

Winter 1-1923

## Volume 32 - Issue 4 - January, 1923

Rose Technic Staff

*Rose-Hulman Institute of Technology*

Follow this and additional works at: <https://scholar.rose-hulman.edu/technic>

---

### Recommended Citation

Staff, Rose Technic, "Volume 32 - Issue 4 - January, 1923" (1923). *Technic*. 404.  
<https://scholar.rose-hulman.edu/technic/404>

Disclaimer: Archived issues of the Rose-Hulman yearbook, which were compiled by students, may contain stereotyped, insensitive or inappropriate content, such as images, that reflected prejudicial attitudes of their day--attitudes that should not have been acceptable then, and which would be widely condemned by today's standards. Rose-Hulman is presenting the yearbooks as originally published because they are an archival record of a point in time. To remove offensive material now would, in essence, sanitize history by erasing the stereotypes and prejudices from historical record as if they never existed.

This Book is brought to you for free and open access by the Student Newspaper at Rose-Hulman Scholar. It has been accepted for inclusion in Technic by an authorized administrator of Rose-Hulman Scholar. For more information, please contact [weir1@rose-hulman.edu](mailto:weir1@rose-hulman.edu).

Def 324 P2 Q2-11-9

# THE ROSE TECHNIC

## *Announcement*

February—Chemical Engineer-  
ing Number.

March—St. Patrick Number.

April—Mechanical Engineer-  
ing Number.

May—Electrical Engineering  
Number.

June—Commencement and  
Civil-Architectural Number.

*Watch for Them*

ROSE POLYTECHNIC  
INSTITUTE

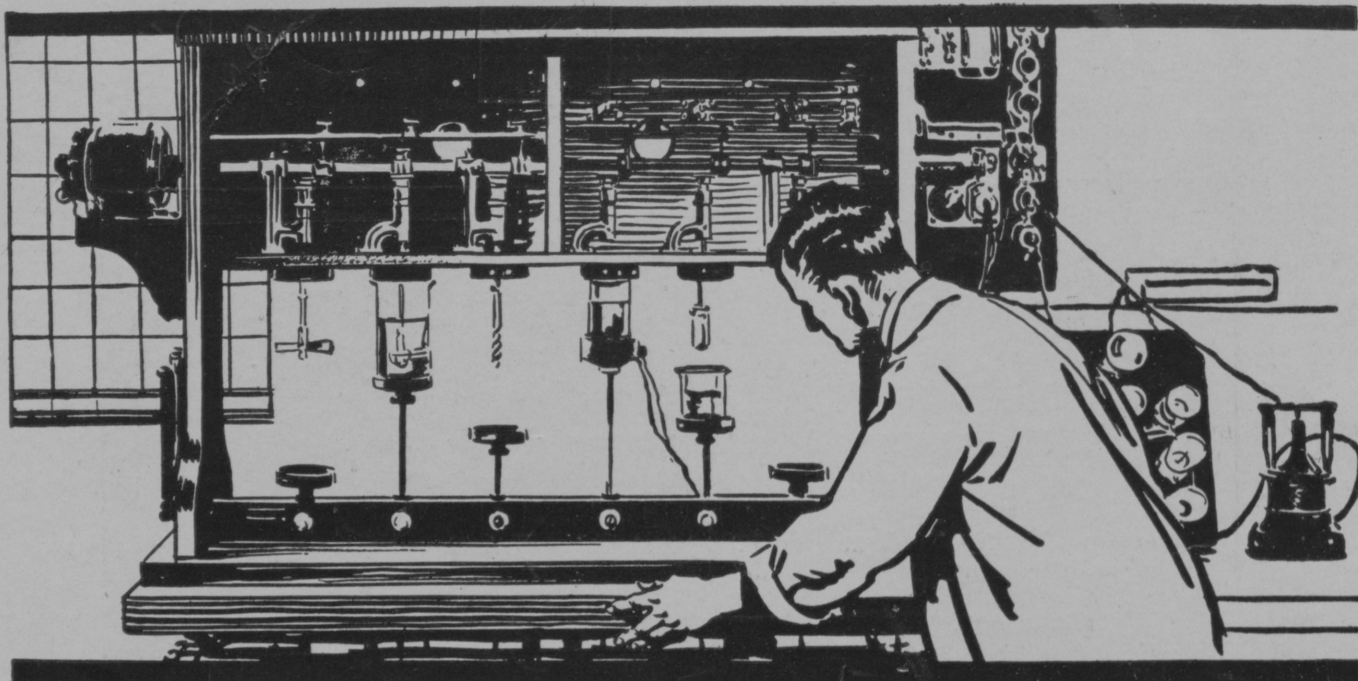
BERGMANN—10

Member of The Engineering College, Associated.

VOL. XXXII.

No. 4





## Blazing Trails for Progress

Curiosity may have killed the well-known cat, but it has been underneath most of the hard-won developments that lastingly benefit mankind. Once in a great while, perhaps, accident has been the spark that has lighted the torch of achievement; but much more frequently—always, nearly—accomplishment, especially in the field of science and invention, has grown out of the insatiable curiosity that seems to be the heritage of us all. Mankind wants to know—and is slowly finding out. Curiosity, the complement of imagination, knows no appeasement.

This is, however, no essay on the vague subject of idle curiosity. There is a vast difference between that and the organized, untiring, well-planned activity which, as an integral part of Westinghouse organization, searches continually for the answers to problems which intelligent speculation sets up. This, if you please, is curiosity in its highest and most intensified form; and it is a fundamental thing in the Westinghouse operations.

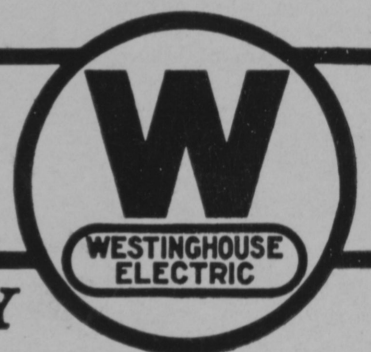
Research, as we know it, is the guiding hand upon the purely creative activities of business. Constantly it brings to light new aspects of known laws, new visions of laws yet to be uncovered. But the search for these is not haphazard nor whimsical; it is organized and planned as carefully and thoroughly as any other business activity. Whether chemical, electrical, or physical, it is engineering; and it follows engineering methods and tradition.

Many great engineers have been wholly at a loss in this specialized activity. For research, in a sense, reverses the usual order. Its endeavor is to discover unknown laws in the known facts—a thing which is quite at variance with ordinary engineering practice. Yet there is a fine type of engineering mind which finds its great opportunity in this kind of work. And to that type of mind, and that type of man, research beckons with an unmistakable hand. It is engineering pioneering, it blazes trails for progress, to new triumphs, in a wilderness into whose outskirts man has scarcely penetrated.

# Westinghouse

---

**ACHIEVEMENT & OPPORTUNITY**



# A STUDY OF CUTTING OILS AND LUBRICATING COMPOUNDS

By Wm. J. McConnell,  
U. S. Public Health Service

The introduction of high-speed metal-cutting machines in industry gave rise to the study of methods for minimizing the heat caused by friction between the cutting tool and the metal under operation. If no preventive measures are taken this heat becomes so excessive that the temperature of the metal is drawn and the cutting edge of the tool breaks down very rapidly; and these is a resultant loss of time in removing the old tool and inserting a new one, not to mention the loss involved in the cost of the tool itself. Moreover, when accuracy of measurement of the cut piece is required, excessive heat is detrimental, for the reason that it causes an expansion of the metal, so that, upon cooling, unless very great precaution has been observed, the piece may be undersized.

In 1883, according to Taylor, the fact was first demonstrated that a stream of water poured directly upon the cutting lip of a cutting tool would make possible an increase in cutting speed with a resulting increase of from 30 to 40 per cent in the amount of work done.

Oils were then tried and were found satisfactory. Lard oil became for a time the most popular of lubricating oils; but on account of the high cost of lard oil and the fact that it has a tendency to gum, experimentation was begun with the idea of combining cheaper oils with water, and the mixtures evolved became known as cutting compounds.

## Classification of Lubricants

Cutting fluids may be grouped into two broad classes, namely, cutting oils and cutting compounds. Cutting oils are pure animal, vegetable, or mineral oils, or mixtures of any of these.

Animal oil, of which lard, sperm, fish, and whale oil are examples, have been used with varying success. Lard oil, when clear and free from rancidity and adulteration, is very satisfactory for all classes of work. The composition of lard oil differs, however, and is graded upon its free fatty acid content, the poorest having a high and the best a low percentage of this constituent.

Olive oil, the most popular of the vegetable oils, is less viscid in cold weather than lard oil, and flows more freely.

The objection to animal and vegetable oils is that the oil film frequently breaks down, because of the decrease of viscosity with increase of temperature.

A mixture of lard oil with a mineral, in varying proportions, constitutes the most important of the mixed oils. Mixtures which have from 50 to 70 per cent of mineral oil are termed mineral lard oils. The efficiency of the mixture depends upon the lard oil content, which also affects the cost. Adulterants are frequently used, therefore, to

lower cost. The adulterants commonly used are rosin oil, cottonseed oil, rape oil, aluminum soap, and lead soap. The latter two substances are employed also to increase the viscosity of some of the mineral oils of low viscosity.

The above-mentioned oils, which are used without further treatment, are known as "straight" oils, in contra-distinction to "soluble" oils, or oils which form milky emulsions when mixed with water and soluble materials.

Sulphonated oil is an example of these soluble oils. By heating castor oil, cottonseed oil, olive oil, and some others, with sulphuric acid, a sulpho-compound is formed. When the excess acid content is neutralized by an alkali, after the addition of sodium chloride to the mixture, a sulphonated oil base results. The base is mixed with a mineral oil in such proportion that all the oil is held in emulsion when water is added to the resultant mixture. Oils of this class are likely to contain free sulphuric acid and fatty acids. A small amount of a mineral oil, such as kerosene or gasoline, is frequently added.

Graphite is held in suspension in oil or water to which small quantities of gallo-tannic acid have been added, and the resultant mixture is marketed as a cutting oil under various trade names.

Many manufacturers prepare their own cutting emulsions, and because of this fact it is not possible to enumerate all the cutting emulsions used. Machine oil, caustic soda, denatured alcohol, and kerosene enter into some compounds. It is a significant fact that no particular oil or emulsion has been accepted as a standard for any one operation. The choice of oil depends upon the judgment and preference of the individual manufacturer. He is influenced by character of machine, hardness of metal, and use of low speed and shallow cut, high speed and shallow cut, low speed and heavy cut, or high speed and heavy cut.

## Analysis of Oils

While the composition of emulsions used is to a certain extent a trade secret, this secrecy is not general, and so several typical oils and oil mixtures is use were analyzed in connection with the study. The United States Bureau of Standards made the analyses. The refrigerant bases are mixed with minerals oils, paraffin oil, kerosene, or a mixture of these in the ratio of one part base with 5 to 8 parts of diluent.

## Character of Oils

### PERCENTAGE COMPOSITION

	Soluble Oil	Refrigerant Base	Mineral Oil	Lard Oil
Total saponifiable matter.....	25.0	37.3	21.4	63.5
Fatty acids, as soap.....	12.7			
Total fatty acids.....	27.0			
Mineral oil.....	75.0	62.7	78.6	
Free fatty acids.....	14.3			14.9
Total volatile matter.....	14.2			
Free acid.....				
Sulphur.....		3.25	3.32	
Fatty sulpho acids.....		.01		



The foregoing table gives a fair idea of the chemical composition of some of the more common oils.

O. H. Schunk, of the Hygienic Laboratory, United States Public Health Service, gives the typical analysis of a sulphonated oil and a soap oil as follows:

TABLE II.—GENERAL COMPOSITION OF SULPHONATED OIL

	Per cent.
Total saponifiable matter.....	15.57
Total fatty acids.....	12.56
Free fatty acids.....	12.08
Fatty acids as soap.....	.21
Mineral oil.....	.62
Total volatile matter.....	25.35
Volatile mineral oil.....	18.30
Nonvolatile mineral oil.....	59.27
Fatty-sulpho acids.....	15.34
Neutral fatty oil.....	.62
Water, ammonia, alcohol, etc.....	7.05

This is described as a clear, urine-red, soluble oil. "A light mineral oil, such as kerosene or gasoline, is present, as shown by the high percentage of total volatile matter. This oil is a sulphonated oil, as shown by the large amount of free fatty acids present, and no soap. The total saponifiable matter in such an oil is present in the form of sulphoacids."

TABLE III.—GENERAL COMPOSITION OF SOAP OIL

	Per cent.
Total saponifiable matter.....	16.37
Total fatty acids.....	16.05
Free fatty acids.....	4.68
Fatty acids as fat.....	3.71
Fatty acids as soap.....	7.66
Soap.....	8.26
Neutral fatty oil.....	4.03
Mineral oil.....	76.26
Water, alcohol, etc.....	7.00

#### Uses of Cutting Oils and Compounds

The use of cutting oils and compounds has become so universal that few machine shops, however small, do not employ them to some extent in the cutting of metal and alloys. "Cutting" of metal means working upon metal in the processes of turning, reaming, broaching, threading, boring, forming, drilling, tapping, grinding, sawing and like processes.

The chief metals which are subjected to these processes are steel, iron, brass, bronze, copper, aluminum and Monel metal. The machines on which the above named processes are carried on are lathes, boring mills, drills, planers, power hacksaws, shapers, grinders, gear cutters, punch presses, milling machines, stamp presses, automatic screw machines and others.

As has already been indicated, the important problem which interested investigators was that of devising the best method for eliminating the heat factor; and the use of cutting tools oils and emulsions is the result of their studies. The terms "coolant" and "refrigerant" are frequently applied to these oils and compounds, because of their cooling properties.

However, the use of these oils and emulsions is advantageous in other respects also. For instance, in deep drilling, milling, and certain other machining operations, the accumulation of chips which result from the cutting processes hampers operation of the machine. The cutting fluid serves the purpose of washing these chips away. Again, in machining such materials as low-carbon steel, the lubricating action of the oils is essential, because, without it, the chip curling back over the tool would produce a bearing which would cause a high frictional resistance, with ensuing heat. These oils likewise protect the metals against corrosion and rust, and insure a good finish on the work.

For the theory of lubrication, cooling, unit pressure, design of bearings, and relative value of the combination of depth of cut, feed, and cutting speed for different kinds of work, the reader is referred to standard textbooks on these subjects.

#### Application of Oils and Compounds

Various methods are used in applying the oil to the work. Frequently, where the amount required is small, a brush or a "dauber," made of waste wound around a wooden rod, is used for the purpose of applying the oil. The so-called "drip-can" method consists in suspending above the work plane a small can with a hole punched in the bottom, through which the oil passes. A delivery tube of some flexible material is sometimes attached in order to direct the flow upon the cutting tool.

The larger plants usually apply the oil by forcing it, by means of a pump, through pipes which lead from a supply tank or reservoir. A pump may serve one or more machines. The central distributing system, which is used in many plants, is preferable to the individual system, and consists of a central oil reservoir from which the oil may be forced by means of pumps or of gravity through pipes to the individual machines.

#### Reclamation of Oils and Compounds

As an economic measure, oils are repeatedly re-used. The method of saving the waste oil for re-use depends largely upon the nature of the work in question. A can suspended under the machine suffices in some instances to catch the oil. As the can fills with waste oil, it is removed and is emptied into the can above the machine. Some machines are equipped with catch pans and troughs for collecting the used oil; and where the work is of such nature as to necessitate the removal of chips before re-using the oil, the removal is accomplished by means of wire screens, perforated steel plates, or dividing baffle plates in the reservoirs, over which the oil must flow when it is pumped. Drain pipes attached to the collecting pans and troughs are sometimes used to convey the oil to the central supply system. Troughs of wood or of concrete built in the floor often serve the same purpose; and outlet pipes through the floor discharge the oil into a collecting reservoir suspended from the ceiling of the room below.

In the larger plants the oils constitute a considerable item of expense, which is greater than it should be because the chips and turnings from metal-working machines retain considerable oil which might be reused. Various methods of minimizing this waste, such as centrifugalization, sedimentation, filtration, straining, magnetization, and combination of any or all of these methods have been devised. A Detroit automobile plant which uses approximately 1,300 gallons of oil daily is said to reclaim 500 gallons. These various methods are here briefly described.

**Centrifugalization.**—The chips, turnings, and metal parts which retain the oil are placed in strainers, where as much as possible of the oil is drawn off through grids, and the chips are then placed in rotating containers in the centrifugal separators. The centrifugal action throws the oil away from the chips, and it is thus reclaimed. In

(Continued on page 18).

## THE NAVY'S RELATION TO COMMERCE AND INDUSTRY

By R. R. M. Emmett, Lieut. Com., U. S. Navy.

(All rights reserved by E. C. M. A. except by Special permission).

The people of the United States are today confronted with their destiny and that destiny lies in a great measure on the sea.

The young man of ambition has a different picture presented to him as he goes out into the world, than had his father or his grandfather before him.

For three-quarters of a century the most attractive careers for each rising generation lay at home. Ours was a country of boundless natural resources, of noble opportunities. There was no limit, other than a man's ability, to what could be accomplished at home. Our relations, both political and economic, with the world abroad were extremely simple. There was no economic demand that our people should go down to the sea in ships and hence we have had no merchant marine worthy of the name. Having no merchant marine to support and secure, our Navy waned to a nominal force, largely composed of old and obsolete ships. It was natural that this should be so. There were no political or economic reasons for maintaining a greater force.

As the country discovered and developed its great natural resources and grew rich and prosperous, men of vision here and there, all over the country, foresaw the need of securing our prosperity. A start was made toward the creation of our modern Navy. Men preached the need of developing merchant shipping to transport our products throughout the world.

Progress was necessarily slow. Opportunity to live comfortably ashore abounded, and men were slow to earn their bread at sea.

The Spanish-American war, with its aftermath of new interests and responsibilities, pushed on our naval development. The manifest need of securing the Monroe Doctrine from the selfish assaults of foreign powers continued the expansion of our Navy.

The application of the Monroe Doctrine has successfully safeguarded, for one hundred years, the affairs of this hemisphere from complications that might have threatened the peace of the world. It has permitted the people of all nations in the two Americas to work out their national problems without interference or exploitation from abroad.

The outbreak of the World War plunged us, whether we would or not, into the turmoil of world affairs. We have emerged from that conflict, for the present at least, the richest and most influential nation in the world. Whether we are to maintain our present relatively happy position in the family of nations rests with ourselves. There can be no doubt but that the genius and industry of our people, the soundness of our political and economic institutions, will enable us to bear prosperity as well as we have supported and borne the strife for prosperity. We must, however, take stock for the future.

### The Secretary of the Navy, Washington.

#### STUDY SEAPOWER.

Young men launched into the world today face a new perspective. The United States stands as a world power. Its commerce carried in American ships, manned by American citizens, secured by an American Navy, second to none, will traverse the seven seas.

I know nothing more important to commend to the minds of our young men than, first to study the inevitable influence seapower will exert on their country's future economic development; and then, to translate convictions gained into deeds which will react to the security, prosperity, and happiness of our great Republic and its people.

(Signed) EDWIN DENBY.

We have a large and increasing population, a great portion of which has assumed a highly industrial character. Our natural resources have been pretty well discovered, are in the course of development, and can be accurately estimated. If the standard of living of our people is to be preserved; if we are to be fed as American citizens have been fed in the past, we must make better and more scientific use of both our industrial and agricultural resources. Our home markets now, with the passage of the years, approach the saturation point. It is becoming increasingly imperative to produce more goods than we can absorb at home. The building up and development of foreign trade and commerce is becoming an essential to our future economic prosperity.

Mexico and the countries of Central and South America are, figuratively speaking, at our doors. Great opportunities await men of ambition, brains and energy in China, Central Asia, the Near East and in Africa.

If our young men go out into the world to compete for the business of the world, they must be served by American ships. If they are served by the ships of other nations, our competitors, they must pay a toll to those foreign ships. If for a time, in spite of that, they are successful, we cannot complain if other nations who control the sea transportation of the world meet our success by taking advantage of such control to prevent our good from moving about the world with the necessary precision as regards time, amount and place. We must develop our own merchant marine. We can and will develop our own merchant marine.

The history of the world can be analyzed and resolved into a few fundamental principles. History invariably has repeated itself and will again. No nation has ever built up a seaborne trade and commerce unless the ships that served that trade were supported and secured by an adequate naval force.

(Continued on page 17).



## PROBLEMS RELATED TO THE HARDENING OF STEEL

One of the most fascinating yet obscure subjects in ferrous metallurgy concerns the problem of the hardening of steel by a suitable quenching treatment and a subsequent tempering of it by slight heating. The interest is centered around the hard constituent or structural condition, known as martensite, the name being derived from the noted German metallurgist, Martens. An investigation has recently been completed by the Bureau of Standards which has a bearing on this general subject.

The study with which this investigation deals was based upon the microstructure of a series of steels of progressively increasing carbon content when hardened under different conditions of temperature and heating periods, and the changes in structure which ensue in the same upon tempering.

Practically nothing is gained in hardness by using very high temperatures or very long heating periods prior to the quenching of steel, provided that the "critical" temperature is exceeded upon heating. This conclusion was based upon small specimens treated in the laboratory; in practice, of course, allowance must be made for the size and shape of the pieces treated. The general conclusion is valid, however.

The changes which take place in a hardened steel upon tempering occur in well defined stages. Until the temperature of reheating exceeds 250 degrees or 300 degrees C (480-570 degrees F) no marked change is to be noted in the visible microstructure, even at a very high magnification, although pronounced changes in the dimensions and density often do take place even at such low temperatures. Above 250 degrees C, the separation of the carbon-bearing compound, cementite, from the martensite begins and at 400 to 500 degrees C (750-930 degrees F) the steel shows a very fine granular structure under the microscope. As the temperature of reheating is increased, the granules increase in size, although a high magnification is still required for seeing them, and the steel becomes softer and finally loses all of the high tensile properties it gained by the hardening treatment.

The frequency of getting rides into town is a function of the number of machines passing, says Daniel Boone Bundy. It wouldn't be so bad to ride trucks in all the time, if it weren't for the dust and dirt that has generally accumulated over the truck bed, Bundy complains; for he hasn't the money to buy a pair of goggles.

When Dr. Sousley was asked why he preferred to walk into the city car line, it is all he is alleged to have replied that he was practicing up on "Long distance Integration", a course which he hopes to introduce as a part of the school's correspondence courses. The course will be offered to seniors.

Are you ready for the finals?

## DUST HAZARDS

In an address delivered in Pittsburgh recently before the meeting of the Coal Mining Institute of America, David J. Price, engineer in charge of development work of the Bureau of Chemistry, United States Department of Agriculture, said that the time was past when we could reconcile ourselves to the belief that dust explosions, now known to occur in a great variety of industrial plants, are disasters from the "hand of God" or an "act of Providence." The recent coal-mine explosions in Pennsylvania and Alabama, he said, had focused the attention of the public again on the problem of prevention.

Mr. Price expressed the hope that the work done by the Bureau of Chemistry in the study of dust explosion in industrial plants might have useful applications in mines. In recent years it has been found that explosions of great violence have resulted from the ignition of many different kinds of dusts, including feed, grain dust in elevators, starch, sugar, flour, spice, chocolate, powdered milk, cork, sulphur, rubber, fertilizer, soap, bark, aluminum, and magnesium. It is estimated that there are in the United States, 21,000 manufacturing plants, turning out approximately \$7,000,000.00 worth of products each year, that are subject to the dust-explosion hazard.

The methods used in protecting lives and property from dust explosions, as described by Mr. Price, consist largely in the collection and removal of dust from industrial plants, the elimination of open lights, the protection of electric lights, the prevention of electric and friction sparks in machines, and the use of inert gases in grinding machines.

That engineering colleges graduates are handicapped without a supplementary commercial training is the basis of research investigations just completed by Dr. W. F. Rittman and W. F. Reilly, of Carnegie Institute of Technology, Pittsburgh.

One of the two most important generalizations cited by the authors in their report is that "the great majority of graduates use their technical education as a means of getting into commercial or managerial work. It is believed that a study of the activities of graduates of technical institutions corresponding to Carnegie Institute of Technology would show this same order of classification, which seems to be natural and in conformity with the trend of the times."

Seventy-five per cent of the centrifugal pumps used in South Africa are of American manufacture. They are used mostly where water can be obtained from rivers or streams. As there are not many streams in South Africa, and none at all in a large part of the plateau region, there are no extensive areas where centrifugal pumps can be used. The cost of fuel for the engines operating these pumps has always been high and this has militated against a more extensive use of such pumps.

## WORK DURING HOLIDAYS PRACTICALLY COMPLETES BUILDING

Tremendous amount of finishing-up accomplished  
while students rest

It was with open admiration, evident fascination and startling reaction to the unexpected sight, that we returned to the Institute, Jan. 3rd, to take up the remainder of the first semester's work.

It was as though a bare structure of brick and wood had been suddenly and alluringly transformed into a modern technical school building. The strip of canvas that hung across the entrance of the building had been replaced by doors—three in all—through which the returning students hastened to view the result of the 20-day layoff.

The vestibule, or lobby of the school, had been plastered, the woodwork installed and stained; a two-way stair had been built over the entrance to the laboratories on the main floor; office rooms down stairs had been finished, desks installed and routine work was being accomplished in the busiest office in school—the registrar's near-sanctum.

Starting through the lower floor, we found double doors between departments blocking our progress—though opened temporarily; the iron railings for the mezzanine passageway, which had formerly been stacked along the hallway, were gone; the iron structures of stairways leading from the passage deck to the departments had been secured in place and the steps poured with concrete—everywhere the view was one of work accomplished, things done.

Farther down the way, the flooring of the mechanical Laboratory had been laid; the transformation of the woodshop from the east wing between the firewalls—next to the Chemistry Lab.—to the west wing of the same compartment had been made. Along the south wall of the woodshop were a dozen wood turning lathes in position, their jackshafting completed on the wall.

All of the work benches had been moved over from the east to the west side, and only two pieces of machinery—a band saw and rip saw—remained in the roomy east compartment.

### Progress in Chem. Lab. Astounding.

But, as we cut into the Chem. Lab., the most surprising spectacle of all sheared our vision. The seven thousand dollars' worth of new equipment was all in place—on freshly laid surfacing of concrete. Every laboratory desk was in position, with the exception of a lecture table and one or two cabinets whose position had not yet been determined. The new still for distilling water was installed, and all but connected to the steam main. Dr. White, Prof. Childs and a crew of six hearty Chemists were making the place buzz with activity. They could scarcely have done less and accomplished the work they did in the space of time they had.

### Shower Room Surfaced.

Down the stairs toward the shower room, we hied, now in a frame of expectancy that would not have known surprise at seeing a hundred men at work below—so few were above stairs. The

shower room had been outfitted with its stone and plumbing fittings, and the job of surfacing the floor was only then being completed.

The boiler room was the eighth wonder. A generator, hooked up to a turbine, both of which had been fragmentary and piecemeal in the occasional visits we had made below—was humming with a soothing synchronism that affected us like the strains of sweet music do to a groom. Then we knew that the Institute power plant was in working order and already furnishing power to the multitude of kilowatt-eating machines over the building.

Too, the atmosphere of busy mechanics, adjusting, cleaning up, rearranging and, above all, working was sweet balm to the now keenly attuned senses of the Men of Rose, who hurried hither and thither—lest they miss some minute detail, some "piece de resistance" in the facilitation of school activities which had been accomplished during the more than welcome vacation.

Above stairs again, we saw with satisfaction the door installed for the gymnasium, the finishing of the surfacing on the mezzanine passageway, the placing of the handrails along this corridor, the completion and connection of the mezzanine lavatories and the generally business-like aspect of affairs.

We continued our inspection, every moment pride swelling more and more within us at the multitudinous things that had been accomplished in our absence, walking down the upper corridor toward the lecture rooms and offices in the "south building".

Each room in the front end had been plastered, sheet metal-roofed, wood-finished and floored during our absence. Chairs had been brought to each, and a temporary assignment of lecture room space had been posted on the bulletin board.

Truly the day was one of pleasant, encouraging surprises, utterly destroying that physical and psychological depression of students and faculty before leaving school, which the faculty and board of managers had wisely seen and overcome by adding a week to the vacation period.

Class work began regularly Wednesday afternoon. By the time of beginning classes Thursday morning, however, scholastic practices were in full swing again at Rose. The reaction had been one toward a better morale, a greater desire to overcome, in the remaining three weeks before finals, the depressing obstructions and interruptions sustained before the holidays.

And, don't let's stop by merely giving credit for the virtual completion of the work—let's help things along, by "getting in there and going," making up for time lost, with a zest and verve that will completely reconcile the pessimist who had foreseen wrack and ruin.



## PAUL BOGART SPEAKS

Mr. Paul N. Bogart, one of the most active members of the Board of Managers of the Institute, spoke at the regular Thursday assembly, Jan. 4, the day after the opening of school.

Mr. Bogart's appeal in an informal address to the students, faculty and board of managers for closer harmony among the three members of the "school family" was enthusiastically received by the assemblage. Some of the difficulties in the construction of the new building were gone over by Mr. Bogart, but his strongest plea was for the development, super-development of the sportsmanlike spirit in every member of the three branches of the school's personnel.

President Woodworth, in presiding over the assembly, announced the action of the faculty at a meeting held at 10 o'clock Wednesday morning, Jan. 3, whereby a week would be added to the first semester. In this way, commencement exercises will be held at the regularly assigned time in the spring.

President Walter Eli of the board of managers, whom Dr. Woodworth introduced at the man who "put over the job" of finishing up the school during the vacation, was reluctant to admit his accomplishment; but after shortly reviewing his connection with the school he reiterated his intention to retain office until the present job was completed.

Still another member of the Board of Managers, James S. Royce, rather diffidently delivered a few words when called upon by the presiding officer.

Mr. Bogart, in his talk, strongly stressed the original purpose of founding Rose Polytechnic held by Chauncy Rose. His aim, said Mr. Bogart, was to provide means for the acquisition of technical education by the youth of the immediate vicinity; and long after the present faculty, the present student body and the incumbent board of managers had served their terms here, this same intent to serve the male youth of the country would endure as the moving factor of Rose.

## WEEK ADDED TO FIRST SEMESTER.

At a meeting of the Faculty, Wednesday morning, Jan. 3, a resolution was adopted whereby the duration of the present semester should be lengthened by one week, and one week be deducted later from the allotted time of the second semester.

This action, it was said, was taken in view of the somewhat slower progress in scholastic work this term than is usual. It is hoped that the added week will prove of great help to all students in bringing up to standard their marks before the final exams.

It was originally voted—when the faculty moved to suspend the exercises of the Institute, Dec. 14—that the week lost be not counted, but upon reconsideration the sentiment of the faculty seemed that an additional week was necessary before the finals. It is certain that every student really appreciates this added week.

## THE JUNIOR PROM

Freshmen, notice; the Junior class extends the privilege to you to attend the first annual Junior Prom at Rose. In but few other schools of the country are underclassmen allowed to attend such an affair. A prom is known among the larger colleges as the most exclusive event of the year, since only the Faculty, the Seniors and Juniors attend.

Sophomores, your support is needed and greatly desired, for the Juniors will not regard this event as a complete success unless you carry on. Every man of you, who can do so, should come, and if you do there will be no doubt about the next year. You will be sufficiently impressed for future proms.

It is needless to say that the Junior class is behind this to the man, and that they need encouragement, in the form of pledges to attend.

An affair of such dimensions must be proved sound before final speculation is to be considered. Also, it must be remembered that such an affair is expensive and that the average Rose student cannot pay the desired fee in one payment. In view of these facts a very good system has been established.

Tickets have been issued which may be reserved by the payment of \$1.00 now, and \$1.00 before the 15th of each month until May, when the final payment is to be made. The tickets are to be sold at \$5.00 each and will not be given to the purchaser until it has been paid in full. Payments are to be made to Robert A. Reddie, Secretary-treasurer of the Junior class.

Alumni support is desired; any alumnus wishing to attend should write the prom committee immediately. The prom offers an opportunity to every alumnus to come back and see "dear old Rose", with her new buildings, her new spirit, and her new students, as well as some of your own classmates.

Students of the New Rose, get back of this new idea with all there is in you and look forward to may for the most outstanding event of the year.

## WUXTRY!! WUXTRY!!

## Streetcar Accident Almost Fatal.

Our illustrious language professor, having walked from school to Highland Lawn to catch his car, a short time ago, had the ill fortune to board a car which was fated to later crash into a coal truck at 25th Street.

Within three seconds after the accident, Froggy, closely followed by McIntyre, was seen to pile hastily, though with his usual dignity of bearing, from the badly damaged conveyance.

With a scarcely a glance at the wreckage strewn upon the street, Froggy started at a speedy trot to circumnavigate the streetcar. Witnesses say that, judging from the agonized look in his eyes, they were convinced that he must have sustained serious internal injuries.

It was later discovered that the professor was merely looking for an inspector. It seems that the conductor of the car, bleeding from a gash in his head, had inconsiderately gone home without giving Froggy the transfer which he so desired.



# ATHLETICS

## ENGINEERS START SEASON SLOWLY

The 1922-23 Rose basket ball team started under the tremendous handicap of not being able to practice until a bare two weeks before the first game of the season. Consequently out of the first six games played, five were lost, and some of them by large scores.

The gymnasium was really not ready for occupancy until after the Christmas holidays, but the bankboards were in place, and the floor was finished approximately a week before the first game, with Central Normal.

The Central Normal game at Danville, Dec. 15, was not as bad as might have been, considering the Engineers lost by a score of 29 to 14.

Dec. 20, Rose dropped another game to the Christian college at Merom, 23 to 19. Things began to take on a rosier aspect, but then vacation came along, and again put a temporary stop to training.

Purdue walloped the Engineers, 41 to 12, the first game after the holidays, at Lafayette. Last year the Techmen outplayed the Boilermakers, but were beaten, but this year the Agriculturists brooked no such chances as a defeat, and waded into our men too hard at the start to be possibly overcome.

The next night, Jan. 6, the Central Normalites came down for a return game. It was the first game of the season played on the NEW ROSE gym floor. The Engineers did themselves proud by humbling their former conquerors to the tune of 19 to 15. A close score—yes, but a close game. The turnout for the first night could have been larger, but Saturday night is Saturday night, and lots of Techmen earn their spending money on Saturdays.

The K. of C. hall was the scene, Jan. 9, for the further humbling of Rose—to our worst rivals, State Normal. The Teachers, or Sycamores as they desire to be called (state,—stateliness,—sycamore), were unable to do much damage the first half, but in the second round found their eye for the basket; and after that they were through pushing air through the basket ahead of the ball, the final count was 58 to 12. The Sycamores had a good team. Our boys fought. They always fight. But the lack of practice earlier in the season had told on them, and they simply couldn't hit the iron hoop as often as was necessary.

Muncie Normal was invaded Saturday evening, Jan. 13, by our "Fighting Engineers," but the tune played was a sad one. They took us over a 55 to 16 count, and no rebate for cash. But we'll get

another smack at Muncie later on in the season. and if the boys continue to improve their game as they have lately, the rooters of Rose will probably have a liking for sprightly, jazzy music when the Muncie-ites attempt to repeat here.

### Schoonover Heads Team.

At a meeting of the basket ball letter men, held shortly before the holidays, Harold Schoonover, husky backguard, '25, was elected to captain this season's quintet. "Schoony" is "defender of the other team's goal", and, except for his being only a sophomore, well-equipped to head this year's aggregation.

At least the basketball men don't know who's who—who is on the varsity and who is substitute. Of the dozen men out, the choice for varsity five lies between seven or eight. It is probable that about eight letters will be awarded at the close of the season.

The men, in order—as closely as our ability will lend us to judge—are Skeeters, Schoonover, Smith, Lentz, Anstead, Moorhead, Watson, Hunter, Tyler, Wilson, Fisbeck, Witty, Kadel. The freshmen named—Hunter, Fisbeck, Kadel and Witty, are all unknown quantities, so it is unfair to hazard a guess as to which one of them will survive the varsity elimination tests.

The telephone is said to be the most far-reaching in its requirements of any utility. Gold, silver, platinum, are present in each telephone—in small quantities it is true, but nevertheless forming important parts of the delicate apparatus that makes all the world neighbors.

In addition each telephone hides inside its somber covering, among other things, portions of rubber, silk, cotton, linen, wood, coal, iron, lead, copper, zinc, nickel, aluminum, mica, shellac, copal, tin and asphaltum.

To have a brilliant  
Ivory Comb,  
And an only hair  
Upon one's dome  
Is bad enough, but still,  
To have a thirst,  
But not a drink  
I think is worse.



## WITH THE ALUMNI

The following Alumni were back for the holidays:

Self, '20, Self, '17, Poggensee, '14, Goodman, '21, Williams, '17; Clark, '21; Wickersham, '03; Dedert, '22; Wilson, H. L. '22; Wilson, L. A. '22; Pence, '20; Steffen, '21; Walker, '21; Dronberger, '22; Froeb, '20; Faucett, '21; King, '20; Probst, '19; Owens, '20; Briggs, '20; Fitzsimmons, '22; Landrum, '22; Reinking, '20; Brophy, '20; Biller, '21; Sliger, '20; Wagner, '16; Henderson, '22; Kessler, '20; Downen, '21; Acheson, '22; Price, '22; Suttie, '22; Harmas, '22; Junker, '21; Stinson, '19; Armstrong, '21; Royer, '22; Hartsock, '22; and Kingery, '16.

### Class of 1945.

On December 19th, 1922, came the announcement of the birth of John McCandish Ross to Mr. and Mrs. Taylor William Ross. Mr. Ross, Sr., is a graduate of the class of '93 and we do not doubt but that in '45 the name of Ross will again be seen in the list of graduates from Rose.

C. C. Scharpenberg, '07, chief engineer for the Standard Oil Co. of California paid a visit to the school on Dec. 11th. It was his first time back for a number of years and he was very much impressed with the great future to be seen for the New Rose.

Announcement is made of the marriage of John A. Wagner, '19 of the Wagner Malleable Castings Co., Decatur, Ill.

Frederick R. Owens, '21, was married to Miss Margaret Richards, of Terre Haute, on Christmas Day, at the First Baptist Church. The couple will reside in Pittsburgh, where Owens is connected with the Duquesne Light & Power Co.

Briggs, '20, is now a test engineer with the Duquesne Light Co., Cheswick, Pa.

Brown, '20, is selling real estate for the Ratteree Investment Co., Los Angeles.

Compton, '15, visited school Jan. 8.

Crowe, '13, who has been track supervisor for the Wabash Railway at Montpelier, Ohio, is filling the same position at Landers, Ill.

Dailey, '05, has returned from Los Angeles, and is visiting in Terre Haute while looking for a new job.

Delle, '06, who has been in Houston, Tex., is president of the Pillsbury-Becher Engineering and Supply Co. at St. Louis.

Flesher, '20, who is with Westinghouse, has been transferred to Chicago.

Harries, '11, has moved from Milwaukee and has taken a position with Westinghouse at East Pittsburgh, Pa.

### CHICAGO TECH CLUB.

Chicago held its January meeting the night of the eleventh, at the Engineers' club. Dr. Woodworth's report on the completion of the new building was heartily approved. Discussion centered mostly on more publicity for Rose, and the arrangements for the homecoming during commencement, in celebration of the 40th anniversary, tentatively slated for June 6 and 7. Those present were: Balsey and Walter Mills, '91; Weatherbee, '92; McDargh, '96; Arn, '97; Gilbert, '03; Mullett, '04; Hahn, '04; Ryan, '06; Goodman, '07; Post, '07; Bernhardt, '08; Bercan, '10; Overpeck, '13; Lyon, '14; Harris, '14; Motz, '16; Brooks, '16; Weeks, '17; Ild, '17; Cornell, '18; Ruston, '20.

### INDIANAPOLIS TECH CLUB.

At the regular November meeting of the Indianapolis Tech club, the following officers for 1923 were elected: Wilbur B. Shook, '11, president; Alvin C. Rasmussen, '12, vice-president; and Raymond S. Davis, '17, secretary-treasurer.

Professor Wickersham, whose resignation was accepted from the Institute two years ago, was present, and gave a short talk. Dr. Woodworth also addressed the gathering.

The members present included: Oscar Baur, '87; R. L. Biller, '21; A. F. Brennan, '13; F. M. Crapo, '19; R. S. Davis, '17; E. F. Folsom, '92; H. W. Foltz, '86; E. W. Klatte, '09; W. C. Noelke, '04; W. H. Palmer, '87; K. R. Garst, '11; A. M. Hood, '93; H. W. Ker, '11; F. B. Ray, '20; J. S. Petri, W. B. Shook, and H. R. Voelker, '11.

### PITTSBURGH TECH CLUB.

The Pittsburgh Rose Tech Club met at the William Penn Hotel, Saturday evening, December 9th for the purpose of electing officers for the ensuing year. H. A. Heichert, '97, was elected president and H. E. Ransford, '14 secretary. The following men were present. J. H. Overpeck, '16; H. S. Heichert, '97; S. M. Finkelstein, '15; F. J. Frisz, '09; R. R. Stoltz, '16; W. S. Risser, '16; E. J. Ducey, '11; H. L. Wilson, '22; W. W. Reddie, '12; B. R. Shover, '90; Brent Wiley, '90; U. U. Carr, '96; A. W. Worthington, '06; S. S. Wales, '91; . Briggs, Jr. '20; R. L. Wilson, '92, and H. E. Ransford, '14.

The present status of athletics at Rose was given prominence in the talks given by the various men and in the discussion that followed the following resolutions were adopted:

(Continued on page 15).



VOL. XXXII

TERRE HAUTE, INDIANA, JANUARY, 1923

No. 4

## THE TECHNIC

Member of the Engineer College Magazines, Associated.

TERRE HAUTE, INDIANA, JANUARY, 1923

A monthly magazine published by the student body and Alumni of the Rose Polytechnic Institute. Member of Engineering College Magazines, Associated.

### Other Members Are

The Transit	Iowa Engineer
Colorado Engineer	Michigan Technic
Illinois Technograph	Wisconsin Engineer
Kansas State Engineer	Cornell Civil Engineer
Nebraska Blue Print	Minnesota Techno-Log
Sibley Journal	Princeton News Letter
Ohio State Engineer	Tech Engineering News
University of Virginia Journal of Engineering	

Recognized by the Terre Haute Retail Merchants' Association as an Advertising Medium.

Acceptance for mailing at special rate of postage provided for in Section 1103, Act of October 3, 1917, authorized December 13, 1918.

### Terms of Subscription

One Year .....	\$2.00
Single Copy .....	.30

### NEW !

Well, fellows, wasn't it about the grandest and most glorious feeling you've felt in a long time, when you came back to school after the holidays?

To emerge, virtually, from the turmoil of construction work, to the orderliness of scholastic and laboratory work was a welcome transition.

Let's do our part; the Board of Managers has done its; the faculty has come through. Don't let it be said that the students backed down.

Things are new—now—but as to how long they are kept new, and in good serviceable condition—we alone are to say. It was a common practice at the old school to scratch names here and there, on desks, on walls and in other conspicuous places. Help to keep Rose clean; to engender a feeling against such offensive practices.

### THESES ABOLISHED

Seniors, as a class, are passive to the announcement by the administration that theses will be abandoned, at last this year. Some individuals would rather work on a thesis subject, while others prefer to put the extra time on added lab practice, and to have additional credits in some of their major subjects.

The same number of credits will be required

### EDITORIAL STAFF.

A. L. Sherwood, '23 .....	Editor.
Raymond G. Fitterer, '24 .....	Asst. Editor.
D. Vern Eichin, '23 .....	Alumni Editor.
Curtis Lehner, '24 .....	Athletics.
S. J. St.Clair, '23 .....	Activities.
H. L. Maury, '25 .....	Asst. Activities.
Francis McCullough, '24 .....	Cartoonist.
W. K. Boyd, '23 .....	Differentials.

### BUSINESS STAFF.

A. E. Woollen, '23 .....	Business Manager.
Earl Dawson, '25 .....	Advertising Manager.
Jesse L. Tygart, '23 .....	Circulation Manager.
Roger Bolin, '25 .....	Asst. Advertising Manager.
J. A. Vanderkloot, '25, Asst. Advertising Manager.	
Carson Simms, '24 .....	Asst. Circulation Manager.

Address all communications to  
THE ROSE TECHNIC, Terre Haute, Indiana.

next semester, but their distribution will be changed. For the most part, the added time will be put in on laboratory practice in different departments. Evaluation and accounting will be changed from a two to a three-credit course.

There's very little difference, though, whether the time be spent at work or one or another problem, as long as the time is devoted to the course which this or that student is pursuing.

Perhaps some Seniors are aggrieved because they won't be able to goldbrick as much in lab as they would in working a thesis!

The Athletic Association provided the first entertainment of any nature whatsoever Friday night, January 19, by giving a "gym hop" after the Hanover-Rose game. About seventy-five of the Engineers brought femmes, and tripped the not-so-light fantastic after the court game.

Bud Cromwell furnished the orchestration for the hop. Five jazzy musical instruments combined their waves, whilst the dancers vibrated from node to ante-node.

The Hanover team was much surprised to see a gym hop. The Hanoverians are not allowed to dance in any of their school buildings; hence, they accepted the invitation with gladness.



## RUSH SEASON MOVED UP WEEK

The first meeting of the year of the Interfraternity Board was held at the instance of Dr. Woodworth, at the latter's home, Jan. 10. Discussion for the most part was general, though mostly covering school activities, and comparison with practices in other schools.

The necessity of changing the opening dates of rushing season on account of the term closing Friday afternoon instead of Saturday noon, as formerly, caused the following schedule to be drawn up and accepted by the board, to govern the rushing season:

**Feb. 2.—3:30 p. m.—Rushing season opens.**

**Feb. 14.—Rushing season ends. (Interpreted as ending at 8:00 a. m. Thursday morning, Feb. 15).**

**Feb. 15.—10:00 a. m.—Invitations from fraternities in office.**

**12 Noon — Invitations distributed by either Dr. Woodworth or Dean White.**

**Feb. 16.—12 Noon—Bids must be returned to office by rushees before noon.**

**3:30 p. m. —Bids handed back to fraternities.**

During the meeting, Dr. Woodworth entertained with a light lunch, and a variety of cigarettes and cigars.

The President expressed satisfaction at the general good feeling manifested and hope that the board would meet frequently to talk over pertinent matters.

**FRESHMEN, NEW STUDENTS and FRATERNITY MEN ARE CAUTIONED TO READ CLOSELY THE RULES LAID DOWN BY THE INTERFRATERNITY BOARD, REGARDING RUSHING SEASON. (See page 56, The Handbook).**

## FRATERNITIES

## ALPHA CHI SIGMA.

Errol L. Fox, spent a week during the holidays at the home of his parents, in Akron, Ohio.

Dr. John White spent Christmas in Chicago.

Brother Garnet Phillips, who was operated on for appendicitis, December 20th, is reported out of danger and is now improving rapidly. He hopes to resume his college work in the very near future.

## ALPHA TAU OMEGA.

The annual smoker for Alumni was held the afternoon of Christmas Eve at the House. A large number of the "old men" were in attendance, and spent an enjoyable afternoon.

Brothers Hager, Hendrich, Lehner and Haupt attended the Fraternity congress, Dec. 27-30, at the Congress Hotel, Chicago.

A New Year's watch party at the House was enjoyed by about fifteen couples.

## THETA XI.

Kappa Chapter entertained with a Christmas dance, Dec. 23, at the Elks club. Brother F. H. Wente, and Brother Leikin of Illinois were guests. Dr. and Mrs. Sousley and Dr. White were patrons. Several alumni members attended.

## P. I. E. S.

The Fraternity entertained with a Christmas dance at the Elks Dec. 21st. Compact boxes with the fraternity seal engraved on blue leather were given the guests.

A party was given at the house New Year's Eve, preceded by a theatre party at the Hippodrome. Dancing, 1923 festivities and a delightful lunch featured the evening's and morning's entertainment

## SIGMA NU.

Among recent visitors at the house were Brother Carl Hollinger of Purdue, Brother Leonard of Indiana, and alumni of Beta Upsilon home for the holidays.

Brother Danner, '22, has removed to Terre Haute, and will be permanently located here.

**WOLFE**—What kind of a time is Glenn having on his auto tour?

**SCHAHFER**—Great! Got two letters from him: one from a police station and the other from a hospital.

## THE OILY BOID.

**A**—Has anyone seen Pete?

**B**—Pete who?

**A**—Pet-roleum.

**B**—Kero-sined him yesterday, but he hasn't ben-zine since.

"Does yo' still refuse, sah, to pay me dem two dollahs I done loned ya'?"

"Nossah!" dignifiedly replied Brother Jones, "I doesn't refuse; I jus' refrains."

To be a college bred means a four-year loaf, requiring a great deal of dough, as well as lots of crust.

**PROF.**—Strange, your recitation reminds me of Quebec.

**STRANGE**—How come?

**PROF.**—Built on a bluff.

## WHY?

**FROSH**—Why is it you like these studies in the nude?

**ART STUDE**—Oh, I guess it was just because I was born that way.

**The hardest thing on earth to lose is a bad reputation.**

**FROGGY**—"For what are you searching?"

**FREERS** (deep in an Atlas)—"I'm looking for Atoms."

**FROGGY**—"You must mean Athens."

**FREERS**—"No, I mean Atoms, the place to which everything is blown."

## SANS REMORSE!

It wasn't the flu that killed poor Mike,

Nor was it the lack of breath;

A fly crawled down Mike's back one day

And tickled him to death.

## REVIEWS

**BELT CONVEYORS AND BELT ELEVATORS.**

By Frederic V. Hetzel. N. Y., John Wiley & Sons; Lond., Chapman & Hall, 1922. 333 pp., illus., diagrams, tab., 9 x 6 in., cloth. \$5.00

This volume deals with belt conveyors and belt elevators, and utilizes these machines, which are so widely useful, to illustrate some of the general principles that underlie the design and use of conveying and elevating machinery. The author has had thirty years' experience in the design, manufacture, and erection of machinery of this kind.

**PRACTICAL TREATISE ON SUSPENSION BRIDGES.**

By D. B. Steinman. N. Y., John Wiley & Sons; Lond., Chapman & Hall, 1922. 204 pp., illus., diagrams, charts, 9 x 6 in., cloth. \$4.00.

This book has been planned for practicing engineers engaged in estimating, designing, or building suspension bridges, and for students. It is intended as an up to date, practical handbook, distinguished by simplicity and convenience. Division 1, on Stresses, presents formulas derived from modern practice, reduced to their simplest and most convenient form for direct application. Division 2, on Types and Details of Construction, is intended to assist in the selection of the best type and the determination of proportion for the various elements. The third division, on Typical Design Computations, gives numerical examples of the application of the author's methods to designs of different types. An Appendix contains charts designed for the expeditious proportioning of suspension bridges.

**RAILROAD CONSTRUCTION.**

By Walter Loring Webb. Seventh Edition, Revised and Enlarged. N. Y., John Wiley & Sons; Lond., Chapman & Hall, 1922. 847 pp., illus., diagrams, tab., 7 x 4 in., fabrikoid. \$5.00.

Important changes and additions have been made in this edition in relation to the shrinkage of embankments; the laws governing the life of ties; substitutes for wooden ties; rail specifications, testing failures, wear; rail-joint failures; water-tank construction; hump-yards; yard grades; train resistance; and stresses in track.

**DIRECT CURRENT MACHINERY.**

By Harold Pender. N. Y., John Wiley & Sons; Lond., Chapman & Hall, 1922. 314 pp., illus., diagrams, 9 x 6 in., cloth. \$3.00.

The author states that he knows of no textbook on direct-current machinery which gives a thorough treatment of the theory and performance of such machines, without, at the same time, going into the details of design to such an extent as to be confusing to the ordinary undergraduate student. It is with the desire to provide such a text that this book is offered. It presents the theory of direct-current machines and gives much space to the performance, application, and testing of the various types of direct-current generators and motors. The testing methods given are those commonly used in commercial laboratories and by manufacturing companies.

**ELECTRIC TRANSIENTS.**

By Carl Edward Magnusson, A. Kalin, and J. R. Tolmie. N. Y. and Lond., McGraw-Hill Book Co., Inc., 1922. 193 pp., diagrams, 9 x 6 in., cloth \$2.50.

The purpose of this book which is an outline of an introductory lecture and laboratory course given at the University of Washington, is to aid the student in gaining clear concepts of the fundamental principles of transient electric phenomena and their application to quantitative problems. Emphasis is placed on the physical properties of electrical transients.

**MANUFACTURE AND USE OF ABRASIVE MATERIALS.**

By Alfred B. Searle. (Pitman's Technical Primer Series). Lond. and N. Y., Isaac Pitman & Sons, 1922. 118 pp., illus., 6 x 4 in., cloth. 85c.

This text contains a brief description of abrasive materials and their preparation and of the manufacture of abrasive wheels, papers, and polishes, together with advice on the selection and testing of abrasives and the erection and operation of grinding machines. The book should be useful to those called on to deal with grinding problems without any very extended experience in the art.

**PRODUCTION GRINDING.**

By Fred B. Jacobs. Cleveland, Ohio, Penton Publishing Co., 1922. 238 pp., illus., 9 x 6 in., cloth. \$3.00.

The methods used in representative plants for cutting and finishing machine parts is described herein. The subject-matter includes the practice of the Marmon, Packard, Oakland, Chevrolet, and Ford automobile plants, methods for finishing chilled-iron valve cams, ball and roller-bearing production, grinding operations in the making of dental tools, finishing calendar rolls, reconditioning automobile engines, die-grinding, and the making of milling cutters. Full data are given concerning methods and output.

**BUSINESS OF OIL PRODUCTION.**

By Roswell H. Johnson, L. G. Huntley and R. E. Somers. N. Y., John Wiley & Sons; Lond., Chapman & Hall, 1922. 264 pp., map, 9 x 6 in., cloth. \$3.50.

This volume, intended for executives of oil companies, is an expansion of that part of Johnson and Huntley's "Principles of Oil and Gas Production" which treats of oil and gas production as a business. It discusses such subjects as the choice of regions, leasing methods of development, size and financing of companies, organization of staff, costs, accounting, depreciation, taxation, drilling methods, prices, and industrial outlook.

**HANDBOOK OF CHEMICAL ENGINEERING.**

By Donald M. Liddell. N. Y. and Lond., McGraw-Hill Book Co., 1922. 2 vol., illus., diagrams, tab., 9 x 6 in., fabrikoid. \$8.00.

This book is intended as a reference work for experienced chemical engineers, and has been prepared by a group of specialists. It is concerned primarily with the major processes common to the chemical industries, and the plant and machinery required therefrom. Typical cases showing the application of these methods are given frequently, but the book does not attempt to supply information on the minor processes of individual industries.

**THEORIES OF ORGANIC CHEMISTRY.**

By Ferdinand Henrich. Translated and Enlarged from the Fourth German Edition of 1921, by T. B. Johnson and Dorothy Hahn. N. Y., John Wiley & Sons; Lond., Chapman & Hall, 1922. 603 pp., 9 x 6 in., cloth. \$6.00.

This text is a discussion of the present theories of organic chemistry, and is intended for graduate students and research chemists. The major lines of development are recorded from the original conceptions of Lavoisier, the reasons underlying the changing views are explained and references to the original literature are given. In preparing this translation, the translators have thought it desirable to stress the contribution of American investigators, and, therefore, have added much material on their work.

**MANUFACTURE OF DYES.**

By John Cannell Cain. Lond., MacMillan & Co., 1922. 274 pp., 9 x 6 in., cloth. 4.50.

This volume seems to be intended as a supplement to the author's earlier work. "The Manufacture of Intermediate Products for Dyes". It describes methods for making a large number of commercial dyes, giving details of the processes and referring to the English, American, French, and German patents concerned, as well as to descriptions in books and periodicals.





Courtesy of I. C. S.

## What chance have you got against him?

**I**T was a cynic who said: "Some men go to college. Other men study."

A slander! But yet there probably are college men whose bills for midnight oil are not large.

And there are men who left school in the lower grades who, along with a hard day's work, put in long hours of study—spurred on by a dream and a longing.

Look out for them.

The achievements of non-college men in business suggest an important fact. Success seems to depend, not so much on the place where a man studies, as on the earnestness of the student.

But, granting equal earnestness and ability, it is still true that the college man has the advantage.

Regular hours for study and lecture, the use of library and laboratory, the guidance of professors, contact with men of the same age and aspirations—all these will count in his favor, *if he makes the most of them.*

A big "if." The new year is a good time to start making it a reality.

*Published in  
the interest of Elec-  
trical Development by  
an Institution that will  
be helped by what-  
ever helps the  
Industry.*

# *Western Electric Company*

*Since 1869 makers and distributors of electrical equipment*

**SAVE MONEY !**  
**Interstate Salvage Company's**  
**January Clearance Sale**  
**U. S. ARMY GOODS**  
**226 Wabash Avenue**  
**Big Reductions on All Items**

High Grade Corduroy  
 Riding Breeches ..... **\$2.98**

Officer's Dress Boots, \$7.45.

Leather Puttee Leggings, \$2.95.

**ARMY SHOES AND DRESS SHOES**  
 at 25% to 40% Reduction.

Special Attention Given to Rose Students  
 Look for Our Name and Number

**Interstate Salvage Co.**  
 226 Wabash Ave. B. W. Roth, Mgr.

**FOULKES BROS.**  
**Wear that Young**  
**Men Wear**

**ANGORA SWEATERS AND**  
**MUFFLERS**

**BERKLEY KNIT NECKWEAR**  
**KEYS CLOTH**

**INTERWOVEN SILK HOSIERY**  
**ENGLISH RIBBED WOOL HOSE**

**THE HOUSE OF**  
**FOULKES BROS.**  
**Hatters, Haberdashers**  
**and Clothing**

**ALWAYS A GOOD SHOW**  
 at the  
**AMERICAN and ORPHEUM**  
**THEATRES**

Home of Paramount Pictures

Concrete Handling Equipments,  
 Steel Derricks

Industrial Cars  
 Inquiries Solicited Covering

**ALL CLASSES OF STRUCTURAL**  
**STEEL FABRICATION**

**Insley Manufacturing**  
**Company**

**INDIANAPOLIS**

W. H. INSLEY, ROSE '00  
 President

A. C. RASMESSIN, '12  
 Chief Engineer

E. W. KLATTE '09  
 Asst. Chief Engineer

**TECHNIC**  
**ADVERTISERS**  
**ARE GOOD**  
**ADVERTISERS**



(Continued from page 9).

Resolved: That there is an apparent lack of publicity both locally and nationally of Rose affairs of all description as indicated by; First, by failure to have published all football scores and schedules in the leading dailies of the country; Second, to properly set forth the natural and historical values of the new school location; Third, Failure to properly commercialize school and student activities; Fourth, to advocate and bring before the manufacturing interests of the country the possibility of utilizing part of the acreage for manufacturing sites, in which Rose students can obtain valuable engineering and shop practice.

Realizing the value of publicity of all kinds and the immeasurable returns which can be obtained with a minimum expense, by publicity.

Therefore: Be it resolved that: That a man or men be appointed from the student body or from the Terre Haute Alumni to handle all matters of publicity, particularly those of athletics. That this man or men furnish suitable copy daily to the local papers and correspondents of the Associated Press and Metropolitan dailies. That the Student Council appropriate sufficient funds to publish the pictures and schedules of all athletic tests in the respective guides as published by Spaulding and Co., annually.

Be it further resolved: That this man or men give to the press articles setting forth the natural possibilities of our new location and to investigate and publish the many historical facts connected with the early history of the site. The uniqueness of the buildings and future school plans should also be published as they are of interest to the entire educational world.

Be it further resolved: That the annual student customs, such as the Pipe Rush and St. Patrick's Day parade shall be broadcasted through the moving picture weeklies and newspapers.

Be it further resolved: That it be brought to the attention of the Chamber of Commerce of Terre Haute, the possibility of locating small manufacturing plants on the ideal site adjacent to the school, where student training can be carried on in connection with the regular school courses.

Be it further resolved: That a radio broadcasting station be installed at the school for broadcasting concerts, semi-technical lectures etc., and that the necessary apparatus for this work be obtained from the Radio Corporation of America the General Manager of which is M. C. Rypinski, class of '97.

Be it further resolved: That copies of these resolutions be sent to the editor of the Technic, Claiborne Pirtle, Scott Mace and the Terre Haute newspapers.

#### CHECKS ON INDUSTRIAL WASTES.

Large sums are lost each year through the corrosion of underground pipes, conduits, and metal structures. Part of this is the result of electrolytic action while part is caused by conditions of the soil. An extensive program to study this subject,

(Continued on page 22).

**BILL CODY'S**

**Hats and Caps**

**MEET ME BAREHEADED**

**BILL CODY**

715 WABASH AVE. TERRE HAUTE

When you think of

**FLOWERS**

think of

**HEINL'S**

129 So. Seventh Street

TERRE HAUTE, INDIANA

**MAX FRANK**

**'THE SOLE SAVER'**

**FIRST CLASS SHOE  
REPAIRING**

7TH AND CHERRY

PHONE 1995

## Freitag Weinhardt & Co.

Opposite Hotel Deming  
20-32 North 6th St.

for Electric Hardware Supplies

PLUMBING and HEATING

PHONE 140

Get it at

## BUNTIN'S

and get it at cut rate

## Buntin Drug Co.

## "Walk Overs" Represent Extreme Good Shoe Values

Realizing that men want the best at every price they pay for footwear we invite choosing from the recognized "best"—Walk-Overs. We admit that some shoes are sold for less money, but we deny that any can be made of higher quality for every price we mark our footwear.

CLEARANCE NOW  
PHOENIX HOSE FOR MEN

**CHENEY'S**  
**WALK-OVER BOOT SHOP**

651 Wabash Avenue

## POLY. BOYS

WE CERTAINLY ARE OFFERING YOU  
SOME SWELL VALUES IN

## Furnishings, Hats, Caps Suits and Overcoats

During the Administration Sale now going on; Collars, Munsing Wear and Work Shirts excepted.

## Harry T. Schloss

Surviving Partner

## THORMAN & SCHLOSS

666 WABASH AVE.

Get Your Hair Cut at

## KRAMER'S BARBER SHOP

SANITARY THRU AND THRU

## All Matters Relating to Patents and Trade Marks

## ARTHUR M. HOOD

Rose 93

908 Hume-Mansur Building  
INDIANAPOLIS, INDIANA



(Continued from page 3).

Admiral Mahan in his two great books entitled, "The Influence of Seapower on History," and "The Influence of Seapower on the French Revolution and Empire," traces with matchless clarity the political and commercial development of the Europe we know today. Their contents are being applied by the statesmen of Europe. The history of the Japanese Empire in the past twenty-five years has been substantially guided and influenced by their existence. The principles adduced and analyzed are particularly applicable to our own country, a country that seeks wealth, prosperity and consequent happiness, not by the sword, but rather by honest, industrious labor.

We in the United States have been accustomed to give little thought to our need for a merchant marine, or, if we have considered it at all, only as something seen dimly, in the distance. We have been accustomed to think of our Navy as our strong right arm, as our bulwark in time of war, but as something in time of peace that was necessary, we supposed, but still required a heavy expenditure of the public funds that might be spent elsewhere to more apparent and immediate advantage.

We must revise our ideas; we must renew our perspective. The economic need for seapower is upon us, and by seapower I mean a fleet of American owned, American manned ships, running from great commercial ports to the ends of the world and back, supported and secured by a Navy trained to the razor edge of efficiency and second in power to none other on earth.

Nothing is more important to the future interest of the United States than a thorough realization by the rising generation of the great influence seapower will inevitably exert on their prosperity and happiness.

#### MEETINGS AND CONVENTIONS.

American Association of Engineers, ninth annual convention, Norfolk, Va. May 7-9, 1923.

Federated American Engineering Society, annual meeting Washington, D. C., January 11-12, 1923.

American Roadbuilders' Association, New York City, Annual Convention, Chicago, January 15-18, 1923.

American Society of Civil Engineers, New York City. Annual meeting January 17, 18, 1923.

American Concrete Institute, Detroit Mich. Annual convention, Cincinnati, Ohio, January 22-26, 1923.

Associated General Contractors of America, Washington, D. C. Annual meeting Los Angeles, Cal., January 30-February 3, 1923.

They may tell us that there isn't any Santa Claus, but never, never, will we believe that St. Patrick wasn't an Engineer.

## STAR BARBER SHOP

1274 Lafayette Ave.

"A BARBER SHOP WHERE YOU  
GET THE BEST OF SERVICE"

IN THE HEART OF  
TWELVE POINTS

RALPH B. JOHNSON, Prop.

## ELECTRIC SERVICE

DELCO—REMY—KLAXON—  
BOSH MAGNETO  
ATWATER KENT

We have the best equipped shop in  
the city for electrical trouble

## JOHN S. COX

222 S. Seventh St. Terre Haute, Ind.

## SWOPE-NEHF, BLOOMER CO.

Headquarters for Fraternity Emblems  
Pins, Rings and Medals

All Repair Work Done in Our Own  
Shop by Expert Workman

524 Wabash Ave. Terre Haute, Ind.

DON'T SAY  
 "Bread"  
 SAY  
**HOLSUM**  
 IDEAL BAKING CO.

## January Clearance Now

This entire stock of Stein Bloch, Sampeck and other leading makes of apparel for men and young men at one-fourth reduction in the January Clearance Sale, now on.

**MYERS  
BROS.**

Fourth and Wabash

**ROUSCH MOTOR CO.**

"We Can Do It"

1339-41 MAIN STREET

Phone Wabash 377

WHEN YOU WRECK' EM

(Continued from page 2).

many cases the oil-covered chips are subjected in the centrifuges to the heat of steam, which has a tendency to make the oil less viscous and more easily removed. By this means the oils may also be sterilized. A subsequent centrifugalization is necessary to separate the oil and water. The water is frequently evaporated, by passing the mixture through a filtering medium to a set of steam-heated coils, which surround the filtering chamber. In some plants all the oil (as well as the chips) is treated by centrifugalization, in order to remove dirt and other foreign matter.

**Sedimentation.**—By sedimentation the foreign soluble substances in the oil are caused to settle at the bottom of the tank, and the oil may pass over baffle plates into an outlet reservoir.

**Filtration.**—By filtration the oil may either be forced through the filtering medium under pressure, or may pass through by gravity. An objection to this method is that the pores of the filter become clogged with chips, and thus the passage of the oil is prevented.

**Straining.**—By the straining method the larger chips and pieces of metal are strained off by running the oil through grids or perforated plates.

**Magnetization.**—In magnetization the oil is passed in a shallow stream over a magnetized plate, which draws out all metallic particles. The surface of the magnetized plate is automatically cleaned from metallic particles.

**Combined systems.**—Frequently two or more of the above systems are used in combination, and such combinations prove to be very efficient in removing the metallic particles.

### DR. WEIDLEIN, MELLON DIRECTOR, VISITS INSTITUTE

Dr. Raymond Weidlein, director of industrial research at the Mellon Institute of Pittsburgh, stopped off at the school for a few hours on Friday, January 12. Dr. Weidlein happened in just in time to address the Chemists in Journal Review.

He spoke for about half an hour on the purpose and scope of the activities carried on by the Mellon Institute. The rare service of this institution to the solution of problems of industry has increased many fold during the last ten years, says Dr. John White, on account, chiefly, of the splendid personal supervision given by Dr. Weidlein in his capacity of director of research.

Some of the Senior Chemists talked to Dr. Weidlein after the impromptu address, asking about fellowships at Mellon. It is thought that one or two of the Seniors will apply for these.

Dr. Weidlein spoke very highly of the Chemistry Laboratory. He characterized the whole plant as a very efficient and highly up-to-date one, and commended the students and faculty on their good fortune at having it.



27 North 7th Street

Tel. Wabash 1137-R

**O. L. TABER**  
Grand Cigar Store

YOUR PATRONAGE  
IS APPRECIATED

**G. R. KINNEY'S  
SHOE CO.**

Shoes and Hosiery for less  
NOTHING OVER \$4.98

*Kinney's*  
WORLD'S LARGEST SHOE RETAILERS

67 Wabash Avenue

Now Going On  
Our Semi-Annual  
Clearance Sale

Seeing is Believing  
SO

See us First

REAL CLOTHIERS

**LEE GOODMAN  
& SON**

410 WABASH AVE.

**J. M. BIGWOOD  
& SON**

WATCHMAKERS and JEWELERS

**EYES TESTED FREE**

By Registered Optician

We Carry a full line of  
Kieth Stationery

Fine Watch and Jewelry  
Repairing

**607 WABASH AVE.**

WM. C. McGUIRE

WILBUR B. SHOOK  
Rose "1911"

**McGuire & Shook**  
Architects and Engineers

320-21-22 Indiana Pythian Building  
INDIANAPOLIS

THE BEST CANDY IS

*Mechinney's*

SNUGGLE BARS, NOUGAT  
CROQUETTES FOUR ACES

Try RAISIN JACK  
SCRUMPTIOUS

and the new one "SOME DUMBELL"  
**TRY SUPERBA MILK CHOCOLATES  
IN BOXES**

Agent for  
Eastman Kodaks, Cameras  
Film and Supplies

## Gillis Drug Co.

"THE CUT RATE STORES"

7th and Wabash and 412 Wabash

## BARTHOLOMEW & HARTIG JEWELER

SUCCESSORS TO E. W. LEEDS

DIAMOND  
EXPERTS

714 WABASH AVENUE  
TERRE HAUTE, INDIANA

**25% DISCOUNT**  
on all Hart, Schaffner  
and Marx Suits and Over-  
coats during January

**TUNE BROS.**

**All Makes**  
**Typewriters and Supplies**

**Ballard Typewriter Exchange**

659½ Wabash Ave.

Phone 4772

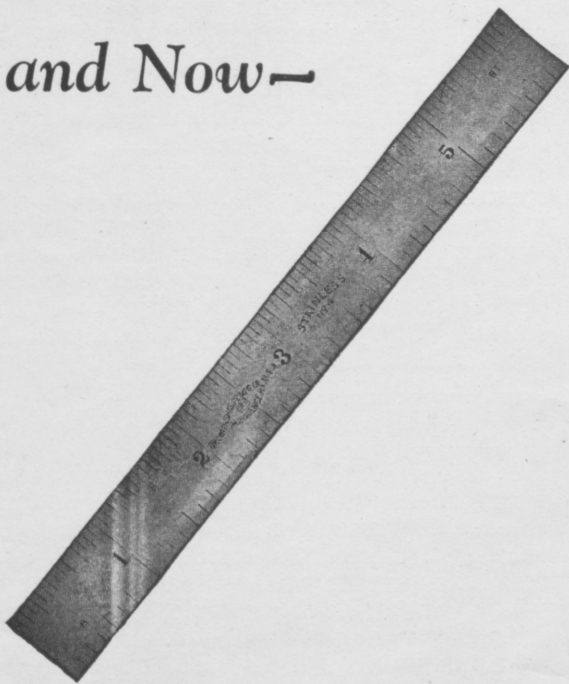
## Advertisers in this Issue

Powers Cleaning Co.  
Grand Cigar Store.  
Star Barber Shop.  
Brunswick Shop.  
Buntin Drug Co.  
Cody, Bill, Hats.  
Freitag-Weinhart.  
Ideal Baking Company.  
Cox, John S.  
Citizens Telephone Company.  
Walk-Over Boot Shop.  
Heinl's for Flowers.  
Swope-Nehf, Bloomer Co.  
Interstate Salvage Company.  
Tune Bros.  
Goodman, Lee.  
Foulkes Brothers.  
Sparks, Ed.  
Thorman and Schloss.  
Kramer, The Barber.  
Mewhinney's Chocolates.  
Craft Book Store.  
McGuire & Shook.  
Hood, Arthur M.  
Insley Manufacturing Company.  
Bigwood, J. M.  
Indiana Blue Print Company.  
Frank, Max, Shoes.  
American and Orpheum Theatres.  
Gillis Drug Company.  
Joseph, M. & Son, Clothiers.  
Kinney's Shoe Store.  
Bartholomew & Hartig.  
Westinghouse Electric Co.  
Brown & Sharpe Mfg. School.  
Western Electric Co.  
Otis Elevator Co.  
Mississippi Glass Co.  
T. H. Savings Bank.  
Myers Bros.  
Sterchi Music House.  
Clatfelter Shoe Store.  
Ballard Typewriter Exchange.  
Rousch Motor Co.  
Ed. S. Lammers.  
Rose Polytechnic School.  
U. S. Ball Bearing Co.

**PATRONIZE THEM**



and Now—



**A Six-Inch Rule  
(Pocket Size) of  
STAINLESS STEEL  
by  
BROWN & SHARPE**

**R**UST PROOF—will not stain or discolor, but will always retain its bright finish—clean-cut graduations in 8ths, 16ths, 32nds and 64ths, of the characteristic Brown & Sharpe accuracy.

**Get one from your dealer today**  
**Ask for No. 350—You'll like it**



**BROWN & SHARPE MFG. CO.**  
Providence, R. I., U.S.A.

**INDUSTRIAL BUILDINGS SHOULD BE WELL  
LIGHTED.**

From the employer's viewpoint, the big difference between men who work out of doors and those who perform tasks inside the building, is the factor of light. Daylight furnishes sufficient illumination outside during the daytime working hours for men to pursue their tasks efficiently and safely. But the proposition of getting enough daylight into the interior of industrial buildings, requires some thought.

It is not a difficult problem by any means, and any employer can take advantage of daylight and utilize it for lighting his building during the daytime, if he desires. It is an excellent light, especially suitable for the eyes, reducing eye strain and eye weariness to a minimum, and has the great economic advantage of costing nothing.

To utilize daylight to the utmost, we must first provide means for allowing daylight rays to enter the interior of buildings in sufficient quantity—namely, proper and adequate windows and skylights. Many excellent instances of buildings designed with a due regard to the importance of daylight lighting can now be seen in many of our industrial cities. Such buildings present the appearance of being practically all windows—"window walled," as they are termed—and this type of daylight construction is coming rapidly into favor, because it constitutes a more healthy building for large numbers of employees, both from the lighting and ventilation standpoints.

Among those who have constructed this type of modern industrial building may be mentioned: The Shredded Wheat Co., Gillette Safety Razor Co., Lyon & Healy Piano Co., H. J. Heinz Co., Corona Typewriter Co., Skimmers Macaroni Co., Grape Juice Co., Dodge Bros., Nelson Valve Co., Piston Ring Co., Remington Arms Co., and a great many others.

The Larkin Co., Philadelphia, has erected a building almost entirely glass, 85% being windows, and the Loomis Breaker, operated by the D. L. & W. R. R. Co., Nanticoke, Pa., is literally a glass house, being 93.5% of glass. The new buildings of the Winchester Repeating Arms Co. have an average glass area of 58%.

An investigation covering 18 buildings constructed by the Aberthaw Const. Co., Boston, shows that the average window area is 57.5%.

These figures indicate how important the subject of lighting is now considered by employers of industrial labor, and how well the idea has been carried out by the architects and engineers, in order that all parts of a building may receive sufficient daylight. But, in addition to providing ample window space, there is another factor which is equally important, and that is, equipping the windows with the proper glass.

The bright direct rays of the sun should not be permitted to strike the eye, and we must provide a means for reducing the glare to rays which will not be too bright. This is accomplished by glass especially manufactured for industrial windows, known as Factrolite. This glass possesses the property of breaking up the intense rays of the sun and diffusing the light into the interior of the building in proper portions, solving the problem of sun glare.

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

**MISSISSIPPI WIRE GLASS CO.,**

220 Fifth Avenue,

St. Louis.

New York.

Chicago.

**BRUNSWICK**  
 PHONOGRAPHS AND RECORDS  
 All the latest hits

**The Brunswick SHOP**

JENSON BROS. 527 Wabash Ave.

## TERRE HAUTE SAVINGS BANK

Southw. st Corner Sixth and Ohio Streets



4% Paid on Savings

ED. S. LAMMERS

RONALD LAMMERS

IF IT IS PAINTS OR GLASS  
 WE HAVE IT

**ED. S. LAMMERS CO.**

13th and Wabash

Phone 5124

(Continued from page 15).

and, if possible, to suggest means for preventing this waste is being mapped out. Pieces of pipe have been buried in different sections of the country, and the effect of the soil in these localities on the metal will be studied.

Most appliances used for heating by gas are operated at very low efficiency, with a consequent waste of gas and also with a very bad effect on persons working in the same room, because imperfect combustion means generation of carbon monoxide, which is extremely poisonous. The subject of improving both natural and artificial gas burners has been studied very thoroughly and recommendations issued which will greatly reduce gas consumption and improve the health of the users.

In the field of building construction more material than is necessary is often used for a wall, column, or floor slab, because information concerning the stresses which such structures or members can safely bear, their ability to resist fire, etc., is inaccurate or incomplete. In order to more definitely formulate safe and economical standards in this field, the suitability of rerolled steel as a reinforcement for concrete, the strength of walls and floors, the resistance of buildings to fire, and the constitution of cement and concrete is being studied.

### MEASURING LIGHT.

The fact that hollow spheres can be used for measuring the total light given by a lamp has been known for some time, but recently their use has increased very greatly because the new gas-filled lamps which have an irregular shaped coil filament can not be very well measured with any other apparatus. Consequently, every factory and laboratory which wishes to make accurate measurements of such lamps has to have a sphere.

If we wish to know the total amount of light given off by a lamp, we must not be content with measuring the candlepower in one direction only. We must measure it all about the lamp in many directions and take an average of the results. Actually to measure lamps in many different directions would require an enormous amount of time and work, and several ingenious devices to get the same result with less labor have been invented. One of the simplest and most satisfactory of these is the integrating sphere. This is simply a large, hollow white-walled ball, inside which a lamp can be placed with a small window so that the brightness of the inside wall can be observed. The light is reflected back and forth between different parts of the white surface, and the sphere has the peculiar property that every part of its surface automatically sends to every other part exactly the right fraction of the light, so that the reflected light falling on the window correctly represents the total amount of light produced by the lamp.

This is true even when the lamp gives all its light upward or downward or in any other direction as well as when the light is given off in all directions. Consequently, a single measurement of the brightness of this window shows the total light given by the lamp.



## ENGINEERING EMPLOYMENT REVIEW

The Employment Department of the American Association of Engineers reports that engineering employment has been getting better every month during the past year. Each month there was a smaller number of unemployed in the technical profession and many made fairly lucrative connections. During December employment was comparatively dull due to the usual year-end pause in general engineering work. For the next year, there is every indication that a big shortage of technical men will be experienced especially during the first few months. Already the demand for designers on all classes of work is far below the supply, with a larger demand certain as new work is started. Construction work cannot be expected to take on definite strides until the spring season opens. Manufacturing during the past year has not been very active although the product from American mills has been equal to the demand. Commerce is bound to take the upward trend, unless it is held back by political interference. Should we be able to avoid the grave strikes we had during the past year, the path of progress will be rather smooth.

The demand for the next year will be for specialists on construction, particularly on buildings, hydro-electric and drainage projects. A fair demand can be expected in the highway field. The demand for railroad professional engineers will not be very large. There are a few big projects under way and several large ones contemplated. Not much new work can be expected with the old trunk lines; their problems are maintenance and operation. A healthy demand can be expected for engineers in manufacturing and specialists on design. The electrical field will be rather dull and men can only expect advancement who specialize in certain phase of the electrical engineering field or who develop their abilities in more commercial work. The fields of the chemical and agricultural engineers are practically untouched and they offer wonderful opportunities.

Salaries for the past year have been on a gradual increase in the more basic positions. An increase of from 10 to 20 per cent is noticed during the year, although there are some cases where the salaries are really lower now than they were at the beginning of the year. The average salary, however, as compared with the cost of living is rather fair but is still below a just figure for a professional engineer. Most of the salaries that were decreased are in the county and municipal fields, occasionally on industrial and manufacturing work, and some railroad positions. This year increases in salaries in these fields can be expected. The average salary for graduates was considerably higher last year than the average before the war. The graduate in 1914 was receiving a salary on an average of \$60 to \$75 a month. Last year's graduates received on an average of \$125 a month.

According to census reports for 1921, there was a decrease of 16.4 per cent in the over-all activities of manufacturers of gas machines and gas and water meters, as compared to the 1910 census,

## CLATFELTER'S

FOR  
YOUR DRESS SHOES  
Better Values at Reasonable  
prices.

826 WABASH AVE.

## Watch Our Newspaper Advertising

for money saving  
January and February  
Sales

**JOSEPH'S**  
512-514 WABASH AVE.

Where Society Brand Clothes are Sold

No Home  
complete without  
a Telephone

# CRAFT'S BOOK STORE

673 WABASH AVENUE

## Sporting and Athletic

## Goods of All Kinds

GOOD MERCHANDISE AT  
CORRECT PRICES

Base Ball - Tennis - Golf  
See the Goods You Buy

# Banjo and Saxophone Quartets

## Get together for real Amusement and Profit

See our Instruments and get our prices. All finishes and grades.

SAXOPHONES    TENOR BANJOS  
 UKELELES

STERČNI

JEWELRY : MUSIC

### Fourth and Wabash

# INDIANA BLUE PRINT

33 So. 5th

ELECTRIC BLUE PRINTERS  
DEALERS IN DRAFTING SUPPLIES

Tracing Papers—Cloth  
Higgins Inks

# Sparks' Clothes

WHEN YOU WEAR SPARKS TAILORED  
CLOTHES YOU HAVE THE BEST  
FOR THE LOWEST PRICE

# ED. SPARKS

## Tailor and Haberdasher

715 Wabash Ave.

## Oh! Mr. Gallagher

## Oh! Mr. Gallagher

Have you heard about the foolish Poly boys?

Now, I'll tell you on the level.

**Their clothes look like the Devil.**

And their socks and ties just make a lot  
of noise!

## Why! Mr. Shean

## Why! Mr. Shean

I'm convinced you haven't seen the men  
I've seen!

## Why their clothes from shoes to collars

Look just like a million dollars,—

Where do they trade, Mr. Gallagher?

## Tech Advertisers, Mister Shean!



# **We Are For Men**

Because we do a very high quality work, the impression has been created that our service is for ladies' finer garments only. Nothing could be farther from the truth.

We want you to know our service is just as prompt, just as convenient, just as quick as any worth while cleansing service you can get. The important thing in cleaning a man's suit is not how often but how thorough it is cleaned.

Our careful workmanship is uniform. Dark colored pieces are cleaned as absolutely as the light colors, where poor workmanship would be discovered.

Our service is for men, real men who want service that is right. Can we not serve you?

# **POWERS**

**Everybody's Cleaner**

WABASH 1918

WABASH 7241

WABASH 437

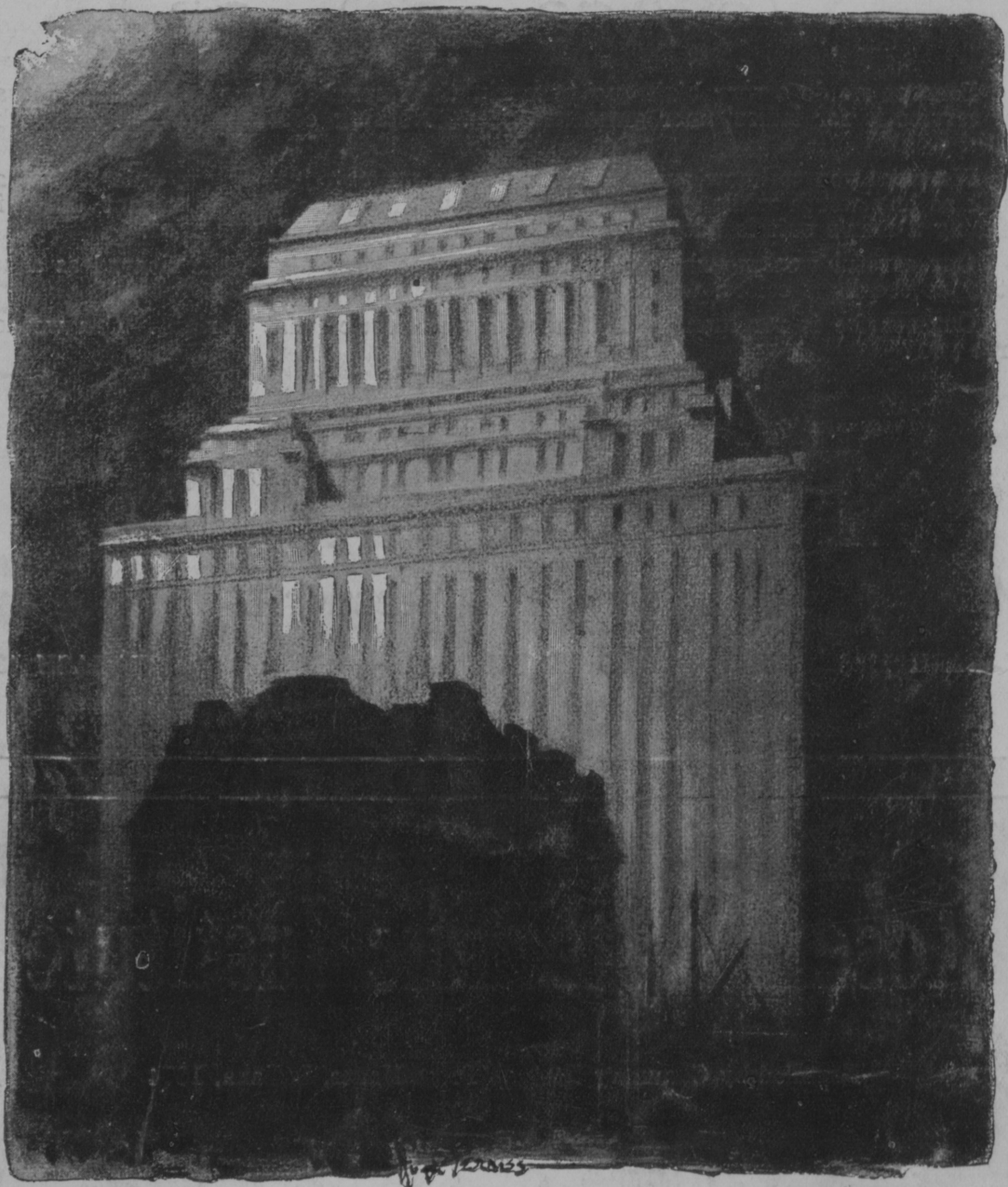
# **Rose Polytechnic Institute**

Founded by Chauncey Rose at Terre Haute, Indiana, 1874

## **A College of Engineering**

OFFERS A SCIENTIFIC EDUCATION, BASED ON MATHEMATICS, MODERN  
LANGUAGES, PHYSICAL SCIENCES AND DRAWING, WITH THOROUGH  
INSTRUCTIONS IN THE PRINCIPLES AND PRACTICES

**Mechanical, Electric, Civil, Architectural and  
Chemical Engineering**



© O. E. CO.

## "Designing in Masses"

The Fisk Building  
New York City

CARRÉRE & HASTINGS  
Architects

THE new architecture transcends detail and expresses the component solids of the great buildings of today and tomorrow. Gigantic profiles are reared against the sky—true expression of structural facts has now come into its own in architectural design, linking architect and engineer ever more closely together.

Certainly modern invention—modern engineering skill and organization, will prove more than equal to the demands of the architecture of the future.

O T I S   E L E V A T O R   C O M P A N Y

Offices in all Principal Cities of the World