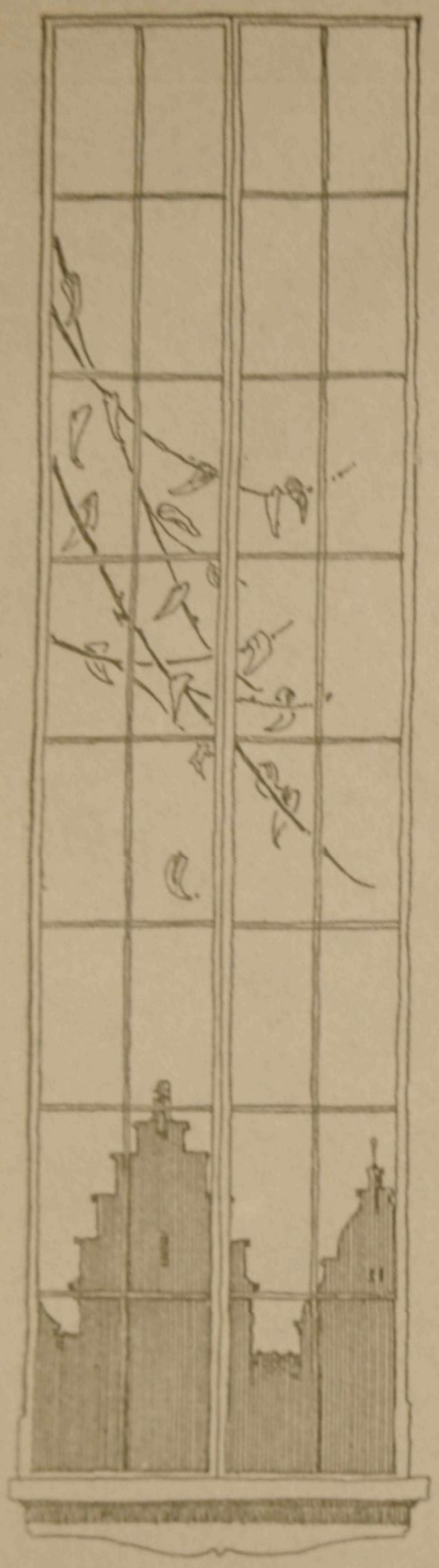
M. J. Bradley



The Illinois Chemist

VOL. VII OCTOBER, 1922 NO. 1

CORN COBS WITH A COLLEGE DEGREE

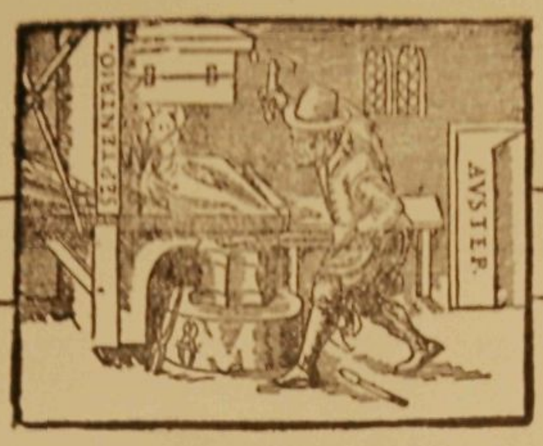
Corn cobs used to be good for just one thing--the corn cob pipe beloved of Mark Twain and Huck Finn. Not long ago science gave corn cobs a college degree through using them as a means for the production of furfural.

Furfural is an important intermediate in the manufacture of dyes. An "intermediate" is a chemical not in itself a dye, but which is made into various dyes by a series of more or less complicated treatments.

Chemical & Metallurgical Engineering, in second article on "The System Furfural-Water" goes into the practical details of concentrating the dilute solutions of furfural obtained by treating corn cobs with sulphuric acid. This solution contains other chemicals, among them acetic acid (the acid of vinegar) and acetone (a widely used solvent) which may also be recovered.

The information outlined in this article is of interest not only to producers and consumers of furfural, but to all plant executives concerned with concentration of a volatile liquid from a mixture of that liquid and water (notably alcohol).

FROM GILBERT'S



DE MAGNETE —

"WORD MONGERS" *and* "CHATTERING BARBERS"

"Word mongers" and "chattering barbers," Gilbert called those of his predecessors who asserted that a wound made by a magnetized needle was painless, that a magnet will attract silver, that the diamond will draw iron, that the magnet thirsts and dies in the absence of iron, that a magnet, pulverized and taken with sweetened water, will cure headaches and prevent fat.

Before Gilbert died in 1603, he had done much to explain magnetism and electricity through experiment. He found that by hammering iron held in a magnetic meridian it can be magnetized. He discovered that the compass needle is controlled by the earth's magnetism and that one magnet can remagnetize another that has lost its power. He noted the common electrical attraction of rubbed bodies, among them diamonds, as well as glass, crystals, and stones, and was the first to study electricity as a distinct force.

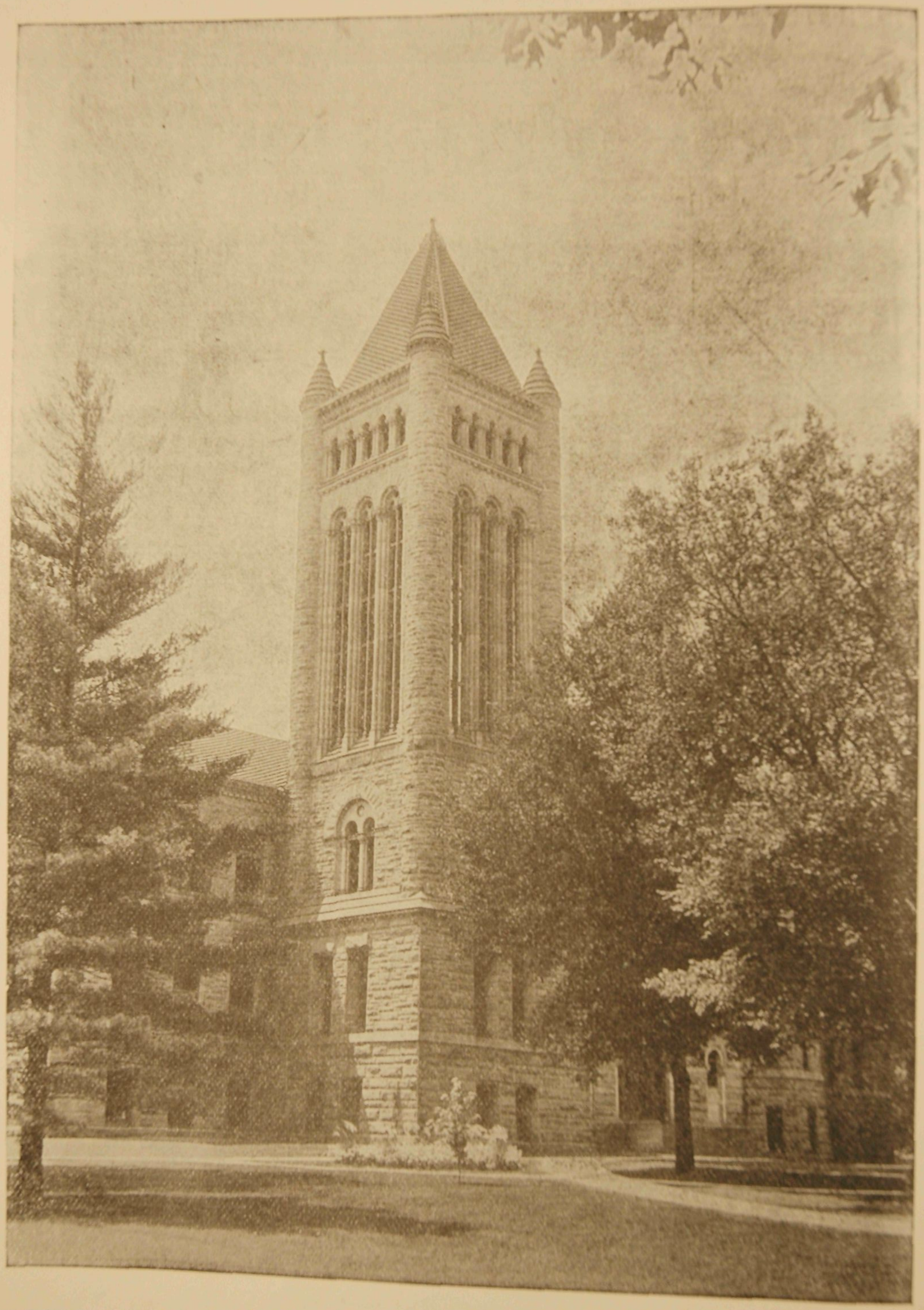
"Not in books, but in things themselves, look for knowledge," he shouted. This man helped to revolutionize methods of thinking—helped to make electricity what it has become. His fellow men were little concerned with him and his experiments. "Will Queen Elizabeth marry—and whom?" they were asking.

Elizabeth's flirtations mean little to us. Gilbert's method means much. It is the method that has made modern electricity what it has become, the method which enabled the Research Laboratories of the General Electric Company to discover new electrical principles now applied in transmitting power for hundreds of miles, in lighting homes electrically, in aiding physicians with the X-rays, in freeing civilization from drudgery.

General Electric Company

General Office Schenectady, N.Y.

63044 R. D.



The Illinois Chemist

CONTENTS

OCTOBER ISSUE

Entered as second-class matter, October 15, 1915, at the postoffice at Urbana, Illinois, under the act of March 3, 1879.

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Gas Plant Work

F. E. VANDAVEER

"Death and eternity are the only things in the future more certain than the coming of a gas age. Before many years have passed, fuel consumers in great cities, getting all of their heat units through pipes, will look back in horror to the day when raw coal was burned, and the people submitted to the evils of smoke, ashes, unnecessary waste and needless labor." In brief, YOU CAN DO IT BETTER WITH GAS, if it's done with heat. This is the slogan of the gas companies as they enter the field of industrial sales. It is especially noticeable in Chicago where high up on their big gas holders throughout the city, on bulletin boards, fences and other places where signs are permitted, these words are printed in bold outstanding letters. The slogan itself is convincing or at least irritating enough for the man who uses a large amount of heat to investigate the correctness of it. The arguments for gas heating have convinced Holabird and Roche to specify the Bryant Automatic gas-fired Boiler for our Memorial Stadium here at Illinois. The boiler specified is to heat 2,000 gallons of water an hour maximum demand. Thus gas enters the world of sports and athletic men will enjoy the comforts of hot water on tap every hour—a cupful or a tankful. This is a welcome announcement, not only to athletes, but also to all future users of the Stadium showers, to know that hot water will always be on hand to greet them. Another example of better heating by means of gas is the heating of a five story and basement factory building in Los Angeles, California. These gas-fired steam radiators heat 3,000,000 cu. ft. of air. General Grant's tomb in New York is also to be warmed this winter by twelve Wolff gas-fired steam radiators. Without going into the large field of domestic uses and shop uses for heating furnaces and kilns, these three illustrations show the increasing interest in the use of gas for heating.

With the increasing interest in gas for heating purposes, gas associations are beginning to realize the need of cooperation with the colleges and universities, the need of putting gas making on a scientific basis. On the other hand, university men are glad to cooperate—to find a new field in which to apply their theories and into which their energy can be turned. Electrical engineering has been in the curriculum of technical universities for a number of years, but it is only this year that a curriculum in gas engineering has been offered at the University of Illinois. The University of Michigan offers gas engineering as a specialized elective in chemical engineering, which is just as good as having a separate curriculum in the engineering college. The University of Wisconsin has a steam and gas engineering laboratory with several courses but no separate option or curriculum in gas engineering. The Illinois Gas Association offers two fellowships in gas engineering at the University of Illinois, and the Michigan Gas Association offers one at the University of Michigan. Whether other technical universities are putting in gas engineering cources the writer was unable to find out. Patterson's Directory of colleges and universities for 1921 did not list a gas engineering curriculum in the larger schools. Someone has said that the reason why the gas lighting industry has been replaced by electric lighting is because the gas men failed to make scientific improvements and studies of gas mantles, easy methods of ignition and safety appliances. And so gas men are now anxious to study gas making and gas burning scientifically. As evidence, The People's Gas Light and Coke Company of Chicago, one of the largest gas companies in the world, have placed at the disposal of the University of Illinois one of their stations for research or any special investigation or demonstration they wish to carry on. Besides this, they are furnishing employment for university men each summer in order that they may become acquainted with the industrial side of the gas business. This is a big advance on the part of the gas company and one to be welcomed by the university.

This summer, seven Illinois men, including the writer, took advantage of this liberal offer and started to work about the middle of June. Six of us were stationed at the main laboratory and one at the meter shop. From the very first day we were treated as part of the "gang" at the laboratory, for most of the fellows were university men, still loyal to their Alma Mater. Three of them, Ernest Thiele, John Spelce, and Jacob Farber, were Illinois graduates, so when the Illinois bunch got together the other colleges didn't have a chance. The work was agreeable, consisting of analytical work, meter tests, some research work, and one fellow was sent out as time keeper for the laying of a large gas main, claimed to be the largest in the world. We were taken on an inspection trip to the Chicago By-Products Coke Company, a plant built for the People's Gas, Light and Coke Company by the Koppers Company. We were invited to attend the Gas Engineers meeting held once a month in the People's Gas Building. Since we did not get an opportunity to work at one of the gas stations we were given a chance to inspect them. Several lessons were learned about industrial work, namely:

(1) If you don't have the facts in your head,

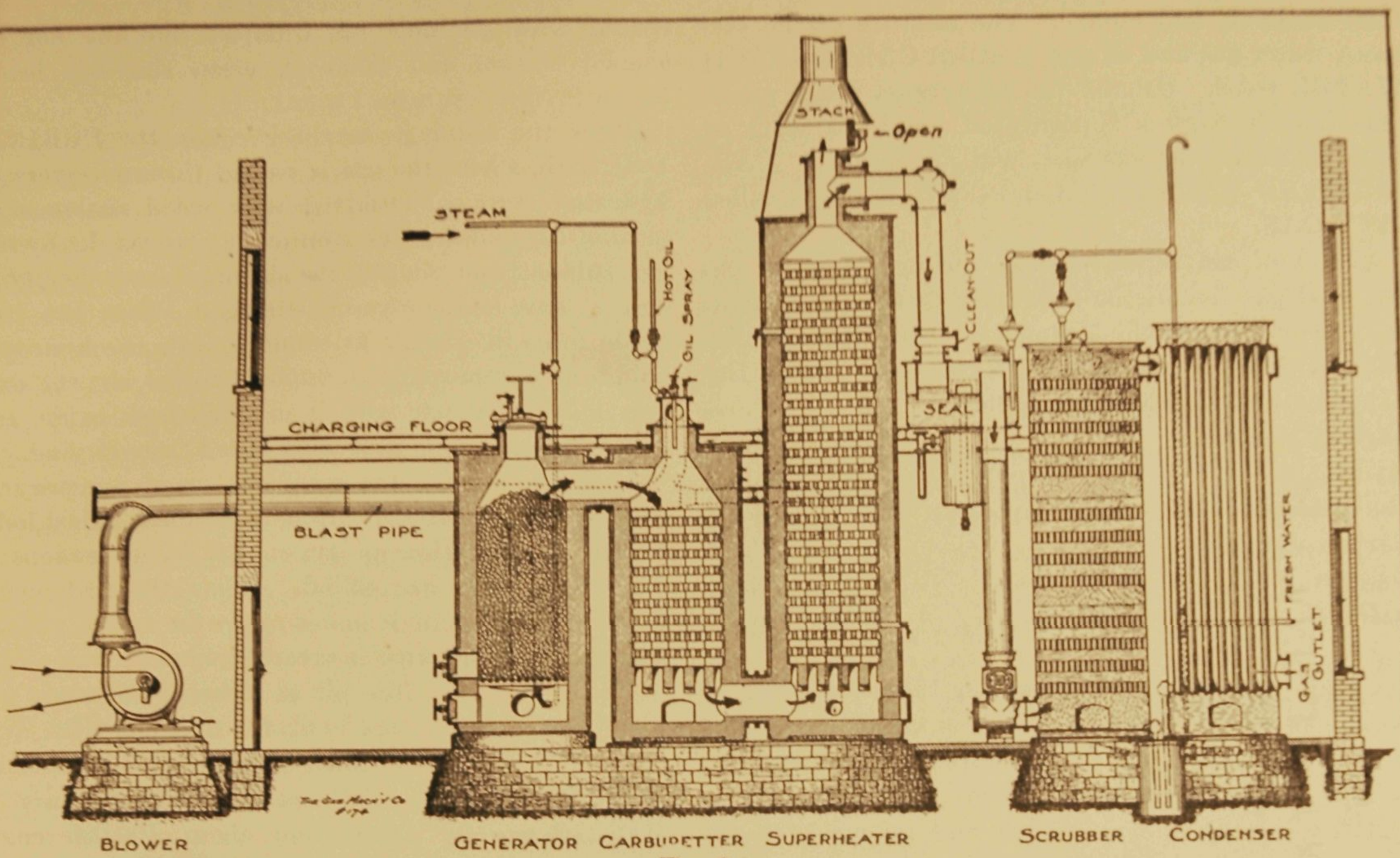


Fig. 2.

SECTION of a CARBURETTED WATER GAS APPARATUS without REVERSE STEAM CONNECTIONS.

know where to get them.

(2) Some of the theory obtained in college is never used in industrial work; it is laid aside for future use if need be.

(3) Good common sense with a will to work and a mind that can think in that line of work are the essentials for a college man in industry.

(4) A gas engineer should be primarily a chemical engineer, with a good knowledge of mechanical engineering, electrical engineering, and mining engineering.

To illustrate this point, one of the problems to be investigated involved running a steam engine, an electric furnace, two gas furnaces, making pipe connections and pyrometry connections. For several days plumbing was first and chemistry second: joints, elbows, unions, T's, nipples, plugs, reducing elbows and pipe threading were primary and carbon, hydrogen, oxygen, and nitrogen were secondary. On the whole the work was agreeable, educational, and profitable.

Even a chemist or chemical engineer often times has a hazy idea what coal gas and carbureted water gas are and how they are made. Certainly a chemist who has not had chemistry 65 is not apt to know what city gas is beyond the fact that it contains carbon monoxide and hydrogen.

Commercially, GAS is a term used to designate a mixture of different gases which can "burn" and produce heat and light or power.

COAL GAS is made by heating to a high temperature gas coal in closed retorts made of fire clay or silica. Chemical compounds of hydrogen, carbon and oxygen existing in the gas coal are volatilized into the useful combustible gases hydrogen, carbon monoxide, ethylene, and methane, the residue left is called coke. The hot gases driven off from the gas coal must be freed from tar, cooled and purified before being sent to the consumer. Coal gas processes permit certain other important compounds such as ammonia, benzene and other by-products (of no value to the gas) to be extracted and saved for other purposes.

CARBURETED WATER GAS is made in two steps. First, usually coke is charged into the hot generator and made nearly white hot by blowing air through it. Then the steam is forced through the hot coke. The usual run is to blow two minutes with air and four minutes with steam during which gas is made The hot coke, with a great expenditure of energy takes the oxygen from the steam and makes a new gas—carbon monoxide—and liberates hydrogen. This mixture of carbon monoxide and hydrogen is caller WATER GAS or BLUE GAS. Second, the water gas is sent through hot brick work on which gas oil is sprayed. The gas oil is decomposed into OIL GAS, mostly ethy-

lene, methane, and ethane. The mixture of the two gases, water gas and oil gas, is called CARBURETED WATER GAS. Usually the carbureted water gas is then sent through a superheater, hot brick work at 1400° F. to fix the gas so it will not liquefy. CARBURETED WATER GAS and COAL GAS are called CITY GAS.

The chief difference between carbureted water gas and coal gas lies in the difference in the proportions of the constituents which compose them. For example:

Kind of Gas	Carbureted Water Gas	Coal Gas
Ethylene and similar hydrocarbons	8.5%	4.0%
Carbon monoxide	29.0%	7.5%
Hydrogen	35.5%	46.0%
Methane and similar hydrocarbons	12.0%	31.0%
Carbon dioxide	4.5%	2.5%
Oxygen	1.5%	2.5%
Nitrogen	9.0%	6.5%

Carbureted water gas is heavier than coal gas. It is the gas used in most cities and is the one produced at the Champaign plant. Carbureted water gas will be used to heat the Stadium boilers.

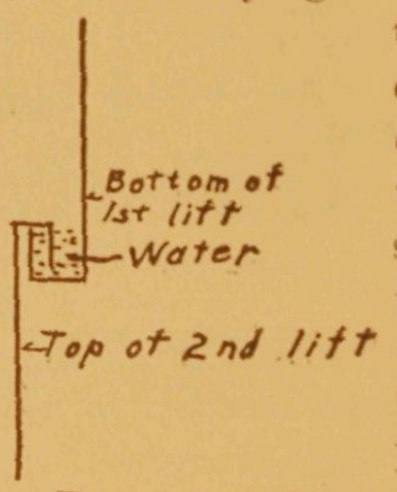
After leaving the generator and superheater the gas passes through a WASH BOX, where it comes in contact with water which removes some heavy tar. It then passes upward through the wooden gridwork of the scrubber where a large part of the remaining tar is removed by impact on the grids. Leaving the scrubber at the top the gas passes down through the CONDENSER where it is cooled by contact with the numerous tubes through which water is kept flowing. This cooling removes further quantities of tar and some partially fixed oils which were not permanently gasified in the gas machine.

From the condenser the gas passes to the RELIEF HOLDER, where it is further cooled, causing more tar and oil to drop out. The relief holder acts as an equalizer on the intermittent flow of gas from the gas machine, thus keeping the rate of flow of gas from this point onward more nearly constant. The relief holder is essentially a hollow cylinder closed at the top and open at the bottom, with the lower edge immersed in water. It varies in diameter from 40 feet to 80 or 90 feet, according to the amount of gas being made: it also varies in height from 10 or 15 feet to those of the telescope type. The water acts as a seal to prevent gas escaping. The inlet and outlet pipes for the gas pass up through the bottom of the pit a short distance above the water level. As gas enters or leaves the cylinder the latter rises or falls.

From the relief holder the gas passes to the SHAVINGS SCRUBBER, entering at the bottom and leaving at the top. The gas passing upward must go through grids upon which are dry shavings. These remove all remaining tar and oil. When the shavings become coated with tar they are dumped into the hopper shaped bottom and removed, clean shavings being blown in through a feed pipe.

After the shavings scrubber comes the PURIFYING BOX where the gas is passed through layers of hydrated iron oxide mixed with wood shavings or ground corn cobs. The iron oxide absorbs the hydrogen sulfide from the gas, the shavings serve merely to create more oxide-covered surface. When the iron oxide loses its ability to combine with the hydrogen sulfide it is removed and exposed to the air, the oxygen of which reacts with it to again form oxide, and free sulphur. This process is called "revivifying."

From the purifier the gas goes through a meter into the storage tank HOLDER as it is called. Most holders are of the telescope type, that is, in sections or "lifts" as they are called. When the first lift is filled the bottom of it hooks on to the top of the second lift carrying with it several inches of water from the pit as a seal. The same process holds for the other lifts. Water must be kept in the seals or gas will escape. Holders vary in size from about 400,000 cu. ft to 15,000,000 cu. ft. The one in Champaign holds 520,000 cu. ft. The largest one in Chicago holds 10,000,000 cu. ft.



From the holder the gas is pumped into the MAINS BY GAS PUMPS and delivered to the customer at from 1⅛ inches to 5 inches of water pressure.

The gas business is a public utility: it must serve the public day and night, 365 days per year. It is a business which deals with every class of people, so that

"A man who has a thousand friends
Has not a friend to spare;
But he who has an enemy,
Will find him everywhere."

University of Illinois
Urbana, Illinois
October 3, 1922.

Dr. H. L. Lochte claimed a Texas girl as his bride on August the twelfth.

———O———

E. W. Wisely, '21, and Mildred Owen of Pana were married September the sixteenth.

———O———

George De Witt Graves and Gladys Marie Beal, daughter of Mr. and Mrs. Claude Melnatte Beal, were married in St. Louis on August the twenty-second. They are living in Urbana.

What About a Chem Club?

E. E. O'Donnell, '23

The Chem. club is the backbone of the student body in the College of Chemistry. It is the medium by which the Chem. students can voice their opinions and protect their interests on the Campus. It furnishes a series of highly instructive lectures every year, and this year in particular the program is of extreme interest. It helps to bring the faculty and students into closer relationship and thus develops within the college a greater interest in the science common to us all.

Every member must be behind this organization in order to have it a success, and every student should be a member. Other college clubs on our campus, the Commerce Club and the Law Club, in particular accuse us of lack of interest. The Engineers point to their Co-op, the Law Club to their proposed campus legislation, the Premedics to a 100% membership, and then they point to us in the college of Chemistry and ask "What have you got?" Chemists are we going to endure this accusation? "No!" you say, "We are not." Then get behind this Chem. Club and push; take an active interest in its organization, and it will take an active interest in you.

Join! Go to its meetings; bring your fellow Chemists, and especially that freshman roommate for he is the nucleus around which its future must be built.

At the annual election held last spring the following officers were elected: G. K. Hardace, president; Irene Kendall, vice-president; J. G. Burns, secretary; Roy Soukup, treasurer; P. M. De Leeuw, custodian; and J. H. Mills, representative to the Illinois Chemist Board. As Mills did not return to school E. E. O'Donnell has been appointed in his place.

CLUB PROGRAM. FIRST SEMESTER.

Tuesday, October 24th.

A four reel motion picture. Zinc mining, milling and smelting.

The real story begins with the lowering of the men into the mines, and takes one through the various smelting operations, from the unloading of a car to the storehouse.

Or: Copper mining, milling and smelting (four reels).

This picture opens in the Utah and Nevada copper regions, and carries you through the loading bins, the various retorts, and reverberatories. It also features the electric precipitators for the suppression and utilization of convertors. This appartaus takes care of about twenty-five thousand cubic feet of gas per hour by means of an electric current of twenty-two thousand volts. The picture ends with the finished product in the storehouses.

Tuesday, November 14th.

Dr. Hopkins will give an illustrated lecture on the plant of Muscle Shoals. This should be of extreme interest to all chemistry students as it shows clearly, the plant and its possibilities.

Wednesday, December 12th.

Joint meeting with the American Chemical Society.

A four reel motion picture: The manufacture of steel for sheets and plates. This picture was taken at the plant of the American Sheet and Tin Plate Company. It is the complete and well photographed story showing the manufacture of steel for sheets and plates. Operations are shown from the time the ore is taken from the ground until the tin plates are packed and ready for shipment.

Or: The National Tube Company. (four reels).

The open cut method of mining with steam shovel is shown. The ore is transported and loaded on boats at a port on Lake Superior. It is then carried and unloaded at a lower port. The method of loading and unloading is shown, the ore is then followed to the blast furnaces, steel furnaces, and mills, where the operations of its transformation from ore to finished pipe is shown. The last reel shows scenes in a playground equipped by the National Tube Company, for the benefit of their employees and their families.

SECOND SEMESTER

Mr. C. O. Ngan—Chinese Alchemy.

This lecture is taken entirely from Chinese books. It is something new to the American chemist and should be of extreme interest to all.

February 27th.

A motion picture: The Story of Coal. (three reels)

This film takes you through the mine and shows the various methods employed in mining, blasting and loading the coal underground. It closes with the unloading of the mine cars at the surface, and the sizing and cleaning of the coal on the shaker screens and conveyor tables.

Or: Copper mining at Anaconda, Montana. (twelve reels).

An excellent picture, six reels of which show the mining operation and six of which show the reduction works. The copper industry is herein completely and perfectly photographed, and at each operation an excellent safety-first example is staged.

Or: The story of sulphur. (two reels).

This picture shows the operations of the Texas Gulf Sulphur Company. The sinking of the well and the pumping of sulphur is shown in detail and the one-hundred thousand ton blocks are clearly illustrated

(Continued on page 22)

Alpha Chi Sigma

Zeta Chapter

Alpha Chi Sigma wishes to announce the pledging of A. Rich, '25, J. A. Arvin, '25, John Fisher, '25, and Edwin Pearson, '26.

Brother C. F. Crossley, '22, after a very successful summer playing commercial baseball, has consented to teach chemistry and coach the atheletic teams at Quincy High School, Quincy, Ill. We have also found some secret information—that Cross has been a poor married man for the last two years.

From a recent letter we learned that R. E. (Red) Lawrence is a foreman at the Matawan Tile Co. at Matawan, N. J.

We have several new graduate students working on their Master's and Doctor's here. From our own class of '22, Beckman, Bruce and Fisher are taking up the advanced work, while in addition G. H. B. Davis from the U. Ky., Eric Arnold from the Case School of Applied Science, and Ralph Shriner from Washington University, are continuing the pursuit of the elusive molecules in our midst.

C. H. Peet, W. M. Gallaher and J. H. Gardner, our old grads, are back at the Annex this year.

It seems that brother (Scotty), G. E. Gunton cannot be induced to leave the Canadian border very far, consequently he will not be here for another semester or possibly a year. He is with the Amalgamated Pulp and Paper Co., Clarke City, Quebeck. Telegraph him all your orders for fire water.

Brother C. P. Stewart, '24, and F. T. Gardner, '23, are also leaving us for a year. Brother Stewart is with the research lab. of the Westclox Clock Co at Peru, and brother Gardner is with a petroleum company in Kansas.

Brother Myron Snell, '22, has just recently taken up a position with Mineral Refining Co. at Valley, Washington.

Brother N. A. Hansen, '22, has been with the Abbot Laboratories at Chicago since the close of the Summer School.

Last spring brother H. C. Larson received a fellowship to study in Sweden and from a recent letter he enjoys being back in the native land.

Brother Wm. Willis is at Armours fertilizer works at Chicago Heights.

Brother R. S. (Shorty) Daniels has a position as government chemist in the Phillippines.

Brother Edwin Webster was married last summer and for the present is at Birmingham, Ala.

Brother "Nick" Carter in addition to attending the University of Iowa is chief chemist for his own chemical concern.

Brother A. M. Montzheimer is with a steel plant at Youngstown, O.

The first house dance of the year will be held October 21, Homecoming, and we expect many of the old grads back.

American Chemical Society

University of Illinois Section

OCTOBER MEETING

An unusually interesting meeting is scheduled for October 17th, at 7:30 P. M. in Room 100 Chemistry. Professor W. A. Noyes will address the Local Section on the subject "Building for Peace A Summer in Europe."

As all of us know Professor Noyes was one of the few American chemists to attend the international meeting held in Utrecht, Holland last June. During his travels in England, France, and Germany, visiting many of his friends and associates in chemistry, he also gave considerable attention to the economic and social relations existing between the various European countries.

His address will be of a general interest to the public and not strictly technical in nature. Members of the section should aid in giving this announcement publicity in order that as many people as possible will have an opportunity to hear the address.

Iota Sigma Pi

Iodine Chapter

With the beginning of every new year another group of officials make their appearance from the ranks. Those chosen, and wisely, bid fair to lead us with considerable skill, if we are to judge from the ability that they have shown in the past. They are: Virginia Bartow, president; Helen Hopkins, vice-president, Marguerite Hayes, secretary; Carolyn Lindquist, treasurer; Catherine Ogden, corresponding secretary.

The first meeting, called to transact some left-over business, was prolonged to give everyone a chance to exchange greetings with those from whom we had been separated for longer or shorter periods. This year we have back with us some of our members who have been away for several years.

Nora Schneider, who has been teaching Physics and Chemistry in Murphysboro High School for the past three years, is here to work on her M. S. in Physiological chemistry with Prof. Rose.

Hilda Steinert has been teaching science in her home town, Farmer City, for three years. She is working for her M. S. this year.

Welma Marlowe was in Winchester for a year and has now returned to work for a M. S. in Education.

Elsie Kirkpatrick is teaching science in the Pawnee High School. This summer she visited Estes and Yellowstone Parks on her trip west.

Grace Spencer is teaching Chemistry and Physics at Averyville, Illinois.

Irene Teagarden is at her home in Missoula, Montana.

Mrs. Ruby Vorhees is at the University of Wisconsin, where she is taking work in Education toward a Master's Degree.

Our new president, Virginia Bartow, spent the entire three months of her vacation in Europe, seemingly visiting chemical laboratories. If there is one that she did not see, it must have been erected since her departure. However, there must have been some reasons other than those of the purely scientific, for who would not hunt up a laboratory if a new silk dress was to be the reward? Her new office shows considerable change since she acquired it; thanks to the contribution of a soap factory.

Marion Lougee spent six weeks of her vacation attending the Harvard summer school where she studied botony.

In accordance with our usual custom, we gave a tea in the club room and had a large attendance of girls who are interested in chemistry.

Gamma Pi Upsilon

Alpha Chapter

Gamma Pi Upsilon wishes to announce the pledging of the following men:

L. Aitken, '23, East St. Louis, Ill.
T. C. Cooke, '25, Chicago, Ill.
A. L. Elder, '24, Urbana, Ill.
G. G. Grogan, '25, Des Plaines, Ill.
L. C. Joedicke, '25, Waterloo, Ill.
F. W. Parr, '25, Chicago, Ill.
N. R. Winslow, '25, Oak Park, Ill.
Geo. Vander Veen, Graduate, Urbana, Ill.
R. Fogler, Graduate, Champaign, Ill.
W. Tully, Graduate, U. of Washington.

Brother James R. Smith, '22, is now inspecting concrete and is Chemist at Testing Laboratory, Omaha, Neb.

Brother P. R. Wilson, '22, is with the American Can Company at Maywood, Ill.

Brother William "Bill" Y. Armstrong, '22, is now connected with the American Appraisal Company, Milwaukee, Wisconsin.

Brother Graeme L. Atkinson, '22, is now connected with the State of Illinois at Lawrenceville, where he is inspecting materials.

Brother Fuller F. Ross, '22, is now connected with the Corn Products Company at Kansas City, Mo.

Brother Arvid H. Berg, '22, is also located at Kansas City where he is connected with the Kansas City Traction Co. as Efficiency Engineer.

Brother O. B. Grant is connected with a Dye works at South Chicago, Ill.

Brother Glen Howe Joseph, '22, has returned to the University to work on his Master's Degree.

Brother George Keller, '22, is now connected with the Glidden Varnish Company at Cleveland, Ohio.

Omega Beta Pi

The total enrollment in the Pre-Medical division of the college of Liberal Arts and Sciences has now reached approximately 225. This represents an increase of about eight per cent over last semester, which has been the usual rate of growth for the last few years. This speaks well for the various schools in which the student carries out his studies. In fact our pre-medical work here has attained a national reputation which is quite enviable. The course offered in chemistry, zoology, and physics, in which pre-medics spend their time, rank in standards with any in the country. It is for this reason that our numbers have increased very rapidly.

Many of the students taking the courses preparatory to medicine spend four years here, before entering the Medical college, in order to obtain a degree of Bachelor of Science or Bachelor of Arts. Thus, their work is not narrowed down to the straight scientific course as is the course of the student taking only two years preparatory work. In fact there are some Medical schools that require a Bachelor's degree for entrance—for example, Johns Hopkins University. In time possibly all of the better schools will follow this example and all ocurses in medicine will be eight years in length.

The application of chemistry has become one of vital importance. Many schools have already realized this and for this reason have set four years as the minimum time to be spent in preparation for the study of medicine. To illustrate this, the entrance requirements to Johns Hopkins Medical University follow:

BIOLOGY—Lecture course 3 hours per week plus 180 hours of laboratory work.

PHYSICS—120 hours of class work plus 90 hours of laboratory work.

FRENCH AND GERMAN—A reading knowledge is required which pre-supposes two years high school work and one at college.

CHEMISTRY—240 hours of class room and 500 hours of laboratory work. The former must include 60 hours of organic and a short course in physical chemistry while the latter 120 hours in organic and a year's quantitve analysis.

These hours represent actual time spent in class.

It is quite evident that chemistry takes up much of the prep-student's time if he desires to work off the above-mentioned requirements.

The pre-medical students are not organized as a whole although convocations are held about every four weeks. At these meetings usually some man who is quite prominent in medical work delivers a short address after which open discussion takes place. The first of these addresses for this year was given by Dr. Spence from Barrow, Alaska, on Monday, October 2. He informed us of some of the problems facing the doctor in Alaska. These convocations along with smokers, get-togethers, etc., are held under the supervision of Omega Beta Pi, Professional Premedical fraternity.

Omega Beta Pi was nationally organized in 1919. It is the first and only national pre-medic fraternity. At present it is undergoing a rapid expansion and hopes to have chapters in most of the better pre-medical schools. Prof. Henry B. Ward, Department of Zoology was the latest honorary member to be initiated. The honorary members from the faculty now are: Dean K. C. Babcock, Dean of L. A. & S.; Prof. H. J. Van Cleave, Department of Zoology; Prof. F. R. Watson, Department of Physics, Dr. Burge, Department of Physiology; Dr. Glasgow, Department of Entomology; Dr. Beard, Health Service; Dr. C. S. Marvel, Department of Organic Chemistry.

—O—

George Henry Cheney and Marie Louise Kolb, daughter of Mr. and Mrs. William Henry Sieb, were married in Buffalo, New York on the twenty-ninth of June. Their home is in Urbana.

—O—

Glenn Howe Joseph, '22, and Laleta Mae Lollar, daughter of Dr. and Mrs. M. E. Lollar, were married in Tuscola. Mrs. Joseph is a graduate of Rockford College.

—O—

It is rumored that Harold Gibb is married.

Brother Arthur R. Murphy, '22, is now with the Pfister and Vogel Tannery also in Milwaukee.

—O—

A. V. Gemwill and Miss Choicer were married in Newark, New Jersey.

—O—

Dr. E. K. Carver was married during the summer in Maine.

—O—

Tom Hollingshead and Miss Schaly were married this summer.

INTRODUCING SILVER AGITATE

The instructions said: Add silver nitrate and agitate. So the dumbbell (which being interpreted is Frosh) added the AgNO3 and then started the search for a bottle of agitate of silver.

We met a student recently who wanted to know the formula for barley acid. All he knew was that it was made with HCl.

The instruction sheet had said: Make barely acid with HCl.

The Chemist has no E Z life,
And if he would X L,
He must get all the A D can
R E cannot do well.

He will become a C D man
And oft be called A J;
Unless he gets what L P can
Obtain in N E way.

So if he fondly hopes 2B
Successful ere he dies,
In K C wants to stand with men
Who R A counted high.

Let him work hard and take A Q,
B E so very wise;
If every D D does is right
He surely must R I's.

Let him keep B Z every day,
And C K task to do
Or L C cannot hope 2 C
The N D has in view.

How to get a good wife.....Take a good girl and go to a parson.

University Co-eds claim they are not as bad as they are painted.

The Chem. analyst has some questions that Edison might ask his purchasing agents. Perhaps St. Peter examines chemists at the Golden Gate. Better brush up!

Are wire nails improved by manicuring?
Where do hexagon nuts grow?
Do brushes shed or moult?
Can flexible hose be darned with screw threads?
Who invented cottongin? What percent is it?
Does refined iron ever lose its temper? State conditions.
From what country did the Manganese emigrate?
Why save daylight—aren't nights worth while?

Kekule on a London bus,
Saw as in a dream,
Jazzing molecules 6 a muss—
Something quite extreme.
From the nightmare thusly seen,
Comes the picture of benzene.
Still one wonders, crust it takes—
Why did Kekule see snakes?

Chemistry is what happens when you mix two things together and they explode and blow everythink sky high or galley west or somewheres like that, or else you get a terrible stink and mebbe have to be brung to by a fire department.

At our school there's a boy what has a big brother which is a chemist. One day this kid brung a bottle of stuff to school what he said was Merry attic acid. Mebbe it was, but I ain't never saw anything merry in our attic. And he had some little lumps what he said was pie rites. I spose they must of been. At recess time he set the bottle up behind the pitcher of George Washington and dropped in the little lumps. Pretty soon the room smelled somethin awful.—It was so bad we had to go home for the rest of the day. Teacher thought it was rotten eggs but it wasn't. IT was chemistry. Chemistry is awful handy some times. When I get big I'm gonna be a chemist.

Hal. O. Gen.

"My dear," said a lady to her millionaire husband, "I have some dreadful news to break to you. You must summon all your fortitude for the sake of your wife and little ones."

"Speak," he said hoarsely.

"The coal is out."

"Great heavens has it come to this?" And the millionaire bowed his head and wept.

Two students rang a hated professor's bell at midnight. He put his head out of the window and wanted to know what was up.

"One of your windows is wide open."

"Where" exclaimed the startled professor.

"The one you are looking out of."

"So you've got a wife," said Jones to a newly married Chemist.

"Don't know, don't know," replied the young man with evident hesitation. "Sometimes I think I've got her and sometimes I think she's got me.. You see, I've only been married a few weeks and I can't tell just how the blamed combination is going to turn out."

A young lady who had been married a little over a year, wrote to her matter of fact old father, saying, "We have the dearest cottage in the world, ornamented with the most charming creepers you ever saw."

The old man read the letter and exclaimed: "Twins, by thunder."

Jenkins was in the pantry trying to open a can of tomatoes, and making a great deal of unnecessary noise about it. "What in the world is the matter?" demanded his wife from the kitchen; "what are you trying to open that can with?"

"Can apener of course," he growled back. "Do you suppose I am trying to open it with my teeth?"

"Oh, I thought perhaps judging from your language that you were trying to open it with prayer."

It takes four years for a college to turn out a good student. But it frequently turns out a bad student in less than three months.

A good looking glass and a good looking lass generally go together.

Gertrude says she would rather fool with a bee than be with a fool.

To remove paint, sit down on it before it is dry.

There are meters of accents
There are meters of tone
But the best way to meet her is to meet 'er alone
There are letters of accents
There are letters of tone
But the best way to letter is to let 'er alone.

Pug: "I'm trying to get ahead."
Nacious: "You need one."

The ages of spring chickens and women are the most doubtful subjects on this little earth.

Advertisement seen in local store, "Buy our New Fall Suits. They won't last long."

The Englishman who said that hugging was " 'armless" was wrong. It is 'armful.

His second girl: "John and I are engaged, but I did not accept him the first time he proposed."

His first girl: "No, you weren't there."

You never hear the bee complain, nor hear it weep nor wail;
But if it wish, it can unfold a very painful tale.

CHEMICAL PROVISIONS OF TARIFF

(Continued from pae 9)

cies, notably the American Chemical Society and the Chemical Foundation are doing valuable work in gaining support for home industries.

Beyond the fact that this country can support a larger chemical industry than it now possesses, the question of military preparedness also deserves some consideration. The Germans themselves showed how speedily conversion could be accomplished in changing from industrial to military manufacturers. No matter how many leagues and treaties are formulated, the danger of war will ever be present while Man inhabits the earth. Against this possible danger, safeguards should be erected in times of peace; an active American chemical industry is one of these. With this end in view, the chemical provisions of the tariff were inserted and it is to be hoped that in this endeavor the tariff will be successful.

WHAT ABOUT A CHEM CLUB?

(Continued from page 16)

as regards to their blasting, loading and shipping.

March 27th.

The story of asbestos. (four reels).

The production and manufacture of the product are shown by the operations of the Johns-Manville Company.

April 10th.

Election of Officers.

The above program as now compiled is rather tentative in regard to the moving picture part of it. Those subjects under consideration are herein given, but as can be seen from their titles and description each subject for a given date takes up the same field of industry and are consequently of eqaul interest to all.

The films have been released throug the courtesy of the U. S. Bureau of Mines.

———O———

Dr. Langely is on the faculty of the Medical School of the University of Pennsylvania.

Dr. Schneider is also on the faculty of the Medical School of the University of Pennsylvania.

Dr. E. A. Wildeman is head of the Department of Chemistry at Earlham College, Indiana.

Dr. W. C. Wilson is on the faculty of the Medical School of the University of Michigan.

Dr. A. A. Christman is also on the faculty of the Medical School of the University of Michigan.

Dr. H. L. Loehte is on the chemistry staff of the University of Texas.

Dr. J. L. Hall is doing research work at the Kansas State Agricultural College, Manhattan, Kansas.

M. C. Crew is teaching chemistry at Pontiac, Illinois.

R. K. Hamilton is employed by the Nela Company at Cleveland, Ohio.

W. L. Findley is employed at the U. S. Bureau of Mines, at the University of Colorado.

J. S. Pierce is on the faculty of the University of South Dakota.

D. V. Alberts is employed in the laboratory of the American Company, Chicago.

J. Simson is a graduate student at the University of Colorado.

George Ruhle, '21, is a graduate student at the University of Colorado.

Dr. C. S. Palmer has received a National Researeh Council Fellowship at Yale.

J. H. Prescott, '21, is instructing chemistry and coaching athletics at the University of Florida.

J. H. Waldo is coaching athletics at Purdue University.

E. W. Thiele, '19, has given up his position with the Peoples Gas Company of Chicago where he has been employed for the last two years. He is now a graduate student at the Massachusetts Institute of Technology.

F. R. Clark has accepted a position with the Utah Oil and Refining Company at Salt Lake City, Utah.

R. H. Gerke, '18, Ph. D. U. of California, '22, is an instructor at the Massachusetts Institute of Technology.

R. W. Miller, '16, Ph. D. U. of Colorado, '22, and M. S. Dunn, Ph. D., U. of Illinois, '21, are on the faculty of the Southern Branch of the University of California at Los Angeles.

Jacob Nevyas has accepted a position with the National Aniline Company.

C. W. Kreger is on the chemistry staff at the Ohio State University.

J. B. Davis is teaching chemistry at the Benton High School, Benton, Illinois.

R. L. Horst has accepted a position with the U. S. Bureau of Chemistry at New Orleans, La.

H. B. Huddle is teaching chemistry at LeRoy, Illinois.

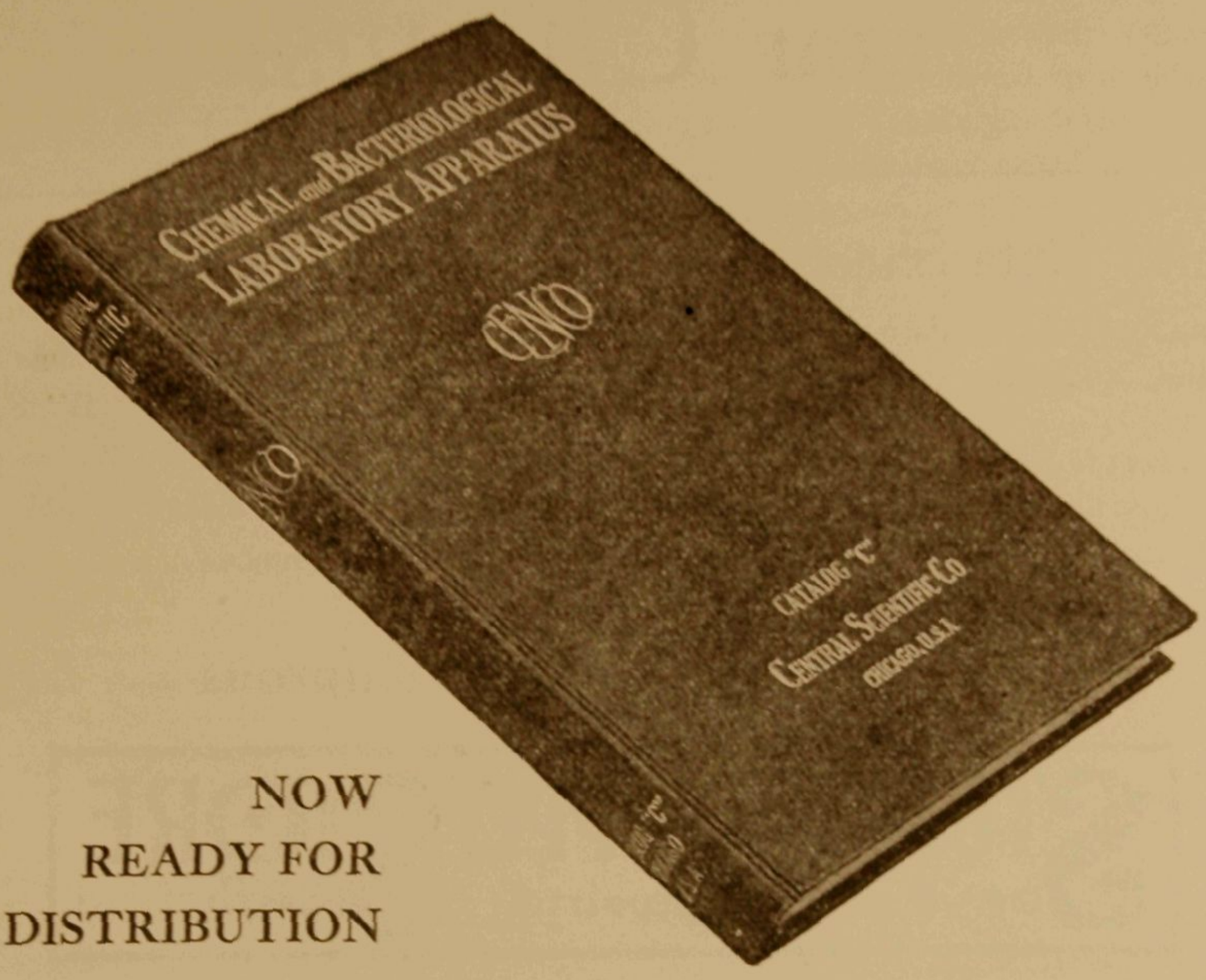
Dr. Bosman has returned to Cape town, South Africa.

Dr. H. M. Charles has opened a clinical laboratory at Champaign, Illinois.

Dr. Engle is on the faculty at the University of Denver.

Dr. Jennings is on the chemistry staff of the Centary College, Shreveport, La.

Dr. A. W. Ingersoll is on the chemistry staff of Vanderbilt University, Nashville, Tenn.



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ONE MILLION TIE PLATES OF ELECTRIC STEEL

The six-ton Heroult Electric Furnace described in the current issue of *Chemical and Metallurgical Engineering* under the title, "Electric Steel Plant at the Southern Pacific Shops" is now working on an order for one million tie plates to be used by the Southern Pacific.

This railway system is one of the largest in the world, and its repair shops are exceptionally up-to-date. The six-ton electric furnace mentioned above was first installed at the general shops of the company at Sacramento, Cal., to produce rivet steel from miscellaneous scrap. Now, in addition to working in this large order of tie plates, this electric steel plant produces all the steel castings for the large western railways as a side line.

According to a writer of the article, Mr. I. T. Barton, the success of the electric furnace (which was selected after careful study and comparison) points out that the future melter for iron and steel in the western states will be the electric furnace.

BIRTHS-

Mr. and Mrs. J. Russell Dilworth announce the birth of Kenneth Eugene on July fourh.

Mr. and Mrs. Herbert Krase inform us that the stork brought them a son, John Miles Krase, who has promised to make his home with them indefinitely.

Marian Swanberg, '18, who is now Mrs. Jordan announces the arrival of Robert Thayer Jordan on August 4, 1922. Mrs. Jordan was vice-president of the Chemical Club in her senior year.

Mr. and Mrs. Floyd E. Rowland announce the birth of a son, Jack Movis Rowland, on March 29, 1922. Mr. Rowland received his P. H. D. here in 1918.

Herbert Vroor, '17, announces the arrival of a daughter at his home in Eugene, Oregon Mr. Moor before leaving for the west, was connected with the Special Chemicals Company, of Highland Park, Ill.

Mr. Ray M. Robison, '22, was married to Lydia Westover on September thirteenth at Dover, Illinois. They will make their home at 132 Winslow Street, Watertown, New York.

THE CHEMICAL ENGINEER

The following extract is from the series of advertisements of the E. I. Dupont de Nemours Company and may give those who are in doubt an idea of the nature of the chemical engineering profession.

The chemical engineer is a rare mingling of abilities. He is a chemist who can take the discoveries made on the experimental scale and put them into production. He is the man who has brought to the door of industry new substances, new uses for long used substances, uses for products that once were waste, and processes that cut the cost of manufacturing, and made possible the country's wonderful strides in commerce.

P. M. Gimmings, A. W. Ingersoll, I. B. Morgan, '22, H. B. Bramlet, '17, C B. Lowell, '20, and W. H. Griffith made the promise "to love, honor, and obey."

———O———

Wilson Davis Langley and Lucie Emma Root announce their marriage on August the twelfth, in Rochester, minnesota.

———O———

E. R. Littonan was married on September the Second.

Completeing the Picture of Industry

In freshman chemistry days we learned that sulphuric acid was the great barometer of industry—in fact, of civilization itself. At that time, to be sure, our ideas on this subject were quite hazy, but since then we have come to realize that literally hundreds of industries are dependent upon this important chemical. Fundamental materials such as copper, steel sheets, gasoline and fertilizers cannot be produced in needed quantities without sulphuric acid. This product lies at the very foundation of all chemical industries. But all these things are well known even to the average layman and would not be worth the repeating here were it not for their bearing on a problem which is now confronting our industries.

When Mr. Hoover became Secretary of Commerce one of his first ambitions was to organize a statistical service which would give the business men of the country a ready and accurate picture of industry. Such a picture meant current figures on the production and consumption of all the basic commodities of commerce. In a large measure Mr. Hoover's plans have been successful. Manufacturers, consumers, trade associations and statistical bureaus have given fully of their information. But there has been one conspicuous and outstanding failure. The picture of industry has been complete except for one important element. Monthly figures are now published for iron and steel, coal, cotton and wool, corn and wheat, copper, petroleum—all these. But the great barometer of industry is lacking. The chemical industry, or rather one of its principal components alone has refused to cooperate with the Commerce Department. We of the industry are entitled to know the reason for this refusal. We have been told that it is because the manufacturer who is refusing to give will use the information to the disadvantage of the producer. We suspect, however, that the reason is this: The big fellow already has his own informational service and doesn't want to share it with the little fellow who can't afford such costly facilities.

There is another thing which any manufacturer who is refusing to give these figures should keep in mind. If enough of the other industries of the country insist that they have a real need for this information, the department is going to get it for them. A sympathetic Congress which has already shown its willingness to back up Mr. Hoover's work with increased appropriations will not hesitate to enact legislation that will compel the giving of information.

The acid makers whose selfish motives have already done damage to the good name of the chemical industries may yet be made to realize their sort-sightedness. —*Chemical and Meallurgical Engineering.*

———O———

NEW PROCESS PROMISES CUT IN ACID COSTS

"The Packed Cell Process for Sulphuric Acid" which appears in the current number of Chemical & Metallurgical Engineering describes a 25-ton plant (wihch has been operating on this new principle for the past two years at Anaconda, Mont.)

The consumption of sulphuric acid has been many times charcterized as the index of a country's civilization. It is used on almost every article we use, whether it be our Ford, our dinner or our clothes. The fertilizers used to grow our farm products, and the paints used to protect and beautify our houses are dependent on sulphuric acid.

Much of the acid made today is produced in so-called "chamber plants," the central feature of which are huge lead-lined chambers.

This new process crowds a lot of action into a small place, and thereby saves enough lead to sink a ship For it eliminates the lead chambers entirely.

Much cheaper sulphuric acid is forecast. The results of the two years of operation indicate that the cost of producing chamber-plant acid ($1.11 per ton) would be $0.58 per ton in a packed-cell plant of similar capacity.

A packed-cell plant can be built at 50 to 60 per cent of the cost of a chamber plant. Its operating cost is the same, while maintenance costs are probably less. The ground space required, more over, is only 30 to 40 per cent of that required by the lead-chamber process plant of the same capacity.

This article is of interest to buyers of sulphuric acid, pointing out as it does, a coming eclipse of an old method, and lower production costs.

ELECTRIC PIG-IRON OVERCOMES LACK OF COKE IN CALIFORNIA-

The May 3rd issue of Chem. & Met. will report the symposium on electrical pig iron production which the American Electrochemical Society conducted at its spring meeting in Baltimore April 27, 1922.

The ordinary method of producing pig iron from ore has been by heating the ore with coke. In some localities, ore is abundant, while coke must be shipped in from long distances if it is to be used. Under such conditions, the use of coke is uneconomical.

Swede is in such a situation. She uses charcoal and also electricity.

California has been one of the pioneer localities, where, coke not being available, the electric current has been used to produce pig iron.

New Arrivals in Department of Chemistry

DR. M. M. AUSTIN

We are sorry that we have not a cut of Dr. Austin to accompany this article. However, he is not a stranger among us as he obtained his Ph. D. degree here in 1920.

Since that time he has been with the National Malleable Castings Company in their research laboratory at Cleveland, Ohio. Dr. Austin says that the research laboratory of the National Malleable Castings Company is probably one of the best equipped laboratories in this country which devotes its entire attention to problems dealing with Cast Iron and Steel.

The work problems in which Dr. Austin has been particularly interested, were related to the mechanism and acceleration of the graphitization of White Cast Iron, and the effect of the less common elements on the stability of Cementite.

At present Dr. Austin is busily engaged as Instructor in Metallography and Mineral Assaying where he can be found every day.

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