and the analysis of the regulations of the plumbing code. The course was offered by the University with the cooperation of the Wisconsin Master and Journeyman Plumbers' Association, the State Board of Health, and the Illinois Master Plumbers' Association.

FACULTY BRIEFS

J. W. Mead Accepts Post with Massachusetts Institute of Technology

The Engineering College, the Civil engineers specifically, have lost an outstanding professor, J. W. Mead, in his acceptance of the position of professor of geology with the Massachusetts Institute of Technology. Professor Mead, a member of the faculty for fourteen years, is an internationally known geologist. He has been a consultant on the Boulder Dam project and has written many valuable papers on metamorphic geology.

Professor Maurer Wins Lamme Award

The Lamme Medal was presented to E. R. Maurer, professor of mechanics and chairman of that department, at the 1934 Ithaca meeting of the Society for the Promotion of Engineering Education. Each year, for the last seven years, this Society has awarded this honor to that technical teacher who has given outstanding service in the teaching or the advancement of teaching of the technical arts. Professor Maurer, during his forty-two years of teaching at the University, has been devoted to the study and exposition of engineering mechanics. He has written three important books, "Technical Mechanics," "Principles of Reinforced Concrete Construction," and "Strength of Materials." The students who have come in contact with Professor Maurer and his associates have appreciated his understanding and analysis, and consider that department as one of the foremost in the engineering college.

* * *

Hougen Heads Research Project in the East

Olaf A. Hougen, associate professor of Chemical Engineering, is taking a year's leave of absence to become the director of research for the United States Testing Company. The work entails the setting up of a textile research laboratory in New Jersey.

* * *

Kommers Collaborates on New Handbook

The new edition of the "Civil Engineering Handbook," which will soon be published by the McGraw-Hill Book Company, will have two of its ten sections edited by Wisconsin men. Jesse B. Kommers, '06, professor of mechanics at the University, has edited a section "Mechanics of Materials," and S. C. Hollister, '16, director of the Civil Engineering College at Cornell, supplied the section on "Concrete."

* * *

Professor Janda a Member of Research Council

Harold F. Janda, Professor of Highway Engineering and City Planning, represents the Central Region of Wisconsin on the Wisconsin Research Council. This organization is a non-political group of individuals and civic bodies whose prime interest is a complete and impartial understanding of Wisconsin's highway situation.

« « EDITORIALS » »

FROM THE CAMPUS TO THE NATION The engineering activities plan is proving to be a successful venture inasmuch as the present condition shows that from ninety to ninety-five per cent of the students have paid their activity fees for the semester. While the administration of the plan is confined to the activities of the students of the college, the far reaching effects of this progressive plan must not be overlooked.

The prestige of an engineering school does not lie in its class room supremacy alone. If the student branches of the professional societies are strong and active, their prominence will undoubtedly be recognized by the national senior societies — in effect by the entire branch of the profession. If a student publication can succeed in winning a high place in a national system of engineering student publications, the general reputation of the college it represents will benefit. If a student body is firmly united as a group and able to make its impression in some manner upon the people of a state, the citizenry will be made conscious of its existence and its place in a state's educational system.

The success of a plan whereby the above aspirations may be assured depends upon the moral as well as the financial support of individuals. Do not lose sight of the fact that, though you have paid your fee, you are still obligated to help your student society, your magazine, and Polygon in doing something with your money.

BALLOTS OF PAPER Fifty years ago there were still a good many men in our governmental system who were publically linked with the word honesty. Should a truly enlightened citizen venture to place his stamp of approval upon any one of a group of foremost candidates today?

As an election approaches, political intrigues, evasions, mudslinging, and even fisticuffs are among the tactics which figure on the front pages of the press. All this routine procedure is conducted to sway the public mind to one's own side. The honest, straightforward political aspirant must play the game, too, if he would hope to ring the bell. This complicated roulette wheel with its secret brakes and devices does not seem to 'fit' into the scheme whereby the winners receive the blanket rights to continue playing with the public's money.

This is the politician's day — he knows it — but the time will come when the voting public will begin to slightly divert its attention from mud and closely scrutinize the slinger as well. The catch and run game will then be out of style.

Today, when we vote, we are on the face of things voting for the lesser of a number of evils. We have no way of actually knowing whether there is a deserving man under the political cloak. Tomorrow we may see a change.

ARE WE GETTING AN EDUCATION? What is the prize that goads us on to this four-year term in college? What allurement is held out to us that will make us work long hours, do without sufficient food, sleep in any quarters however habitable, just to employ our energies in the modern university? Is it an education that we crave, and if it is, are we apt to be blessed with any degree of success in our endeavors?

A perusal of these queries and some individual searching of ourselves for the answers may betray our lack of a guiding motive in school. If we give the trite answer, "We want an education," do we know what we mean? This education that we should look forward to to-day, has changed somewhat from the old conception. The old idea of education was the imposition of truth by age upon youth, by teacher upon student. Mr. Dooley in satire says, "It makes no difference what you teach a boy, so long as he doesn't like it." But today we regard education as something higher.

It is possible that it goes beyond laws of mechanics and theories of investment. Berton Braley in a late number of the *Literary Digest* asks; "Are the 'intellectuals' really intelligent?" By a questionnaire he tries to prove that "intellectuals" are really just ignoramuses. Some of the questions are these:

What is a compensating engine?
What is the difference between a Monotype and a Mergenthaler?
What are options, binders, abstracts of title?

We, as engineers, let our minds have full sway in the laboratories of the natural sciences. Where our experiments in physics take us, there we draw our conclusions. But the same method must be applied to social sciences as well. And if we engineers would beware of becoming the professional robots of business men, if we would be wary of letting our destinies lie loosely in the hands of those who have blundered all too often in the past, let us learn to think — to dissociate the wheat from the chaff in the field of living as well as in the field of mechanical experimentation.

. . . To restrict production and to raise prices, as a general policy, is, to me, not liberalism but reaction, not statesmanship but surrender, not creative advance but cowardly retreat. That way lies the subsidizing of inefficiency. That way lies the sabotage of superior management that knows how to bring both the cost of production and the price of products down. That way lies a permanent and perilous lowering of living standards for the swarming millions. It was not for this that the pioneers builded their blood and sacrifice into the foundations of this Republic. More goods at lower prices, not fewer goods at higher prices, is the logical goal of an age of science and technology.

—President Glenn Frank.

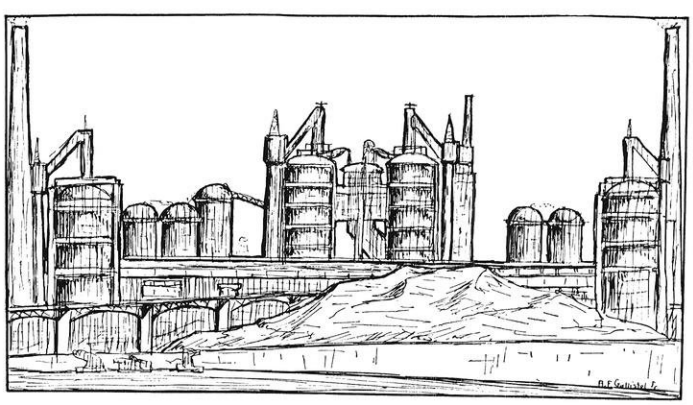
« ALUMNI NOTES »

CIVILS

FREAS, ALAN D., '33, was married to Miss Ruth E. Biesen, ex'33, on Sept. 15 in Milwaukee. The couple is residing in Madison where Freas is connected with the U. S. Forest Products Laboratory.

NEEL, MERVILLE C., '20, was transferred on April 2 from the state architect's office to the Industrial Commission's staff at Madison, Wisconsin, as senior assistant building engineer.

MIKULA, JACK H., '33, has been working in various departments of the Milwaukee Gas Light Co. since November, 1933.



HEBERLEIN, EDWARD G., '30, is with the Wadham Oil Co. in Wisconsin visiting industrial plants as lubrication adviser.

MATSEN, ROBERT, ex'31, is junior range examiner with the U. S. Indian Service at Fort Defiance, Arizona. He took a degree in forestry at the University of Montana in 1933.

BARTH, JOHN H., '11, has been appointed city engineer of La Crosse, Wisconsin.

MOHS, CARL E., '24, is Wisconsin state secretary of the National Association of Retail Beverage Dealers.

KALINSKE, ANTON A., '33, student assistant in the hydraulic laboratory, was married on September 12 to Mildred Weber of Madison, a former student at the university.

SOGARD, LARRY T., '24, announces the arrival of a son, Ralph John, on September 2. The Sogards are living at 2455 East 78th St., Chicago.

DRUML, FRANK U., '30, is in the U. S. Engineer Suboffice at St. Joseph, Mo., as assistant to the NIRA inspector of the area.

FRAZIER, ARTHUR H., '28, presented a paper on "Effects of Ice-formation upon Flow Conditions of the Upper Mississippi," on April 26 at the annual meeting of the American Geophysical Union at Washington, D. C. Address: Room 632 State Office Building, St. Paul, Minn.

WOHLGEMUTH, JOHN F., '31, was married on April 7 to Adele Klemstein of Milwaukee. They are living at Port Washington, Wis., where Wohlgemuth is field engineer and assistant superintendent on a breakwater project for the Great Lakes Dredge and Dock Company.

BENNETT, WILLIAM B., '04, has been made assistant to the president of the newly-formed Capital Transit Company of Washington, D. C.

PELESKE, LEO W., '30, is on the staff of the U. S. Engineers in the Duluth-Superior district, acting as inspector on harbor dredging work. With the assistance of three aids he must lay out the work and see that it is done in accordance with the specifications.

HOLLISTER, S. C., '16, who has been professor of structural engineering at Purdue, has been appointed director of the School of Civil Engineering at Cornell University.

BESPALOW, EUGENE F., '21, is consulting engineer for the Tri-State Culvert Mfg. Co. at 491 South 2nd Street, Memphis, Tenn.

JOHNSON, ROBERT C., '17, who sprang into prominence in state affairs last winter as head of the CWA program, was defeated for lieutenant governor on the Democratic ticket in the September primaries.

BETTS, CLIFFORD A., '13, who was office engineer on the Moffat tunnel and the Owyhee dam, is on the technical staff of the Mississippi Valley Committee in Washington.

HARROP, J. L., '06, is vice-president of the Trojan Engineering Corp. at 40 Exchange Place, New York.

IAKISCH, J. R., '11, is with the U. S. Bureau of Reclamation as resident engineer in charge of construction on the Ogden River Project in Utah. The principal construction feature is the Pineview Reservoir at the head of Ogden Canyon. It involves an earth and rock-fill dam 80 feet high and 500 feet long at the crest. An unusual feature arises from the fact that the new reservoir will inundate the artesian wells that supply Ogden with drinking water, so that it will be necessary to arrange to collect the water underground.

MECHANICALS

GUY, J. ROBERT, '26, is with the Northwestern Mutual Life Insurance Co., 347 Madison Avenue, New York City.

WOLLAEGER, C. G., '26, is assistant manager, Fireproof Material Division of Milcor Steel Company, Milwaukee, Wis.

HOYLE, ROBERT L., '32, is with the Burgess Laboratories, Madison, Wis.

SCHOWALTER, C. H., '26, has an instructorship in the Mech. Eng. Dept. at University of Idaho, Moscow, Idaho.

ANDERSON, EDWARD, '18, M. S.'28, is teaching in the Mechanical Engineering Department at the University of Iowa, Iowa City, Iowa.

ERBACH, FRED R., '22, is Chief Engineer of Lipman Co., Beloit, Wisconsin.

RESAN, STEPHEN F., '31, M. S.'34, is with the Chicago Pump Co., Chicago, Ill.

BRUHN, HJALMAR D., '33, is with the Agricultural Engineering Department, University of Wisconsin.

RIECK, JOHN J., '33, M. S.'34, is with the National Aniline & Chemical Co., Buffalo, N. Y.

CHEMICALS

ALTPETER, ROGER J., '31, Ph. D.'34, was appointed instructor in chemical engineering at the Case School of Applied Science, Cleveland, Ohio.

WATSON, CHARLES C., '32, sailed for Sweden in August to serve as assistant to Professor Svedberg and J. W. Williams at the University of Upsala for the year 1934-35.

MINERS AND METALLURGISTS

ELSTAD, EDWARD M., '22, formerly with the International Lead Co. in Chicago, is now representing a German firm in marketing a new process for industrial blue printing which is entirely dry.

WECKMULLER, GERALD, '32, is a member of the blast furnace department of the Illinois Steel Co., South Works, at South Chicago, Ill.

HEIMKE, HUGO W., '26, M. S.'33, is now a welding engineer for the Bureau of Engineering of the Navy Department. He formerly was associated with the A. O. Smith Corporation as a research engineer in welding.

SCHULTE, WILLIAM C., M. S.'33, who received his B. S. degree in 1930 at the University of Illinois, is a metallurgist for the Lukens Steel Company of Coatesville, Pa.

HULTEN, DONALD, '32, is working in the flood control division of the Wisconsin Emergency Conservation Work at Mt. Horeb, Wis.

ARCHIE, G. E., '31, M. S.'33, and **CANWRIGHT, JOHN R.**, '33, are with the production engineering division of the Shell Oil Co. at Tulsa, Okla.

KIEWEG, BURTON R., '32, M. S.'33, is an engineer for the U. S. Forest Service in northern Wisconsin.

KNECHTGES, EDMUND J., '32, M. S.'33, has been doing research work on a new roasting process for high grade silver ore at the Bunker Hill Mining and Smelting Co. at Kellogg, Idaho.

CRAWFORD, H. DEAN, '27, formerly associated with the United Verde Copper Company of Clarkdale, Arizona, as chemist, is now with the Commonwealth Telephone Company at Wausau, Wis.

BEMIS, REGINALD, '33, was recently married to the former Jane Thayer of Beloit, Wis. The couple will reside in Milwaukee where Mr. Bemis has a position as chief chemist in the research laboratory of the Chain Belt Co.

ELECTRICALS

MUIR, ROY C., '05, better known to his friends as "Stuffy", famous baseball player, who was appointed manager of the engineering department of the General Electric Company at Schenectady, N. Y., in 1933, has again been advanced and now is vice-president in charge of the engineering department.

In May, 1930, he became general assistant to the late C. E. Eveleth, vice-president in charge of design engineering of the General Electric Co. This position was followed by that of manager of the engineering department in 1933 and on May 25th the board of directors announced his election as one of the five vice-presidents of the General Electric Company.

JORDAN, R. D., '27, is secretary-treasurer of the General Electric Test Alumni Association which has its headquarters at Schenectady, N. Y.

TOBEY, S. B., '27, is with the Western Electric Company at Kearney, N. J. His address is 1 Roosevelt Road, Crawford, New Jersey.

NORTON, PAUL T., JR., '17, professor of industrial engineering at Virginia Polytechnic Institute, is the author of a bulletin entitled, "Economic Lot Sizes in Manufacturing" issued by the Institute in April.

FOX, GORDON, '08, vice-president of the Freyn Engineering Co., and recently returned from Russia where he was actively engaged in the development of steel mills, is the author of an article on "Electrical Practices in U. S. S. R. Steel" (Electrical Engineering for Sept., 1934), and a serial article on "Reversing Drives for Blooming Mills" (Blast Furnace and Steel Plant starting July, 1934).

KIECKHEFER, HERBERT H. C., '33, a recent editor of the "Wisconsin Engineer," is at present working in the timber mechanics department of the U. S. Forest Products Laboratory here in Madison.

Why we advertise

We advertise in order that the public may better understand what the Bell System is doing, and why it does it. In this way we keep customers and prospective customers informed of our aims, policies and progress.

We advertise in order to aid the telephone customer in making the best possible use of his service. As our advertising influences one person after another to use the telephone more effectively, the service rendered every other user is correspondingly improved.

We advertise because we have a varied service to sell and by selling more of it we increase its value to each user. Because of the nature of the telephone business, it is our duty to inform the public continuously of the character and varied kind of service we provide.

In line with this broad plan, we find real opportunity in addressing messages to college and university people in their own publications, just as we also vary our advertising for women's magazines, farm papers and so on. 1934-35 is the fifteenth year during which the Bell System has published advertisements which take college men behind the scenes of Bell Telephone service.

June, 1934 - - -

Bachelors of Science (Engineering)

- - - October, 1934

CHEMICALS

TRUMPY, VICTOR H., is employed by the Pure Oil Company in one of their refineries in Oklahoma.

DONNELLY, MARGARET, succeeded in obtaining employment in the industrial gas department of the Milwaukee Gas Light Company, Milwaukee.

HOERIG, HERMAN F., is enrolled in the "Flying Squadron" of the Firestone Tire and Rubber Company in Akron, Ohio.

MATTERS, ROBERT G., obtained a position with Allis-Chalmer Manufacturing Company in West Allis, Wisconsin.

HOIBERG, ARNOLD J., and **NEILL, WAYNE K.**, are assistants in chemical engineering at Madison.

WOODS, WALTER S., after serving his term in the R. O. T. C. summer camp at Edgewood Arsenal, Maryland, reported for work at the Chicago Paint Plant of the Du Pont Company.

CIVILS

AFFLECK, HERBERT, received employment from the Madison water department.

BEHRENS, HAROLD J., is with the Highway Commission at Milwaukee.

CERNA, SANTIAGO, returned to Mexico where work was awaiting him.

CLARK, CHARLES O., is employed in the hydraulics laboratory.

COUCH, EDMUND, is working in a cannery in Waupun, Wisconsin, where he has a position as sanitary engineer.

DIBBLE, JOHN T., has a job with a contractor in Sterling, Illinois.

DITTMAN, RICHARD, acts as assistant to a technician in the Biological Survey division of the U. S. Department of Agriculture.

ENGELHART, ROBERT L., is doing miscellaneous surveying.

FEDEROWSKY, G. M., spent the summer in New York designing sanitary equipment for office buildings. He plans to return for graduate work.

GERBOTH, HAROLD C., is a special agent for the Provident Mutual Life Insurance Company in Milwaukee.

HARBECK, G. EARL, and **JANACEK, EMIL**, are senior engineering aids with the Highway Commission at Rhinelander.

JASKANIEC, EUGENE W.; **VIEREG, JOHN R.**, and **VON GUNTEN, JOHN L.**, are engineering aids for the Highway Commission at La Crosse.

JOHNSON, CLIFFORD E., is working for his father.

KROENING, GEORGE C., has temporary work as inspector for the Milwaukee Sewerage Commission.

KRUGER, KENNETH W., is with the city engineer at Madison.

LEFEVRE, WINFRED C., after working for the Pittsburgh Plate Glass Company this summer, has returned for graduate work.

LINDQUIST, KENNETH E., is farming with his father.

MESSMAN, D. VERNON, is an engineer for the city of Freeport, Illinois.

MILBRANDT, WILSON A., obtained a position as chief of party for the Highway Commission at Eau Claire.

PERSEN, EDWARD A., is in Manitowoc, Wis., where he is associated with the Aluminum Goods Manufacturing Co.

SCHAEFER, MILTON W., has work in the U. S. Forest Service as subforeman of the C. C. C. camp at Clam Lake, Wisconsin.

THOMPSON, ORVILLE, is a 2nd lieutenant in the C. C. C. camp at Ft. Sheridan.

TRESTER, HAROLD C., is in Green Bay with the Highway Commission.

ULRICH, EARL E., obtained work in Madison as junior chemist for the Highway Commission.

VILLEMONTE, JAMES R., works for the Highway Commission at Lancaster, Wis.

ZOKOVETZ, N. G., received work as superintendent of construction for U. S. S. R. at Leningrad.

DYSLAND, LLOYD; **LEMKE, ARTHUR**; **VOLK, WAYNE N.**; and **WEST, ALFRED W.**, are returning to school for graduate work.

FISS, MELVIN T.; **GRADT, EUGENE W.**; **HERMANSEN, EVALD**; **HORDER, JOHN S.**; **KNELL, KARL**; **KOCH, FREDERICK O.**; **LUTZ, MILTON**; **MAERSCH, JOHN M.**; **SCHILLER, ROBERT A.**; **SPARS, RAYMOND F.**; **UEHLING, VICTOR B.**; and **WERNER, MAX A.**, have not as yet received engineering employment.

NEWLIN, BENJAMIN V., is ill and in a hospital.

ELECTRICALS

BERG, EUTOLLE W., is in Superior, Wis., where he has the position of engineering aid for the Highway Commission.

BLANDINO, GEORGE, is doing C. C. C. work in West Allis, Wis.

ELLIS, CHARLES G., has a position with the Oil Gear Company, Milwaukee, Wis.

HALAMKA, GEORGE L., is working in the engineering library as a bibliographer.

HAWORTH, RICHARD A., received a position as salesman from the Cutler-Hammer Company of Milwaukee.

KUHLOW, HERBERT F., is employed by the Beverage Tax Commission of the State.

SCHNELLER, JOHN, after finishing the current football season as a player for the Detroit professional team, will start work at the General Electric Company in Schenectady, N. Y., the first of next year.

SCHROEDER, H. E., is working for the Goodyear Rubber Company of Akron, Ohio.

SEIFERT, FREDERICK F., received a position at the Milwaukee Gas Light Company.

STEHR, MELVIN W., has found work in the rate department of the Wisconsin Power and Light Company at Madison.

WALSH, W. J., is employed by the Westchester County Lighting Corporation located near New York.

WALTER, C. W. P., is in New York City where he has found employment with the de Bothezat Company, manufacturers of fans and ventilating equipment.

CREGO, JOHN; **ENGEBRETSON, NATHAN O.**; **HOPKINS, EDWARD J.**; **KRAUSE, ERNST H.**; and **PLAUTZ, A. C.**, are returning to take graduate work.

MECHANICALS

LEONARD, JOHN B., is employed by the Northern Pump Company located in the Chrysler Building, New York iCty.

ANDERSON, ARTHUR H., has a position with Armour Company, at Chicago.

BIRBAUM, LESTER W., is with the Milwaukee Stamping Company, Milwaukee.

ANDERSON, CHESTER B., is a production man at the Murray Corporation of America situated in Detroit.

BRENNAN, JOHN E., has been given a position with the Chrysler Company in Detroit.

ERMENC, JOSEPH J., is a cadet engineer with the Milwaukee Gas & Electric Company, Milwaukee, Wis.

CLAUSEN, CHRISTIAN E., has a position as Diesel engineer with the Fairbanks, Morse & Company in Beloit, Wis.

HORWITZ, DAVID R., found employment at the Banclage Corporation of Sheboygan, Wisconsin.

COLLINS, LAWRENCE N., is with the Republic Steel Corporation located in Chicago.

MacARTHUR, DONALD, received a position with the Koppers Gas & Coke Company, Kearney, New Jersey.

MOHN, H. LEROY, is in Oswego, N. Y., where he is employed by the Fitzgibbons Boiler Company.

PFANKUCH, LEO A., has a position with the Chain Belt & Stoker Company at Milwaukee.

ROLOFF, WILLARD C., has been made sales manager for the Roloff Industrial Supply Company.

SIMPSON, A. JOHN, found work as student engineer for the American Blower Corporation of Detroit, Mich.

ZIEPRECHT, WILLIAM N., received a position from the Morrison Brothers Company of Dubuque, Iowa.

MINERS AND METALLURGISTS

CLARK, HARRY M., found employment at the Illinois Steel Company in Chicago where he has a position in the heat treating department.

« CAMPUS ORGANIZATIONS »

POLYGON

The object of Polygon is to have a central committee which can act at all times for the best interests of the College of Engineering and in students' relations with the faculty perform the coordinating functions not easily carried out by any other agency. In addition the organization is to serve as a clearing house for the activities and problems of the component professional societies. It is to plan and sponsor an engineering social activity program that will aid in adding recreation to students' campus relationships. In order to justify itself the organization must, of necessity, receive the continued cooperation of the students that it represents. In the success of the activity fee plan placed in operation during the registration period, the fact was evident that Polygon did obtain the cooperation necessary. Now, with the funds obtained, the cooperation of the student body is just as imperative in order that the administration of the fund for the proper activities is a success.

The members of the Polygon group for the current year, to whom matters of departmental origin should be referred are:

Civil Engineers—E. R. Ziehlsdorff, C. D. Matthias.
Electrical Engineers—A. Vollenweider, D. Blankley.
Mining Engineers—G. O. Nieman, A. E. Gallistel.
Mechanical Engineers—B. E. Buxton, L. S. Nikora.
Chemical Engineers—J. T. Smithwick. Junior member to be elected.

Officers are: G. O. Nieman, President; E. R. Ziehlsdorff, Treasurer; J. T. Smithwick, Secretary.

The activity plan sponsored by the organization has been successfully launched with almost 100 per cent participation by the students. The faculty of the college and the staff of the *Wisconsin Engineer* aided very materially in collecting the fees. Approximately one hundred and thirty dollars will revert to the organization for the activities sponsored by it during the semester to which only students who have paid their activity fee will be admitted.

TAU BETA PI

Tau Beta Pi is a national honorary engineering fraternity, with 56 chapters, which includes in its membership chemical, civil, electrical, mechanical, metallurgical, and mining engineering students of superior scholastic attainment. It is sometimes referred to as the engineering Phi Beta Kappa. Contrary to general belief, scholastic attainment, although essential, is not the only requirement of the fraternity. In addition, before a student is tendered an invitation to membership, he must possess good character, ability to fraternize with fellow students, and interest in extra-curricular activities.

At the present time the chapter is considering the liberalization and lengthening of engineering curricula. Due to the complexity of the subject, five months have been devoted to investigation of the matter; and it is expected that at least three months more will be required before the matter is brought to the attention of the proper authorities.

A. S. M. E.

The officers of the student chapter who will serve for the first semester of the year are: Harold Mittelstaedt, President; Burton Zien, Vice-President; William Meade, Secretary; and Harold Albert, Treasurer.

The first meeting in the society's extensive program for the year was held on Tuesday, October 9, as a closed faculty-student smoker at Tripp Commons in the Memorial Union. Madison members of the national senior society were invited for the occasion.

The president, Harold Mittelstaedt, gave a short introduction for the new members after which the honorary chairman, B. G. Elliot, and the faculty advisers, G. L. Larson, L. A. Wilson, P. H. Hyland, and J. W. McNaul were introduced to the group. Professor Grayson L. Kirk of the political science department gave an interesting talk on the problems of disarmament. After some group singing by the members present, refreshments were served and the meeting informally adjourned.

In the near future the society is planning to have the Marquette chapter as its guest at a meeting. Arrangements are pending to have Father Kelly, honorary chairman at Marquette, as the speaker for the occasion.

A. S. C. E.

Membership in the student branch of the American Society of Civil Engineers offers the opportunity to meet and get acquainted with other men of the civil engineering course, thus forming friendships that may mean much in the years to come.

Monthly meetings are held to discuss engineering enterprises, to hear talks by practicing engineers and members of the faculty, to view moving pictures of construction projects, and to benefit by sharing student viewpoints, associations, and fellowship.

Officers for the coming semester are:

President ---------- J. E. Henry, c'35
Vice-President ---------- E. K. Neroda, c'35
Secretary-Treasurer ---------- L. W. Crandall, c'35

Professor L. F. Van Hagan is the faculty adviser and Clayton N. Ward the contact member for the national organization.

G-E *Campus News*

STONE-THROWING ROMEOS

The engineers of the General Electric Company have been asked to solve some unusual problems, but never before have they had to work against Cupid. This is how it came about: Some of the swains who did their courting in parked cars along certain lighted roads in New England found that the lamps crimped their style. With simple but destructive logic they decided to extinguish the lamps with stones. Their aim was so good that repairmen of the utility which serviced the lights could hardly keep up with their depredations. Finally, G-E illuminating engineers were called in to design a fixture to foil the stone-throwing Romeos. These engineers produced a cast-aluminum guard, which looks very much like a baseball catcher's mask. It protects the lamp, and at the same time helps to concentrate light on the roadway.

HURRY! HURRY!

A flood had crippled three important electric motors in the refinery of a large oil company on the island of Aruba, 50 miles north of the coast of Venezuela. The plant had to be shut down until new coils could be installed. Losses caused by the shutdown ran into thousands of dollars a day. An order for the coils and word of the refinery's predicament reached General Electric in Schenectady, N. Y., on a Sunday morning. Work began immediately, and by dint of night shifts and a great concentration of efforts, the two-and-one-half-week job was completed in three days. The 808-pound shipment of coils, conveniently packed in small cartons, was flown in a chartered plane from Schenectady to the Newark airport, where it was transferred to an Eastern Air Lines plane bound for Miami. On Wednesday morning the cartons were transferred to a Pan-American Airways ship at Miami for the hop across the Caribbean to Kingston, Jamaica. From there, they were flown directly to Aruba in a specially chartered plane. They arrived Saturday morning, just six days after the order had been received by General Electric.

J. A. H. Torry, Union College, '11, and G. H. Magner, Acadia College, Nova Scotia, '09, of the International General Electric Company, Inc., made the arrangements for filling the order.

FAT SPARKS

The artificial lightning boys have beaten natural lightning in one regard, at any rate. Engineers in the General Electric high-voltage laboratory have produced discharges of a quarter of a million amperes, which is greater than the current of any direct lightning stroke yet recorded. This current is discharged at a pressure of 150,000 volts.

Just as natural lightning, with amperage almost as great, destroys that which it strikes, so does the laboratory discharge; and just as natural lightning is accompanied by thunder, the laboratory bolts have their ear-splitting crashes. A copper wire a tenth of an inch in diameter is completely vaporized. A similar piece of iron wire is "exploded," the remaining ends continuing white hot for several seconds. A section of reinforced concrete is broken into bits. The handle of a silver-plated ice cream spoon vanishes with a shower of sparks, leaving behind only the bowl discolored by the heat.

These engineers were the first to produce 10,000,000-volt artificial lightning discharges, and they are continuing their studies through these high-current discharges, in order to find better means of protecting electric distribution systems. K. B. McEachron, Ohio Northern, '13, Purdue, '20, M.S., is director of the laboratory, and associated with him in these tests are: W. L. Lloyd, Rennselaer Polytechnic Institute, '18; J. L. Thomason, U. of Idaho, '29; G. D. Harding, U. of Arizona, '29; and J. R. Sutherland, Yale, '29.

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