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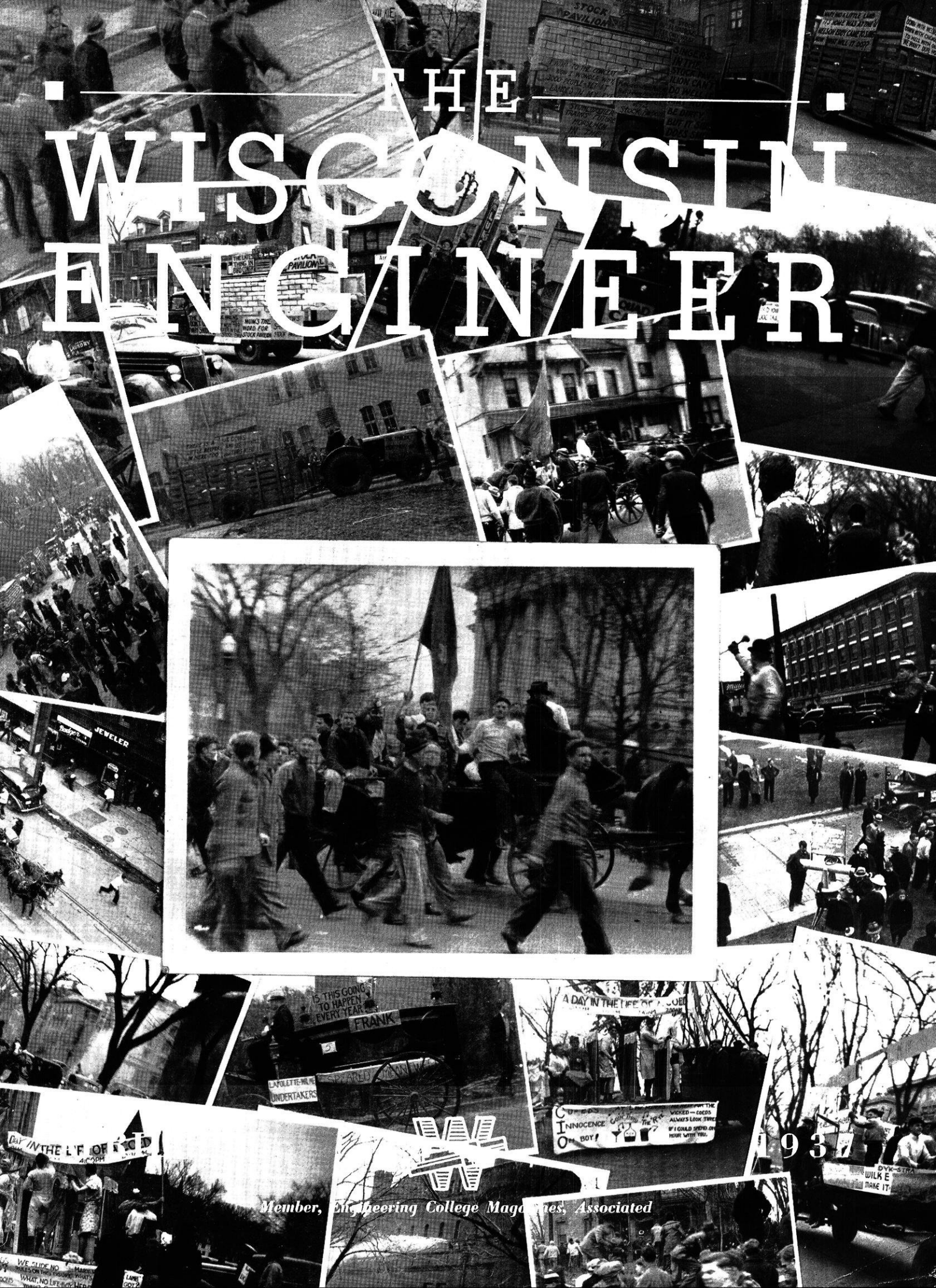

THE
WISCONSIN
ENGINEER
STOCK PAVILION
JEWELER
IS THIS GOING TO HAPPEN EVERY YEAR
FRANK
LAPOLETTE-HOLME UNDERTAKERS
A DAY IN THE LIFE OF JOE
INNOCENCE
WICKED — GOOD
ALWAYS LOOK THREE
IF I COULD SPEND AN HOUR WITH YOU
1931
DYK-STRA
WILKE
MAKE IT
Member, Engineering College Magazines, Associated

Checkmates Corrosion

Welding aids modern metallurgy to produce completely corrosion-proof assemblies

EQUIPMENT is subject to corrosive attack and consequent deterioration by three forces: chemical attack, electrolysis and erosion. Chemically active gases, liquids, pastes, or solids eat away the more easily attacked portion. Dissimilar metals often set up galvanic currents, which cause pitting and corrosion. High-velocity steam or solid particles in a slurry add mechanical abrasion to the ravages of chemical and galvanic attack.

Welding Prevents Deterioration

Welding is a valuable aid to users and fabricators of equipment for corrosive service. By welding, equipment can be made smooth, jointless—one-piece. Valves and necessary fittings can be faced with corrosion-resistant metal welded in place. Chemical attack can be further prevented by making welds of material similar to the body metal.

Welded assemblies present a smooth, unbroken internal surface. No pockets are formed in which concentration and consequent deterioration can occur.

Galvanic attack, which occurs with other types of assembly, ceases to be a factor in welded equipment. In a welded assembly, the same or similar metals are fused together. Perfect electrical contact prevents the damage due to galvanic action. Abrasion by steam, water, or solids is prevented by welding on hard alloys at constrictions and bends.

Welding Stops Corrosion Losses

Abrasion, chemical attack, electrolysis, are defeated on a thousand fronts by welding. New equipment, designed to resist corrosive conditions and fabricated by welding to assure satisfactory performance, is achieving enviable records in service. Equipment which would otherwise be scrapped is renovated and protected against further deterioration. Many corrosion problems, localized in extent, are conquered through the application of resistant materials to the affected parts by welding.

As a result of the successful application of welding to check corrosion losses, industry is saving money. Repair and replacement bills are cut. New machinery and supplies have a longer life, and thus amortization charges are lowered. Less valuable production time is lost through shutdown and accident.

A few of the many ways by which welding checkmates corrosion, selected from actual case histories, appear in the column at the right. These and many other similar welding applications may be utilized in your future business.

THIS ALL-WELDED KITCHEN UNIT includes sink, dishwasher, drainboard, working space, and closets. It is made of stainless steel, welded into a jointless unit which is strong, easy to clean, and resistant to corrosion. Many of the utensils also are of stainless steel.

Welding Savings

In the textile industry, stainless steel is used for dye-vats, tanks, buckets, dippers, and many other purposes. The equipment, welded throughout, resists chemical action, is smooth inside and therefore easily cleaned, and is strong and durable.

* * *

Wear by sandy water had pitted the surfaces of two 42-inch diameter balance needle valves so seriously that the valves would no longer operate efficiently. Twenty-two hours of welding saved these expensive semi-steel castings, which otherwise would have been scrapped.

* * *

In redesigning several 700-gallon tanks for food storage, it was necessary to eliminate an unsanitary and corrosion-ridden condition. The tanks were redesigned to be made from stainless steel with welded joints. The inside and outside are now permanently free from undesirable laps where germs might lodge or corrosion might start.

* * *

Sea water had seriously corroded the impellers of cargo pumps on an oil tanker. Five hours of welding repaired this damage at a fraction of the cost of new parts. Resistant metal used for the repair will prevent recurrence of trouble.

* * *

Welded piping in the floor of a skating rink successfully resists severe corrosion in addition to mechanical stress. No mechanical joint could withstand this service. The piping carries alternately refrigerating brine for freezing the skating surface and steam for melting it.

* * *

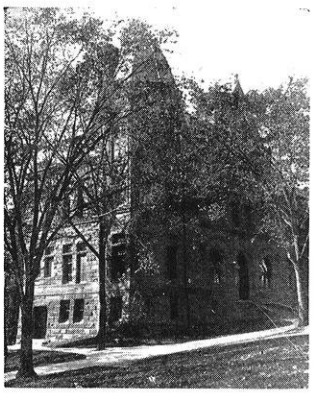
Milk storage tanks for a chocolate manufacturer were welded to prevent corrosion and unsanitary conditions. These tanks were fabricated entirely of stainless steel. They were welded to prevent corrosion at the seams as well as off-taste in the milk. The smooth, flush, inside surface left no pockets for chemical and bacterial action to produce spoilage.

* * *

A container for caustic soda solutions, made of Monel metal to resist corrosion, had a cast iron plug in the base. Corrosion troubles were imminent. By welding this and all other joints, corrosion was successfully prevented.

* * *

Tomorrow's engineers will be expected to know how to take advantage of this modern metalworking process. Many valuable booklets describing the oxy-acetylene process are available without obligation. For further information write any Linde office.



The Law Building

With the Contributors . . .

- Prof. Ray Owen worked in the flood area for about two weeks, so his article, beginning on page 127, telling of some of his experiences, is of unusual interest.

- Were you one of those who read and was aroused by the account of the St. Pat's Parade in the Cardinal? You will want to read an authentic version, interspersed with pictures, on pages 130 and 131.

- On page 132 you can find out some things you didn't know about some of our more prominent classmates.

- In the Alumni Notes, pages 134 and 135, we have included a list of the Wisconsin engineers employed by the General Electric Company. Read it, it's extremely interesting.

- Beginning on page 136, Professor Ayres gives his idea of what "The Next Step in Engineering Education" is. It's well worth reading.

The Wisconsin Engineer

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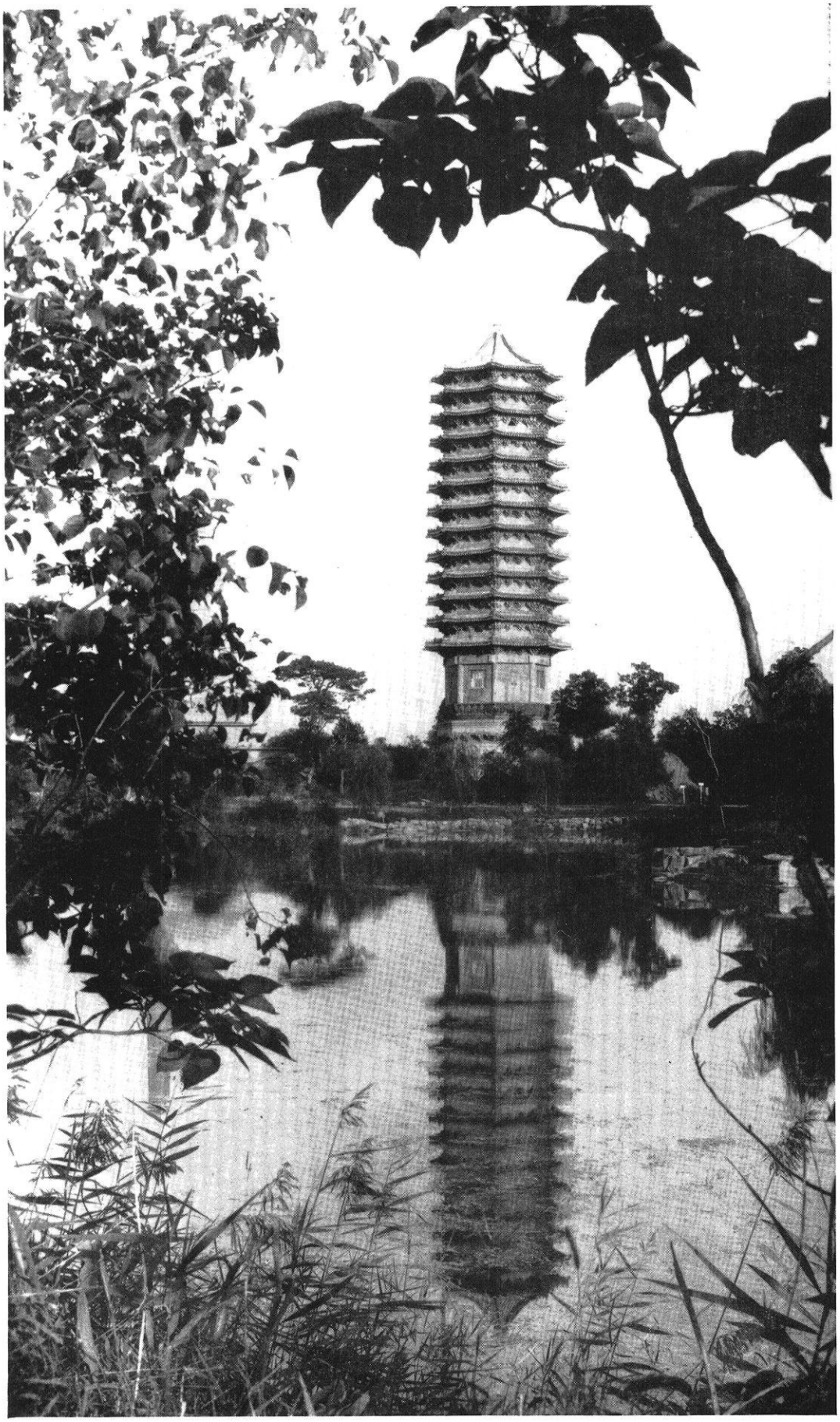


Art In Engineering

INTRICACY in design of the Pagoda Water Tower, Yenching University, Peiping, China, typifies the Chinese technique in glorifying an engineering structure. The architectural treatment of this tower is an exact copy of that of an old pagoda.

Wisconsin's Relief Unit at the Ohio Flood

by **RAY S. OWEN, c'04**

Associate Professor of Topographic Engineering

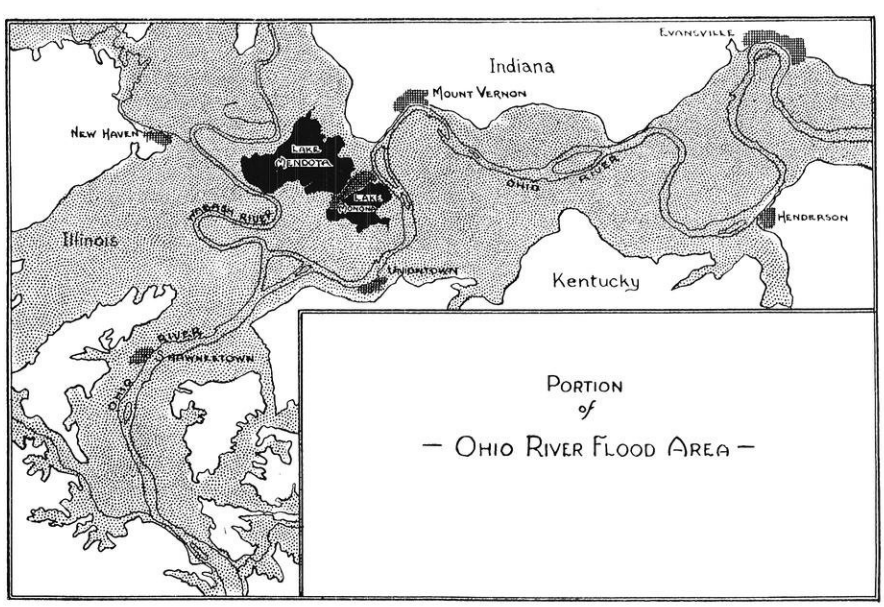
ON THURSDAY morning, January 28, 1937, just as the sun was rising, the Dane County American Legion Mobile Relief Unit left Bungalowen en route to the flooded area in southern Indiana.

The medical personnel of the unit consisted of Dr. Merle Owen Hamel and Dr. Charles Ihle, both of Wisconsin General Hospital. The writer was the driver and general manager. The physical plant was made of a V-8 Ford Cabriolet and a Covered Wagon trailer. A gasoline engine 6-volt generator was carried to supply lights when regular 110-volt current was not available. The trailer and car were piled full of medical supplies, canned goods and clothing furnished by the American Legion.

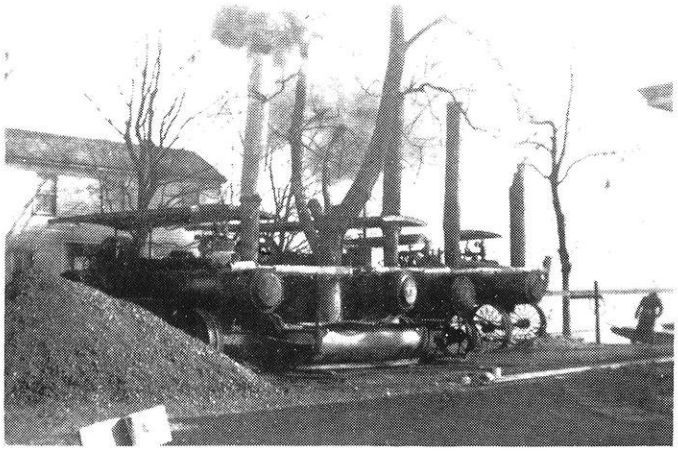
We stopped by the roadside and cooked lunch near Ottawa, Illinois, arrived at Lafayette, Indiana, in time for supper which we prepared and ate while parked in a service station area. An attempt was made to reach Indianapolis before bedtime but the fog was so thick the attempt was abandoned at Lebanon, Indiana, and the trailer was parked in a cabin camp ground. The temperature was several degrees below freezing but we were comfortable in the trailer. Friday morning still in a dense fog we pushed through to Indianapolis. We stopped at a service station to telephone National American Legion headquarters, the service station manager personally escorted us to the building, and "Pep" Plummer, of Wisconsin, a national officer of the American Legion, met us as we drew up to the curb. We were interviewed, photographed, given credentials and letters of introduction and routed to Evansville, Indiana. At Bloomington, Indiana, we filled the trailer tank with 20 gallons of water which was used sparingly for drinking only and lasted during the stay, so we were spared the necessity of drinking boiled and chlorinated water, to the envy of all who knew of it. We left Indianapolis at about noon, saw our first flooded homes at Shoals, Indiana, on the White River about sixty miles from the Ohio River. We had our first submerged highway to negotiate at dusk and it seemed just a little hazardous to start through water of unknown depth with a trailer of not much road clearance, with bedding packed under the seats at floor level, and cartons of canned goods, medical supplies and clothing on the floor. The concrete slab was marked by stakes and lanterns, and by driving slowly and not raising too much of a tidal wave we passed through the flood dry shod.

We reached the banks of the Ohio at Newburgh, Indiana, at about 5:30 on Friday, and realized we were really "there" when two soldiers stopped us from driving down the road into the river. It reminded one of the A.E.F. in France when there was an M.P. at every corner telling you where you couldn't go.

Just around the corner was a flare, and traffic police who gave directions for driving through the next stretch of submerged slab. Thinking of my trailer floor, I asked "How deep is it?" and the reply was about thirty feet. I assured the man I could never make it, but he said he meant the water at the side of the fill in case we ran off. I promised to drive carefully. A few miles from Newburgh, just outside of the Evansville city limits, we encountered another flooded section where the river was attempting a cutoff across a bend. Sand bags were piled thick and high on the upstream side of the slab, but water was percolating through so that it was nearly as high on the downstream side. To have driven through, even if we



The flood area. Note the area of Lake Mendota and Lake Monona laid in to scale.



Supplying the water works with steam.

had piled everything off the floor, would have soaked woodwork and carpets, so traffic was halted while the car and trailer backed and cramped and finally turned around without getting stuck or submerged. The Hebron School was back about a quarter of a mile and we parked in the school yard.

The school house was being used as a place of refuge by local people who had been flooded out of their farm homes. The woman in charge who was doing the cooking proudly announced that they were not destitute, that none of them had been on relief. However, they had had to leave home so hurriedly that some were short of bedding and warm clothing, and the food distribution system had not been perfected yet, so that some of the clothing and supplies we brought were very acceptable. We were invited to supper in the basement and given permission to make our camp in the school yard. After supper we disconnected the trailer and drove into Evansville without it. Water came well above the running boards at the first ford, and one other was passed before reaching the American Legion Club House, which was in use as a scarlet fever hospital. Our first contact was with Colonel Dobbins, a Medical Reserve officer on active duty in charge of the medical activities of Evansville. He had lived in Kenosha for years and was glad to see someone from Wisconsin. Our letters of introduction were presented to the American Legion commander who was just going on the air at the Evansville radio station, and in less than half an hour someone in Madison telephoned Mrs. Owen that he had heard over his radio of our safe arrival in Evansville.

Col. Dobbins then took us to Red Cross headquarters, where we were registered and given placards for the car and badges for the personnel; then to the Red Cross medical headquarters in the Court House. This was a busy place. The Red Cross medical director had just arrived and he did not know conditions, the idea of a mobile relief unit was a new one and we sat around and watched young women with hip boots on doing office work and packing supplies, while marines, coast guards, naval reserves, engineer troops, boy scouts, national guards, and police, both state and city, hurried hither and yon. By 11 p. m. a decision was reached—for us to come back Saturday morning. So we drove back to our home on wheels and turned in.

Evansville was a quieter, less tragic place than the mental picture one would get from listening to the radio broadcasts from Louisville. We reached Evansville about two days before the absolute flood crest, but that was only a few tenths higher than when we arrived. In Louisville portions of the town were surrounded by swiftly flowing water and were confronted by a crisis more acute than the plight of Evansville.

The city pumping plant was out of commission for several days due to the settling and breaking of a supply main near the building, but a small supply was kept in the mains by private pumping systems. Drinking water was supplied at many places in the city from tanks set up in the streets. These tanks were kept filled with chlorinated water by tank wagons. Electric and telephone service was normal but the fire alarm system was out of service. The street car system was at a standstill but auto traffic seemed normal except for flooded and undermined streets which were barricaded and guarded. No unauthorized persons were allowed to enter flooded areas where the inhabitants had been evacuated. This was a measure against looting.

The lower houses in a flooded city really get more than their share of grief. As the river rises the hydraulic gradients of the sewers rise and finally they discharge into basements instead of the river. As the river continues to rise the sewers are flushed out backward into basements and lower floors where the solids settle out and remain when the flood abates and the sewers again function normally.

We hopefully reported to Red Cross headquarters Saturday morning and by noon Dr. Ihle had been assigned to the hospital at Mt. Vernon, Indiana, twenty miles below Evansville. And Dr. Hamel and I were asked to come back in the afternoon for further consideration. We went home, had lunch, Dr. Ihle packed his belongings and we came back to headquarters and said goodbye to him.

While we were at the school house we had requests for typhoid shots and asked for authority to administer them, but the Red Cross in Evansville was doing only work with the people after they were sick—the Department of Health did the preventative work. So after some phoning we were sent to the City Police station, where we found Dr. Reitz, who once taught at the University of Wisconsin Medical School. But our school was not in the city, so we waited while Dr. Reitz phoned the County Health office and we were told to go ahead. This was at 4 p. m. Saturday. We drove back to our trailer, just in time to hear over the radio the announcement that our station was ready for business. Dr. Hamel inoculated about forty people between Saturday afternoon and Monday evening. We were not getting much business so Monday morning I went back to Red Cross headquarters, then to the Legion, where I asked for action—and we got it, assignment to the hospital at Mt. Vernon, to go at once. So we pulled in with the trailer after lunch and reported to Red Cross at

Evansville for final instruction. We got them, together with five Chicago nurses, their baggage, and a carton of supplies. I don't know just how it happened, but I drew the two oldest ones to ride with me in the car and Dr. (Mrs.) Hamel picked the three young ones to ride with her in the trailer. The direct route from Evansville to Mt. Vernon is twenty miles, but that road was submerged so we had to tack back and forth for forty-six miles to get there. One "ford" was so deep that I wondered just what was going to happen to the bedding and baggage, clothing and supplies packed under the trailer seats and in the lower cupboards. But I plunged in, drove slowly and came through dry shod and dry, too, were all the other things I mentioned. I had a printed sheet of road directions and by inquiring the way ten times I got off the route only twice. It was interesting to arrive after an hour's drive of nineteen miles at the 5-Mile House, five miles from Evansville.

And at 5:45 p. m. when we arrived in Mt. Vernon with our load of six good looking women, we caused much more excitement than when we arrived at Evansville. We were received with open arms and sighs of relief. This is a town of about 6,000 people with several hundred refugees. Mt. Vernon is built on high land close to the river and had no submerged dwellings, although many home heating plants were out of commission because of water in the cellars. The water works system was out of commission for a few days because the rising river water drowned out the fires under the boilers. Steam was then supplied to the pumps through a pipe from four threshing engines established on the street above the water, each with its own fireman and pile of soft coal. The fireman shovelled coal out in the open all day and never got anywhere or turned a wheel.

There were several townships not far from Mt. Vernon which were flooded and there were refugees from Kentucky, Indiana, and Illinois in the city. There was no hospital in Mt. Vernon before the flood, and the need was met on the start by the American Legion, which transformed their Memorial Hall into an emergency hospital and dining room. This was later taken over by the Red Cross; the gymnasium in the basement was used for cooking and for feeding several hundred refugees, and the auditorium on the main floor was divided into three sections by canvas curtains, a separate ward being thus arranged for men, women and children. The exposure and excitement took heaviest toll of older and younger victims. There were not many young and middle aged people in the hospital.

One Sunday evening I saw a tubercular white woman breathing her last while her negro son came to see her, and in another corner there was an old man with the death rattle in his throat who was passing away from an infection within a week of the death of his wife from pneumonia. There was one flood baby born in the hospital, an emergency appendectomy and a leg amputation necessitated by gangrene poisoning. The children developed a lot of ear infections and Dr. Hamel became expert in piercing ear drums.

We purchased a doll, toy automobile or woolly dog for every child in the hospital and felt just like Santa Claus. There were several small towns back from the river where refugees were quartered, and we made a trip with a nurse and doctor looking after the needs of the sick and the requirements of the Public Health nurse in charge.

At Poseyville the Red Cross had asked the citizens to get ready to accommodate 200 refugees. The inhabitants of this small town made great efforts to find beds and bedding for 200 people, then due to the roads and the usual confusion during such a crisis only twenty-seven persons were brought to the high school gymnasium which had been converted into living quarters for 200.

Our trailer was parked in the side yard of a home hotel; we were connected up with electricity and Dr. Hamel and I lived in the trailer, while Dr. Ihle was billeted in an office in the hospital. We were warm and cozy with a coal fire in our trailer heater while the Red Cross administrator and others in the hotel shivered over evil smelling oil stoves, because the hotel heating plant was drowned out. There were many electric or hand pumps at work dewatering flooded basements.

There was a National Guard artillery unit on duty at Mt. Vernon for general police and motor truck duty, and a Naval Reserve unit on the river. The boat was the "Dubuque" from Detroit, a 24-foot, 2-ton "motor sailer" with a 60 horsepower motor and carrying a crew of about five, commanded by an ensign, which is the equivalent of a second lieutenant on land.

Dr. Hamel and Commander Howden of the American Legion started in the Naval Reserve boat "Dubuque" on Thursday morning. The water area was many times that of Lake Mendota and a hard north wind kicked up a high sea and the open boat was tossed about and stranded in the tops of some submerged trees. Passengers and crew donned life jackets and hoped for the best. It was not until night that the boat got free, sailed up the main street of submerged Uniontown, Kentucky, and we proceeded by truck and handcar to Morgansfield, where the party spent the night. In Morgansfield Dr. Hamel was recognized by Chester Obma, c'32, who is working with the Army Engineers.

Dr. Hamel is probably the only woman who has been

Somebody left him behind.

seen in Kentucky wearing ski pants, and her appearance caused a sensation.

On the day following the return from the Shawneetown cruise I went with the crew on a trip to rescue a flock of stranded turkeys. We navigated about five miles from the river bed in a boat that drew four feet of water. We got some barbed wire wrapped around our propellor shaft in hurdling a fence, and ran aground on a lumber wagon, but we rescued the turkeys that had been roosting on the ridgepole of a shed for about ten days. Their breastbones were rather sharp.

The water began to recede after we had been at Mt. Vernon a week and as the situation was stabilized I left for Madison. A Red Cross nurse from Chicago had been sick with "flu" and we used the trailer as an ambulance to take her and another nurse to Chicago. The two doctors stayed at Mt. Vernon for nearly two weeks more, until the hospital was closed.

The emergency has passed and the excitement is over, but there is a lot of dreary, hard work for the people who are moving back to their water-soaked homes. There is the job of shovelling, flushing, washing, drying out, rebuilding, repainting and refurnishing. Veneered furniture splits and curls up, furniture comes unglued, doors fall to pieces, floors buckle up, plaster falls off, wallpaper hangs in shreds, every drawer, shelf and keyhole are filled with silt. Windows at the water level are broken by waves and driftwood, upholstery is ruined, automobiles are damaged to a large percentage of their value. I heard one farmer complain that his pigs had ruined his auto top because it was about level with the top of the water and they swam to it and used it for a bed.

The land itself may be enriched by the deposit of silt similar to the annual fertilizing of the Nile Valley by the overflow of the Nile River.

Studies should be made of means of protecting the larger cities by sea walls. Smaller towns can and, in some cases, are being moved bodily to higher ground. In my opinion, the farm lands in the area subject to overflow should be purchased and converted into game refuges or forest preserves, or else they should be leased to farmers who would make their homes on high ground and, like the French farmers, drive from homes to farm the land. Then when floods come the loss would be, at most, only the crops and winter floods such as the recent record breaker would do little damage.

We Came, We Saw, We Conquered

The St. Pat's Parade as *Seen* by

"Engin Ears"

And how . . . on all three counts. We came . . . two hundred fifty strong; we saw . . . eggs, snow, mud, and fruit; we conquered . . . the parade running majestically, triumphantly its appointed course, allegiance sworn to the ancient Blarney Stone, and the world once more shown that St. Pat, the patron saint of Engineers, ever rules supreme on Lincoln Terrace. There were, of course, minor annoyances enroute, but these were quelled, likewise, in the usual manner.

At the left—the attack from the Armory failed; at the right, some nameless soul attempts to shut off the hydrant with his hat.

The 1937 Cavalcade of Death moves off at the zero hour, preceded by its mighty swing band, past the assembled multitudes at the Union . . . first eagle-eyed St. Pat (nee' Barlow) and the precious Blarney Stone (kissing which is said to guarantee an A in any course, even Steam and Gas) in their stately carriage, followed by the gleaming floats: "A day in the Life of a Co-ed" with four rather pale and grim mannequins; "The Funeral of Glenn Frank"; "The Wil-kie Way," which proves to be quickly convertible into a very wet but efficient battle wagon; "The E.E. Lab. Junkyard," most timely and pointed satire of the day, not forgetting "Paul Bunyan's Transit," though Paul should have known his task to be hopeless.

This peaceful and dignified procession had gone but half a block when from the Armory roof begins a stream of "pennies from heaven" interspersed with preserved fruits. The Annex doors are battered down, the water valve shut off . . . and that is that. Up Langdon with pomp and circumstance roll the slaves of the slip-stick, exchanging greetings, each in appropriate manner, with both admirers and hecklers, tossing favors to Ann Emeryites, and enjoying life in general.

So, unsuspecting, they approach a down-at-the-heel eat-

The enemy—at the left, they await the parade; in the center, they are being urged to leave; on the right, the "paddy wagon" is loaded with some confiscated ammunition.

In spite of the cloudy day, a good many pictures were entered in the contest for the best pictures of the St. Pat's Parade announced last month. On the cover and on the accompanying two pages we have used a good portion of the prints turned in. Anyone desiring to know who took a particular picture may find out by stopping in the Engineer office.

First prize in the picture contest was won by William M. Senske with the picture in the center of the front cover. He received a Leicascope exposure meter. Second prize of a 5x7 portrait was awarded to Richard W. Metter for the series of pictures above. George S. Faulkes, c'36, received third prize—an 8x10 enlargement of any negative—for the picture of the prize winning A.S.C.E. float reproduced herewith. All prizes were contributed by the Photoart House, 413 State Street.

ing club called the Chi Phi house, we understand, from whose sagging roof comes a shipment of the fruit of the hen. Reluctantly the Engineers break out the munitions brought along for such emergencies. Then it's egg for egg; only our ingrained sense of respect for property, such as locked doors, saves certain shysters from a Fate worse than Death. One bystander, too free with his pitching arm, is here treated to an egg shampoo. Amid all of which frolics "Hindu" proudly sporting the winter undies of some Alpha Chi Rho who mistakenly thinks Spring has arrived.

Now to the Square, where the music goes round and round with the rest of the parade lagging a bit behind to leave the mark of St. Pat on each shyster's window along the line of march. Here again the skulking shysters strike and, opposed to violence as the paraders are, they are forced to dispatch fleet-footed law-and-order squads, who conduct a spectacular if belated Easter egg-rolling on the Capitol lawn. Here, too, is born a treatment which may well become standard: the offender's mouth is gently but forcibly opened, an egg (of gay '90s vintage) dropped in upon his tonsils, then—zoch! the mouth is forcibly closed. It's a ducky game, fellers.

Having performed this distasteful chore, the still peace-loving Plumbers move down State Street displaying their wares. Lo, wafting from the Orpheum comes the tell-tale odor of shyster—"parfum des oeufs."

The Engineers, now the Fighting Engineers, clear for action. And from the housetops down it comes—a cloud-burst of vegetables, fruit salad, and eggs, sunny side up and on the half shell. And up it goes—the counter barrage of equal potency, unborn poultry in great looping parabolas, while shysters slither down behind protecting cornices. A suggestion to turn off the route is howled down; the Blarney Stone must go through! And through it goes: the fighting, riding, sharpshooting Engineers move on in combat order, smearing all opposition. Someone opens a fire hydrant in their path, but a nameless hero throttles it with his hat while the parade passes.

Behind Kiekhofer's front wall they meet the last desperate ambuscade of the enemy, an enemy entrenched and stocked with missiles ranging from the giant watermelon to the humble egg. It takes a charge led by Woy, our incubator baby, and a short, satisfying slug-fest to clear up that situation once and for all. It is at this point that one of "Madison's finest," being on the receiving end of a potential chick, pulls his gun, a la Wild Bill Hickok. This childish act is loudly booed by all witnessing Engineers—who know perfectly well that shooting is too good for shysters. Whereupon, our brave copper puts away the hardware and beats a hasty retreat, followed by forget-me-nots from both factions.

With little further ado, the triumphant, if bespattered, procession draws up before the Library steps, where the Blarney Stone is exhibited, ceremoniously kissed, and St. Pat proclaimed ruler of the Hill. There is, it seems, one dissenting voice. Its owner, rash shyster, is rolled quite thoroughly in the wet, thick mud of the lower campus to teach him better manners, and with him several confederates who unwisely came to his aid.

Finding no one else in the vicinity still unconvinced, St. Pat concludes the ceremonies, passes his benediction, and the battle-scarred but all-conquering Plumbers, still covered with glory, mud, andiluvian fruit, and bits of chicken, trek homeward to hot showers, clean clothes, and dinner with a song in their hearts: "ST. PATRICK WAS AN ENGINEER!"

The prize winning A.S.C.E. float.

Our ENGINEERS in the News—

Statistician:
ALDRO LINGARD

And this is Mrs. Lingard's boy, Aldro, junior electrical, with a slide rule fixation and the far away look in his eyes. For **he** has been quoted by Winchell! To Aldro, the slide rule wizard, is credited the discovery that all the lipstick used each year by our co-eds would suffice to paint four barns, that the b.t.u.'s which go up in our cigarette smoke would furnish power enough to run five escalators continuously up and down Bascom Hill (what a brain), and that, judging from accurate ink consumption statistics, the student population writes some 1,100,000,000 words per annum on quizzes, reports, or in blue-books.

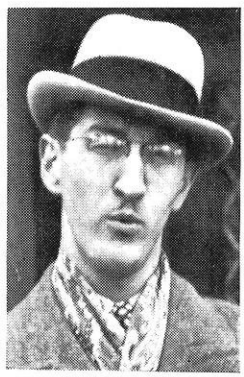
Just in the line of relaxation, he then goes home to dash off an S. &. G. report or three and design the new public address system which, as an NYA project, he is installing in the Armory. Aldro, you'll also remember, has recently swapped his famous bicycle for a car of somewhat dubious character, and is now frequently seen walking to school.

A graduate of Madison West High, with a National Honor Society pin and a Class A amateur radio license (W9SST), Aldro is a rabid "ham." He goes for E.E. in a big way, but says thumbs down on Mechanics. A member of the Cardinal feature staff and R.O.T.C. pistol team, he has also picked up Sophomore Honors and an Eta Kappa Nu key along the way and hopes to enter the communications research field upon graduation . . . if he hasn't worn out his slip-stick before then.

St. Pat:
JOHN A. BARLOW

Here we find another famous face . . . one that should need no caption. You've guessed it . . . the noble physiognomy of our intrepid St. Pat, John A. Barlow to outsiders. A fine, honest, rugged pan it is, too — respected by Plumbers, dreaded by shysters. For Barlow is the man who led us to victory through the wildest, hardest, yet on the whole most satisfying parade in years, the target of a thousand eggs, and faithful guardian of the Blarney Stone.

John, a Milwaukee boy, came to us via Washington High and St. John's Military academy. An all-city football man in his senior year at Washington, he has on record at Wisconsin his freshman numerals and a year on the varsity squad. President and house manager of Sigma Chi and well known in campus social circles, John still manages to do a pretty good job of mechanical engineering with side trips into the commerce school. He claims to be looking forward to engineering administration upon graduation this June, and will have his chance with the Buffalo Forge Company, for whom he plans to go to work.



Big Shot:
ALLEN S. JORGENSON

The gentleman at the top of this column is not angry with anyone. Its just that our photographer caught "the busiest man on the campus" in a moment of strain. And if being chairman of Military Ball, feature editor of the Cardinal, captain in the R.O.T.C., associate editor of the 1937 Badger, as well as carrying a third-year M.E. schedule and a major in the commerce school isn't work, we don't know what is. Incidently, since the above photo was taken, "Slugger" has been (forcibly) relieved of the smudge shown beneath his nose, with the general approval of the student body.

Another Washington High, Milwaukee, product, lanky Allen S. got his stage start as stage crew manager there, gained his military fundamentals at St. John's, and then, for good measure, spent a year as tool-maker in a machine shop. Enrolled as an engineer, his syrupy pen soon won him fame as "May-I-Present" Jorgenson of the Cardinal staff. One time news editor of the same publication, he also has been a leading player in the 1935-36 Haresfoot productions. Scabbard and Blade and the Wisconsin Players both claim him, and in another year he has many more worlds to conquer. Beyond graduation, he plans to begin his career in industrial production with a view toward graduating into administrative work or technical journalism.

ON THE CAMPUS

FACULTY CHOOSES FELLOWS

Two fellowships in engineering for 1937-38 were filled by action of the faculty on March 22. Chosen from a list of twenty applicants were Parker S. Dunn of Corpus Christi, Texas, and Albert A. Rosenberg of Corvallis, Oregon. Dunn, who has a B.S. from Ohio State in 1930 and an M.S. from M.I.T. in 1931, is a chemical engineer. He has been a paper technician with the Mead Corporation of Chillicothe, Ohio, and also has been with the Southern Alkali Corporation at Corpus Christi.

Mr. Rosenberg will be graduated from mechanical engineering this June by the Oregon State College. He is a member of Tau Beta Pi and editor of the "Oregon State Technical Record."

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NEWS FLASHES

'Tis said, and from a very reliable source, that the staunch supporter of St. Pat who put the green flag on the top of the Law building very nearly came to grief. The flashing which he was hanging onto suddenly gave way, and but for a bit of quick work on his part he would have been a very battered engineer.

Bob Losse, m'37, claims he has the prize as far as thesis subjects go. His is on how many times you can use a lock washer and not destroy its elasticity. He will be bending lock washers in his sleep soon, if he doesn't watch out.

And speaking of lawyers reminds us that there will be no law ball this year on the campus for reasons we won't state here.

Allen Jorgenson, m'38, who, incidentally is head of the Military Ball this year, really went to town in E.E. lab a few weeks ago. All was serene until suddenly a circuit breaker went and there stood Al watching a puff of smoke slowly rise toward the ceiling. Five more times he tried and five more times the circuit breaker went into its dance. Total accomplished that afternoon by Mr. Jorgenson was nothing and one ammeter burned out by the combined efforts of 120 amps.

DRAWING CONTEST

The fourth annual **Wisconsin Engineer** drawing contest, with more men making drawings than ever before in its history, is coming to a close. Entries will be received up to and including April 17. In the May issue of the **Wisconsin Engineer** the winning drawing will be reproduced and the three prize winners announced. Judges are Mr. J. W. McNaul, assistant professor of machine design, Mr. W. S. Cottingham, assistant professor of structural engineering, and Mr. R. W. Fowler, assistant professor of drawing, Extension Division.

Prizes will be awarded as follows:

1st—One Kodak Bantam Camera, or $5.00 in trade, donated by Photocraft, 670 State Street.

2nd—One Automatic Pencil, donated by Rider's Pen Shop, 605 State Street.

3rd—$1.50 in trade at the Netherwood Printing Company, 519 State Street.

QUALIFY AS WASHER-WOMEN

At least two junior and two sophomore electricals have proven themselves qualified washer-women as the results of a washing machine test which they have been running for the last few weeks. Roger Schuette and Howard Olds, sophomore electricals, and Art Jark and Fred Neumann, junior electricals, ran the test on ten washing machines to compare them as to effectiveness and endurance. The sheets used in the test were blackened with lampblack, and the fellows are sorry to report that, in spite of their best efforts, the sheets were far from white when they finished the run. The most difficult and tedious job, according to Roger Schuette, was giving the spinners, agitators, and motors the equivalent of ten years average use. This was done by starting and stopping the units from six to ten thousand times, and even an engineer is likely to get tired doing only that for hours on end.

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STEAM AND GAS 28

As we wandered into the steam and gas laboratory in the Mechanical Engineering building the other day, we encountered a class in steam and gas 28 hard (?) at work. Down in the basement were John Wright and Robert Pinkney, e'37, measuring condensate with the aid of two chairs apiece. Their job consisted in shifting the condensate pipe from one tank to another, and even this was done with the aid of a stick and a rope without stirring from the chairs. Tough job! Upstairs, Gerhard Vater had the toughest job in keeping the brake load constant, while Carl Walter, e'38, kept himself at fever heat reading two meters every five minutes. "Chief of Party," Aldro Lingard, e'38, claimed he should get the most credit because he had to loaf all over instead of only in one place.

Incidentally, the instructor of the class is none other than Bill Woerner, end coach under Doc Spears. He is a graduate of Purdue in mechanical engineering from the class of '29.

ALUMNI NOTES

Mechanicals

ANDERSON, GORDON R., '37, reports that he is now employed with the Johnson Service Co. of Milwaukee.

DERLETH, C. F., '29, formerly chief design engineer with the D. F. Kusel Co., has been promoted to sales manager in that concern, located in Watertown, Wis.

GARMAGER, HENRY C., '36, has left the Diesel engineering department of the Fairbanks-Morse & Co. to take a position in the Diesel engineering department of the Caterpillar Tractor Co. in Peoria, Ill.

GESTELAND, A. E., '33, formerly affiliated with the Creamery Package Co. of Lake Mills, Wis., is now the chief design engineer of the D. F. Kusel Co. of Watertown, Wis.

GILLETTE, EDMOND S., '13, in the opinion of many old timers the best quarterback that Wisconsin ever had, is mayor of Santa Monica, Calif., a city of 35,000 population.

LAUSCHE, LUVERNE F., '34, has left the Savidusky Co. of Madison to be an instructor and assistant plant engineer at Ohio University, Athens, Ohio.

METALKA, RAYMOND F., '35, and **MOLLICA, SALVATORE,** '34, are presently both connected with the Chain Belt Co. of Milwaukee.

MILLER, OTTO, '37, is to be connected with the Chicago Pump Co. of Chicago, Ill.

SEVERSON, P. T., '37, has a position as engineer at the Cutler-Hammer Co. of Milwaukee, Wis.

THOMAS, JOHN P., '36, formerly of the Federal Rubber Co. of Plano, Ill., where he was an assistant to the plant superintendent, is now connected with the Elmendorf Corp. of Chicago, where he is a research engineer.

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Electricals

LUND, A. O., '34, has been transferred from the Pittsburgh to the Chicago plant of Westinghouse Electric Elevator Co. Residence, 522 Wrightwood Ave., Chicago.

MARTIN, C. R., '36, is now with the Allis-Chalmers Corp., Milwaukee.

RODERICK, HARRY, '36, who had been working for Ken-Rad Tube Corp. at Owensboro, Ky., received an appointment from 5th Corp Area to attend Signal School at Fort Monmouth, N. J.

RYALL, THOMAS H., '35, is employed by the Western Electric Co., Chicago.

SUTTER, ROBERT R., '36, works in the drafting department of Cutler-Hammer Co., Milwaukee.

SWANSON, MAURICE C., '36, corresponds that he is in the Photo-Micrographic Laboratory of the Schenectady Works of the American Locomotive Co.

TANG, GENE KWONG, '35, has completed his work with General Electric and sailed from Vancouver on Feb. 20 for China, where he will work with the China General Edison Co., Shanghai.

TUTTLE, Le ROY H., '34, has been employed by Western Electric Co., Hawthorne Station, Chicago.

UTTER, F. D., Jan.'37, has accepted a position with Barber-Coleman Co., Rockford, Ill.

VAN DYKE, RICHARD J., '36, formerly with General Chemical Co., Hagewisch, Ill., has accepted a position with Belle City Malleable Iron Co., Racine, Wis., doing analytical work.

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Miners

OCKERHAUSER, C. E., '36, was married on Feb. 5 to Miss Virginia Reynolds of Madison. Mr. Ockerhauser is employed by the Shell Petroleum Co. at Turon, Kan.

Wisconsin Engineers Employed by Gen

[As of

Name	*Duties and Location*	*Yr. Grad.*	*Degree*
Merrick, E. G.	In Chg. Power, Transmission, etc., Indus.-GO	1900	EE
Fowler, M. M.	Service Div., Engineering-Central District	1901	EE
Belling, J. W.	Mgr., Transportation-New England District	1903	EE
Brown, L. R.	Mgr., Transformer Div., Central Sta.-Pittsfield	1903	EE
Brobst, J. E.	Managing Engr., Industrial Control Engr.-Schenectady Works	1903	EE
Whiting, M. A.	Special Engr. Assignments, Industrial-GO	1904	EE
Ward, H. C.	Sales Representative-Rochester Office	1905	EE
Wagner, R. T.	Manager Sales, Lightning Arrester, Cutout, etc., Transformer Div., Central Station-Pittsfield	1905	EE
Muir, R. C.	Vice President, Engineering General	1905	EE
Sorem, A. J.	Industrial Sales-Central District	1906	EE
Brandel, C. O.	Assistant General Sales Manager, Western Sales, Incandescent Lamp Dept.	1908	EE
Jones, C. A.	General Sales-Milwaukee	1909	EE
Wright, J. D.	Assistant Manager, Industrial-GO	1909	EE
Griswold, E. C.	Induction Motor Engr.-Schenectady Works	1909	EE
Moss, L. M.	Nela Press, Incandescent Lamp Dept.	1909	EE
Van Horn, I. H.	Lamp Develop. Lab., Incandescent Lamp Dept.	1909	EE
Zabel, W. P.	Lamp Develop. Lab., Incandescent Lamp Dept.	1909	EE
Magdsick, H. H.	Engineering, Incandescent Lamp Dept.	1910	EE
Pergande, A. A.	Standardizing, Incandescent Lamp Dept.	1910	EE
Sumnicht, H. A.	St. Louis Lamp Works, Incand. Lamp Dept.	1910	EE
Staehle, P. M.	Sales Mgr., Spec. Transf., Indus.-Ft. Wayne	1912	EE
Bradish, C. B.	Design, Engr., Indus. Control Engr.-Schenectady	1912	EE
Henningsen, E. S.	Engr., Motor & Gen. Engr.-Schenectady Works	1912	EE
Norris, L. A.	Indus. Control Engr.-Schenectady Works	1912	EE
Horstkotte, E. H.	Engr., Laboratory-Erie Works	1912	EE
Anderson, E. A.	Michigan Div., Incandescent Lamp Dept.	1913	EE
Raube, W. C.	Machinery Manuf. Sec., Industrial Dept.-GO	1915	EE
Pinney, A. J.	Machinery Manuf. Sec., Industrial Dept.-GO	1917	EE
Warren, G. B.	Designing Engr., Turbines, Turbine Engr., Schenectady Works	1919	ME
Blowney, W. E.	Admin. Engr., Turbine Engr.-Schenectady	1920	EE
Hamilton, R. E.	AC Apparatus Engr.-Ft. Wayne Works	1920	EE
Taylor, H. D.	Turbine Generator Engr.-Schenectady Works	1921	ME
McLenegan, D. W.	Asst. Engr., Com. Engr. Div., Air Cond. Dept.	1921	ME
Reed, P. D.	Attorney, Law Dept.	1921	EE
Bowman, P. G.	Engr.-Minneapolis Office	1922	EE
Glenn, T. G.	Asst. Engr.-Central District	1922	ME
Prideaux, G. F.	Engr., Incandescent Lamp Dept.	1922	EE
Staley, K. A.	Industrial Sales-Atlantic District	1922	EE
Bowers, A. F.	Industrial Sales-Atlantic District	1923	ME
Raube, R. H.	Apparatus Sales-Detroit Office	1923	EE
Henry, G. B.	Indus. Control Specialist-Central District	1923	EE
Groot, R. W.	FHP Motor Div., Industrial-Ft. Wayne	1923	EE
Gluesing, W. A.	Publicity-GO	1923	EE
Nerad, A. J.	Mechanical Investigations, Research Laboratory	1923	EE
Zuelow, F. W.	Wage Rate-Schenectady Works	1923	EE
Eaton, T. O.	Switchgear Specialist-Pittsburgh Office	1924	EE

Chemicals

DEDRICK, J. H., '35, is taking graduate work at Pennsylvania State College.

KEHL, GEORGE L., '34, holds an appointment as research fellow at Lehigh University. He recently published a paper in "Metals and Alloys" on Preferred Orientation in Rolled Copper.

SCHEIL, M. A., '27, M.S. '30, was coauthor of a paper presented at the February meeting of the American Institute of Mining and Metallurgical Engineers. The paper dealt with Fractional Vacuum Fusion Analysis.

CIRVES, FRANK J., '21, is engaged as research chemist by the Robert W. Hunt Co., Engineers, Insurance Exchange Bldg., Chicago, Ill.

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Civils

ADLER, ORVAL C., '31, is back again with the Great Lakes Dredge and Dock Company in charge of all office work on the construction of a lock at Peoria, Ill. Address: 707 S. Capitol St., Pekin, Ill.

BLOECHER, WALTER P., '14, is assistant to the president, Philadelphia and Reading Coal and Iron Co., Haverford, Pa.

BLOODGOOD, DON E., '26 is employed in the City Sanitation plant, Indianapolis, Ind.

BORKENHAGEN, EDWARD H., '33, is a draftsman with the U. S. Forest Service at Milwaukee.

CONNELLY, ROBERT M., '16, president of the Engineering Society of Wisconsin, has been making arrangements for a meeting of the society to be held in Madison shortly. Mr. Connelly resides in Appleton, Wis.

FRAZIER, ARTHUR H., '28, connected with the Water Resources Branch of the U. S. Geological Survey, Washington, D. C., has been studying the possibilities of getting data from which estimates of the recent flood may be obtained.

GREENMAN, RALPH N., '23, is with the Long Lines Dept. of A. T. & T. Residence: 750 Huron Road, Cleveland, Ohio.

HENRY, JAY E., '36, writes that he has recently moved to Wheeling, W. Va., where he is to be employed by Engstrom and Wynn, Inc., general contractors.

HUNT, PAUL J., '37, who has been working with the Dane County surveyor since February, began work on April 1 with the Milwaukee Road at Milwaukee.

LANE, E. NEIL W., '30, has been with the Nebraska Department of Roads and Irrigation since September, 1933, as bridge inspector and instrumentman. Residence: 1909 Perkins Blvd., Lincoln, Neb.

LOCHER, FREDERICH, '32, has the position of resident engineer for the Wisconsin Highway Commission at Wisconsin Rapids, Wis.

NERODA, EDWARD K., '35, was promoted on Jan. 1 to senior engineer in the Soil Conservation Service and transferred to Camp Irving at Black River Falls, Wis. He was recently detailed to the La Crosse office temporarily to assist in the revision of the Service's handbook.

NIEDERER, EDWARD, '35, has returned from Canada and is now in charge of the Philadelphia office of the British American Mining Co., Philadelphia, Pa.

OAKEY, JOHN A., '29, is an instructor in civil engineering at Columbia University, New York, N. Y.

PERRY, THEODORE H., 31, is with the Kimberly-Clark Co., Neenah, Wis.

REED, GEORGE L., '24, is an associate engineer with Public Works Administration at Washington, D. C. He is married and has one child. Residence: 1650 Harvard St., N.W.

RUSSELL, CECIL R., '23, M.S.'24, has established a business as civil and electrical engineer in Christchurch, New Zealand.

SMITH, DAVID J., '36, has been with the Wisconsin Rural Electric Cooperative Association at Madison. He will be in the field this summer, taking out power lines.

VAN HAGAN, CHARLES E., '36, engineer with Engstrom and Wynn, contractors of Wheeling, W. Va., is working on a sewage treatment plant that is being constructed at Atlanta, Ga. Address: 63, 14th St., N.E.

VOGEL, RALPH H., '36, is designing and supervising construction for Vogel Bros. Construction Co., of Madison.

WICKESBERG, ALFRED W., '31, is engineer with Greeley and Hansen, consulting engineers of Chicago. He has been engaged on the construction of a sewage project at Appleton, recently completed. He was transferred to Buffalo on March 6 where work commenced on a large sewage treatment plant. Address: 505 City Hall, Buffalo.

tric Company and Affiliated Companies

, 1936]

Name	*Duties and Location*	*Yr. Grad.*	*Degree*
Coates, R. E.	Power Transformer Engr.-Pittsfield Works	1924	EE
Thomas, E. J.	Vacuum Tub Engr.-Schenectady Works	1924	EE
Manke, Arthur	Radio Receiver Engr.-Bridgeport Works	1924	EE
Gettelman, A. F.	Engineering-Duluth Office	1925	EE
Prideaux, D. W.	Northern Div., Incandescent Lamp Dept.	1926	EE
Holder, L. F.	Aeronautics & Marine Engr.-Schenectady Works	1926	EE
Summers, E. R.	Induction Motor Engr.-Schenectady Works	1926	EE
Davis, K. C.	General Sales-Toledo Office	1927	ME
Churchill, W. W.	Electric Welding Sec., Industrial-GO	1927	EE
Jordan, R. D.	Publicity-GO	1927	EE
Suits, C. G.	Vacuum Tube Engr.-Schenectady Works	1924	EE
Radtke, Laurence	Research Laboratory	1927	EE
Robarge, R. W.	FHP Motor Specialist-New England District	1928	EE
Frackelton, W. B.	Industrial Dept.-Chicago Office	1928	EE
Morack, M. M.	Power Rectifier Engr.-Schenectady Works	1928	EE
McDougall, K. R.	DC Apparatus Engr.-Ft. Wayne Works	1928	EE
Ajer, Oliver	Research Laboratory	1929	EE
Sweet, A. L.	Industrial Control Engr.-Schenectady Works	1929	EE
Jewell, R. G.	Engineering-West Lynn Works	1929	EE
DeCola, Rinaldo	Radio Receiver Mfg.-Bridgeport Works	1929	EE
Howes, E. W.	Engr., Air Cond. Dept.-San Francisco	1930	EE
Guth, S. K.	Engr., Incandescent Lamp Dept.	1930	EE
Jones, J. L.	Advanced Engineering Course-GO	1931	EE
Teare, W. H.	Vacuum Tube Engr.-Schenectady Works	1931	EE
Sweet, C. M.	Appliance Mfg.-Bridgeport Works	1931	ME
Karsten, W. F. R.	Commercial Engr. Div., Air Cond. Dept.-Bloomfield	1931	ME
Vea, O. F.	Test.-Schenectady	1932	EE
Evans, S. O.	Advanced Engineering Course-GO	1932	EE
Wyss, W. E.	Patent Dept.-GO	1933	EE
Moe, R. E.	Radio Receiver Engr.-Bridgeport Works	1933	EE
Anderson, G. C.	Test.-Schenectady	1933	EE
Schmid, B. J.	Test.-Schenectady	1933	ME
Hinman, J. H.	Test.-Ft. Wayne	1934	EE
Hausler, G. M.	Indus. Control Engr.-Schenectady Works	1935	ME
Bennett, R. M.	Test.-Schenectady	1935	EE
Dow, H. W. Jr.	Test. Schenectady	1936	ME
Hertel, R. F.	Test.-Schenectady	1936	EE
Kuehn, F. J.	Test.-Schenectady	1936	EE
	AFFILIATED COMPANIES		
Call, L. L.	General Electric X-Ray Corporation	1918	EE
Berg, Leo	Edison General Electric Appliance Co., Inc.	1924	EE
Trenary, H. I.	General Electric X-Ray Corporation	1924	EE
Taylor, W. H.	International General Electric Co.-Mexico City	1925	EE
Hanzel, J. W.	General Electric Vapor Lamp Company	1926	ME
Ludwigsen, L. L.	General Electric X-Ray Corporation	1929	EE

GO—*General Office, Schenectady, N. Y.;* Sec.—*Section;* Div.—*Division;* Test.—*Testing Dept. or student engineering course.*

The Next Step in Engineering Education*

by **EDMUND D. AYRES**

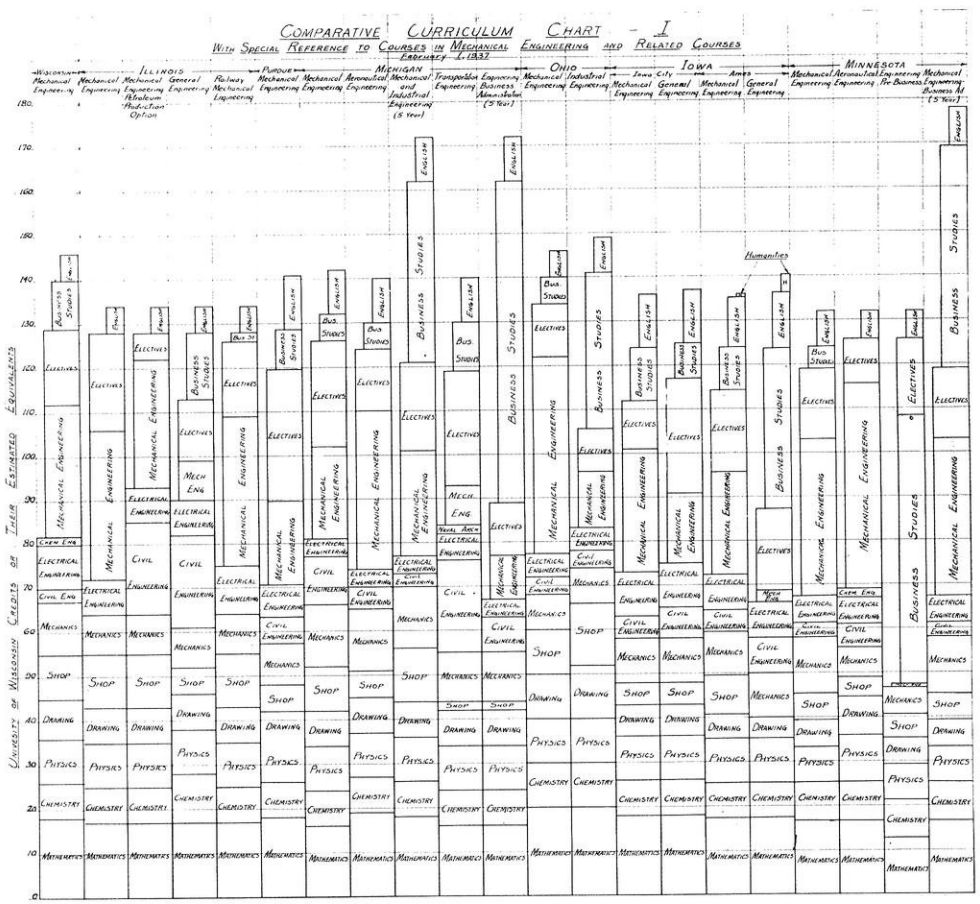
Associate Professor of Engineering Economics, University of Wisconsin

ABOUT March, 1935, a careful study was begun for the purpose of finding an answer to the problem of what should be done at Wisconsin with respect to the teaching of business and economics to engineers. This study has in the course of approximately two years produced some interesting conclusions whose soundness and simplicity make them worthy of consideration for application on a national scale.

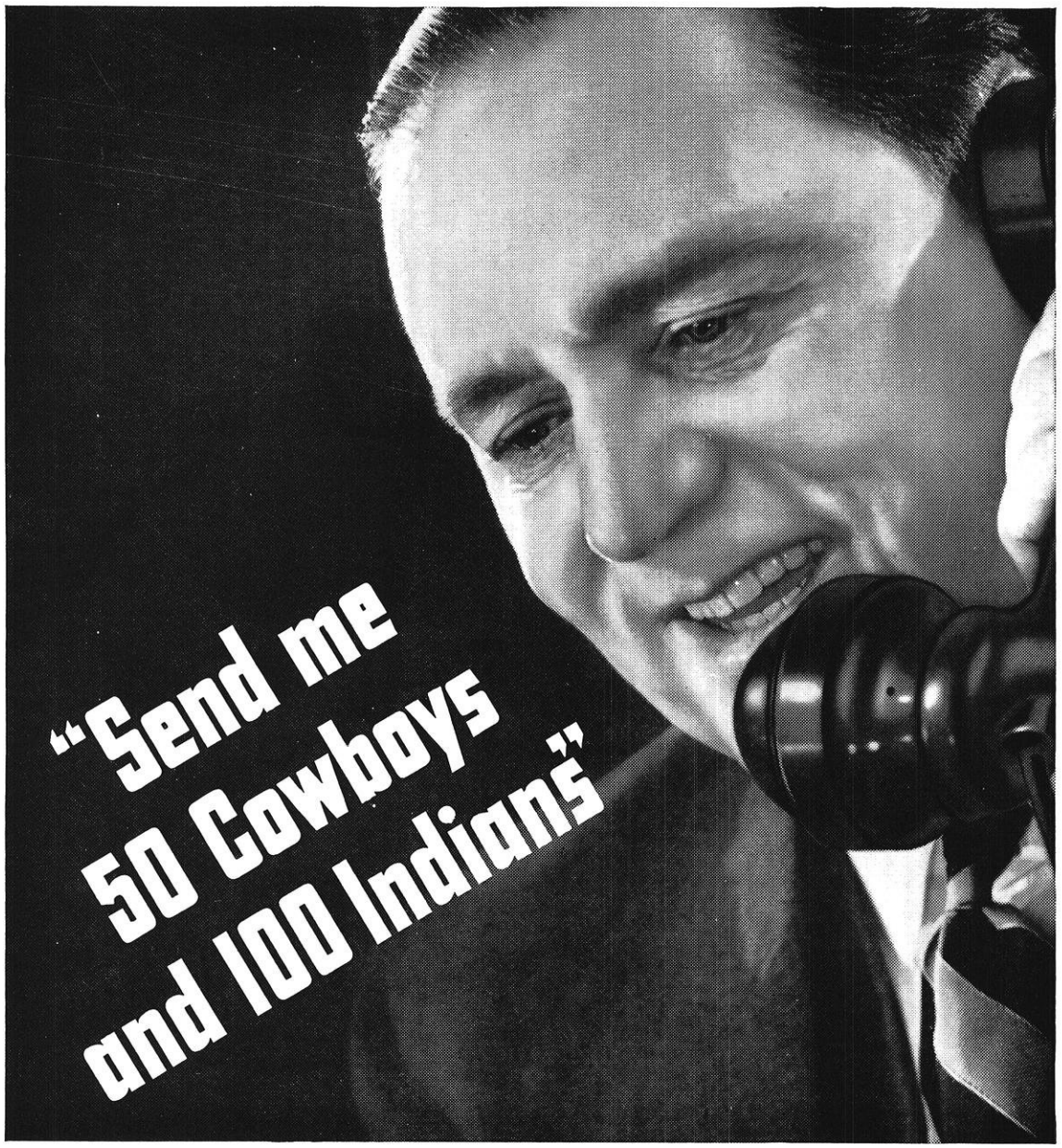
It must be remembered that the focus of the work has been definitely upon the local problem at the University of Wisconsin. The College of Engineering here has always encouraged her engineering students to avail themselves, through elective work in the internationally eminent departments of economics and sociology of the university, of the opportunities for broadening their vision and understanding in the humanities. She has, however, never established courses in engineering leading to degrees in administrative engineering, industrial engineering, business and engineering administration or similar curricula. A department of engineering economics, until recently called the department of engineering administration, however, has sturdily attempted to bridge the gap between technical engineering and business by providing in the senior year surveys of the relations between engineering and commerce, and providing guidance to the commercially minded student in making the best use of his free elective work. Although this work of the department of engineering economics has been opened up recently to the younger undergraduates, the status of the facilities and opportunities for providing the engineering student with work in business and the humanities has not changed essentially in recent years.

Close study of the situation at Wisconsin and a scrutiny of educational programs in engineering offered in general in the east and the middle west against the background of increasing professionalism and the evident need for broader curricula suggests that the time is ripe nationally to project the education of the engineer beyond the end-point of commencement day into the post-school period. The new goal, if it can be considered new, should be the achievement of a recognized professional level. The new feature, if it can be considered new, is the development of the idea that the university should take hold and provide

*This article is considered by its author to be in the nature of a final report upon the general program which should be adopted at Wisconsin for the teaching of both the undergraduate and graduate engineer in business and economics.



Analysis of mechanical engineering curricula in some of the "Big Ten" schools.



WHEN Hollywood wants to film a scene requiring hundreds of "extras," it makes a telephone call—and gets them. ¶ This is made possible by a central casting bureau, whose amazingly fast service is based on systematic use of the telephone. This organization has a telephone switchboard where as many as 30,000 calls a day are handled in bringing actors and producers together. ¶ Another example of the value of telephone service to business and social America. It is the constant aim of Bell System men and women to make it ever more useful—constantly better.

BELL TELEPHONE SYSTEM

Keep in closer touch with home—by telephone. Rates to most points are lowest after 7 P. M. and all day Sunday.

educational paths through this post-school period to suit the individual. The idea appears as a responsibility which the colleges of engineering should grasp, because no other agency is so peculiarly fitted to attend to the birth struggles of professionalism for the engineer as is the university and to surround the young infant with comforts drawn out of its stores already developed for its resident instruction work, for its adult education work, and for its alumni and placement work.

In considering a plan for providing education for the engineer in business and economics, at least four definite fundamental premises are immediately encountered:

(1) In the usual four years' college preparation, it is impossible to expect the average engineering student to emerge with a degree in engineering and also a degree from a school of commerce.

(2) Engineering schools are primarily interested in turning out men with the proper background for becoming successful engineers; hence it is of first importance that the engineering student in college emerge at graduation with an adequate education in engineering fundamentals.

(3) The present trend toward professionalism in engineering is not likely to diminish in importance in the coming years, and the old importance of graduation from an engineering school as the end of one of the final stages in an engineer's preparation is overshadowed, or soon will be, by goals pushed forward to several years after graduation in the form of a state license or recognition of an attainment of a professional level by engineering societies.*

(4) The engineer has a definite need for an education in business and economics, ranging from the needs of an ordinary citizen to the needs of a future executive or administrator in industry. In attempting to meet the needs of engineers within such a wide range, any plan for education in these fields must have sufficient variation in the way of optional paths to meet the particular demands and problems of the individual engineer.

Concerning premise (1), many interviews with prominent engineers and engineering educators over the period given to this study have revealed a growing conviction that courses in engineering must be lengthened to five or even six years. Ultimately it may be feasible to so lengthen the period of resident instruction. There is, however, a definite drawback to such proposals. Today there are many capable engineering students who are finding even the term of four years a severe drain upon their economic resources. It does not seem possible that the idea of lengthening the curriculum can ever be universally adopted in the face of this one real obstacle. The careful development of post-graduate work by the universities, however, can sidestep this obstacle, gain the lengthened curriculum in fact, and moreover provide the instruction at a time when it can be thrown against a background of the junior engineer's work in industry. Thus the work can be given to the engineer in the realistic atmosphere and environment of industry, which for certain purposes is likely to prove more stimulating and conducive to its appreciation than the college environment.

The idea which has been proposed for consideration at the University of Wisconsin recognizes the two limits:

(1) the matriculation of an engineer as a freshman in the engineering college, and

(2) professional recognition coming probably several years after college,

as the two points in time within which the plan should normally operate. It proposes an organized path with many options to be made available:

(1) in the form of resident instruction at the University of Wisconsin,

(2) in the form of correspondence instruction through the University of Wisconsin Extension Division, and

(3) in the form of class instruction through the Extension Division of the University of Wisconsin at Milwaukee.

It proposes:

(1) that this plan be called to the attention of students in their freshman year in college,

(2) that as much of the work as their individual programs and interests will permit be offered, with the proper amount of guidance in these matters, to undergraduates and graduates in residence in the form of regular college courses, and

(3) that any part of the work not taken in college or all of the work, if so desired, be offered in the form of correspondence instruction or class instruction at the Milwaukee Center of the University of Wisconsin Extension Division.

It further proposes that for a definite amount of the work satisfactorily completed by attendance at college, a degree of Master of Engineering and Economics be offered (provided satisfactory arrangements can be made with the Department of Economics in the School of Letters and Science); also for completion of the work, partly covered by correspondence and partly by resident instruction at the University of Wisconsin, or entirely by correspondence instruction, that a certificate indicating a completion of the course be granted.

Such a proposal provides the flexibility which is essential to meet the varying needs of individual students both with respect to course content and availablity of facilities to obtain instruction when and where needed.

The matter of course content or subject matter to be offered is open to ready change and infinite variation. It is believed that in addition to business studies as listed below, the door is wide open for the inclusion of better treatments of such subjects as engineering English and public speaking, the treatment of advanced technical work and any amount of cultural work in the humanities.

The study to date has attempted a focus upon what the author has chosen to call "business studies." The view taken was this. The engineer in general is called upon to work for or with business units already established, the corporation and the giant corporation probably looming over all other types in importance. One of his first and most practical needs is for more technical familiarity with

*See 2nd and 3rd annual reports of the Engineers' Council for Professional Development for years ending October 1934 and 1935.

the inner workings and administration of these units in order that he may orient his own work properly with other functions of the business that are non-engineering and in most cases financial in character, and that he may develop to its highest level any innate ability he may have to lead others and get along with others in his sphere of influence. Not second in actual importance, but perhaps second in practical importance, he should have a view of social matters to help him understand the significance of his work and that of others in order that he may be ever ready intelligently to join forces with or stand firm against those social movements which are intended by others to improve society as a whole. The following list of business studies is aimed primarily to furnish the technical familiarity cited first and lay certain foundations for cultural work which may be needed for the latter aim. The following list is not exhaustive, it simply represents an honest attempt to compile a list of studies with which the engineer should have a working familiarity in the main. This list was first submitted to Dean Turneaure in a report dated September 30, 1935, entitled "An Engineering Economics Department of Instruction for the College of Engineering." The list follows:

1. Economic Theory
2. Accounting
   a. Bookkeeping Methods
   b. Financial Statements
3. Statistical Theory
4. Economic Selection and Replacement
   a. Arithmetic of Economic Selection
   b. Estimating
   c. Depreciation

d. Plant Location and Layout
e. Specifications for Materials and Machines
f. Economic Lot Sizes

5. Business Law
   a. Contracts, Torts, Bailments, Agencies, Carriers, Sales, Negotiable Instruments, Bankruptcy, Suretyship, and Guaranty
   b. Law of Corporations, Partnerships, and other Business Units
   c. Public Utility Law and Government Regulation of Industry
   d. Patent Law
6. Marketing and Merchandising
   a. Market Analysis
   b. Salesmanship
   c. Sales Management
   d. Advertising
   e. Prices
   f. Purchasing
   g. Transportation and Traffic Management
   h. Cooperative Marketing
   i. Foreign Trade
7. Labor and Personnel Management
   a. Human Relations and Applied Psychology in Handling Men
   b. Principles of Efficiency
   c. Incentive Systems
   d. Time and Motion Study
   e. Personnel Surveys
   f. Job Specifications
   g. The Labor Market
   h. Trade Unions
8. Money and Banking
9. Business Organization
10. Corporation Finance
11. Corporate Consolidations and Reorganizations
12. Financial and Business Forecasting
   a. Business Cycles
   b. Statistical Analysis
   c. Budgetary Control
13. Organization for Operation
   a. Organization Charts
   b. Planning, Scheduling and Dispatching
   c. Operation of Stores
   d. Quality Control
14. Cost Finding
15. Valuation
   a. Basic Principles
   b. Cost and Value Determinations
   c. Depreciation Theory and Practice
   d. Law
16. Investment and Speculation
   a. Financial Arithmetic
   b. Risk and Profit
   c. Stock and Produce Exchanges
17. Insurance
18. Real Estate
19. Credits and Collections
20. Government Finance
21. International Exchange

Out of this list were chosen:

(a) economics
(b) accounting
(c) statistics
(d) business law
(e) economic selection and replacement, and
(f) marketing and merchandising

as fundamental introductory studies which should be covered in laying the foundation for any individual plan.

Growing out of and closely related to these introductory studies is another group of studies, a large proportion of which should be fitted into any plan. In the report mentioned above, the following subjects were selected:

(a) business organization
(b) corporation finance
(c) money and banking
(d) labor and personnel management
(e) business forecasting
(f) government finance
(g) investment and speculation
(h) insurance, and
(i) international exchange.

Beyond the subjects mentioned above, including the fundamental introductory subjects, lie many special emphasis groups into which individual interest and a particular professional experience will lead both early and late in the programs of various individuals.

The inclusion of such a list as appears above with the suggestion that avenues be left open for additions to this list of cultural and advanced technical subjects is so staggering that the reader is inclined to become lost in its implications and stamp the plan as having no dimensions, no focus, and therefore no starting point. If this be a weakness, the actual operation of the plan must rise above it, for the wave of a wand will not make the list disappear, nor is there any question that the above work, without additions, represents a life-time task if tackled by the student under his own power by selections of his own from the downtown bookstore.

The plan in the face of criticism of its comprehensiveness settles down to this simple procedure. A curriculum requiring definitely the six fundamental subjects listed above, further requiring an election of, say, four from the second list of "closely related subjects," and in addition, say, six more subjects from the entire list could not be considered unwieldy in the face of a comparison with any one of the highly developed programs involving this work as shown in Chart I accompanying this treatise. The plan then consists of a curriculum of six required studies, four restricted electives, and six free electives. Such a plan can be operated by means of orientation courses covering accounting and economic selection and replacement taught by engineers and courses representing the remaining list of subjects taught by economists, sociologists and other experts in whose fields the subjects lie. This course can float between the end points given of matriculation in college and the day of achievement of a recognized professional level using resident instruction, extension work centers and correspondence instruction with but the small teaching contribution mentioned and little other than a strong coordinating influence emanating from the engineering college. That is absolutely all there is to it. To improve it may require the simplification and condensation of many subjects, to enrich it may require the association of other features, but the starting curriculum suggested is within the reach of almost any college without much change in course content for subjects now being taught. The ideas as a whole once instituted, the difficulties arising from so many professions attempting to work together can be ironed out with leisure.

As to the relation of orientation courses to the work, in a speech given before the Graduate Study Conference, held in connection with the annual meeting of the Society for the Promotion of Engineering Education at Madison last June,* the author outlined briefly his opinion as to the proper handling of this matter. The present survey courses at Wisconsin are deemed admirably suited for use as orientation courses. They are built around the subjects of "accounting for engineers" and "economic selection and replacement" as key material. The treatment of either of

*Page 103, Journal of Engineering Education, October, 1936.

these subjects by other than an engineer leaves something to be desired which it is hard for a differently trained teacher to meet.

The matter of accounting should be treated from the engineer's viewpoint of the use of accounting as a methodology or tool, with the specific purpose of covering the accounting field very quickly, yet with sufficient thoroughness to give an engineer with no previous background a grasp of the subject such

(1) that he can, with confidence, find and interpret accounting information which he may have cause to obtain directly in the books of any business in his engineering work, and
(2) that he can carry on a conversation with a professional accountant in a business conference with full understanding of the meaning of the many accounting terms and with an insight into the purposes, limitations and advantages in the use of any particular double entry system, ranging from a simple set of books to one employing many subsidiary journals and ledgers and embracing many special features.

The subject of economic selection and replacement pertains largely to the "Will it pay?" problem and deals specifically with the selection and replacement of equipment, the preparation of estimates and certain major aspects of valuation.

Using these two subjects, namely accounting and economic selection and replacement as vehicles for an orientation course, it is possible to present extremely important material, while, at the same time, a glimpse down the various paths of study leading out from engineering into business and economics can be given from particularly favorable vantage points. It is believed that, in the orientation

course so constructed, it is possible to cover the average needs of the engineer in these particular subjects. To make this point particularly clear, I wish to state that intensive preparation for certain executive and administrative work in all probability would require some engineers to take further training in accounting taught from the accountant's viewpoint rather than from that of the engineer. The intention, however, is to cover the two fundamental introductory subjects of accounting and economic selection successfully within the bounds of such an orientation course.

The big job is not done, however, once the program for resident instruction and post-school instruction of business studies is operative. The inviting opportunity of the university is only niggardly realized if the plan is pushed no farther. If the engineer is to be built up professionally with attention to engineering English, advanced technical work, cooperation with state licensing boards and, as is fondly hoped, with considerable attention to developing the stature of the individual and improving the ethics of the profession, this is a task for the engineering college with as much partnership with industry as can be worked out. Lest this vision be an additional scarehead for the engineering educator, who of all men, is prone to keep his feet on the ground, with haste it should be stated that this vision is the star to which his hopes and aims should be hitched—the building of the ladder into this stratosphere must come with sound and careful measures to insure the success of such an ultimate venture. It is believed that the College of Engineering can start with a modest program of handling business and economics for the engineer and build outwards into the post-school area and inwards into the resident instruction area now comprising its own bailiwick.

Digressing slightly from the subject in hand perhaps, it nevertheless seems appropriate to point out that just as economists, sociologists and other social scientists have their opposing schools of thought—so has the engineering educator in the matter of treating the subject of how to meet the need of the engineer for the greater opportunity in the field of business and economics. We find one school of men who firmly believe that the strict scientific and technical path in engineering is the best preparation for almost any path of life. We have another, the extremists among whom advocate the abolishment of both engineering schools and schools of commerce in favor of "schools of industry." Because both of these ideas are definitely needed to provide the kind of an engineering education which will fit the broad range of candidate aptitudes, modern engineering education is doing both. Side by side, the eminently technical curriculum is being paralleled with curricula leading to administrative degrees and the like. Such a solution, however, in the opinion of the author, sidesteps the real need. The student with technical strength is neglected while something very definite is being done for the strongly commercial-minded engineering student. The student to be classified in between these two types is getting a "laissez faire" treatment which neither makes for building his stature technically nor commercially. Some day perhaps the engineering college will be organized like industry with a vice president in charge of production and a vice president in charge of purchasing and marketing. A dean will be used to assume the responsibility for quality of curriculum and standards of instruction as now. Still another dean coordinate in responsibility and importance will busy himself with the quality of the raw product coming to the engineering college from the high schools, the development of the personality and professional strength of the students in the educational process, and the marketing of the finished engineering product to industry, and if the proposal made here bears fruit, with the guidance and development of the product leaving the college through the junior engineer period to a mature professional level.

The curriculum leading to the administrative degree is a fine step in the right direction, but leaves the bulk of the engineering product ripe for the guidance and aid which the proposal made in this report will bring.

A great deal of material has been collected, a great part of it has been analyzed, many interviews have been made, and a great deal of thought has been given to the subject discussed. A chart showing the curricula relating to mechanical engineering analyzed in Wisconsin credits to show the relative business study content, content with respect to English and the humanities, professional work and foundation studies for some of the "Big Ten" schools of the Middle West is new and accompanies this treatise. The background for the building up of the conclusions of this report have been fairly well expressed in a series of reports to Dean Turneaure, the content of which it is impracticable to include here.

Whether the idea of a floating curriculum meets with the approval of the University of Wisconsin or not, whether the Engineers' Council for Professional Development can see in this plan a sound "going concern" plan for adoption for its professional training needs or not, whether the engineering societies and industry can approve the extension of the influence of the university into the post school field or not—the problem will remain and ultimately a plan of the nature suggested seems inevitable as the next step in engineering education.

WITH THE SOCIETIES

TAU BETA PI

At a banquet held in the Memorial Union Monday, April 5, Tau Beta Pi, national all-engineering honorary fraternity, inducted its second semester initiates into the organization. The toastmaster was Dr. Ivan S. Sokolnikoff, who kept the program rolling merrily along with a "few well chosen words" at appropriate moments. President Gerard Rohlich welcomed the incomers and Paul Ketchum responded for the initiates. The address of the evening was given by Paul G. Jones of the School of Music who gave a demonstration-lecture on the Hammond electric organ and contrasted it with other pipe organs in its price range.

The initiates are, seniors: Edwin J. Voss, Russell Langteau, and Russell Poyner; juniors: Peter S. Sarocka, Robert B. Hopkins, Glenn C. Krejchik, John W. Marston, Everett Utecht, Frederick J. Krenzke, William W. Humphrey, Paul M. Ketchum, Leo A. Herning, Everett H. Davies, Carl E. Schultheiss, Harvey J. Hoge, Robert H. Berg, Henry K. Voigt, Ralph J. Harker, and Richard A. Boettcher.

MINING CLUB

The Mining Club held one of its meetings in the Mining and Metallurgy library on Wednesday evening, March 24. Several topics were discussed before the main topics of the evening were brought up.

Officers were elected, some of which are to officiate for the rest of this semester, as well as the next. Those elected were: Howard Grange, president, to succeed Wayne Hunzicker; and John Kildsig as vice president. Karl Klapka was elected secretary, and Herbert Geittmann, treasurer. John Yarnutoski was unanimously re-elected as mucker amid many cheers, and Nicholas Friesan was chosen as his assistant. Charles Schmidt was elected to preside in the position of Polygon representative.

The meeting was then adjourned, and the members gathered in small discussion groups as they partook of the refreshments.

PI TAU SIGMA

Pi Tau Sigma, honorary mechanical engineering fraternity, held its spring initiation banquet on Wednesday, March 31, in the Memorial Union. Prof. Ben G. Elliott presided as toastmaster. The president's welcome was given by Donald DeNoyer and the initiates' response by Frederick M. Johnson.

Dr. J. Lawrie, father of Jim Lawrie of Pi Tau Sigma and who is associated with the Schlitz Brewing Company of Milwaukee, was the main speaker of the evening with an excellent and fascinating speech accompanied with slides on termites.

The class of initiates were: Daniel Dobrogowski, Frederick M. Johnson, Arthur H. Krumhaus, Harold Leviton, Fred A. Loebel, Robert A. Sharp, and Everett A. Utecht.

A.I.E.E.

The student branch of the A.I.E.E. held a meeting in the Memorial Union on Tuesday, March 23. Prof. Miles Hanley of the English Department was the guest speaker for the evening. He gave a very interesting informal talk on sound recordings, speech analyzers, and the practicability of printing books on motion picture film.

A short business meeting was also held during which William Hafstrom was elected Sophomore Polygon representative. A committee was also appointed to bring nominations for the new officers at the next meeting, which will be held in April. Refreshments and informal discussions followed the regular business meeting.

CHI EPSILON

The Chi Epsilon spring initiation banquet was held March 31, 1937, in the Beefeaters Room in the Union. Prof. W. S. Kinne acted as toastmaster and Prof. J. H. Mathews gave an illustrated talk on crime detection.

The following men were initiated:

Seniors: Philip S. Davy, William H. Polk, Francis C. Wilson; Juniors: Frederick C. Alexander, Herbert E. Johnson, Glenn C. Krejchik, Milton O. Schmidt, Norman E. Van Sickle, Lyle F. Yerges.

EDITORIALS

ENGINEERING PERSONNEL GROUP

We greet with interest the announcement of the formation of the Engineering Personnel Group. Representing the collaborated efforts of a distinguished alumnus who has gained outstanding recognition in the handling of personnel problems in industry, of one of our own professors who came to us direct from industry, and of three of our undergraduates, the Engineering Personnel Group starts in with great hopes of becoming a force for good in our midst.

"The universe pays every man in his own coin; if you smile, it smiles upon you in return; if you frown, you will be frowned at; if you sing, you will be invited into gay company; if you think, you will be entertained by thinkers; if you love the world and earnestly seek for the good therein, you will be surrounded by loving friends, and Nature will pour into your lap the treasures of the earth."

—Anonymous

Briefly, it is aiming to foster closer contacts with industry for undergraduates and is committed to a policy of helping undergraduates realize their potential abilities and the resources of their individual personalities. The group is attempting to draw together those engineering students interested in the commercial phases of engineering, future administrative work, industrial problems and development of their individual personalities and capacities by establishing continuing channels for obtaining the best in guidance with respect to these problems. They plan to pursue through discussion, lecture, and interviews a definite program for the development of the personality and capacity of the individual student. Included in this program will be small field trips from time to time.

The aims of the Engineering Personnel Group are not new—the novelty of its attack lies in the attempt to work with a group of undergraduates who have an urge to make the most of their potentialities and seek first hand their knowledge from leaders in industry. The group proposes to hold all its activities open to the engineering college, but the keepers of its enthusiasm, the hands that will motivate its progress will be members of a small band bound together by mutual interest and carefully selecting its members on the basis of interest and personality ratings. The prestige, strength and success of the Engineering Personnel Group will rest in this governing council. If it can keep membership open in this council to all that are truly interested and limit membership only for reasons of unmanageable size, it would see that the Engineering Personnel Group is to be equipped with powerful motors to drive its program and philosophies forward.

ARE YOU GYPPING YOURSELF?

In the past few weeks, we have come to the conclusion that a fairly large number of the students in this school are "gypping" themselves—both now and for the future. A senior adviser pointed out to us recently that one of his pet peeves was the student who comes to class and never hands in an assignment. He mentioned a certain course, in which just about the only requirements for passing are regular attendance and turning in the written work and showed two students who have not turned in an exercise all semester. He summed up his discussion with, "And then in a year or so they'll be coming around wanting to use my name as a reference."

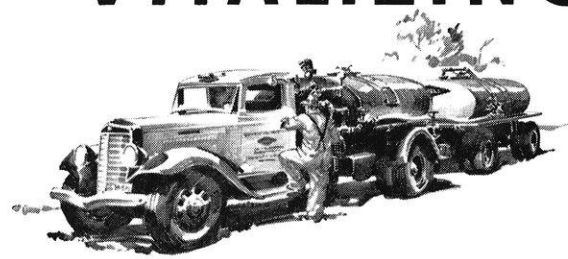
Has it ever occurred to you that by merely turning in the assigned work regularly you will get a reputation for dependability which will stand you in good stead later on? Do you know that when you turn in a piece of work at the time you say it will be in, you are adding another bit to your good reputation? Then, when you are in the market for a job, you will have no hesitancy in coming back to any member of the faculty for a recommendation—the faculty know what you have been doing in your last four years much better than any other group of persons could possibly know. These men won't lie about you to make a good-sounding recommendation; they couldn't or their statements wouldn't mean a thing after a year or so. They may not say anything about your bad points, just leave that part out and limit themselves to your known good qualities (if any), but an experienced personnel man (and all people hiring graduates are in that class) can spot a deficiency quickly when the recommendation does not mention some essential characteristic. What this man is looking for is a statement from your references—not merely a routine and tiresome statement of facts he already knows—but a statement that goes into your qualifications enthusiastically and points out why you would be a logical man for the job in hand. These are the kind of recommendations that the man who reads it will have faith in. Since you will want a recommendation that goes farther than the wastbasket, it behooves you to avail yourself of all the opportunities you have to build up your reputation for integrity and dependability.

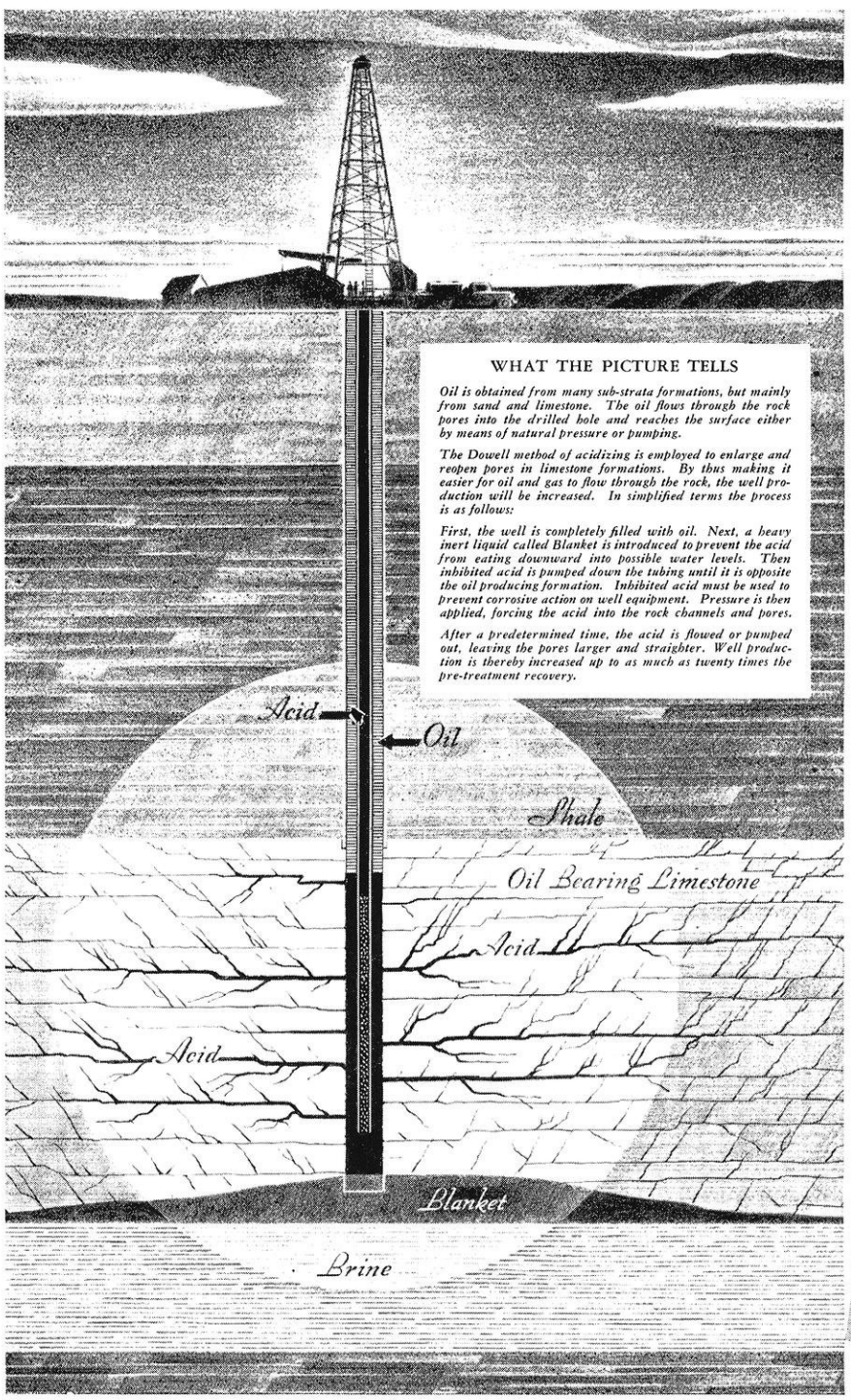
One of the ways is by handing in written work promptly.

SLIDE RULES

Why doesn't the faculty advise freshmen or sophomores of the type of log log rule that is best suited to their field? True, they all tell us that we can do everything we will ever need to do on a Mannheim, but they don't say that we could save lots of time with a "big" rule. Most students realize this soon enough and purchase a log log rule without any particular thought as to which type will best suit their needs. It serves them adequately as sophomores, but as juniors they may find that they should have a different type—a junior electrical needs a log log decitrig or vector, a log log duplex is no more useful than a Mannheim. The chances are they will turn it in on the one needed, but they have lost in the transaction. This extra expense could be avoided if the faculty would tell us in our freshman year what particular type of rule will be most useful to us.

VITALIZING OIL WELLS VIA *Chemistry*





WHAT THE PICTURE TELLS

Oil is obtained from many sub-strata formations, but mainly from sand and limestone. The oil flows through the rock pores into the drilled hole and reaches the surface either by means of natural pressure or pumping.

The Dowell method of acidizing is employed to enlarge and reopen pores in limestone formations. By thus making it easier for oil and gas to flow through the rock, the well production will be increased. In simplified terms the process is as follows:

First, the well is completely filled with oil. Next, a heavy inert liquid called Blanket is introduced to prevent the acid from eating downward into possible water levels. Then inhibited acid is pumped down the tubing until it is opposite the oil producing formation. Inhibited acid must be used to prevent corrosive action on well equipment. Pressure is then applied, forcing the acid into the rock channels and pores.

After a predetermined time, the acid is flowed or pumped out, leaving the pores larger and straighter. Well production is thereby increased up to as much as twenty times the pre-treatment recovery.

SO VITAL is petroleum in our highly mechanistic age, that it might be said a nation's sword of Damocles is no longer suspended by a thread but by a drop of oil.

Since the days of Colonel Drake who gave America its first commercial oil well in 1859, the discovery and production of petroleum has constituted one of the most vivid chapters in our national development.

Billions of barrels have flowed from the earth's depths in close to one-half of our states—and there is little question that this abundant resource has literally oiled the wheels of American progress.

But, despite our apparently bountiful supply, both known and yet to be discovered, the need for more efficient and conservative production of petroleum has been long regarded as essential.

A sizable stride in this direction was taken when, five years ago, Dow brought to the oil-producing industry through its subsidiary, Dowell Incorporated, a specialized chemical service for oil wells.

Whereas formerly, through natural and mechanical means, oil producers extracted approximately twenty per cent of the potential petroleum accumulation, by putting chemistry to work they stepped recovery up to double, and even triple this amount.

Stripped of technicalities, Dowell undertakes through special acids and chemicals to overcome natural barriers to greater oil production in areas where oil is produced from limestone or dolomitic formations. To render this service, Dowell maintains headquarters at Tulsa, Oklahoma, and a complete field organization located in the principal oil fields.

To date it has treated over 9,000 wells, resulting in approximately $50,000,000 gain to the oil industry. In servicing these wells, Dowell trucks and cars have traveled 4,500,000 miles and its treating engineers have handled over 15,000,000 gallons of special acid.

Thus, Dow research and chemical application reaches out into another channel of usefulness—promoting and developing the value of a great national resource.

THE DOW CHEMICAL COMPANY
MIDLAND, MICHIGAN

Branch Sales Offices: 30 Rockefeller Plaza, New York City
Second & Madison Sts., St. Louis • 135 S. LaSalle, Chicago

DOW

CHEMICALS INDISPENSABLE TO INDUSTRY

G-E *Campus News*

IN EVANSVILLE

Into the flood zone several General Electric engineers—among them Henry Duval of Washington University, Eugene Darlington of Oregon State, and Harold Towlson of Clarkson Tech—took two radio-equipped police cars and played an important part in the relief activities along the Ohio Valley. The equipment included a two-way ultra-short-wave police radio set in each car, a 50-watt headquarters transmitter, and a 150-meter transmitter having its own gas-engine-driven electric generator—in reserve in case of power failure.

One of the engineers reported, "We arrived in Evansville and erected our antenna on the 75-foot tower of a bank building. We were on the air continually, rendering service to the flooded area."

In a further effort to aid flood victims, General Electric sent extra men to the G-E Service Shops in the affected area to speed repair work.

IT'S "NEW AMERICAN"

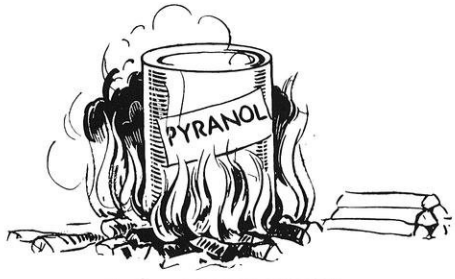
Conceived by General Electric, the "New American" home promises to influence profoundly the trend in American building. The program is sponsored in co-operation with all those professionally interested in building new and better homes.

The modern kitchen is one of the results of this work. It has been changed from just a room where a variety of tasks must be performed to a scientifically planned workshop. It is equipped with electric appliances which do the drudgery of kitchen work silently and easily. The electric range, refrigerator, dishwasher, Disposall unit, and modern lighting are but examples of the improvements which have been made in the home workshop.

The radial wiring system used in the "New American" home was designed for safety and convenience. Plenty of outlets for lights and for appliances are the outstanding features of this system.

The home is thoroughly air conditioned. Conditioned air is not only more comfortable but also more healthful, and the G-E air-conditioning units have been designed to promote such conditions.

With the elimination of wasted space, steps, and time throughout the entire dwelling—with the maximum in health, comfort, and economy—the "New American" home is building a brighter future for the cottage and the mansion.



IT WON'T BURN

Noninflammable and nonexplosive, this new cooling and insulating liquid, Pyranol, was developed by General Electric for use in transformers, capacitors, and cable. Its unusual characteristics have been recognized by the National Electrical Code, making it possible to install transformers indoors and at the load centers, without fireproof vaults. This results in savings in secondary copper and installation costs.

Pyranol is chemically stable and does not sludge, a feature which minimizes maintenance. Experience to date has showed that the materials used in Pyranol transformers have a longer life than under oil. The result—longer transformer life.

Pyranol transformers were first used in 1932, and now more than 700 units, totaling more than 200,000 kva of transformer capacity, have been installed, all giving excellent service.

96-375DH

GENERAL ELECTRIC