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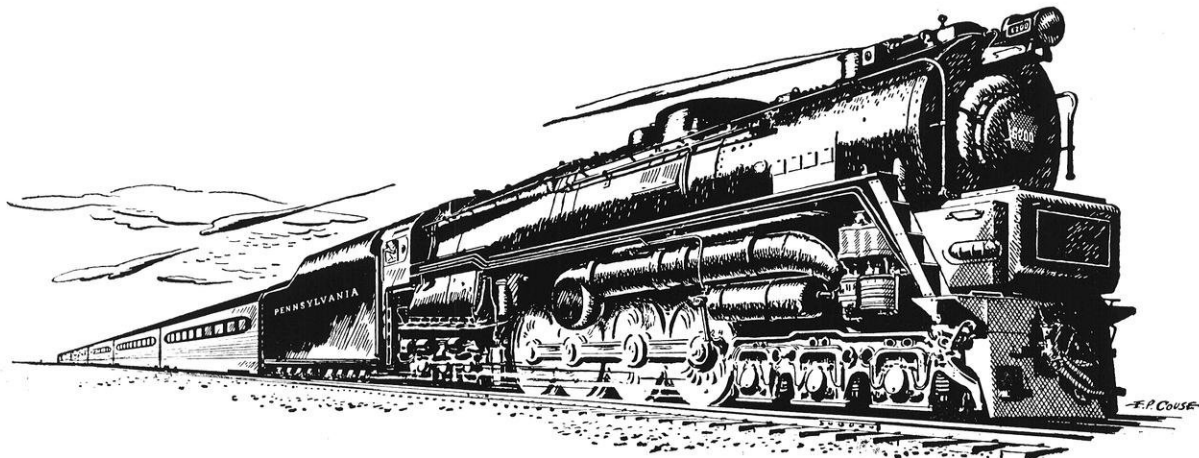
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WISCONSIN ENGINEER

March, 1945

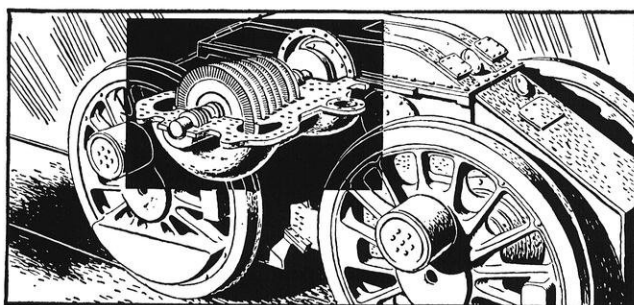




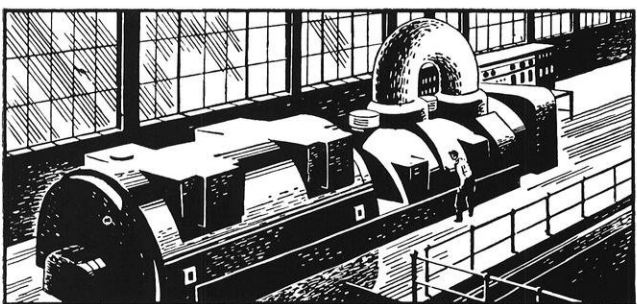
This Newest Locomotive *is Powered Like a Battleship*



LONG AGO successfully developed by Westinghouse for ocean vessels, the *steam turbine* has now been harnessed as a brand new type of smooth, efficient motive power for modern railroad locomotives.



THE WESTINGHOUSE steam turbine in the Pennsylvania Railroad's new direct-drive locomotive is *no bigger* than a household electric refrigerator—yet it will haul long passenger trains with ease.



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THE VELVETY FLOW of power from this 6,900 horsepower *steam turbine* locomotive will make trains run with extra smoothness and is a major contribution to finer transportation for the future.

THE RAILROADS are developing a dazzling new kind of transportation for the future. The latest and most dramatic improvement is *steam turbine* power, which gives the Iron Horse "new lungs."

To help produce this new locomotive, the Pennsylvania Railroad, a long-time pioneer in transportation improvements, turned to Westinghouse and the Baldwin Locomotive Works. Working as a team, these companies have produced this latest in a great line of

steam locomotives—descended from "Old Ironsides," built by Matthias Baldwin in 1832. *Westinghouse Electric & Manufacturing Company, Pittsburgh 30, Pennsylvania.*

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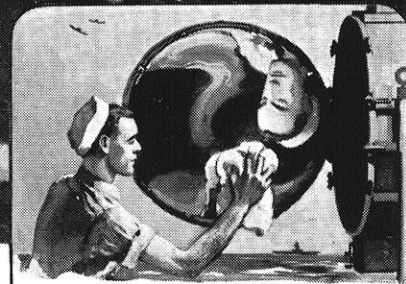
LIGHT ON THE RISING SUN

UNCLE SAM'S NAVY has the most efficient searchlights on the Seven Seas. They are so powerful that one of them measuring 24 inches across can shoot a beam of light through 23 miles of inky darkness.

The reflectors of these searchlights are made of an alloy perfected and produced by HAYNES STELLITE COMPANY, a Unit of UCC.

The Navy is using this Haynes Stellite alloy for several reasons. It will not shatter from shock of gunfire. It has high resistance to corrosion by salt air, salt spray, powder and sulfur fumes. It withstands the terrific heat of the arc light—and hot particles of copper and carbon from the electrodes do not cause it to pit and lose its

reflectivity. Searchlight reflectors are indicative of the many applications to which Haynes Stellite alloys—with their unique combinations of properties—can bring more efficient performance.



Keeping Navy searchlight reflectors spotlessly clean is an unending job. The Haynes Stellite alloy, from which many reflectors are made, is so hard that constant cleaning and polishing will not mar its surface.



Haynes Stellite alloys have long been used for scientific mirrors, surgical and dental instruments and other equipment requiring great resistance to corrosion, wear and heat. Unending research by UCC is constantly adding to the variety of these alloys. They can be produced in many exacting shapes—in quantity—and delivered ready for assembly without further finishing.

Consulting engineers, production managers, educators and designers are invited to send for booklet P-3 describing the properties of Haynes Stellite alloys.

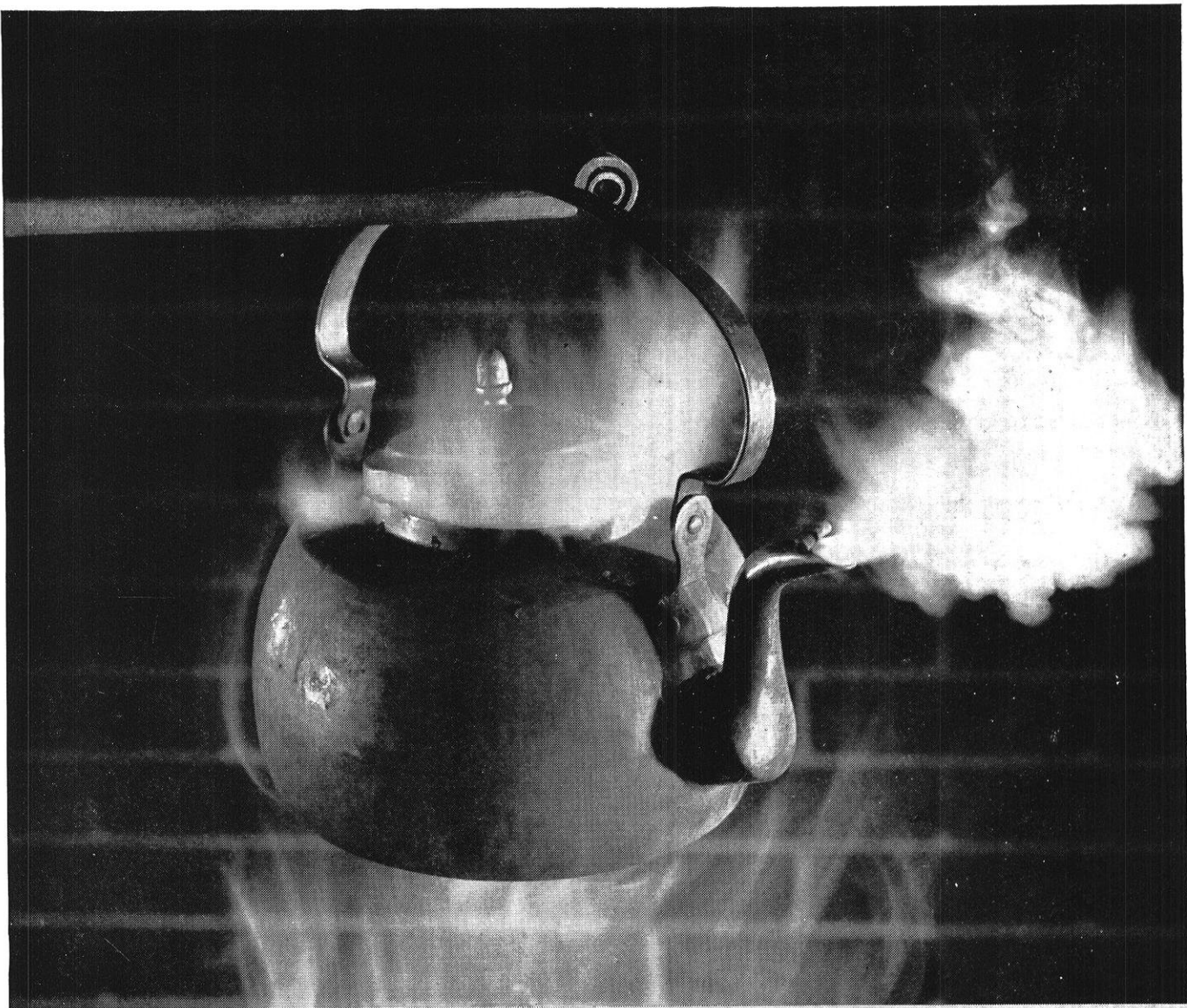
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STEAM jiggled the lid of many a kettle before James Watt asked why . . . and went on to make steam work an engine that helped touch off the Industrial Revolution.

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Possibly you haven't used plastics for as many applications as you profitably might. Perhaps you

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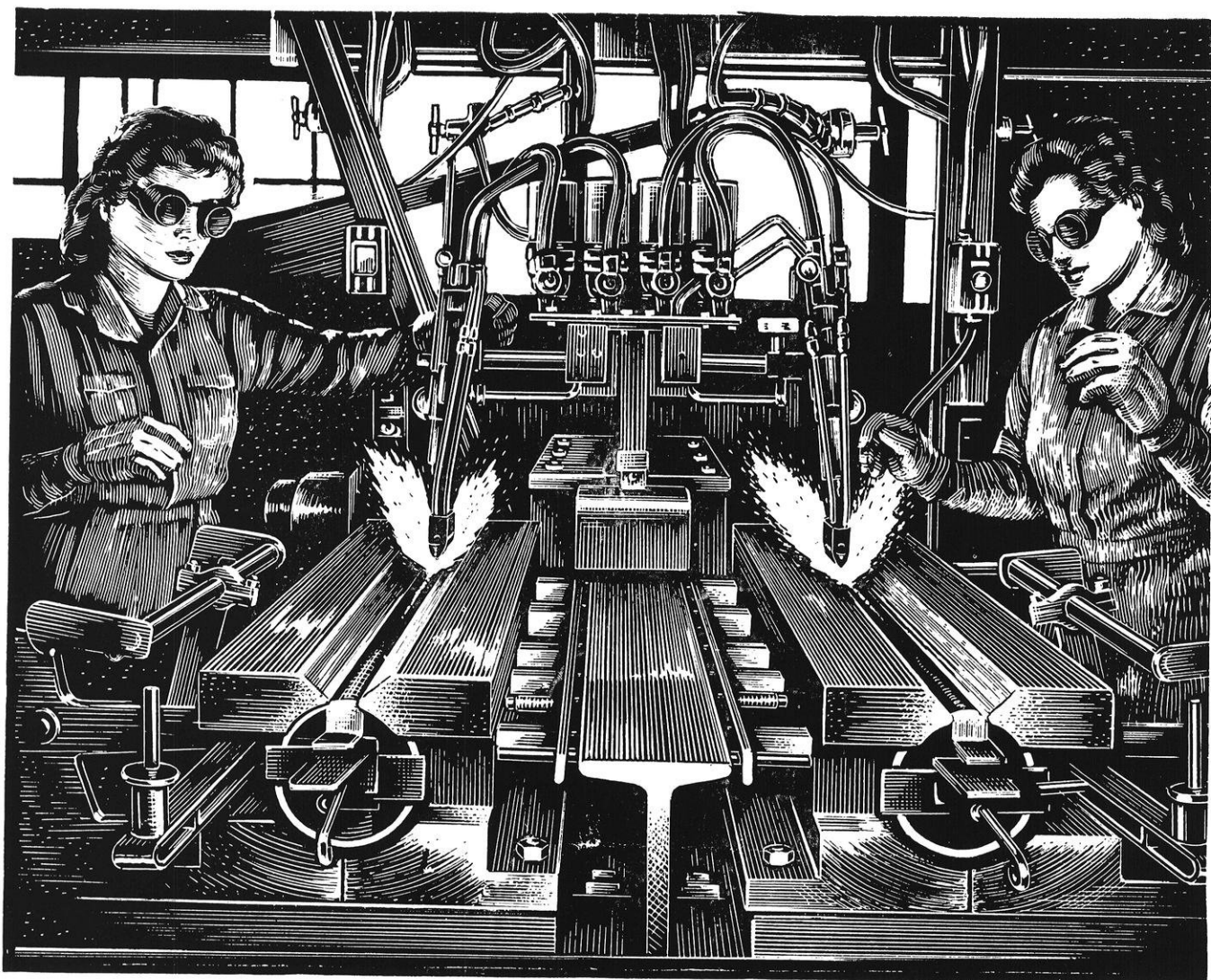
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This mechanical welding operation—developed in wartime by Airco Engineers—presents interesting opportunities for postwar manufacturing. It

combines unusual speed with a high degree of weld uniformity, features that make for increased economy and reduced rejects

For additional information on Airco oxyacetylene flame and electric arc processes, write for a free copy of the interesting publication "Airco in the News". Address your request to Dept. CP, Air Reduction, 60 East 42nd Street, New York 17, N. Y.

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THE WISCONSIN ENGINEER

An Introduction To This Issue

A NEW CHAPTER has begun in the College of Engineering with the inauguration of a new semester. Registration for some was the beginning of something new and different, for others it marked the passing of another turn, and for others it meant the beginning of the last lap. Which ever one it is, good luck to you!

But now let's take a look at this issue of the ENGINEER. The first two articles this month, on Better Photographic Plates, and Tropical Disease, were originally written as entries to the annual Westinghouse Talent Search contest, conducted each year in the high schools of the country. Two of the finalists from each of the previous three years have come to the University of Wisconsin. In each of the next three issues, we are printing two of these essays. This month they are "Better Photographic Film" by Paul Frederick Cranefield, Jr., and "Tropical Diseases" by Janet Mary Jacobson, both 1942 finalists. The other finalists were: for 1943, Elizabeth Ann Lean and Virginia Ellen March; for 1944, Ruth Hilda Miles and Wayland Evan Noland. For the essays we wish to credit Science Service.

Also this month, Don Hyzer introduces you to three more "profs," and not forgetting St. Pat's Day, is an article by Harry Hanson which is a history of St. Pat brawls and happenings since they began on the University of Wisconsin Campus. It also tells of the achievements of St. Pat which made him the first engineer.

A faculty article by Professor J. B. Kommers who has done extensive research with testing of materials, is "The Endurance Limit in Fatigue Can Be Altered."

Ralph Watson, a comparatively new staff member and one of the few in mining and met, has written a good article on "Rubber Pants for Machine Tools" found on page 13.

Remember the Pratt-Whitney girls, any of you fellows? Mel Sater has gathered some material about them—their present work, etc., and has presented that in a short article.

And then, there are the regular features of Campus Notes and the "Short Circuits."

So, let's turn the page and see what we have—



WISCONSIN ENGINEER

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In This Issue . . .

COVER . . .

A tiny power line is struck by three million volt man-made lightning in the Westinghouse high voltage laboratory at Trafford, Pa., enabling engineers to learn how to better protect actual electric transmission systems against real lightning. In this picture, lightning strikes a protective wire which carries no electric power but is connected to ground to detour "uninvited bolts." Even the cows shown here are man-made. —Courtesy Westinghouse

FRONTISPIECE . . .

Industrial scene. —Courtesy General Electric

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BETTER PHOTOGRAPHIC FILM

—Paul F. Cranefield, Jr.

PHOTOGRAPHIC FILM combining the qualities of speed and definition would prove of value in aerial photography and in Signal Corps work.

In daylight aerial photography such film would present several alternatives as to its use. Used in the regulation size aerial camera the speed would permit stopping down of the lens, with consequent gain in detail. The power of definition would register the detail more accurately. In aerial mapping and camouflage detection the gain in detail would be of great value.



Photography . . . an art, a science, a business, a hobby — even a weapon of modern warfare.

Film of greater definitive power would also permit the use of smaller cameras, lenses and other equipment. Using a small film of high quality, the results would be comparable to those obtained with a larger film of poorer quality. Due to the need for lens glass and precision equipment, smaller cameras would put less strain on production facilities.

In night aerial photography fast, fine grain film would permit the use of smaller stops or less flash powder.

In the general Signal Corps work this film would be of

value for the same reasons, and it would also be a boon to amateurs after the war.

The present status of such films is that the power of definition and the lack of graininess seem to be in approximately an inverse proportion to the speed. There are films, such as those used in 35 mm. copy work, which are very fine-grained and have excellent definition, but they are very slow. The Weston speed of a very fine grain copy film is .25. There are rapid films, but they are grainy. Some news films have ratings as high as 100, or higher, 2,500 times as much as the slow films.

From these fast news films, however, news photographers claim very large enlargements can be made without grain, through the simple process of enlarging while the negative is still wet from the hypo bath.

A tentative explanation is as follows: In the wet film the grains of silver may be thus—; when the film dries, they "clot"—, preserving the areas of lightness and darkness but forming a less fine image. Obviously a straight line like this is more clear than one like this Of course, it is possible to make at least the original prints from a wet negative, but this process may be harmful to the negative, may obscure some detail in itself, and is temporary, since the negatives cannot be stored wet.

In "Kodachrome," Eastman color film, there is less grain, partly because the silver image, after the negative is dyed in proportion to the silver deposit, is dissolved out in silver remains as in a dye which does not clot or form "grain". If a dye were found which, possibly with a mordant, would dye the film in direct proportion to the silver deposit, the dye could be applied after developing the film, and the silver deposit dissolved out. Variations on the "Kodachrome" dyes might work. The reclaimed silver would, incidentally, provide an offset to the expense of this process. It is possible, however, that detail would be lost in the dyeing process.

If a chemical which would "set" the reduced halides quickly could be found, it might solve the problem, as it seems that it is in the customarily slow drying process that the clotting occurs. Films dried rapidly (2 minutes) with an infra-red lamp have less grain, but this process is by no means satisfactory, at least, in the experiments of my friends and myself. Furthermore, under any sort of

(please turn to page 26)

TROPICAL DISEASES

—Janet Mary Jacobson

AMERICA must win the war! To do this it is imperative that she make every provision for maintaining a high standard of physical fitness among soldiers and sailors. This means not only medical care given by army doctors, but extensive research on problems of military medicine. Startling therapeutic advances have been made in the last few years, and it seems probable that newly discovered chemo-therapeutical and biological agents will be the doctors' greatest weapons against disease and infection.

In the sulfonamide group there are three drugs particularly adaptable for military use. The first two, sulfadiazine and sulfathiazole, can be used to combat pneumococcal infection. The third, sulfanilamide, is deadly in its effect against gas bacillus and anaerobes in wounds. Although complete statistics are not available, we already know that these drugs saved countless lives and limbs after the attack on Pearl Harbor. In military use the sulfonamides present

himself; second, that if the wounded soldier cannot take the drug himself, he be removed from the field quickly, so that the right drug may be administered by others. Since military strategy may make the removal impossible,



JOB FOR THE MEDICALS—The battle of science isn't finished when the last shot is fired. It must still be fought in hospitals and research laboratories if wounded soldiers, like the one depicted in this drawing by Coast Guard Combat Artist Norman M. Thomas, are to be restored to life and usefulness. Disease, too, must be combatted constantly.



FIRST AID ON IWO JIMA—The purpose of saving lives and relieving suffering is fully as vital as learning new ways of administering death. Here a wounded marine is treated by medical corpsmen in the "coffee grounds" sand on Iwo Jima, shortly after the first wave stormed ashore on armtracs and Coast Guard-manned landing boats. Marines of the Fourth and Fifth Divisions came in from the mighty Navy task force which bombarded the volcanic island before the assault.

the serious problem of administering the drug soon enough to obtain maximum results. There are two solutions to this problem: first, that each soldier carry, in a container, a prophylactic dose which he can administer to

some certain way must be developed for administering the sulfanamides immediately under medical supervision.

Another problem facing medical science is the isolation of influenza viruses. Influenza and resulting pneumonia are such serious diseases when encountered in wartime that it is vitally important that vaccines be developed to prevent epidemics. To do this the isolation of more of the influenza viruses is necessary. At the present time three types, A, B, and C, are known, but only fifty per cent of all influenza cases are attributable to these three viruses. This isolation of more influenza viruses offers a tremendous challenge, since it is estimated that influenza vaccines could rate first in medical armament.

Vitamins present another challenge to medical science. They have been the topic of widespread, indiscriminate conversation and fantastic claims. Close investigation reveals, however, that there are four major questions still unanswered.

1. What is the normal vitamin requirement for the average individual?

(please turn to page 21)

Humanitarian ---St.

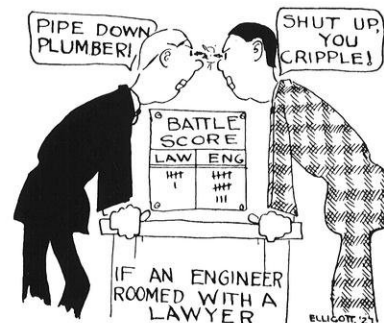
FOR SEVERAL YEARS now the waters of Lake Mendota have not been disturbed by the unceremonious dumping of offending students who happened to be enrolled in the wrong school (i.e., Engineering or Law), the gentle lake breezes have carried no telltale aromas of aged hen fruit about the campus and the fair city of Madison in general, and peaceful calm has reigned over the lower campus and State street. Since the truly wild and woolly parade that was held in 1938, no appreciable celebration of this type has been in evidence, and homage has been paid to the eternal engineer by only our annual St. Pat's ball.

St. Patrick, the engineer of all engineers, became famous in the days of yore, when, as a very able man, he rose from the ranks of the common people of Ireland and rid that beautiful isle of two black mars upon its landscape: snakes and lawyers. Elimination of the latter marked our hero as a great humanitarian, and his prowess as an engineer was soon displayed by many remarkable feats. He first won wide recognition and acclaim with his invention of a worm drive gear, with an enlarged unit of which he drove the snakes out of Ireland, case books, walking sticks and all. Thus began sanitary engineering. His next major accomplishment was to survey the roadbed and pave single-handed the highway to Hades, and its performance in bearing the huge burden of shyster traffic testifies to the quality of the job. Another important contribution to the engineering world was his invention of the can-opener, for the avowed purpose of relieving beer cans of their contents. During spare moments while working on these projects he also invented calculus (don't blame him—EE was yet unknown) and the renowned left-handed monkey wrench, and all the while conducting extensive research on cooling systems because he was so fast with his slide rule that said rule had to be water-jacketed to keep it cool enough for efficient use.

Even though St. Pat had accomplished these wondrous tasks impossible for anyone but a full-fledged plumber, it was not until 1903 that any engineer realized that it was only fitting and proper to pay homage to this illustrious person. The first celebration in his honor was held at the University of Missouri in that year, when engineers enlisted in the "Guard of St. Patrick", and proceeded to

disrupt classes and parade around town carrying with them what they thought to be the original Blarney stone. (They apparently didn't know that nine years later the engineers at the University of Wisconsin produced the one and only original Blarney stone.)

The Wisconsin engineers first celebrated St. Pat's day in 1912, when the Blarney stone was placed in an open carriage drawn by four white horses and paraded all over the city. Not much information is available regarding celebrations between 1912 and 1919, but in 1920 a parade was



held that really did old St. Pat justice. A clear day and a large crowd insured the success of the promenade, which was led by a forty piece band composed entirely of engineers. Next came the conspicuous and meaningful snake, followed by St. Pat in a stately vehicle drawn by perspiring freshmen. Then came the Blarney stone and many floats, of which the best was the "wrench" that screwed the Law School "nut" off the "bench".

In March of 1921 the parade outdid anything ever shown before, and many original and unique ideas were displayed. Among these were the "Phantom Band", which was merely a radio and a wireless sending set in Sterling Hall, and a Mechanical Cow, which was milked by using her tail as "ye olde towne pump".

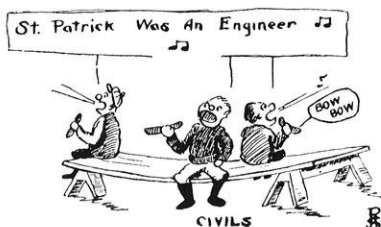
The celebration of 1923 was marked by kidnapping, a libel suit, and a considerable number of editorials in the Cardinal. The lawyers waylaid the engineer elected to represent St. Pat and carried him off to Middleton, but, since capable engineers are far more numerous than honest lawyers, a substitute was easily found and due respect was

Engineer Pat

—Harry Hanson, ee'46

paid St. Pat. A libel suit loomed when a local dance hall proprietor threatened to sue the A.S.C.E. for obvious reasons, but all was forgiven when a public apology was printed in the Cardinal.

March 28, 1925 was a perfect day for the procession and the attendance was very large. Even the shysters turned out, although events soon proved that they were there for the usual rowdy purpose. When the procession was half way down State street, the engineers met a most concentrated barrage of well-ripened hen fruit thrown from



storetops, which were easily and quickly scaled by the vengeful plumbers. Because the aim of the lawyers was no better than their judgment, however, much bad feeling was caused when the clothing of innocent bystanders as well as that of paraders was ruined. State street had to be thoroughly flushed off and cleaned by the fire department because of the unsavory aroma, but the parade returned via Langdon street and the engineers repaid the lawyers manifold when the shyster fraternity houses became the target of able right arms.

In 1926 an effort was made to avoid a recurrence of the 1925 incident and despite bad weather the parade was successfully carried out without lawyer interference. The parade of '27 was blessed by perfect weather and was highly successful, this being the first year that St. Pat rode in an automobile instead of a "coach and four". The parades of '28 and '29 were relatively unnoted and in 1930 the celebration was banned by the Polygon board because they feared a repetition of the 1925 affair.

Violent feuding broke out in 1933 when the lawyers had the fortitude to say that St. Patrick was a lawyer. To put the shysters in their place, the engineers padlocked

that infamous red building and the lawyers had to use the basement entrance while the janitor laboriously filed through a chain which contained a lead link that could easily have been pulled apart. Before the parade, however, a treaty was made between the hitherto irreconcilable foes and the parade was the most successful ever held. Surprisingly, the shysters kept their word.

The parades of '34, '35, and '36 were of the usual sort with little fighting, although the trees in front of the Law building blossomed with beautiful green tissue and midnight raiding parties became the social vogue. In 1937, however, a more successful parade was held with the usual interruptions at Langdon hall and a short skirmish at the Armory. An additional stop was made at a certain shyster fraternity.

A year to be remembered by all engineers and forgotten by all lawyers was 1938, for the celebration of that year was the rowdiest, bloodiest, but altogether most successful ever staged in the history of St. Pat. The parade's personnel was the largest ever, and the floats displayed were outstanding exhibits. The large-scale annoyances caused by the lawyers were insufficient to stop the huge parade, which was rerouted several times by police to avoid fights. Efforts to preserve peace were unsuccessful, however, and a huge battle royal took place on State street.

A truce was declared in 1939, and this, together with the damper placed upon celebrations by the high powers, resulted in a peaceful parade, except for the usual brief affair at Langdon hall, where the unappreciative girls tossed bags of water from the rooftop.

In 1940 and '41 the engineers overlooked the troublesome lawyers and paid homage to St. Pat in an entirely different fashion. All efforts were concentrated on making successful the Engineers' Expositions of those years, and their efforts were richly rewarded.

These celebrations have naturally fallen off during these wartime years because the male student population has decreased, and because of the preoccupation of the students in other affairs. Only the annual St. Pat's dance has marked the day when the greatest of all engineers is celebrated, although there still are incidents to fan the old flame of rivalry . . .

Meet the Profs

—with Don Hyzer, me'46

FOR you to meet the professors, yours truly went out and met the following three L.&S. instructors in the College of Engineering. So that you might be introduced, or get to know them better here are the results of the interviews and other data collected.



Mrs. Sokolnikoff

As an emergency instructor, Mrs. I. S. Sokolnikoff is now teaching mathematics to Engineering students while her husband is doing government work in New York. She combines instructing with housework, which includes shoveling the sidewalks, and caring for Thor, an Irish Setter. The speed and accuracy with which she puts math on the blackboard and into the heads of the students, combined with the regularity of her quizzes make her famous.

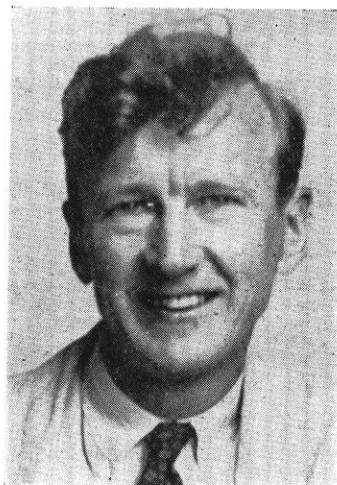
After spending her childhood in Providence, R. I., Mrs. Sokolnikoff attended Brown University. While in college she was business manager of the yearbook. She graduated in 1923 and received her Master's Degree the following year. The state of Texas welcomed her then and she taught at the University of Texas for one year and at the Texas Technological College for three years. Mrs. Sokolnikoff then came to the University of Wisconsin for two years on a fellowship, and during the stay met her future husband. After receiving her Ph.D. she returned to Texas for one year. But "absence makes the heart grow fonder," so she came back to Wisconsin in 1931 and became Mrs. Sokolnikoff.

No doubt a wonderful wife, Mrs. Sokolnikoff insisted on talking more about her husband than about herself even to the point of wanting to have his picture put in this article instead of one of herself.

* * *

Known around the campus because he and his wife chaperon many student parties and dances, Professor C. H. Sorum spends the day instructing in chemistry.

He left his father's farm in Minnesota after graduating from high school when he was fourteen years old to attend St. Olaf College. After changing his mind about wanting to be a minister, he took a general course with a science major. Prof. Sorum then got a fellowship from M.I.T. and received a degree in chemical engineering in 1920. While working with an oil company in Oklahoma, he had an accident which made him stay out of chemistry for several years. To fill in the time he first went to the University of California where he studied landscape architecture until he found that he could not draw. From there



Professor Sorum

he went to the University of Minnesota where he studied law. Deciding to earn some money, Prof. Sorum went to South Dakota where he coached athletics in a small high school for two years. One of his basketball teams went into the state finals.

Returning to chemistry, Prof. Sorum took an assistantship at the University of Wisconsin and earned his Mas-

ter's Degree in 1927 and his Ph.D. in 1929. He became an assistant professor in 1931, a full professor two years ago with the associate professorship coming somewhere in between. He has taught chemistry course and chemical engineers for five years. Although he would rather teach he has done research on magnesium and colloids. He is a member of several fraternities and societies.

Once given up for a confirmed bachelor, Prof. Sorum married one of his own students eight years ago and now has two "very sweet children."

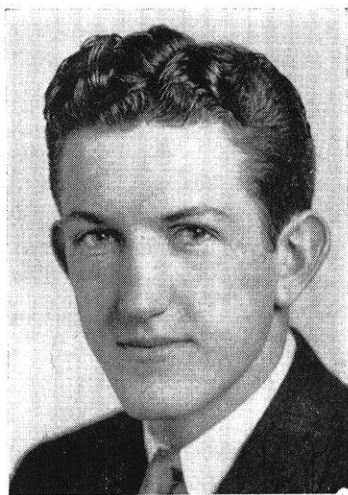
His favorite sport is baseball and he would play it rather than do research. He plays lots of tennis and goes to the armory twice a week to play handball and badminton.

When "the first time I ever had a student in my class become a father," Prof. Sorum took time from his lecture to present a gift from the students to the new son.

Although lecturing a rather factual course he, with Mr. Tolifero's help, make the lectures interesting and the atmosphere friendly.

* * *

"When I take my daughter to the Union she says, 'Let's go to the poolroom and meet some of Daddy's sailor students'," "Sailors in the Union" is just one of Mr. Leonard H. Rall's favorite subjects in Economics lecture.



Mr. Rall

Mr. Rall was born in Nebraska and went through school there. While in high school his school had the state championship in basketball and football. Although he got his letter as a substitute end on the football team, he is proud of it because the fellow he substituted for became an All-American in college.

After attending Doane College for one year he went to the University of Nebraska where he was on the track team and played clarinet in the band. Mr. Rall received

(please turn to page 21)

Rubber Pants For Machine Tools

—Ralph Watson, m&m'46

ONE of the most time-consuming operations involved in much industrial electroplating and painting has recently been relegated to the limbo of out-dated practices. Rubber masks have replaced former methods of masking machined parts prior to painting or plating.

Standard masking practice has been to mask parts by dipping or spraying them all over with wax or lacquer, then cutting away those portions of the coating where plating or paint was desired. Another method used to a large extent consisted of covering the gear or shaft to be finished with masking tape except for areas to be painted. This procedure was applicable only to painted parts because the tape could not prevent a plating solution from leaking under the edges. These methods are slow and tedious, taking much time to apply the protection and still more to remove it after parts are plated. Cleaning of finished part is always needed.

Precision-molded masks of rubber have now been developed that reduce time of application and removal to a minimum. Being pliable and elastic, they slip on and off even oddly shaped products as easily as the rubbers for your shoes. In one plant at which 15 men were employed to apply a protective coating of wax, the same work is being done by five men using rubber masks. Another manufacturer plating a small portion of a five inch pinion gear found that masking time could be reduced from 35 to 40 minutes using wax to 2 to 3 minutes with the new rubber mask.

Although the new method is principally a time saver, better quality with fewer rejects is an important byproduct. A tiny hole in a wax coating can let the plating solution through and spoil an expensive bearing. Overheated solutions may cause the wax to melt and run, covering up a portion of the part which should be plated. Neither of these disasters can occur with the molded rubber mask.

Special formula rubber has been developed to handle all kinds of metal plating except chromium. One type is especially for bright nickel and silver plating. Another is best for cadmium, lead, tin, zinc and copper. Different degrees of hardness may be obtained to suit individual conditions. Soft, form-fitting strips are used to cover gear teeth while a hard rubber plug will mask a hole and pro-

(please turn to page 23)

The Endurance Limit In Fatigue Can Be Altered

—Prof. J. B. Kommers, mechanics department

IN 1920 there was still discussion on the question as to whether engineering materials, especially steel, had an endurance limit. By endurance limit is meant the maximum unit stress to which a material may be subjected for an indefinitely large number of repeated stresses without failure. From 1920 to 1921 experiments were carried on at the University of Illinois by Professor H. F. Moore and the author in which all specimens that did not fail were subjected to a standard run of 100 million cycles of stress. These experiments on quite a large variety of steels, both heat treated and not heat treated, proved that these materials had an endurance limit.

The solid curve in Figure 1 shows how the endurance limit of a material may be determined. A specimen is put in a repeated stress testing machine and tested at a fairly high stress until it fails by cracking. This kind of failure is called a fatigue failure. The result of the test is plotted on an S-N diagram in which the unit stress to which the specimen was subjected is the ordinate, and the number of repeated or reversed stresses required for failure is the abscissa. Successive specimens are tested at lower stresses until a specimen is found that does not fail. This is shown on the S-N diagram by the curve becoming horizontal. For steels it is usually sufficient to carry out the test to 10 or 20 million cycles to determine the horizontal part of the curve. The unit stress corresponding to this part of the curve is called the endurance limit for the particular

kind of stress cycle employed. For stresses less than the endurance limit the material will not fail no matter how many cycles of repeated stress are applied. For Figure 1 the specimens were rotating beam specimens, in which the stress on the outer fiber was subjected to complete reversal from tension to compression for each revolution of the specimen. The speed of rotation used in the machine was 1750 revolutions per minute, so that 2.5 million cycles could be applied in 24 hours.

For some of the nonferrous metals the S-N curve does not become horizontal as quickly as it does for steels, and the maximum run to determine the endurance limit may be as high as 50 million cycles for brass. For duralumin the situation is still more difficult, and this material may show a small slope on the S-N curve even after several hundred million cycles.

There is nothing fixed and unalterable about the endurance limit of a material. The particular endurance limit which a steel may have will depend upon its previous history of stressing, heat treatment, and mechanical treatment. The endurance limit of an annealed steel may be low, but when this steel is quenched and drawn by proper heat treatment the endurance limit may be greatly increased.

Another method by which the endurance limit may be altered is by subjecting the material to cold work, such as cold stretching, cold squeezing, cold twisting, or cold rolling. Such cold work generally has the effect of increasing the endurance limit to some extent. If the cold work is such as to leave undesirable residual stresses in the material, a further improvement can be made by giving the material a low temperature anneal to remove most of the residual stresses.

On the other hand, sometimes machine parts are purposely given residual stresses by drastic
(please turn to page 24)

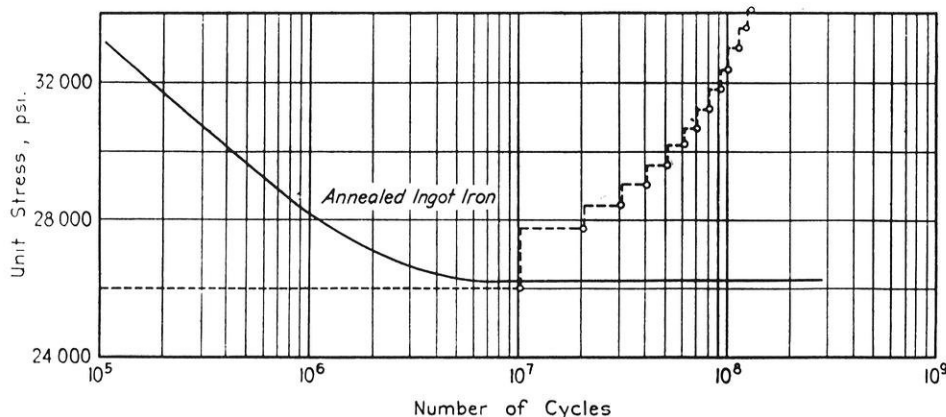
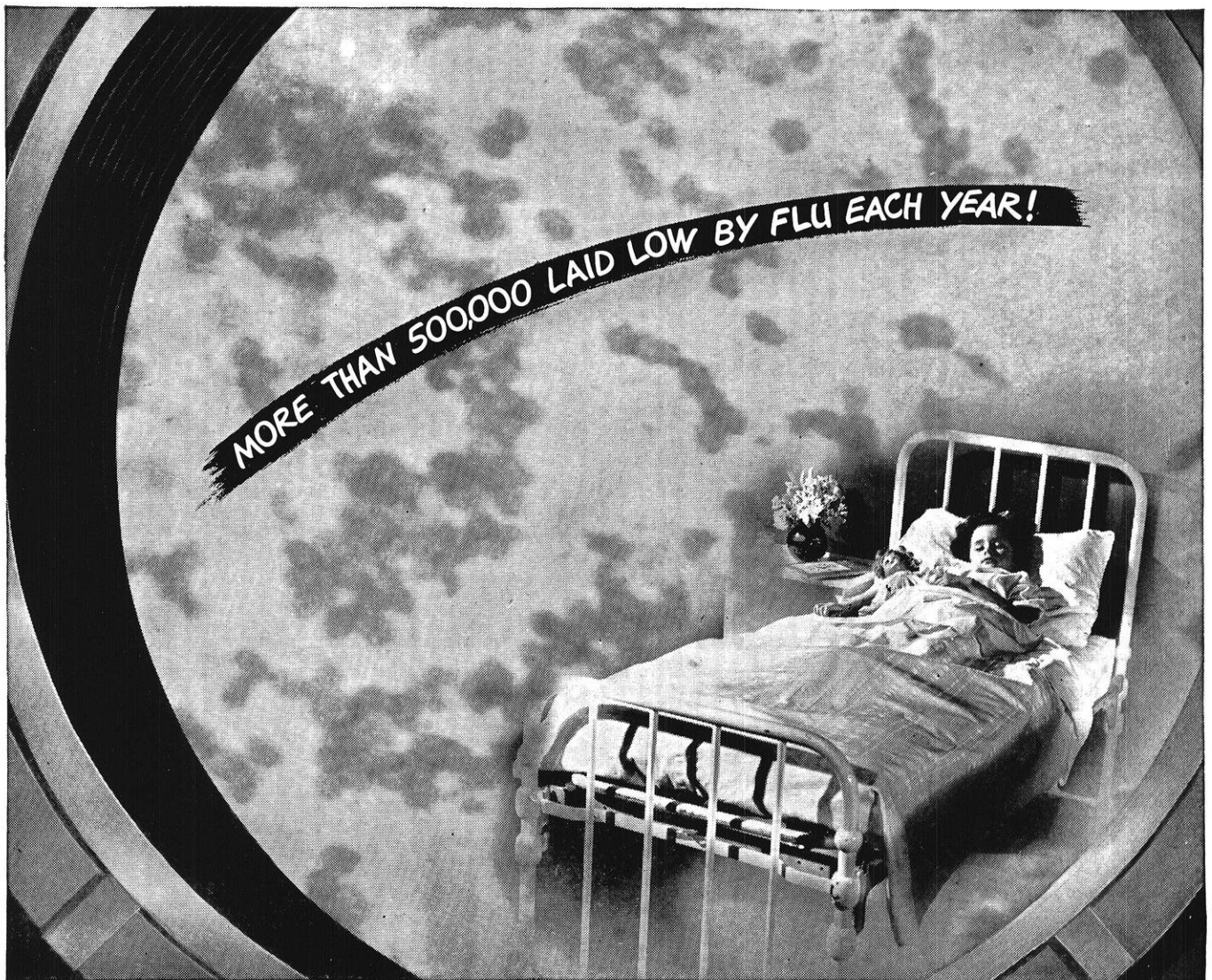


FIG. —Results of Understressing and Coaxing.



to destroy 'em you have to see 'em

Microscopes are gunsights in Medicine's battle on bacteria.

Optical microscopes, however, were not powerful enough to "draw an accurate bead" on the deadly virus that caused influenza.

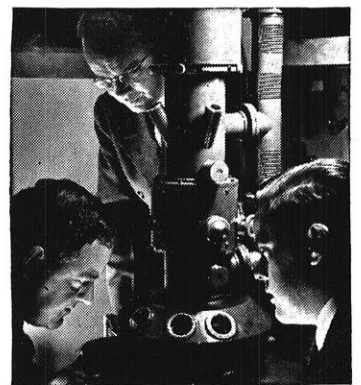
But today, medical men have seen what no optical microscope could bring into focus—the infinitesimal influenza virus that previously had lain craftily camouflaged among larger cells.

This revelation came about through the Electron Microscope, developed by scientists at RCA Laboratories. And now, having been seen, influenza may be forced to unconditional surrender, saving the lives of thousands each year.

Here is but one facet of the genius shown by scientists behind RCA research... the

"ever-onward" research that saves lives or creates a better radio with equal skill... the "there-when-you-need-it" research that gave super-secret equipment to the United Nations... the "way-ahead" research that goes into everything made by RCA.

When you buy an RCA radio or phonograph or television set or any RCA product, you get a great satisfaction... enjoy a unique pride of ownership in knowing that you possess the very finest instrument of its kind that science has yet achieved.



They see what human eyes have never seen before!

Drs. Arthur Vance and James Hillier, scientists at RCA Laboratories, with Mr. E. W. Engstrom, Research Director (standing), examine the RCA Electron Microscope that has useful magnification up to 100,000 diameters, revealing unseen new worlds to the eyes of man.

RADIO CORPORATION of AMERICA

PIONEERS IN PROGRESS



Report From The Pratt-Whitney Girls

—Mel Sater, ch'46

In the spring of 1943, the Pratt and Whitney Aircraft Engine Company began to train college women students to fill critical jobs in their firm. Fellowships were offered to eight Wisconsin co-eds amounting to one thousand two hundred and twenty-three dollars plus tuition for the twelve month period. At company expense they were invited to study the plant set-up before accepting the offer. The eight girls accepted for fellowships were Janet Edwards, Genevieve Sherwin, Jane Morris, Genevieve Sewall, Romaine O'Day, June Dvorak, Dorothy Wilson, Natalie Bernstein. On completion of the twelve months course,

ing. Genevieve Sherwin is working with data obtained in engine tests.

An insight into the more private lines of the girls reveals that Natalie, Jane, Janet and Dorothy have found an apartment and are applying their domestic abilities. As for Gay Sewall, she is married to Bob Thompson, a graduate mechanical engineer from Wisconsin. Gay quit in July and she and her husband went to Tennessee. Genevieve Sherwin shortly afterward changed her name to Mrs. Joe Terrana.

It is significant to note that these girls have set an outstanding record in their work.

DID YOU KNOW THAT . . .

One good reason why major league night games average 6 to 1 in attendance over weekday games and minor leagues from 4-to-5 to one is that women are night baseball fans.

An electronic measuring instrument that can record the speed of any mechanical rotation known and record it with great precision has been developed.

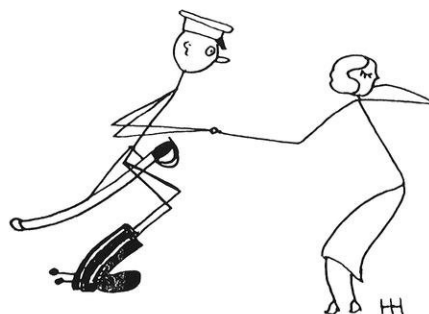
A turbosupercharger with a top ranking operational record of functioning flawlessly on 102 Flying Fortress bombing missions against German industrial and military targets was presented as a gift from the 381st Bombardment Group of the Eighth Air Force in England to Dr. Sanford A. Moss, inventor of the turbosupercharger at the Lynn, Mass., Works of General Electric Company



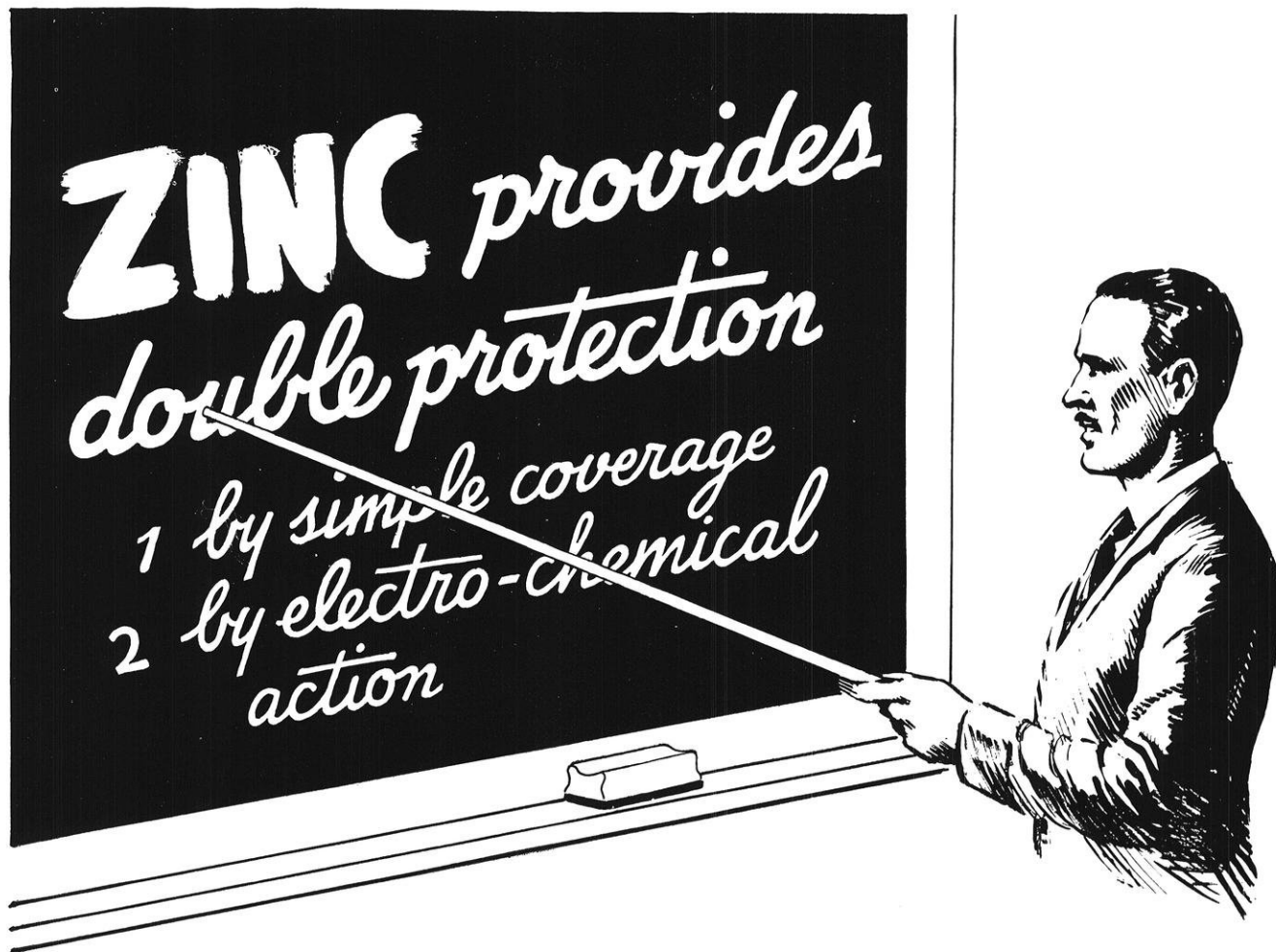
From left to right: Romaine O'Day, Janet Edwards, Genevieve Sewall, Genevieve Sherwin, Natalie Bernstein, Dorothy Wilson, Jane Morris, and June Dvorak.

the girls reported to work at the Hartford, Connecticut, Pratt and Whitney plant.

The placement of the girls was as follows: Natalie Bernstein went into spectroscopic analysis, which was one of her main interests in school. Genevieve Sewall and Romaine O'Day both followed the lines of experimental test work. Jane Morris' work is along the metallurgical line in the investigation of materials control laboratory. The nature of June Dvorak's investigations are of a secret nature and could not be revealed. Dorothy Wilson stated that she runs tensile testing machines in the physical test division of the company. Janet Edwards applies her knowledge of chemistry now to the science of electroplat-



Today??



Yes, zinc does double duty when applied to metals. It gives mechanical protection, with a sheath of rust-resistant metal; the durability depends on the thickness of the zinc. Zinc is also a rust inhibitor—it literally “stops rust before it starts”, through electro-chemical action. The U. S. Bureau of Standards says Zinc is “by far the best” protective metallic coating for rust-proofing iron or steel.



Lifetime Galvanized Roofing

With reasonable care, galvanized (zinc-coated) roofing will last a lifetime. Its care is a simple matter—a few precautions taken at the right time is all that is necessary. These are fully described in a booklet, “How to Make Galvanized Roofing Last Longer”, which will be sent free to anyone upon request. A post-card will do—send it today.

AMERICAN ZINC INSTITUTE
INCORPORATED

60 East 42nd Street • New York 17, N. Y.

CAMPUS NOTES

—Mae E. Zimmerman

Newest idea of the month — to study hard in the new semester — actually keep up on the work.

Blurry eyes surrounded by bags, brisk steps to the assigned building—dragging feet after the two-hour ordeal, sleep a thing of the past, cigarettes chain-smoked, black coffee taking the place of the other "stuff" until after the last ordeal . . . give up? Finals!!!

Because of finals, we were unable to get the "latest" from our foreign correspondent "Horning", but if we are lucky maybe we can corner him before the Engineer goes to press.

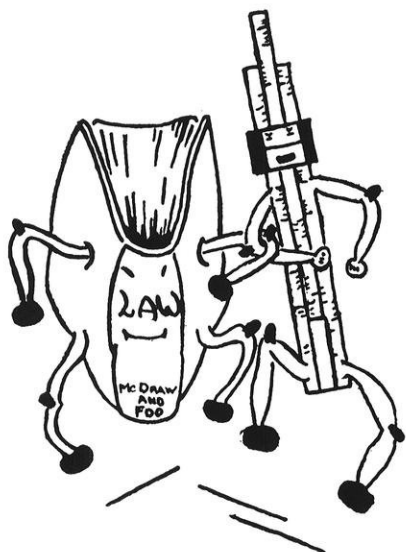
FINALS OVER! New semester, new start, new work. What a life!

John Tanghe, ex ee'44, back for a visit. John is in secondary radio-tech school stationed at Navy Pier in Chicago.

Some people will swear to it — that they can get more sleep here than is ever possible at home.

St. Pat —

Yes, the month of old St. Pat again. Is there any spirit left for the good old day?



Oh—Yeh?

Poem of Saint Patrick

—John Senft, m'39

The sons of St. Patrick are brave men and bold
And quite unaccustomed to fear,
But the bravest of all was a man, I am told,
Called Abdul, the young engineer.

When they needed a blade to lead the parade
Or to fill all the lawyers with fear,
To remove any doubt, they all set up a shout
For Abdul, the brave engineer.

There are heroes a-plenty, and men known to fame,
In the ranks of the men of the bar;
But most famous of all was a man by the name
Of Ivan, the scheming loy-yar.

He could imitate Crosby, play schafskopf or pool,
Or perform on the Spanish guitar;
In fact, quite the cream of the whole shyster team
Was Ivan, the "smoothie" loy-yar.

One day this bold fellow found an egg freshly laid
And walked down State Street with a sneer.
He seemed unafraid, when he met the parade
Led by Abdul, the proud engineer.

Young man, said Abdul, is the law school so dull
That you're anxious to end your career?
For infidel, know, your egg hit the toe
Of Abdul, the bold engineer.

So take your last look at your "Evidence" book
And send your regrets to the bar.
By this, I imply, you are going to die,
Oh, Ivan, conniving loy-yar.

Like a guard at Old Bailey, he took his shillelah
While the spectators came from afar.
With murderous intent, he most suddenly went
For Ivan, the fighting loy-yar.

The rotten eggs flew for a decade or two,
While the "sage of Mendota" kept score,
Till they finally said, we're so dog-gone near dead
We'd better not fight any more.

So the dust settled down on this college town,
And left the atmosphere clear
For a finer parade. In tribute 'twas made
To ST. PATRICK, THE FIRST ENGINEER.



Fighting moisture and fungus— *communication's jungle enemies*

Ever-present dangers to military communications are the twin enemies of the jungle—moisture and fungus. By impairing the efficient working of telephones and radios, they can halt vital messages as effectively as cutting the wires.

The long experience of Bell Labora-

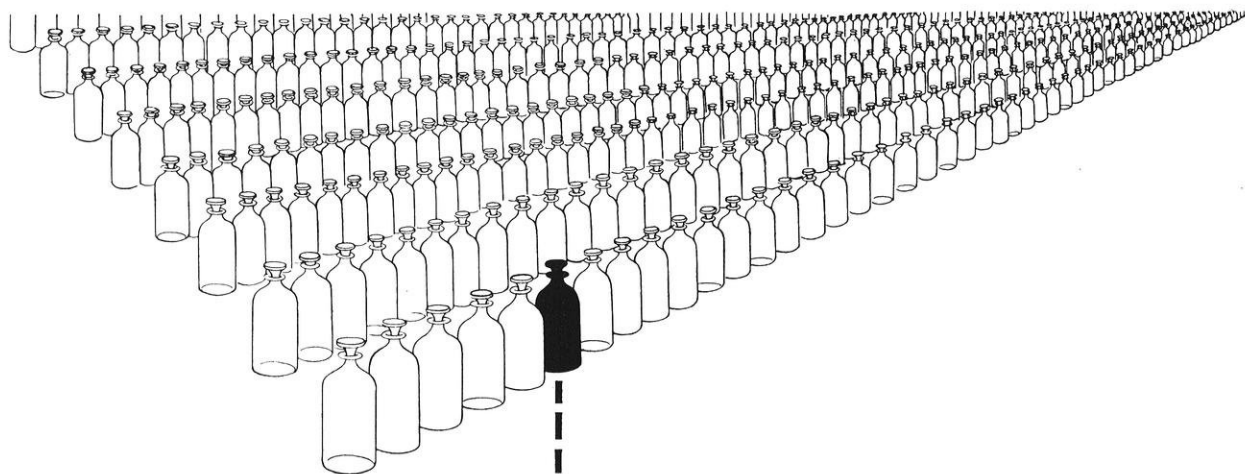
tories engineers in designing telephone equipment for use under all climatic conditions has helped the Signal Corps counter-attack these jungle enemies.

Lessons learned in this wartime emergency will aid in building better communications equipment for war and peace.

BELL TELEPHONE SYSTEM

"Service to the Nation in Peace and War"





Industry's "special account" with Dow

It is characteristic of large scale chemical operations, such as Dow's, that one thing leads to another. Sometimes materials emerge from development work not specifically sought for in the original task. Yet they are the logical result of established chemical reactions. Their properties, of course, are known, but their ultimate usefulness to industry has not been completely charted.

There are probably as many as 7,000 of these chemicals and

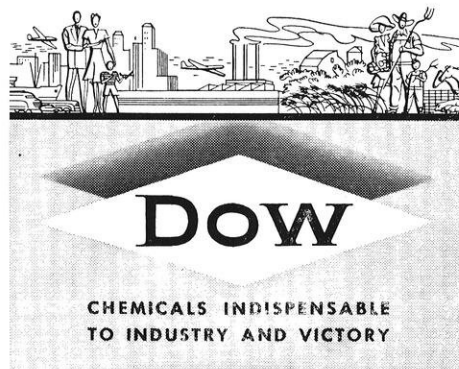
chemical compounds that have emerged from Dow laboratory developments. They are neither accidents nor by-products, but co-products. They align themselves readily into scientific groups—for example, phenolic derivatives. From time to time these are referred to technicians in various manufacturing fields who may find among them *just the needed chemical ingredient* to put the finishing touch to their own work in progress.

To borrow a banking analogy,

these chemicals are industry's "special account" with Dow on which it can draw so that constructive developments may proceed to their successful conclusion. And thus America at large has a genuine stake in this accumulation of potential assets.

THE DOW CHEMICAL COMPANY, MIDLAND, MICHIGAN

New York • Boston • Philadelphia • Washington • Cleveland • Detroit • Chicago
St. Louis • Houston • San Francisco • Los Angeles • Seattle



THE WISCONSIN ENGINEER

TROPICAL DISEASES . . .

(continued from page 9)

2. What are the actual relationships of one vitamin to another?
3. How can vitamin deficiencies be detected quickly?
4. What constitutes a safe dosage?

The answers to these questions would provide a basis for improving army nutrition and the general well-being of soldiers.

Tetanus toxoid is expected to be much more effective against lockjaw than tetanus anti-toxin because it gives longer and better immunity. Other valuable therapeutic agents are the antiseptic dyes used locally to destroy infectious organisms; blood plasma used in the treatment of shock, burns, and hemorrhage; and the barbiturates used as sedatives.

With all these remarkable medical weapons, the greatest enemy still stalks, an enemy which is causing more terrible destruction of human life than bullets or bombs, a foe of all armies since wars began; namely, tropical disease. Malaria, yellow fever, dysentery, dengue, plague, cholera, hookworm, every work is a death knell for some American soldier. When these diseases strike, the opposing army gains an immeasurably valuable ally. Our valiant soldiers at Bataan finally surrendered to the Japanese, not because they were tired of fighting or discouraged by the hopelessness of their position, but because they were so stricken with malaria and dysentery that it was a physical impossibility for them to carry on longer. Although tropical diseases do present a problem in the army, they also present a grim picture when we realize that, after the war, when our soldiers return, they will bring with them many

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PROFS . . .

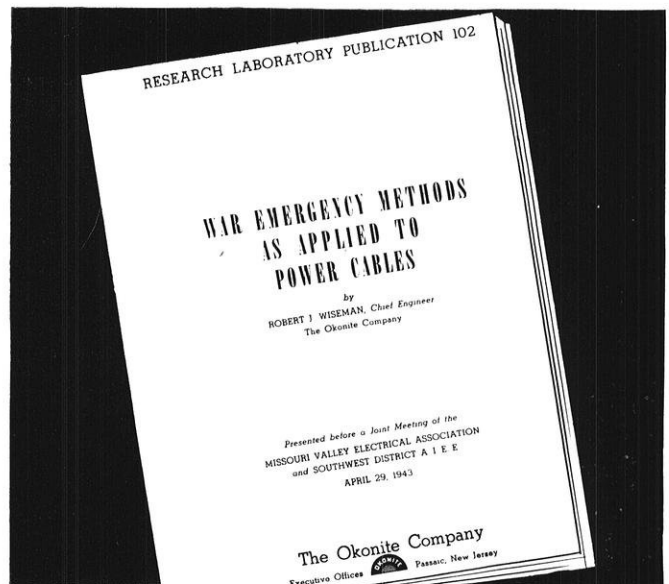
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his degree in 1935, after which he worked for the Federal Housing Administration. In 1937 he returned to the University of Nebraska on a graduate scholarship and earned his Degree of Master of Science in Economics. He was Assistant Professor of Economics and Commerce at Nebraska Wesleyan University until he came here to work on his Ph.D.

After being away from Doane College for four years he went back to its library to get a book and was introduced to the future Mrs. Rall. He walked her home and got a date with her for the following evening. (And he talks about the sailor's way with the women.) They now have a daughter three and one-half years old who he likes to take to such places as ski meets on Muir Knoll.

For recreation, and rest after teaching engineers, he plays tennis, swims, and goes on hikes.

Mr. Rall does not like "to have students coming to class later than he does." Of the engineering students he says "fine bunch, above average, and very amenable to suggestions—will even laugh at old jokes."



Every engineering student will be interested in this Okonite research publication* giving data in connection with carrying greater emergency loads on power cables. Write for your copy of Bulletin OK-1017. The Okonite Company, Passaic, N. J.

*By R. J. Wiseman, chief engineer of The Okonite Co., presented before a joint meeting of the Missouri Valley Electrical Association and Southwest District A.I.E.E.

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LUFKIN
HI-WAY DRAG TAPE

**EXTRA STURDY
EASY-TO-READ**

Extra sturdy tape and reel designed for highway, railroad and survey work. Deep etched markings, easy to read and most permanent. See it at your dealers and write for catalog.

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SAGINAW, MICHIGAN · NEW YORK CITY
TAPES · RULES · PRECISION TOOLS

Short Circuits

—*Fran Tennis, m'46*

Bob Clayton, m'46

Canny

Their cars having just collided, Jock and Pat were surveying the situation. Jock offered Pat a drink from his bottle. Pat drank and Jock returned the bottle to his pocket.

"Thank ye," said Pat, "but aren't you going to have a nip yourself?"

"Aye," replied Jock, "but not until the police have been here."

One afternoon on the veranda of a hotel a beautiful young woman and her six year old son sat near a man. The little fellow trotted over to the man, who patted him on the head, inquiring: "What's your name?" After he told, the boy lisped, "Is you married?" "No, I'm not," was the reply. Then the child paused a moment and, turning to his mother, said: "Mother dear, what else did you tell me to ask him?"

Marriage is the only life sentence that gets commuted for good behavior.

Absent-minded salesgirl (as date kisses her goodnight): "Will that be all?"

Six year old Mary awoke about 2 o'clock in the morning; "Tell me a story, Mama," she pleaded.

"Hush, darling," she said, "your father will be home in a few (minutes?) and tell us both one."

Wife: "Haven't you got anything nice to say about my mother?"

Husband: "Yes, she objected to our marriage."

He: "I suppose you dance?"

She: "Oh yes, I love to."

He: "Great, that's better than dancing."

At Board of Directors' assemble.

W. K. NEILL, adv. — "Oh yes, — and I don't know where those 'Short Circuit' writers get their jokes—but they're beginning to make the 'June issue' look like 'Lily Whifers'."

Mistress: "You know, I suspect my husband has a love affair with his stenographer."

Maid: "I don't believe it; you're only saying that to make me jealous."

Davis: "Conductor, does this train stop at San Francisco?"

Conductor: "Well, if it doesn't son, there is going to be one hell of a splash."
—Battalion

A tactful girl is one who makes a slow guy think he's a fast worker.

Overheard in Chem. lab . . .

Prof: "What is the outstanding contribution that chemistry has given the world?"

Engineer: "Blondes, sir!"

Confident young man on telephone: "Hello honey, this is Gideon."

Girl: "Who did you say?"

C.Y.M.: "Gideon, honey; G for gin, I for ice, D for drink, E for excitement, O for orry-eyed and N for necking. Got that, honey?"

Girl: "Well, not all of it but come up anyhow."

Indian Love Song

Comb 'um hair,
File 'um nails,
Paint 'um mug,
Catch 'um males.

"My, my, so you lost your girl. What happened?"

"Oh, nothing much. I just flattered her until she was too proud to speak to me."

Extract from a co-ed's letter home: "I weigh 125 stripped. I'm getting fat. Of course the drug store scales may not be so accurate but that's the way they register."

A man came home from work one day and his wife met him at the door. "John," she said, "I wish you would fire that new hired man; he sings dirty songs."

"Why, I haven't heard him singing any dirty songs," replied the husband.

"I know," she retaliated, "but he whistles them!"

Then there was the Scotch farmer, father of two daughters, who bought a double-barreled shotgun.

"Oh dear, I missed you so much," she said as she raised the revolver and fired again.

RUBBER PANTS FOR MACHINE TOOLS . . .

(continued from page 13)

vide a convenient support for attachment to the hanger.

Obviously the initial cost of such precision masks is high. The cost of designing and machining dies is a large item and cannot be justified where anything but mass production is contemplated. User experience has shown, however, that the fact that the masks may be used repeatedly will usually pay for them within a short time.

So far the technique has been applied chiefly to the electro-plating of machine parts but manufacturers and users of the elastic precision molded rubber masks are visualizing their usefulness in every plant where parts are painted or plated. Gears, bearings, supercharger impellers, spline shafts, and sprocket wheels are among the present applications.

BRIEF NEWS

Concerning

ST. PAT'S EVENTS

Doors and walls of the law building were painted green in honor of St. Pat.

The "Wall" received a fresh coat of green, commemorating St. Pat as being the first engineer.

Appropriate signs concerning the "shysters" and the "superior engineers" were posted around the campus.

The "Sliderule" put out by the lawyers caused quite a commotion as it appeared on campus. It was a good trick — a clever one and we admit it. But next year the tables will be turned.

The "sliderule" made such a fanatical statement as that the engineers admitted St. Pat was a lawyer. Such wishful thinking.

THE WISCONSIN ENGINEER



Controlled Quality

Only from Ampco can you get all of these services and benefits:

- 1 Distinctive properties of resistance to wear, impact, fatigue, corrosion.
- 2 A series of engineered alloys — with physical properties to fit your application.
- 3 Quality control to hold these properties within narrow limits.
- 4 Diversified production facilities — coordinating in one place all the commonly used metal-working processes.
- 5 Engineering and production "know-how" to give you a practical manufacturing program.
- 6 A nation-wide organization of field engineers to assist you.
- 7 A record of proved performance in hundreds of leading makes of equipment.
- 8 A national reputation that makes Ampco Metal parts a sales asset.

...one of 8 big reasons why you can depend on AMPCO METAL PARTS

Quality control is one of the main features that set Ampco apart from ordinary sources of bronze—that assure you of an engineered alloy unvarying in its properties today, next month, or a year from now. This uniformity is important when performance of your equipment depends on material that *always* meets predetermined specifications.

- Ampco's laboratory control — a long-established feature of Ampco service — is carried out by the largest corps of technicians in the bronze alloy field.

Ampco also offers you the production "know-how" to *produce* to a standard.

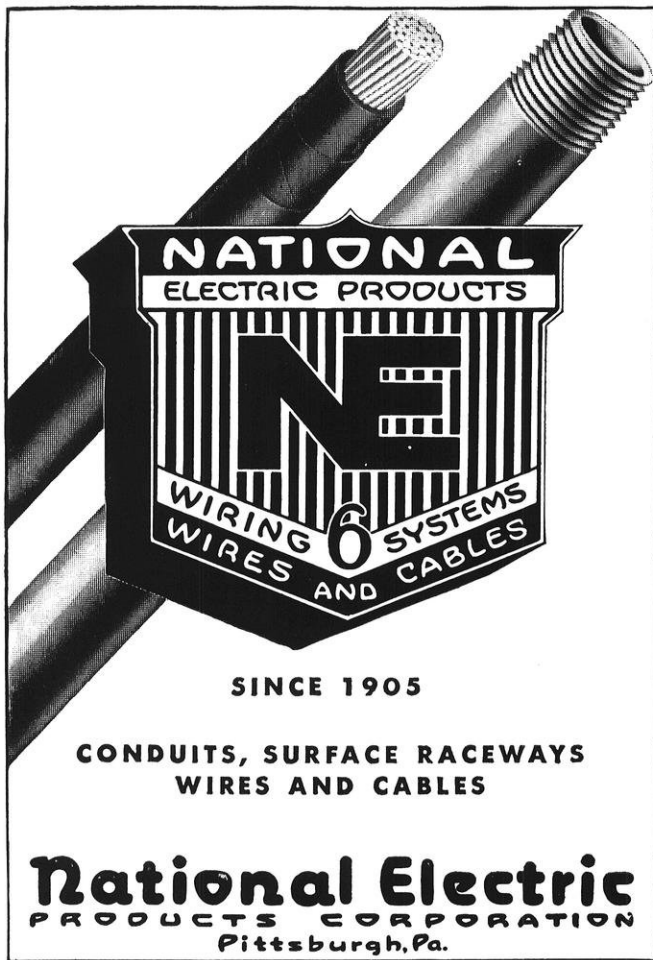
- Utilize the exceptional properties of Ampco Metal in your post-war products —it pays! Send us your prints for helpful suggestions. Ask for bulletins.



Specialists in engineering, production, finishing of copper-base alloy parts.

A-8B

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Ampco Field Offices in Principal Cities



SINCE 1905

**CONDUITS, SURFACE RACEWAYS
WIRES AND CABLES**

National Electric
PRODUCTS CORPORATION
Pittsburgh, Pa.

ENDURANCE LIMIT . . .

(continued from page 14)

overstressing, shot blasting, or peening. If residual compressive stresses are left in those parts which will be subjected to tensile stresses in service, there is an improvement in fatigue properties.

Another method of altering the endurance limit is by subjecting the specimen to stresses just below the endurance limit. This process is called understressing. Apparently there is a minute amount of cold work done at each repetition of stress and when this is repeated millions of times the endurance limit is increased. The author has succeeded in increasing the endurance limit of cast iron by 31 per cent, and that of low carbon ingot iron by 23 per cent.

The endurance limit can also be increased by a process of understressing and "coaxing". By coaxing is meant the process of gradually increasing the stress by small increments. In Figure 1* the dotted and stepped curve shows that the first run on this specimen was at 26,000 cycles, and the succeeding runs were for 10 million cycles each, the load of the specimen being increased by one pound, after each run of 10 million. The specimen finally failed at a unit stress of 34,100 psi, after having run over 7 million cycles at the stress.

In this case the last stress applied was 34,100 or 30.2 per cent above the endurance limit. However, the most virgin specimen as this stress was about 65,000 cycles, so

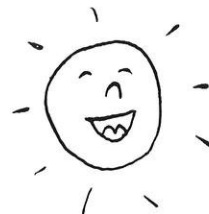
that 7 million cycles represents an increase of endurance life of 108 times, or 10,700 per cent.

At the next to the last run the unit stress was 33,000 significant result of this understressing and coaxing was the effect on the endurance life. The normal life of a psi and the run was 10 million cycles. Since the normal life at this stress was 85,000 cycles, this represents an increased life of 118 times, or 11,700 per cent. Since the specimen ran 7 million cycles at 34,100 psi, it is safe to assume that it would have run at least another 10 million cycles at the next lower stress of 33,600 psi. Such a run of 20 million is 235 times the normal life or an increase of 23,400 per cent.

Still another method by which the endurance limit of a material can be changed is by overstressing. This process means applying a stress greater than the endurance limit. The author has shown that when such an overstress is applied for a number of cycles less than that necessary to cause failure, the effect is to reduce the endurance limit. Such reduction of endurance limit may be 30 to 40 per cent, depending on the two factors of the amount of overstress used and the number of cycles applied. Such tests are rather time-consuming because a series of specimens must be subjected to the same overstress and the same number of cycles, and then these specimens must be tested at lower stresses to find out what the new endurance limit is.

The percentage by which the endurance limit was reduced by such overstressing was called the percentage of damage. It was found that after a specimen had been damaged by previous overstressing, this damage could be overcome or healed by subsequent understressing and coaxing. The damaged specimen was first stressed below its new endurance limit, and gradually the stress was increased by small increments. By this means it was found that the endurance limit could not only be restored to its original value, but in some cases could be raised to substantial percentage above the original value.

The previous discussion has made plain the fact that the previous stress history of a piece of material plays its part in determining the mechanical properties. It may be said that every time a material is stressed, whether within or beyond its proportional limit, its mechanical properties have been changed. This change may be very slight, and for the case of static loading within the proportional limit, may be considered negligible. However, when stresses are repeated many times, as in fatigue loading, the effect produced may amount to a considerable percentage of change in certain properties.



New semester faces.

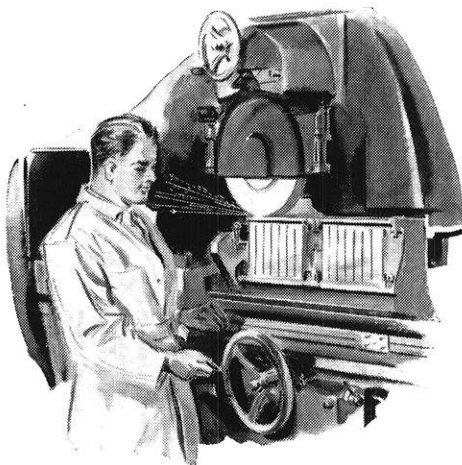
THE WISCONSIN ENGINEER

What made Johann run?



What turned the tide in Normandy? People in the know give a lot of credit to the "tank 'dozer" that knocked down the hedgerows to let Yank armor and motorized infantry through. This fighting adaptation of peacetime earth-moving equipment is just another example of how American engineering and production have helped turn the tides of war—of how the products of The Carborundum Company help make things better in war as well as in peace.

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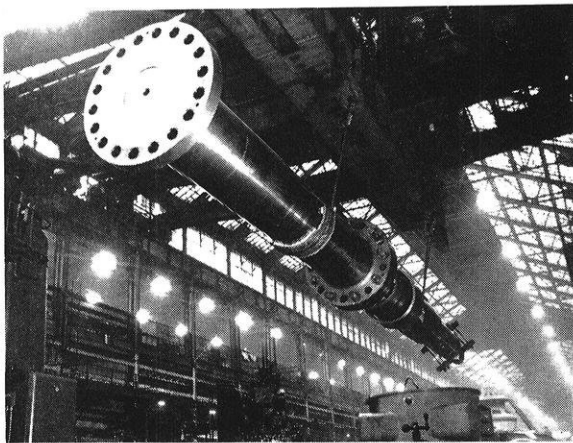
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BETTER PHOTOGRAPHIC FILM . . .

(continued from page 8)

military field conditions, such as will be, if they already have not been, met by Signal Corps photographers, bottles of chemical solutions would be better than the comparatively elaborate lamp arrangement.

Some extremely rapid withdrawal of water, in such a way as not to cause emulsion blister, would serve this purpose. Professional photographers use grain alcohol for rapid drying, but only when necessary, as it endangers the negative. Also, it is even less rapid than the infra-red



SHAFT FOR HUGE GENERATOR—Shot detail such as in this photograph, taken against a strongly sun-lighted skylight, would be impossible except on double-coated non-halation film of the highest quality.

lamp method. It is possible that a rapid dehydrating agent which would not affect the emulsion could be found. This would be preferable to dyeing as it would be less complicated and probably less expensive.

The ideal solution would appear to be in development of new film types. Since so much of the unsuccessful development has been with silver halides, perhaps an entire new field dealing with organic compounds of silver or with halides of organic compounds, or possibly with some entirely different organic set-up would provide the answer. Due to the relative stability of organic compounds, this perhaps would be a difficult line to work on. Work on a new type of film base would perhaps be of value. If a base could be found which would form a true bond with the silver instead of holding it in suspension, perhaps the silver would not be able to draw together and clot.

Whichever means would be best, all are possible, and the end is an important one.

—Courtesy SCIENCE SERVICE
Cuts Courtesy Westinghouse

TROPICAL DISEASES . . .

(continued from page 21)

of these horrible afflictions which may cause malaria, yellow fever, and amoebic and bacillary dysentery among those who are left at home. Parasites also are a serious menace. People who have been in the tropics tell unbelievable tales of natives who are eaten alive by them.

It is unfortunate that we are not better equipped to handle the tropical disease problems. To be sure, we have yellow fever vaccine to inoculate soldiers going to the tropics, but there is still no prophylactic against bacillary dysentery; no way of effectively controlling the chronic amoebic dysentery carrier; no protection from malaria should the supply of quinine give out as it did in Bataan.

In the field of tropical disease there is work for the entomologist, the parasitologist, the epidemiologist and the sanitary engineer. More centers for research work could well be established in the United States. The recently opened Department of Tropical Medicine at Tulane University may prove to be the beginning of a center for studying such diseases.

To win the war science must further its research in medicine. It should be chiefly concerned with the war-time problems of caring for wounds, reducing epidemics of influenza, typhus, malaria, yellow fever and tropical dis-



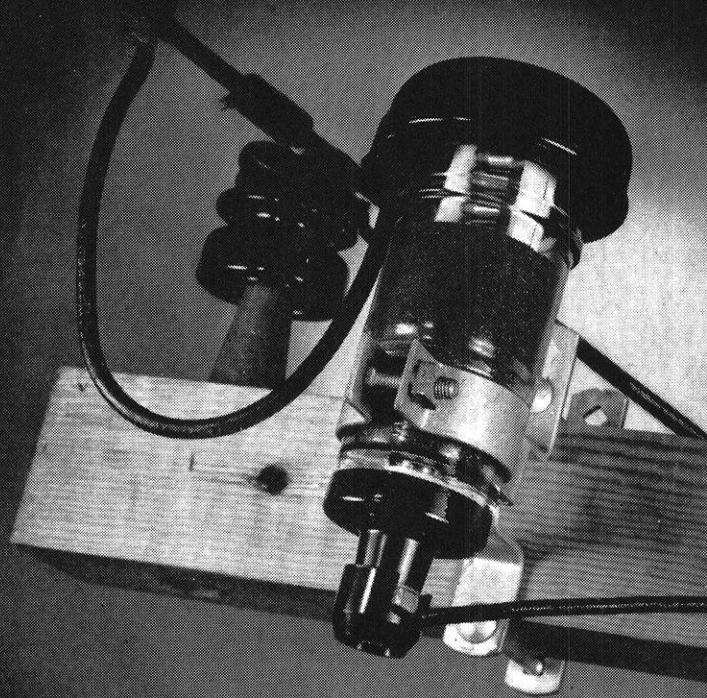
LIFE SAVER—Countless lives have been saved in World War II by the prompt administration of blood plasma. Here a canteen worker is shown placing a pint bottle of blood in sanitary storage.

eases produced by parasites. We must speed up our effort! We, young Americans interested in medicine, may well let research be our goal, and dedicate our services to it.

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It tells lightning where to go...



REMEMBER in "the good old days" how often you were without electric power for hours after a severe electric storm?

Among the many reasons why you get almost uninterrupted service today is this glass gadget that looks like an over-size salt shaker. When lightning hits a line, the lightning arrester whisks the harmful jolt into the ground in a split second. And the line goes back to normal operation. The lightning arrester body is built by Corning out of a special Corning-developed glass. It's tough, and it will change

your opinion of glass if you always thought of it as a frail, brittle material. You'll find hundreds of such surprises at Corning today. Glass pumps, for example, and heavy glass fractionating columns for chemical industries. Airfield runway marker lenses capable of bearing the weight of a plane. Corrosion-resistant glass pipe for the food and other industries. These are just a few of the jobs that glass can do better than other materials, thanks to Corning's nearly 100 years of glass-making experience. Corning, like every-

body else, is deep in war work today. But after the war keep your eye on *glass* as a new pioneering material for industry and on *Corning* as the outfit that knows glass. Corning Glass Works, Corning, N. Y.

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Bits of News

Powerful G-E Jet

The new G-E Jet generates more motive power than any other aircraft engine and now is being used by the Army Air Forces to drive propellerless Lockheed P-80 fighters faster than any other planes in the world will fly, it has been announced by General Electric Company with approval by the War Department.

G.E. Paid \$232,735 for Suggestions Last Year

Production suggestions from employees, many of which accelerated the war program, netted General Electric workers \$232,735 in awards during 1944, according to company tabulations recently released. Payment was made for 19,488 ideas. Top award was \$2,000.

G-E Jet Mass Production

The beginning of Jet engine production on a volume schedule for AAF combat operations already is underway at the General Electric Company's second largest wartime plant in Syracuse, N. Y., it has been announced with approval by the War Department.

Measured to a Millionth

Ever try to measure the diameter of a fine wire? You do it with a micrometer, of course; but only to 1-10,000th of an inch. And in the case of wires used in suspending galvanometer mirrors, that isn't accurate enough. So what to do? An engineer of General Electric at Schenectady does the trick by a new method. He bakes small pieces of the wire he wants examined into a special plastics block. Then very carefully he exposes a cross-section of the wires, and polishes them smooth. Then a technician puts the block under a microscope with a micrometer eyepiece. And now at last you see how it is possible to measure the diameter of the wire to precisely 1-1,000,000th of an inch!



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