

THE GEAR  
OF  
THETA TAU

OFFICIAL ORGAN OF THE FRATERNITY



1916

NINTH DIRECTORY NUMBER

JUNE, 1916









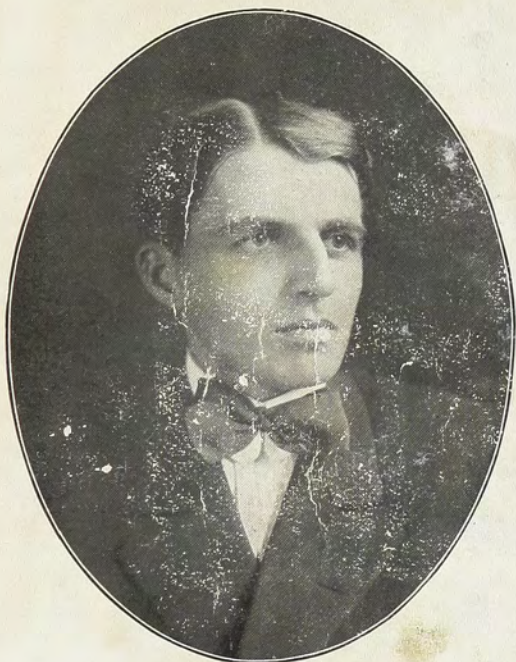


# THE GEAR OF THETA TAU

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E. J. SCHRADER  
Grand Regent



of the original  
Melville W. V. 11

80.47

# Theta Tau Fraternity

Founded at University of Minnesota

October 15, 1904

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## FOUNDERS

Erich J. Schrader  
W. Murray Lewis

Edwin L. Vinal  
Isaac B. Hanks

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## GRAND OFFICERS OF THETA TAU

1916—1917

*Grand Regent*—Erich J. Schrader, '05      ALPHA  
Rockland, Nevada

*Grand Vice Regent*—      TICKET      DELTA  
16924 Lake Ave., Lakewood, Ohio

*Grand Scribe*—H. H. Hopkins      BETA  
164 N. Dearborn St., Chicago, Ill.

*Grand Treasurer*—B. B. Walling, '09      ALPHA  
624 Plymouth Bldg., Minneapolis, Minn.

*Asst. Grand Treas.*—P. A. Johnson, '11      ALPHA  
624 Plymouth Bldg., Minneapolis, Minn.

---

*Grand Historian*—Otto C. Budde, '12      DELTA  
1579 Compton Road, Cleveland Heights,  
Cleveland, Ohio

*Grand Outer Guard*—E. F. Davis, '10      EPSILON  
1911 Cedar St., Berkeley, Calif.

*Grand Inner Guard*—R. I. Parker, '12      ZETA  
525 Rugby Road, Schenectady, New York

# The Gear

The Annual Publication of  
THETA TAU

A Professional Engineering Fraternity

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OTTO C. BUDDE, B. S., '12 . . . *Managing Editor*  
1579 Compton Road, Cleveland Heights,  
Cleveland, Ohio

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## ASSOCIATE EDITORS

|                           |         |         |
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| PHILIP D. TRYON, '18      | . . . . | ALPHA   |
| CLYDE W. NICOLSON, '16    | . . . . | BETA    |
| CHARLES R. VORCK, '16     | . . . . | GAMMA   |
| DONALD F. PANCOAST, '17   | . . . . | DELTA   |
| WALTER G. FARNLACHER, '16 | . . . . | EPSILON |
| ARTHUR W. TEMPLIN, '16    | . . . . | ZETA    |
| ARTHUR M. MILLER, '17     | . . . . | ETA     |
| JOHN PARK, '17            | . . . . | THETA   |
| E. ROSS HOUSHOLDER, '18   | . . . . | IOTA    |
| CARL PAUL ERNST, '16      | . . . . | KAPPA   |

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|                         |       |                     |
|-------------------------|-------|---------------------|
| H. H. HOPKINS, JR., '08 | . . . | CHICAGO A. A.       |
| E. A. TAYLOR, '11       | . . . | CLEVELAND A. A.     |
| C. A. KUMKE, '06        | . . . | SOUTH WESTERN A. A. |
| N. S. KINGSLEY, '11     | . . . | TWIN CITY A. A.     |

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Advertising rates will be sent upon application to the Managing Editor.



# THETA TAU FRATERNITY

## Chapter and Alumni Association Directory

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ALPHA—Established October 15, 1904

University of Minnesota, Minneapolis, Minn.  
Address Theta Tau House, 308 18th Ave.

BETA—Established March 26, 1906

Michigan College of Mines, Houghton, Mich.  
Address Theta Tau House, Houghton, Mich.

GAMMA—Established November 8, 1907

Colorado School of Mines, Golden, Colo.  
Address Theta Tau House, Linder Block,  
Washington Street

DELTA—Established May 23, 1911

Case School of Applied Science, Cleveland, O.  
Address Theta Tau House, 1938 E. 101st St.

EPSILON—Established May 4, 1911

University of California, Berkeley, Calif.  
Address Mining Bldg.

ZETA—Established April 17, 1912

University of Kansas, Lawrence, Kansas  
Address Theta Tau House, 1225 Oread Ave.

ETA—Established March 23, 1912

Massachusetts Institute of Tech., Boston, Mass.  
Address A. M. Miller, 327 Huntington Ave.,  
Boston Mass.

THETA—Established May 7, 1914

Columbia University, New York City, N. Y.

Address John Park, 558 West 113th St.,  
New York City

IOTA—Established February 5, 1916

Missouri School of Mines, Rolla, Mo.

Address F. H. Geib, Rolla, Mo.

KAPPA—Established March 25, 1916

University of Illinois, Champaign, Ill.

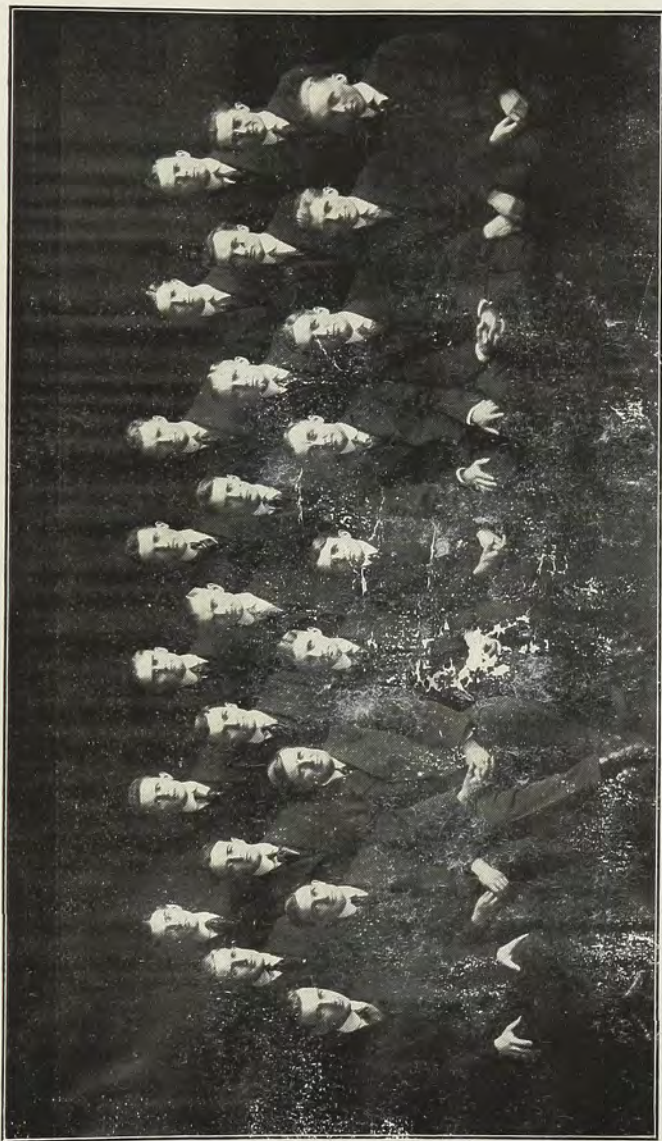
Address C. P. Ernst, Champaign, Ill.

Chicago Alumni Association      Established 1910  
Chicago, Ill.

Cleveland Alumni Association      Established 1913  
Cleveland, Ohio

South Western Alumni Assn.      Established 1908  
Douglas, Arizona

Twin City Alumni Association      Established 1912  
Minneapolis, Minn.



# ALPHA CHAPTER

|        |         |              |          |          |              |             |
|--------|---------|--------------|----------|----------|--------------|-------------|
| Askew  | Ritchie | Davies       | Wallace  | Jones    | Randall      | Hagerman    |
| Dennis | Hubbard | Stone        | Bros     | McGilvra | Anderson     | Tryon       |
| Hult   | Leonard | Prof. Zelter | Giltinan | Schrader | Prof. Holman | Houghtaling |
|        |         |              |          |          |              | Rufsvold    |





## ALPHA CHAPTER

|                                  |     |
|----------------------------------|-----|
| Total number of initiates.....   | 146 |
| Active members 1915-1916.....    | 22  |
| Members initiated 1915-1916..... | 9   |

---

## CHAPTER ROLL

|                            |                   |
|----------------------------|-------------------|
| <i>Anderson, Edward I.</i> | '18               |
| <i>Askew, Thomas A.</i>    | '17               |
| <i>Bros, Ernest T.</i>     | '18               |
| <i>Davis, Fred A.</i>      | '16               |
| Dennis, Richard            | '17               |
| Dopp, James L.             | '17               |
| Giltinan, David M.         | '16               |
| <i>Hagerman, Oliver S.</i> | (L    School) '16 |
| Houghtaling, Elting W.     | '16               |
| <i>Hubbard, William E.</i> | '18               |
| Hult, George A.            | '16               |
| Johnson, Ralph E.          | '17               |
| Jones, Robert A.           | '16               |
| Leonard, Thomas K.         | '16               |
| <i>Luplow, Walter D.</i>   | '18               |
| McGilvra, Donald B.        | '18               |
| <i>Randall, Larcum</i>     | '19               |
| Ritchie, John R.           | '17               |
| Rufsvold, Olaf M.          | '16               |
| Stone, Charles W.          | '16               |
| Sullivan, Daniel C.        | '18               |
| <i>Tryon, Philip D.</i>    | '18               |
| Wallace, Carl S.           | '17               |

N. B.—All members initiated during the year 1915-1916 are set in italics.

## ALPHA CHAPTER

By PHILIP D. TRYON, '18, Associate Editor



THE past year has been an important one in the history of Alpha Chapter, for the dream of many years was made a reality last Fall, when we moved into a house. Although the house is not perfect, it possesses most of the necessities of life and seems to us a big step in advance, putting us on an equal footing with our competitors.

At the beginning of the year there were only fourteen old men to share in the responsibility of getting started. In October, 1915, six new men were initiated and became duly enrolled members of Theta Tau. They were Brothers Fred Davies, of Minneapolis; Thomas A. Askew, Jr., of Plainview, Minnesota; Edward I. Anderson, of St. Paul; Oliver S. Hagerman, of Morris, Minnesota; Philip D. Tryon, of Minneapolis, Minnesota, and Larcom Randall, of St. Paul, Minnesota.

Alpha had a great treat during the last half of January, for Brother Erich Schrader stopped off, on his return from convention, at his home in St. Paul, for two weeks. He spent a good deal of time at the house with the Brothers. Shortly after his arrival, we held a dinner in his honor for the active chapter and alumni, at the Andrews' Hotel, on the evening of January 20, 1916. All of the active men were there and about twenty alumni in addition. It was a great success. After the dinner we adjourned to a private sitting room, where we had a meeting and general "Free for all" talk.

On the evening of February 3, 1916, three more men were initiated, bringing the active



chapter roll at present up to twenty-two. These Brothers were: Earnest T. Bros, of Minneapolis; Walter D. Ludlow, of Cottonwood, Minneapolis; and William E. Hubbard, of Duluth, Minnesota. Owing to the fact that we expect to lose six Brothers by graduation, we are planning to take in four or five more men this Spring, so that our list of active men may be reasonably high next Fall.

During the past year we have had several very interesting papers read at the meetings by various Brothers. One of these was that by Brother Houghtaling, a post senior electrical, on the Taylor's Falls Power Plant. This paper dealt with the subject in a very technical, but at the same time intensely interesting way. For the Spring, the Program Committee has planned several more papers to be given by the older Brothers.

The big problem of the year has been to get the house running on a sound financial basis. There are now five Brothers living at the house, who pay regular room rent and board. We have a ruling by which each active man is required to pay for twelve meals a month. This serves the double purpose of insuring a fairly good crowd each noon, for lunch, and of placing the table on a sound financial basis. Of course each man can eat as many more than twelve as he desires, but twelve is the minimum.

At present, Alpha is well represented in many of the various branches of college activities. There are two Brothers active in Tau Beta Pi, the Honorary scholastic engineering organization; five are senior advisors; three were on the 1915-

1916 foot-ball squad; one is Sigma Delta, the competitive athletic fraternity; three are on the track team; one on the hockey team; one on both the Minnesota Daily Board and the Gopher Board; one is a member of the Players' Club, a dramatic organization; two are actively connected with the Scabbard & Blade, an honorary military organization; two are officers in the University of Minnesota Cadet Corps; and two are members of the University Rifle Team; three are Delta Wye men, a senior and post-senior civil organization; two are managing the finances for two activities and one is a member of the All University Council.

In June, Alpha will lose by graduation, Brothers Houghtaling, Jones and Hult, who will receive their E. E.'s; Giltinan and Stone will receive the degree of M. E.; Leonard and Rufsvold their C. E.'s and Davies his mining degree.

In the latter part of February, Alpha won a glorious victory, that is, glorious in the minds of the Brothers who participated. We accepted the challenge of Alpha Kappa Sigma Fraternity, which is a local engineering organization, to a bowling meet. Brothers Leonard, Askew, Jones, Hubbard and Davies composed the Theta Tau team. Brother Askew was handicapped by pinching his finger between two balls before the start of the game, but even with this handicap the Theta Tau team came out with a comfortable winning margin.

At present, we have two pledges, G. Albin Ek and Lawrence H. Wadsworth. Ek is a senior mechanical and is president of the Minnesota Student Branch of the A. S. M. E.. Wadsworth is a freshman minor.

On March 23rd, we held our first annual inter-professional fraternity banquet. Most of the Brothers from the house attended, and agreed that it was a great success. In all probability, it will become an annual affair.

It is with the most sincere hope that the coming year may bring to each sister chapter of Theta Tau even greater success than in the past year, that Alpha Chapter extends the wish of good fellowship to all the Brothers.

308 18th Ave., S. E., Minneapolis, Minn.



## ALPHA ALUMNI PERSONALS

Wendel P. Chapman, '14, is now superintendent of roads of Rice County, Minn. He is located at Fairbault.

"Rip" Dorr, '14, is at present with the Aeolian Organ Co. in Chicago two days in each week and the remainder of the time with The Hall Organ Co. in Minneapolis.

"Dan" Helmick, '15, went to New Orleans in March, 1916, as junior engineer for the government.

"Maury" Hewett, '14, is with the Security Bridge Co., of Minneapolis.

A. Stanley Hill, '11, and Miss Hazel Hammer, of Spokane, Wash., were married October 15th. Brother Hill has been doing experimental work in the flotation process on lead ores.

"Jack" Hurley is with C. A. P. Turner in Minneapolis.

"Vic" Kruse, '14, is with the Max Toltz Engine Co., of St. Paul.

"Ted" Kopper, '14, took a position in January, 1916, with C. W. Tubby & Co., northwestern agents for the Worthington Pump Co.

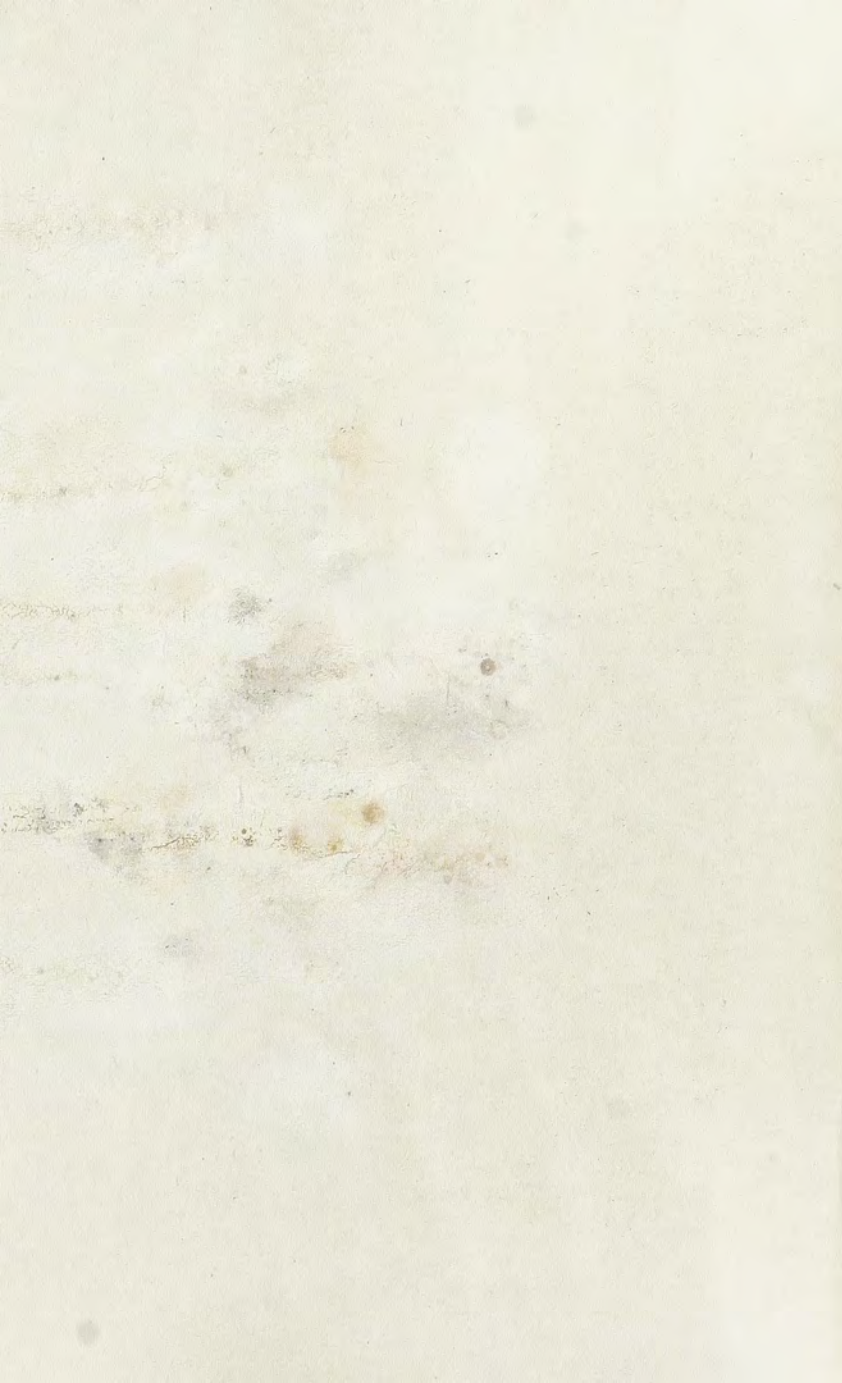
Howard Quinlan, '14, is now with Foley Bros. & Quinlan, wholesale grocers of St. Paul.

Stanley Loeffler has been making some investigations on secondary stresses of bridges, for the Great Northern & N. P. Railway.



# BETA CHAPTER

|           |          |             |        |          |            |
|-----------|----------|-------------|--------|----------|------------|
| Idema     | Holmes   | King        | Foard  | Bradt    | Harrington |
| Remington | Mitchell | Sheldon     | Clarke | Poss     | Griffin    |
| Aldrich   | Cramer   | Prof. Houle | Moon   | Nicolson | Shields    |
| Lorain    |          |             |        |          |            |





## BETA CHAPTER

|                                  |     |
|----------------------------------|-----|
| Total number of initiates.....   | 158 |
| Active members 1915-1916.....    | 22  |
| Members initiated 1915-1916..... | 7   |

## CHAPTER ROLL

(See N. B. Alpha)

|                               |     |
|-------------------------------|-----|
| Aldrich, Harry S.             | '17 |
| <i>Bemis, Edwin L.</i>        | '18 |
| Bradt, Maurice L.             | '16 |
| Clarke, John C.               | '16 |
| Cramer, Charles F.            | '16 |
| Foard, Merlin W.              | '17 |
| Fraser, Donald D.             | '16 |
| Griffin, Roy J.               | '17 |
| <i>Harrington, John M.</i>    | '17 |
| Heine, Bernhart E.            | '16 |
| <i>Holmes, John F.</i>        | '18 |
| <i>Idema, Robert D.</i>       | '18 |
| Kendall, Arthur               | '17 |
| King, Roland B.               | '16 |
| Lorain, Sinclair H.           | '17 |
| <i>Mitchell, Frederick R.</i> | '18 |
| <i>Moon, Ralph M.</i>         | '18 |
| Nicolson, Clyde W.            | '16 |
| Poss, John R.                 | '16 |
| <i>Remington, Clyde A.</i>    | '18 |
| Sheldon, Churchill G.         | '16 |
| Shields, Chester P.           | '16 |

## BETA CHAPTER

By CLYDE WALLALE NICOLSON, Associate Editor



F this letter is not so long nor so detailed as some of the other Chapter Letters, our excuse is that everything that has happened during the past year has been recorded in our quarterly letters, which are sent to all alumni of this Chapter and to the Corresponding Secretaries of the other Chapters, and that this letter can be at best, but a resume of these quarterly letters. We shall try, insofar as we can, to present the same facts in a different way and if you notice any sentences that seem familiar we beg that you will overlook the repetition as there are only a limited number of words in the English language anyway, and we have forgotten most of those which contain more than two syllables.

Our letter in the 1915 Gear ended with a promise that the boys would do what they could to keep last year's R3 trip up to the standard set in the preceeding years. They did, as far as we have been able to ascertain for they considered that night wasted whose low ascending sun saw not the boys returning, one by one. The trip resembled most of the other trips in that we went to Iron River, Iron Mountain, Iron-wood and the suburbs thereof; that "Cap" spent most of the time arguing with mine captains, shift-bosses, pumpmen, and other mine officials; that he disclaimed all responsibility for reverse faults. According to him ours was the saddest class he had ever had the misfortune to drive knowledge into, and it would be a benefit to mankind and the mining world in general, if we would fall down

a chute and be drawn off with the rest of the poor rock. Having heard all that before, we devoted ourselves busily to the main object of each day, which was to catch up with the sleep that we had missed the night before by dozing off behind a pile of lagging. Despite Cap's pessimistic promises all the boys got through the course in good shape and on arriving in Houghton, enthusiastically saluted the Old Boy with the new R3 yell:

R-3! R-3!

Maybe: Possibly:

R-3: Dear me:

Sketch it, I say, sketch it:

Where's the ore?

Under the dike, I say, under the dike.

Summer term was much the same as other Summer terms have been. Christy made a nuisance of himself in patterns by requesting that the boys should not sit down while working. To enforce this he hid all the stools. We tried to sit on the benches, but were promptly shooed off. We then sat on the floor. Christy said that this was not the true professional attitude. So, perforce, we stood.

To the surprise of all in the Q-1 class, Cap was able to flunk but one man and was forced to hand out some respectable marks. He's getting a bit old, is Cap, and his thirst for student blood seems to be failing.

The first of October saw sixteen H and T men in school, which number was increased to twenty-one by the initiation in November of five pledge-men, two of whom came from the University of Michigan. This number was later increased to twenty-three, but dropped to twenty-two when



Brother Suverkrop was obliged to leave school by an attack of bronchial pneumonia. He is recovering rapidly, though, and is in no danger.

The schedule of courses has been changed considerably this year, credit now being given in credit hours rather than in tenths. This, of course, affects only the men who entered this fall. Many of the courses have been altered more or less, the most noticeable change being in the Metallurgy Department which is in the hands of Brother Houle. Those courses which had been allowed to weaken were freshened or eliminated until now, with Brother Houle, Mr. Chapman and Mr. Cunningham on the staff, a man would go far to find better metallurgical training.

The Fall election of officers of the Student's Organization brought up the old Fraternity-Independent question. A small clique of sore-heads among the independents placed a great emphasis upon this question and by swinging a solid vote against us, captured the presidency and secretaryship. We succeeded, however, in getting the vice-presidency and two committee chairmen. This anti-fraternity feeling, though dying out somewhat, was still in evidence at the election of the senior class officers and our candidate for president was defeated by one vote. We sincerely hope that this feeling will disappear in time, not that we are desirous of positions, but that we wish to be on good terms with all the student body.

Christmas vacation saw but two men in the house, the rest having returned unto the paternal hearth, and the lights of the big cities, where they learned the "Charlie Chaplin" and caught the grippe. The first two weeks of the Winter

term were miserable ones, those having the grippe sharing it with those who had not, whereby the house became a morgue and all interest in life disappeared. The only remedy which seemed to have any beneficial effect was that dispensed by John at the Douglass House.

Two months of the Winter term are now gone and the boys are plugging along steadily. The snow lies four feet deep in the front yard and we are down over our heads in quizzes, and consequently there is nothing to report. All eyes are turned to the time nine weeks away, when the sophomores leave for the R-3 trip and the seniors rest their weary brains and begin to figure, how to live on sixty a month. So now we close this brief report with the assurance to the rest of the fraternity that throughout the past year we have tried to keep Beta Chapter worthy of its place in Theta Tau, and with the kindest of fraternal wishes to all our brothers.

233 College Ave.

Theta Tau House, Houghton, Mich.

## ALUMNI NOTES

Arthur Allen is engineer for the Winona Copper Co., at Winona, Mich., being engaged especially in experiments on the recovery of float copper.

Albert A. Alsip is engaged in leasing in Colorado and when last heard from was at the Queen's Hotel, Denver, Colo.

Gideon Apell is engineer for the Virginia and Rainey Lake Co., Cusson, Minn.

Landon N. Brown, from the meager reports we have received, has been bumming around the country from Florida to Arizona for the past year, Lord knows what he is doing.

Percy D. Brown, last heard from in 1912, was in Durango, Mexico.

G. M. Burke was at Joplin, Mo., in 1910, but has failed to supply any itinerary since then.

Emmet Coughlin, after some months with the Michigan Road Survey, is now engineer for the Republic Iron and Steel Co., Bessemer, Ala.

Joseph David is efficiency engineer at the Winona Copper Co., Winona, Mich., after having spent several months at the Dome Mines, Porcupine, Ontario.

D. I. Dobson is chemist for the General Motors Co., Detroit, Mich. He expects to attend the University of Wisconsin next year, returning to Houghton the following year.

M. C. Drake is engaged in equipping a silica and mica-sand mill at Northeast, Md., address Howard House, Elkton, Md., after having been for some months in charge of a steatite proposition at Glendon, N. C.



Al Ferris returned to the Copper Country for a few months this Fall during the Arizona strike. While here, he worked at the Victoria Mine. When work commenced after the strike he returned to Metcalf, Arizona.

D. A. Hall is a post-graduate student in geology at the University of Wisconsin. He was married last June to Miss Elizabeth Wortley of Houghton and is now living at 605 State St., Madison, Wis.

Frank V. Hicks is engineer at the Shattuck Mine, Bisbee, Arizona. Rumor hath it there is soon to be a Mrs. Hicks.

John B. McLean is, we imagine, still at South Barre, Vt., though we have not heard from him for two years or more.

A. H. Meuche is now in the insurance business at Dayton, Ohio, with the firm of Meuche and Hickman. His address is 519 McLean St., Dayton, Ohio.

Carl E. Mills is with the United Verde at Jerome, Arizona. He regrets that his masterly control of the Finnish language, acquired by diligent attendance at Germania Hall, is of no value to him. There is plenty of work down there, he says, but a decided lack of pretty girls.

Hap Mills is still smiling genially on the world at large from his sequestered retreat at Loretto, Michigan.

The last letter to R. B. Phillips at Warren, Arizona, was returned to us.

Ocha Potter is superintendent of the Superior Copper Co., Houghton, and head of the efficiency department of the Calumet and Hecla.

Ed Riker was at L'Anse, Michigan, last year, but has given us no address since then.

L. A. Suverkrop, having left school on account of illness, is at the Queen's Hotel, Montreal Can.

S. H. Zimmerman is mining captain at the San Francisco Mine, Morococha, Peru, S. A.

The Gear does not boast as yet concerning its Cradle Roll membership but we are pleased to mention that "Billy" Carrole's family has increased; a baby girl arrived March 13, 1916.





GAMMA CHAPTER R

- |          |          |         |        |       |          |        |          |
|----------|----------|---------|--------|-------|----------|--------|----------|
| Knepper  | Heitzman | Burns   | Cheney | Teers | Zaigler  | Vorck  | Howbert  |
| Bicknell | Harrod   | Whetsel | Putnam | Mann  | Gauthier | Hofius | Higgins  |
|          |          |         |        |       |          | Boot   | Anderson |





## GAMMA CHAPTER

|                                  |    |
|----------------------------------|----|
| Total number of initiates.....   | 96 |
| Active members 1915-1916.....    | 20 |
| Members initiated 1915-1916..... | 14 |

## CHAPTER ROLL

(See N. B. Alpha)

|                               |      |
|-------------------------------|------|
| <i>Anderson, Ray B.</i>       | '16  |
| <i>Beall, A. B.</i>           | '15  |
| <i>Bicknell, H. L.</i>        | '16  |
| <i>Boot, Harry E.</i>         | '16  |
| <i>Burns, Jay J.</i>          | '16  |
| <i>Cheney, George</i>         | '17  |
| <i>Gauthier, C. B.</i>        | '16  |
| <i>Harrod, Wayne A.</i>       | '16  |
| <i>Heitzman, Mearl G.</i>     | '17  |
| <i>Higgins, Robert</i>        | '17  |
| <i>Howbert, Van D.</i>        | '16  |
| <i>Hofius, Max T.</i>         | '17  |
| <i>Knepper, Capt. Chester</i> | '17  |
| <i>Munn, Harold E.</i>        | '17  |
| <i>Putnam, W. F.</i>          | '17  |
| <i>Robinson, H. A.</i>        | '17  |
| <i>Teets, Charles W.</i>      | '17  |
| <i>Vorck, Charles R.</i>      | '16  |
| <i>Whetsel, R. V.</i>         | '16  |
| <i>Zeigler, Victor</i>        | Hon. |

## GAMMA CHAPTER

By CHARLES R. VORCH, Associate Editor



ON taking "Tally" of Gamma's men about the second week of the Fall term of 1915 we found that the active representatives of Gamma had dwindled to an alarming extent. In fact only six Brothers answered the first roll call, Brothers Burns, Bicknell, Harrod, Gauthier and Vorch, with Brothers Beall back in school as post graduate and very busy with special work.

Evidently it was up to us to start some "development work" at once and to do some intensive prospecting for new members. The names of eighteen men representative of all school activities were proposed and of this number twelve were decorated with the triangular shield and Gear. They are as follows: Brothers Anderson, Boot, Cheney, Heitzman, Hofius, Higgins, Howbert, Munn, Putnam, Robinson, Teets and Whetsel. Three of these men are seniors of the class of 1916.

The question of a Chapter room has long been a source of discussion at Gamma. Matters finally came to a head this Fall and before the initiation of our Fall pledges, Gamma was installed in quarters of her own. Our Alumni will perhaps remember the "Linder Block" on Washington street. We were fortunate in securing an upper suite of four rooms for our use and not tenanted otherwise and, therefore, especially suitable for our purpose. Our initiation was held in the new Chapter room, followed by the customary feed around the "Gamma Table," on which the new



men got busy and inscribed their names, as has been the custom for years.

A number of changes in the personnel and policies of the C. S. M. have made the year 1915-1916 a notable one.

The first event of the school year was the inauguration of Wm. Battle Phillips of the University of Texas as our president. "The old order changeth" and the alumni will soon have a hard time recognizing the schedule of courses to be given. Prominent among the proposed changes is the plan of allowing degrees after a period of two years following graduation, at the end of which time a satisfactory thesis must also be submitted. Such methods have for sometime been in vogue at other institutions and stamps the C. S. M. as up to date in its policies. It is also ordained that now and hereafter the "Experimental Plant" shall serve a useful as well as ornamental purpose and be used for the advancement of the Mining Industry in Colorado.

On December 2, 1915, we held our first Banquet of the year at the "Albany" in Denver.

Brother Dittus honored us with his presence and added to the enjoyment of the occasion with some of his "Canuck" stories, ably assisted by Brother Bicknell, who has leanings towards grand opera and rendered "The Working Girl" most pathetically.

The writer of this letter is very much pleased to say he attended the Cleveland Convention as delegate. Delta Chapter certainly is a royal entertainer and from the time of our arrival, when Brother Greenslade put a few gray hairs in our heads by his non-observance of the Cleveland

speed laws, in taking us to the Chapter House, until the New Year's whistles blew we had a great and glorious time.

On returning to Colorado, Gamma's delegate found that the worst had happened and Colorado was the same as the sands of the desert, uncommon dry. The friendly "Keg" is no more and the "clay pits" are good for naught but clay henceforth.

Aside from these pleasantries, the convention had a distinctly beneficial influence on the Chapter. The new ideas and policies advanced there were put in force at once and have added materially to the impressiveness of our meetings.

The next event of note in our calendar and certainly the most important was the pledging and initiation of Brother Otto Zeigler and Captain Chester M. Knepper. Prof. Zeigler is Gamma's first honorary member and from all indications is going to be very active in the affairs of the Fraternity. He is assistant Professor of Geology at C. S. M. We feel that he is a man who will be heard from in his profession. Captain Knepper of the U. S. Navy (retired) stands unique among the initiates of any Theta Tau Chapter. It is not always that a man's ambitions will lead him to seek a college degree at the age of sixty, especially when he has thirty years previously won laurels as an Annapolis Naval Cadet. The Captain is a staunch supporter and as a scholar makes his juniors in years "hump themselves."

To welcome these new men into the Chapter a banquet was held at the "Shirley" on February 12, 1916, following which the "bunch" went to the Orpheum and saw a program of stunts, which



evidently struck Brother Dittus' sense of humor most forcibly.

On February 20th we were delighted to find that Brother Schrader had come to pay us a visit. His advice and suggestions are always good. He gave us a number of pointers on things concerning the Fraternity at large. His suggestions that we pledge three or four second semester students of the Sophomore class each was received with approbation and will be acted on.

As representative of the various school activities and honors Gamma of Theta Tau is among the first C. S. M. Among the Tau Beta Pi men are Brothers Cheney, Hofius, Howbert, Vorck, Whetsel and Munn. Burn, Gauthier and Hofius are "M" men in basketball. Brother Heitzman is an "M" man in football and Captain of the 1916 base ball team. Brother Howbert is Senior Class president and Brother Munn that of the Junior class. Brother Hofius is Editor-in-Chief of the "Prospector." Brother Bicknell managed the Football team and Brother Teets the Basketball five. Theta Tau has also a majority in the Athletic Board of Control and in the Student Council.

To you, our Alumni, we extend an invitation to be sure and "look us up" if you should happen to come to Denver. Let us show you the Chapter room and ask your advice for Gamma's good.

To all the Chapters of Theta Tau, Gamma brings greetings and extends a most hearty welcome to her incoming Brothers of Rolla and the University of Illinois.

Theta Tau House, Linder Block, Washington St., Golden, Colo.



## ALUMNI NOTES

Brothers Ramsay, '12, McHugh, '11, Strong, '13, and Charlie Hill, '12, are working for the Dorr Cyanide Machinery Co., of Denver.

Phil. McHugh, '11, is manager for the Dorr Cyanide people in Denver.

Paul Hillsdale, '11, is "Supt." of a mine at Breckenridge, Colo.

Hughie McKnight has chosen Korea for the field of his labors and is with the Seoul Mining Company there.

Dyrenforth and Dick are running a mine between them at White Pine, Colo.

Benyousky superintends a gold mine at Sugar Loaf, Colo.

J. M. Bisland, '13, was married June, 1915, to Miss Merle Arreismith of Golden and left for Mexico shortly afterwards. He was forced to leave in a hurry and had to leave most of his personal effects to the mercies of the natives.

Duggleby, '15, is doing experimental work at Butte, Mont., but says he will hit for the hills with the coming of Spring.

Ben Essig, '15, is now a mighty Prof. of Mining at the University of Oklahoma. As far as we remember Ben hadn't much use for the "genus professors" while at school here.

Commodore Follansbee, ex-'16, must have gotten wind of the "dry law" in Colorado and has hustled back to Fort Springs, Va.

Allen Kissock is in Tucson, Ariz., and is continuing his experimental work on aluminum.

"Punk" Garnet is superintendent of the Potosi Mine at Arden, Nev.

Toughy Woolf is leasing at Idaho Springs.

Sammy Burns is erecting a cyanide plant and doing experimental work somewhere in Colorado.

"Bubba" Luke, '14, prefers box cars to Pullmans, since having left Mexico in one and is now leasing in Arizona.

Al Flinn and Jack Myers have both been married since the last publication and are both working for the Empire Zinc Co., at Canyon City, Colo.

Phil McGuire is working for the Portland Mining Co., at Cripple Creek. He was married to Miss Gladys DeLacy of Denver in January, 1916.

Lionel Brooke is working for the Chili Exp. Co., at Chuquicomater, Chili.

"Gene" Snedaker is with the Goldfield Gen. Mining Co., at Goldfield, Nev.

Touch Wood, ex-'16, is working for the Ray Con. at Ray, Ariz.

"Dad" Munn, '17, married Miss Evelyn De Lacy in October, 1915.

## DELTA CHAPTER

|                                  |    |
|----------------------------------|----|
| Total number of initiates.....   | 76 |
| Active members 1915-1916.....    | 23 |
| Members initiated 1915-1916..... | 13 |

(See N. B. Alpha)

## CHAPTER ROLL

|                               |      |
|-------------------------------|------|
| <i>Atwood, Charles R.</i>     | '18  |
| <i>Buell, Edward J.</i>       | '17  |
| <i>Cobbledick, Stanley E.</i> | '17  |
| <i>Craun, John M.</i>         | '18  |
| <i>Cutter, Paul F.</i>        | '18  |
| <i>David, Carl E.</i>         | '17  |
| <i>Diemer, Alan J.</i>        | '18  |
| <i>Freeman, Harley</i>        | '17  |
| <i>Ganzert, H.</i>            | '17  |
| <i>Groselle, John A.</i>      | '17  |
| <i>Haserodt, Herbert G.</i>   | '18  |
| <i>Hoffman, Walter R.</i>     | '18  |
| <i>Holzhauer, William</i>     | '18  |
| <i>Hunscher, Homer L.</i>     | '19  |
| <i>Jeffries, Zay</i>          | Hon. |
| <i>Kaiser, Howard W.</i>      | '17  |
| <i>Kennedy, Duane E.</i>      | '19  |
| <i>Kodet, Gustaf</i>          | '18  |
| <i>Liebing, William</i>       | '17  |
| <i>Mix, Robert C.</i>         | '17  |
| <i>Pancoast, Donald F.</i>    | '17  |
| <i>Sprowl, Norman E.</i>      | '17  |
| <i>Stenberg, Walter M.</i>    | '19  |
| <i>Willson, Thomas R.</i>     | '17  |






# DELTA CHAPTER

|         |               |            |         |         |         |          |
|---------|---------------|------------|---------|---------|---------|----------|
| Stevens | Ganzenmueller | Cobbledick | Cutter  | Hoffman | Kennedy | Holzhoer |
| Freeman | Hunscher      | Pancoast   | David   | Craun   | Liebing | Groselle |
|         | Atwood        | Haserodt   | Willson |         |         |          |
|         | Sprowl        | Beell      |         |         |         |          |
| Mix     |               |            |         |         |         |          |
| Kaiser  |               |            |         |         |         |          |



## DELTA CHAPTER

By DONALD FRED PANCOAST, Associate Editor

O all Brothers and Chapters in Theta Tau, Delta Chapter extends the heartiest fraternal greetings. Particularly do we welcome Iota and Kappa Chapters into our fellowship and express our hopes that they may be two of the strongest links in our fraternal bond which have ever been forged under Hammer and Tongs.

To chronicle in detail all the interesting events which have occurred to us here at Delta, would overstep our allotted space, so we shall endeavor to set down here a few of those things of outstanding importance which we shall look back on with pleasure after we have gone out into the world and which will be of interest to the other Chapters and to those of our Alumni who are unable to keep in touch with the affairs of the Chapter in any other way.

Without question, the most important event which has occurred at Delta this year was the third Biennial National Convention of the fraternity which was held here December 28, 29, 30 and 31st. Early in the school year a letter was received from the Executive Council saying that the Convention could not be held at Berkeley, California, as was originally intended, and asking us if we would renew our invitation which had been presented at the Second Convention. Realizing our opportunity, we promptly went into executive session and commenced preparations which occupied more or less of our time until convention week. In this we were ably assisted by the Cleve-



land Alumni Association, to whom we wish to express our appreciation.

The Grand Officers and Delegates arrived at Cleveland during the afternoon and evening of December 28. That evening a formal initiation was held, followed by a smoker and general "get acquainted" session. Afterward the delegates were taken to the Hotel Regent, a short distance away, where they were lodged. Throughout the convention the men got their meals at the Chapter House. Each morning was given over to the business meeting and the afternoons and evenings were devoted to some form of entertainment. On the afternoon of the 29th the delegates were taken on a tour of inspection thru Case School of Applied Science and that evening were entertained at a theater party at the Hippodrome. The next afternoon there was an inspection trip thru Nela Park, where are located the research laboratories of the National Electric Lamp Association. In the evening the convention banquet was held at the Hotel Statler. The last day of the convention was devoted to business and many of the delegates left for their homes during the afternoon altho a number stayed until the following day in order to see more of the city.

The business side of the Convention is discussed elsewhere in this volume so we shall say nothing here, further than to state that it afforded every member of Delta Chapter the most intense personal satisfaction to be able to meet the Grand Officers and Delegates and to welcome them here as Representatives of our Sister Chapters in Theta Tau.

Immediately after the opening of school last Fall the Chapter moved into a new house on East

101st Street. The inevitable confusion attendant upon getting settled in the new house put a handicap on the rushing of new men. A strenuous effort was made, however, smokers and other entertainments were held and men were invited over to the house for luncheons with such effect that within a short time twelve men were pledged and initiated on October 16.

Owing to a ruling of the Pan-Hellenic Council, freshmen at Case are not initiated until the second semester. The first evening of the convention Robert C. Mix, '18, was taken in.

Owing to the pernicious activities of Trig, Descriptive and other evils which beset the paths of struggling freshmen we were only able to initiate two freshmen. H. L. Hunscher, '19, and D. E. Kennedy, '19, on February 5. On March 13 W. M. Stenberg, '19, was initiated. We have the following pledges whom we expect to initiate at the end of the school year: P. J. Thornton, R. O. Herbig, F. S. Baster, A. K. Walton and H. E. Ward. We now have an active Chapter of twenty-three men and on the whole feel that Delta is in a very prosperous condition.

Among the extra-fraternity activities participated in by our members we might mention that Brother Kaiser is a member of the Board of Managers of the Case Club, elected for two years; that he represented Case at the annual convention of the National Association of Student Unions held at Columbus, O., last February, and that he was elected president of the Association for the ensuing year. Kaiser is also sergeant-at-arms of the Junior Class and a member of the Student Senate. Brothers Willson, Cutter and Diemer are members of the Musical Clubs. Sprowl is chairman of the



Junior banquet committee, drum-major of the band, and member of the Senate. Pancoast is on the "Differential" board. David is secretary of the "Pick and Shovel" Club. Cobbledick, Baster and Diemer are out for baseball and Mix, Haserodt and Willson for track; Diemer was also on the second team in football.

In scholarship we have a high standing. In the contest for the inter-fraternity scholarship cup we lost out the first term by a fraction of one percent. Buell was the only Junior to make Tau Beta Pi in the first semester of the Junior year. Ganzenmueller made it the second semester.

On the social side, we have had three fraternity dances to date, one dinner party and numerous smokers, all of which served to lighten our hours of arduous (?) toil, to keep up the interest of our Alumni and to draw the men together in a way which could not but be beneficial to the fraternal spirit.

With much of the school year yet before us we feel certain that this will be one of the most prosperous years which Delta has ever enjoyed and we hope that the same can be said of the other Chapters. In closing, we only wish to say that Theta Tau House in Cleveland is always open and we will be happy to see any Brother there and to make him feel at home.

Theta Tau House, 1938 East 101st St., Cleveland, O.



## DELTA ALUMNI PERSONALS

Bro. Abbey is with the Aetna Machine Co., of Toledo. Occasionally, on his rounds, he finds time to drop in at the house and pay us a visit.

We certainly regret to hear that Bro. Alderson is located so near the North Pole. From last reports it would seem as though the climate does agree with him. He is able to work thru most of the 24-hour day.

As for Bro. Anderson—he has at last fit into the niche that was cut for him in the Halls of Learning. He has been a faculty member at the Univ. of Mo. the past year.

Brothers Applegate and Churchill are in the heart of the steel mills at Youngstown.

Bro. Arms has earned another distinction the last year thru his metallographic research. The degree of Met. E. was conferred last June by Case School of Applied Science.

Bro. Badger is now located at Toledo. We wonder what the attraction may be.

Bro. Bever now belongs to the married men's club. He says he just couldn't think of settling down to bachelordom for life.

Bro. Braun left for Toledo a short time ago to take care of a few of the other Delta men in that vicinity.

Bro. Budde, as editor of the 1916 Gear, says that he would like to get in touch with every Theta Tau Brother before 1917. Who will be the first from Delta?

We regret very much to hear that Bro. Caine's illness has confined him for some months past. We hope for his speedy recovery.

Bro. Collier always attends our Alumni meetings whenever he can tear himself away from the baby on a Sunday afternoon.

Bro. Cotton reported several times last year and each time he seemed busier than the last. Goodness knows what he is doing now.

Bro. Diemer is not in the blast furnace work as yet but he is in the engineering department of one of the most modern of blast furnace plants. He is with the Corrigan, McKinney Co.

We understand that Bro. Driscoll intends returning to school next year.

Bro. Fortune is not so far away from Cleveland but that he could drop in and visit with us once in a while.

Bro. Frisbie is burning up his energy in the wholesale coal business. He is manager of The Toledo Coal Sales Co.

Bro. Greenslade is in the automobile sales business. He says it is hard these days to sell cars even though they were as cheap as Fords.

Bro. Haeberle is still with the Grasselli Chemical Co.

Not having heard from Bro. Hansen for some time, we surmise that all is as usual.

Bro. Hartley reports Will Tomlins, Jr., Feb. 9, 1916. He wants to know who else of the '11 class is married.

Bro. Hasse is assisting greatly in promoting the Cleveland Alumni Ass'n, House Fund. He was a right hand man during the Convention.

Bro. Heena has been attending the University of Cinn. the past year.

From what we hear Bro. Heston rather enjoys coming down to Cleveland to spend the week end at the Chapter House.

Bro. Housholder was instrumental in assisting to establish Iota Chapter at the Univ. of Mo. He has also been a student at the same institution.

Bro. Jeffries visits the Chapter periodically to drop words of encouragement as well as advice.

Bro. A. H. Kline found out after several months of hard experience that "Naugatuck" was quite some distance from Cleveland to have a good time. He has now located at Alliance, just a two hours' ride from the center of attraction.

We should like to hear from Bro. Z. C. Kline even though he is located at Pawtucket, R. I.

Bro. Koehler was married last year and is now living in Youngstown. He is with the Youngstown Sheet & Tube Co.

Bro. Krill will return to school next fall.

Bro. Kuzell is smelting superintendent with the Anaconda Mining Co.

Bro. MacInnes is to be commended upon his frequent visits to the Chapter house whenever in town. He is metallurgist for the Shelby Seamless Tube Co.



From reports that we have heard Bro. Malm outgrows his positions quite rapidly. He was master mechanic with The Elyria Iron Works Co., but now is one of the Dept. Supts.

Bro. McLaughlin is in the refinery work of the Standard Oil Co. If you want a good grade of oil Mac will see that you get it.

Bro. Moses always has a good excuse (when-ever he gets to our Alumni meetings) to leave about ten minutes after he has arrived.

Bro. Rose was married last year.

A most interesting letter from Bro. B. D. Schramm early in the year reports on past experiences and future expectations. We hope conditions have changed for the better by this time.

Bro. O. F. Schramm is with The American Steel Foundries Co., Chester, Pa.

Bro. Scott will soon be a full fledged stage manager or director. He is now attending the Harvard Graduate School of Art and Sciences.

I don't know just what would happen if we should hear from "Pick" Severin. He, too, is married and lives out west.

Bro. Stein is helping the Dow Chemical Co. boost stock quotations.

Bro. Strand is with the Crown Cork & Seal Co., Baltimore, Md.

We ought to hear from Bro. Strong in the near future, telling a few of his experiences since leaving Cleveland.

Bro. Taylor as research chemist for The Grasselli Chem. Co. is kept on the jump all the time.

It was a great pleasure to get Bro. Troppman's letter in reply to a circular letter sent out earlier in the year.

Bro. Vickery is proving himself to be an indispensable Brother with the Cleveland Alumni Assn. He is their counselor at law and is doing a great work.

R. C. Wallis, the only uninitiated member of Sigma Kappa Alpha, the local from which Delta was formed, has on several occasions tried to meet with us for his initiation. So far he has been unsuccessful but we hope that arrangements will soon be made to initiate him.

## EPSILON CHAPTER

|                                  |    |
|----------------------------------|----|
| Total number of initiates.....   | 92 |
| Active members 1915-1916.....    | 21 |
| Members initiated 1915-1916..... | 7  |

## CHAPTER ROLL

(See N. B. Alpha)

|                       |     |
|-----------------------|-----|
| Adair, Samuel         | '16 |
| Brunel, Louis J.      | '16 |
| Butterworth, E. M.    | '16 |
| Buwalda, John P.      | '12 |
| Clark, Clifton W.     | '13 |
| Chey, George W.       | '17 |
| Davis, E. Fred        | '10 |
| D'Evelyn, Wright E.   | '17 |
| Farnlacher, Walter G. | '16 |
| Hazzard, Andrew M.    | '16 |
| Hoenigman, Frank J.   | '16 |
| Kew, W. S. W.         | '13 |
| Kirwan, Thomas D.     | '16 |
| Knox, Charles R.      | '17 |
| May, Art R.           | '17 |
| Miller, William B.    | '16 |
| Moody, Clarence L.    | '16 |
| Ogilvie, Samuel J.    | '17 |
| Starbird, Roy         | '17 |
| Shilling, Karl H.     | '17 |
| Uren, Lester C.       | '11 |





# EPSILON CHAPTER

|            |          |         |              |            |          |       |
|------------|----------|---------|--------------|------------|----------|-------|
| Miller     | Waithman | Buwalda | Prof. Hersam | May        | Brunel   | Davis |
| Bretherton | Moody    | Cavins  | Dougherty    | Farnlacher | Starbird |       |
| Adair      |          |         | Hoenigmann   | Kirwan     |          |       |





## EPSILON CHAPTER

By WALTER G. FARNLACHER, Associate Editor



S residents of a certain State called California, containing the city of San Francisco, capable of producing such a wonderful fair as the Panama-Pacific International Exposition, we are proud to greet you, Brothers of Theta Tau. (Please pardon the pride, the Expo really was pretty good.)

Of course, all the members of Epsilon Chapter were disappointed because circumstances did not permit the holding of the third biennial convention at "Frisco in 1915." We all had high hopes of meeting the representatives from the other Chapters here at that time, and, from what our delegate, Brother "Bill" Geis, tells us, we would have been delighted in learning what fine fellows the members of the other Chapters are. However, such knowledge is indeed very pleasing, even though we had to forego the pleasure of finding it out for ourselves individually, among the exhibits in the Palace of Mines or Metallurgy, or on the Zone "seeing Stella," as the case may have been.

As may be surmised, the World's Fair, only forty-five minutes ride from Berkeley, made the year 1915 a doubly busy one. Every year, of course, is a busy one, in the vigorous atmosphere of the Pacific Coast (there we go again, talking climate—just like Californians).

At the last meeting of the Spring Semester in 1915, on May 1, after the regular final banquet at the Hof Brau in Oakland, Brother Kew was unanimously elected regent for the Fall Semester. Brother Prof. E. A. Hersam delivered a short ad-



dress and farewell speeches were given by the Brothers who were to graduate.

After three months of Summer vacation, during which nearly all gained some experience in mining or geology in various parts of California or Nevada, the first meeting of the Fall Semester was held August 25th. A letter was read from Brother Brett, stating that he would be unable to return to College, so his resignation from active membership was, with regret, accepted.

Grand Regent Schrader visited us at the next regular meeting, September 28th, and left us favorably impressed with his earnestness and sincerity. His short stay afforded us much benefit, and we hope to be more frequently honored by his visits in the future.

On October 20th, 1915, nine new members were initiated to Epsilon Chapter. These worthy Brothers are: Roy Everett Darke, '10; Omar A. Cavins, '15; W. B. Miller, '16; Louis J. Brunel, '16; Samuel Adair, '16; Joseph W. Bostick, '16; E. M. Butterworth, '16; Art R. May, '17; Roy Starbird, '17. The two juniors were chosen from the five highest in scholarship in the junior class. The goat was up to his usual pouncing form. Nourishment was furnished later in the evening in the form of a light supper.

Prof. Umpleby, who came last year from the East to be Professor of Geology and Petrography at the University of California, favored Epsilon Chapter on November 3rd with an informal talk. His subject was: "The Organization and Work of the U. S. G. S."

On November 18th, Brother Buwalda delivered an interesting talk, followed by discussion,

on "Faulting in the Eastern and Southern parts of the Sierra Nevada." At the last meeting of the Semester, December 2nd, 1915, a banquet was held at the Oakland Hof Brau.

Epsilon Chapter has been progressing nicely during 1916. At the meeting of February 3rd, Brother Geis' convention report was accepted and heartily approved. An interesting paper written sometime ago by Grand Regent Shrader was read. The subject concerned labor conditions in Mexico.

The following new members were recently elected to Theta Tau: G. W. Coffey, '17; W. E. D'Evelyn, '17; C. R. Knox, '17; S. J. Ogilvie, '17; K. H. Schilling, '17; C. W. Clark, A. B. 1913 and M. A. 1915, a graduate from Illinois department of geology; L. C. Uren, graduate from U. C. with honors in 1911, and now instructor in several live mining courses.

At the meeting of February 17th, Brother S. E. Woodworth, a Charter member of Theta Chapter, gave us a very interesting talk on the subject of "Oil Flotation," emphasizing particularly the application of the process to the gold ores of the Mother Lode region of California. Brother Woodworth is now in active business in San Francisco, being a member of the firm of Hamilton, Beauchamp, Woodworth, Inc. We welcome him as a Theta Tau man, and hope that he will be with us frequently.

Prospects look bright for the College of Mining at the University of California. Prof. A. C. Lawson, also dean of the Geology Department, has been acting dean for the Mining College, and has done much to improve it. The College has been divided into four departments, Mining, Metal-



lurgy, Economic Geology and Petroleum Engineering. Brother Prof. E. A. Hersam is associate professor of the Metallurgy Department.

The scholastic record of Epsilon Chapter is being kept up in good form. Brother Hoenigmann was elected to Tau Beta Pi last Semester, while recently Brother Starbird and Mr. G. W. Coffey (not yet initiated) became Tau Beta Pi members.

In College athletics we are well represented by Sammy Adair, captain of the Varsity baseball team. Roy Starbird is trying hard for position at first sack. Brother Hoenigmann is our representative in the military department; he is captain of the provisional company of cadets, and is doing all he can to give them six months training in a few weeks. As president of the Mining Association, Brother Bill Miller is having his hands full in arranging dates and preparing for the University Labor Day.

Brother Buwalda passed a very successful public examination for his Ph. D. last May. Later he accepted appointment as instructor in the department of geology.

The oil geologists in China are still absent at the time of this writing, but are expected in Berkeley very soon. We feel the need of having Brother Prof. Louderback and Brothers Eaton, Hudson, Morse, Taliaferro with us again, and their return will be a fine thing for the Chapter.

In closing, we desire to express our wish for the success, prosperity and happiness of all Brothers of Theta Tau.

Mining Bldg., University of California, Berkeley, Calif.



## ALUMNI NOTES

"Stan" Arnot, '13, is assayer and chemist for the North Star Mining Co., Grass Valley, Calif.

Dan Billick, '13, is engaged in oil flotation work for the Engels Copper Mining Co., Keddie, Calif.

Sid Bretherton, who obtained his B. S. at Christman, 1915, does the assaying for the Penn Copper Co., Campo Seco, Calif.

H. Austin Brett is in the U. S. Indian Service, Los Angeles, Calif.

"Casey" Campbell, '13, after moving about the region near the Mexican border, is now located at Durango, Mexico. For his complete address see the directory.

Omar Cavins, '15, is back at his job for the Santa Fe railroad and incidentally gathering more knowledge about mining.

Harry L. Coles, '13, is now in San Francisco.

Geo. Collins, '11, is Assistant Engineer for the city of Honolulu.

T. Davis, '10, is still with us. He is giving a fine course in tectonic geology and another on earthquakes, he is working steadily on his thesis. His presence as an active member is very valuable to Epsilon Chapter.

"Bill" Geis, '15, a Christmas graduate, immediately after his return from the convention obtained a position as assayer and surveyor at the Skidoo Mines, Skidoo, Iryo Co., Calif.

Geo. Clark Gester and Stephen Howell Gester are geologists for the S. P. Co., San Francisco, Calif.

A. K. Hegeman, '14, is in the copper country at Ely, Nev.

"Bill" Kew, '13, is doing graduate work at the University of California, and is classifying geological specimens at the Academy of Sciences, San Francisco.

We congratulate Arthur Werner Lawsen, '12. He was married in February, 1916.

J. B. Orynski, '14, is in charge of a stamp mill at the Canvas mine, and is tending to the opening up of a few prospects at La Paz, Baja Calif, Mexico.

L. W. Orynski, '14, at the first of this year was appointed superintendent of the Skidoo mine, Skidoo, Inyo Co., Calif.

Robert W. Pack, '93, is paleontologist for the Geological Survey at Washington, D. C.

Earl Packard, '11, is very much interested in giving a number of courses in the department of geology at the University of Washington.

"Barney" Rocca, '15, after graduating last May, spent several months surveying around the mines and then went to Humboldt, Ariz., where he has been doing some draughting work in connection with additions to the plant.

Charion M. Staples, '10, is mining engineer for the Arizona Copper Co., Morenci, Ariz.

Percy W. Thompson, '12, is now field superintendent for the Standard Oil Co., Fullerton, Calif.

Lawrence Vander Leck, '15, is making good as field geologist for the Standard Oil Co.

"Joe" Waithman, since Christmas, 1915, has been preparing geological reports in a San Francisco mining engineer's office.

Edgar Woodcock, '14, continues successfully as determinative mineralogist for the State of California.



## ZETA CHAPTER

|                                  |    |
|----------------------------------|----|
| Total number of initiates.....   | 81 |
| Active members 1915-1916.....    | 32 |
| Members initiated 1915-1916..... | 16 |

## CHAPTER ROLL

(See N. B. Alpha)

|                              |      |
|------------------------------|------|
| <i>Alt, Glenn L.</i>         | '16. |
| <i>Bell, Arnold A.</i>       | '18  |
| <i>Buckhannan, Joseph P.</i> | '17  |
| <i>Burton, Willard A.</i>    | '16  |
| <i>Cole, Lawrence E.</i>     | '16  |
| <i>Cooley, Samuel J.</i>     | '17  |
| <i>Crawford, Hugh W.</i>     | '17  |
| <i>Deaver, Ray E.</i>        | '17  |
| <i>Diehl, Paul A.</i>        | '17  |
| <i>Fast, J. C.</i>           | '18  |
| <i>Gedney, Kenneth H.</i>    | '18  |
| <i>Gibson, Woodman L.</i>    | '18  |
| <i>Groft, Andrew J.</i>      | '16  |
| <i>Holt, Hobart C.</i>       | '18  |
| <i>James, Darl S.</i>        | '16  |
| <i>Lindsey, Adrian H.</i>    | '18  |
| <i>Madden, J. Edgar</i>      | '18  |
| <i>McCune, Malcolm L.</i>    | '16  |
| <i>Rice, Herbert A.</i>      | Hon. |
| <i>Russell, Harlan A.</i>    | '17  |
| <i>Samson, Henry E.</i>      | '16  |



# ZETA CHAPTER

|            |            |        |          |          |          |            |        |
|------------|------------|--------|----------|----------|----------|------------|--------|
| Buckhannan | Cooley     | Vawter | Fletcher | Alt      | Diehl    | Van Houten | Deaver |
| Fast       | Van Derlip | Ackers | Gibson   | Crawford | Madden   | Harding    | Bliss  |
| Samson     | Gedney     | Groft  | Burton   | James    | Holt     | Cole       | Smee   |
|            |            |        | Yeokum   | McCune   | Wakenhut | Young      | Shreve |
|            |            |        |          |          |          |            |        |

Also Reid, Mahan and Bunn





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|                             |      |
|-----------------------------|------|
| <i>Shaad, George C.</i>     | Hon. |
| <i>Shreve, J. Donald</i>    | '18  |
| <i>Smee, George</i>         | '17  |
| <i>Templin, Arthur W.</i>   | '16  |
| <i>Van Derlip, Clyde L.</i> | '17  |
| <i>VanHouten, Harold C.</i> | '18  |
| <i>Vawter, Jamison</i>      | '16  |
| <i>Wakenhut, Carol J.</i>   | '17  |
| <i>Washburn, Ellwood G.</i> | '16  |
| <i>Yeokum, George H.</i>    | '17  |
| <i>Young, Yessel Y.</i>     | '18  |

## ZETA CHAPTER

By ARTHUR W. TEMPLIN, Associate Editor

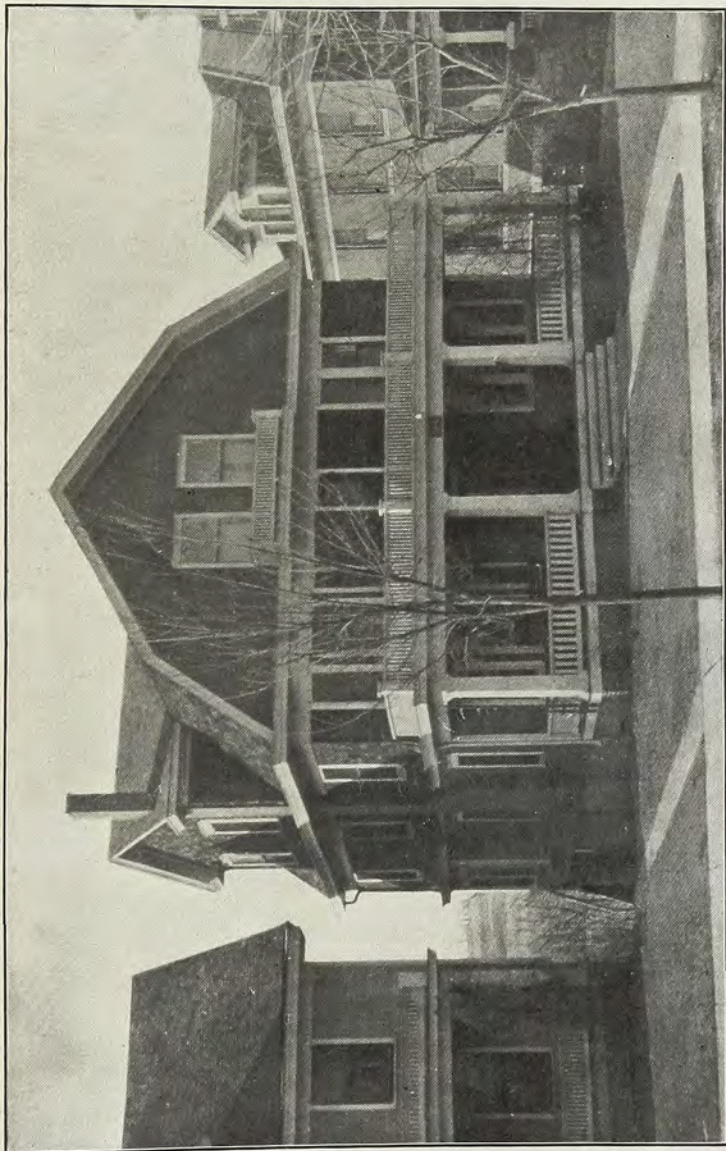


TWENTY H. & T. men and two pledges returned to school in the Fall of '15, eight of them moving into our new home at 1225 Oread Avenue. Early in October Alt and Fast were initiated, and Buckhannan, Lindsey, Vawter and Cooley were pledged after a "get-acquainted" smoker. The latter four were initiated October 27th. A favorable report was obtained from the Alumni and Professor Geo. C. Shaad of the Electrical Engineering Department was pledged as an honorary member. He was initiated on November 12th, the eve of the annual Homecoming Day at K. U. A banquet was afterwards served at the Oread Cafe.

Washburn and Shreve were pledged and immediately moved into the house, as did Lindsey and Buckhannan. Washburn was initiated January 6th, 1916.

Early in the year a smoker was held and seven sophomores pledged. They were initiated on February 8th, as was Shreve. Recently we have pledged three men, Reid, Bunn and Mahan.

Theta Tau has had many school honors this year, athletic, scholastic, and political. The entire second row in the picture are "K" men. James is captain of the football team; Cole is captain of the basketball team, and Lindsey will lead the pigskin chasers next year. Groft, Burton, Russell, Fast and Holt have football letters and Smee, Russell and Lindsey baseball letters;



ZETA CHAPTER HOUSE





Bell, Fletcher and Buckhannan were on the football squad.

Vawter, the Texas Longhorn, made Sigma Xi and Diehl, Boman, Alt, Templin, Crawford and Bunn are Tau Beta Pi men.

Crawford is president and Gedney secretary and treasurer of the Civil Engineering Society, and Crawford is editor of the "Kansas Engineer." James, Burton and Groft are Sachems, honor society for seniors; Lindsey, Yeokum and Crawford are Owls, honor society for juniors; and Gedney, Holt and Fast are Black Helmets, honor society for sophomores.

Two smokers, held at the Chapter House, constitute the social activities of the year so far. The Professional Fraternity Council, of which we are a member, gives a dance soon and we will have our Founder's Day Banquet in April. There will be another smoker in the near future also.

This is our first year in a home of our own and it has been highly successful. The advantages of closer acquaintance and a place to have entertainments and meetings have been obtained at practically no extra expense.

The annual Engineers' Day will be held the fifth of May. This is a holiday for engineers and is featured by a parade, field meet and dance. The annual Engineers' Banquet was held February 24th.

Theta Tau House, 1225 Oread Ave., Lawrence, Kans.

## ALUMNI NOTES

Ross I. Parker, '12, Charter member, paid us a visit March 1st. He is still with G. E. at Schenectady.

Jimmy Hunt did not return to school this Fall, but got married instead.

G. C. (Mun) Harding received his degree in February and is now with the Frisco at Springfield, Mo.

Billy Price, '13, was married in February, but failed to send cigars and the lady's name.

Deane E. Ackers has accepted a position as assistant engineer on a \$200,000 concrete arch bridge at Lawrence, Kans.

J. Lawrence Bliss received his degree in February and is designing concrete in St. Louis. His address is 3433 Arsenal.

Arthur L. Boman, '16, is office engineer of Topeka, Kans., a good and lucrative position.

G. C. Fletcher accepted a position with the Santa Fe in Topeka for the remainder of the year. However, Fletch will be back for his degree next Fall.

Dick Templin landed a two-year research fellowship in concrete at the University of Illinois. Incidentally he is the first K. U. man and the youngest man to hold such a fellowship.

Butler (N. W.) Brown is with the Santa Fe out of Amarillo, Texas.





# ETA CHAPTER

|          |         |           |            |        |           |          |         |
|----------|---------|-----------|------------|--------|-----------|----------|---------|
| Barry    | Ross    | Gay       | Kittredge  | McIvor | Krug      | Swan     | Bryant  |
| Lord     | Nielsen | Fleming   | Ingraham   | Hill   | Igleheart | Swan     | Freeman |
| Lawrason | Dean    | Lowengard | Hepinstall | Pryor  | Buxton    | Holbrook | Little  |
|          | Pyle    | Richmond  | Young      | Blaine | Miller    | Ingle    |         |



## ETA CHAPTER

|                                  |    |
|----------------------------------|----|
| Total number of initiates.....   | 70 |
| Active members 1915-1916.....    | 32 |
| Members initiated 1915-1916..... | 12 |

## CHAPTER ROLL

(See N. B. Alpha)

|                             |     |
|-----------------------------|-----|
| Barry, Edward               | '16 |
| <i>Blain, Emmons</i>        | '16 |
| <i>Buxton, Paul H.</i>      | '16 |
| Bryant, Fred C.             | '16 |
| Dean, Kemerton              | '16 |
| Farthing, William J.        | '16 |
| <i>Fleming, William H.</i>  | '16 |
| Freeman, Hovey T.           | '16 |
| <i>Gay, Robert N.</i>       | '17 |
| Hepinstall, John            | '16 |
| <i>Hill, Lucius T.</i>      | '17 |
| Holbrook, F. Cabot          | '16 |
| <i>Igleheart, George P.</i> | '17 |
| <i>Ingle, John B.</i>       | '16 |
| Ingraham, Franklin T.       | '16 |
| Kittredge, George           | '17 |
| Krug, Jr., F. Stanley       | '17 |
| Lawreson, Levering          | '16 |
| Little, Thomas W.           | '16 |
| Lord, Charles R.            | '16 |
| Lowengard, Richard O.       | '17 |



|                            |     |
|----------------------------|-----|
| <i>McIvor, Carlisle C.</i> | '18 |
| Miller, Arthur M.          | '17 |
| Nielsen, Otto E.           | '17 |
| <i>Pryor, Willard L.</i>   | '17 |
| Pyle, Oden B.              | '16 |
| Richmond, Kenneth C.       | '17 |
| Ross, Ralph                | '17 |
| Shuey, Arthur              | '16 |
| <i>Swain, Winthrop C.</i>  | '16 |
| <i>Swan, Leroy H.</i>      | '17 |
| Young, Vertrees            | '16 |

## ETA CHAPTER OF THETA TAU

Bt ARTHUR M. MILLER, Associate Editor



ON October 15th, 1915, Eta held her first meeting of the year at hotel Plaza. The Chapter consisted of twenty active men, ten having been lost by graduation.

On November 9th, 1915, a most successful smoker was held at the Boston Harvard Club. As an outcome of this smoker twelve new men were initiated, the ceremony being held at the American House.

Our meetings have been particularly interesting and instructive. Following are some of the most noteworthy papers delivered:

Zinc Chlorid as a Preservative for Structural Timber.

The Latest Design in Recording Instruments.  
Measuring the Lengths of Electric Waves.

Oil as a Fuel for Steam with Special Reference to New England.

Some idea of the activity of the Brothers may be given by a mention of the following offices held by Eta men.

President of the Senior Class; president of the Civil Engineering Society; president of the Mechanical Engineering Society; three members of Osiris, the Senior Society; three members of the Institute Committee which is the governing board of the Institute; two members of Class Day Committee; two members of the Glee Club, and two members of the Technique Board (year book); five members of the Walker Club, and three members of the Beaver Club.

Eta, as in previous years, has taken its members largely from the body of men at Tech who have attended other Colleges. In accordance with this policy the personnel of the Chapter is made up of twelve College Graduates and eight men who have attended other Colleges out of an active Chapter of thirty-two.

We were very fortunate in having Brother Young as treasurer this past year. He came into office when Chapter was in considerable debt. It was his energy and activity which placed Eta on a firm financial basis, in fact the Chapter is now square with the world and has a comfortable balance in the treasury.

The coming year will be an important one in Eta's career, for this Summer Technology moves to its wonderful new buildings in Cambridge. The Brothers are looking forward to a permanent Lodge and more intimate association, with the beginning of this new regime.

In the near future Eta will hold another Rush Smoker, soon after which will come the Spring term initiation.

After this most prosperous year Eta extends greeting to her Sister Chapters and a hearty good wish for the future.

327 Huntington Ave., Suite No. 19, Boston, Mass.



## ETA ALUMNI PERSONALS

Brother W. M. Africa, '15, is with the Manchester Gas Co., Manchester, N. H.

Brother George Beach, '14, and Brother W. P. Mauther, '13, sailed for South America as machinery salesmen early in March.

Brother R. L. Fletcher, '15, is doing metallography work with The La Belle Iron Works, Steubenville, Ohio.

Brother C. Fiske, '14, is with Kidder Peabody Co. Brother Fiske recently announced his engagement.

Brother Robert Harper, '15, is now in Ohio with The Goodrich Tire & Rubber Co., Akron, Ohio.

Brother Thomas Huff, '15, is now an instructor in the Aeronautics Department of Massachusetts Institute of Technology.

Brother Henry Leeb, '15, is with the Gunn-Richards Co., consulting engineers of New York.

Brother E. E. Polley, '16, is on evaluation work with Sloane-Huddel & Freeman Co., Chicago, Ill.

Brother Wallace Thomas, '15, is in Springfield, Ohio, with The Thomas Plow Co.

Brother Alden D. Wheeler, '15, is with The Goodyear Tire & Rubber Co., Akron, Ohio.

## THETA CHAPTER

|                                  |    |
|----------------------------------|----|
| Total number of initiates.....   | 43 |
| Active members 1915-1916.....    | 19 |
| Members initiated 1915-1916..... | 9  |

## CHAPTER ROLL

(See N. B. Alpha)

|                           |     |
|---------------------------|-----|
| Banks, R. M.              | '16 |
| Benson, R.                | '16 |
| Birkett, H.               | '16 |
| <i>Dixon, M. M.</i>       | '17 |
| <i>Gibson, A. W.</i>      | '17 |
| Kemp, J. T.               | '16 |
| Klein, K. F.              | '16 |
| Klugescheid, W.           | '16 |
| <i>MacMillan, H.</i>      | '17 |
| Mandell, A. J. E.         | '16 |
| <i>Norris, Jr., R. V.</i> | '17 |
| <i>Park, J.</i>           | '17 |
| <i>Smith, B. R.</i>       | '17 |
| <i>Sommerville, W. B.</i> | '17 |
| <i>Tichborne, H. M.</i>   | '17 |
| <i>Walker, A. W.</i>      | '17 |
| Webb, T. H.               | '17 |
| Wensley, R. L.            | '16 |
| Wormser, F. E.            | '16 |

## THETA CHAPTER OF THETA TAU

By JOHN PARK, Associate Editor



EARLY in January of this year, the Chapter added to its membership by initiating the following men: A. W. Gibson, M. M. Dixon, J. Park, H. MacMillan, B. R. Smith, K. Klein, A. W. Walker.

Shortly after three other men were pledged and initiated soon after; these were: W. B. Somerville, H. M. Tichborne, R. V. Norris.

The Chapter is very much interested at present in the Senior Mining Society, of which Brother Kemp, '16, is president; Brother Wensley, vice president, and Brother Klugescheid, treasurer. It is the purpose of the society to invite to Columbia men who will speak on subjects of interest to students in mining and metallurgy. Up to the present time this has been carried out very satisfactorily.

That the Chapter is active on the Campus is shown by our record.

Bro. Wormser rowed on the Varsity crew at Poughkeepsie last June.

Bro. Birkett is chairman of the senior dinner committee.

Bro. Webb was captain of the undefeated hockey team.

Bro. Kemp is president of the Senior Mining Society. Bro. Wensley is vice president and Bro. Klugescheid is treasurer.

Bro. Mandell was captain of the Intercollegiate champion chess team.



Bro. Howry was on the wrestling team. He was also leader of the Mandolin Club.

Bro. Gibson is on the waterpolo team and the fencing team.

Bro. Tichborne rowed on the varsity crew.

Bro. Wensley is president of the Senior Science Class.

Bro. Benson, '15, was a member of the baseball team.

Bro. Wright was elected to Tau Beta Pi.

Bro. Thomas, '15, is at the N. Y. office of the Aetna Explosive Co.

Bro. Curwen, '15, was married just after leaving college last year. He is with F. W. Dodge Co. in New York.

Bro. Alden is with the United Steel Corp. at Canton, Ohio.

## THE INSTALLATION OF IOTA CHAPTER

By E. ROSS HOUSHOLDER, Associate Editor

Eight upperclassmen of the Missouri School of Mines and Metallurgy were initiated as Charter members of Iota Chapter of Theta Tau, Saturday evening, February 5th, 1916. The installation ceremonies were carried on in the metallurgy lecture room of the mining building by Professor H. A. Rice, head of the departments of Mechanics and Civil Engineering of the University of Kansas, and Grand Vice Regent of the fraternity, together with Brother C. Van Derlip, a senior at the University of Kansas and an officer of Zeta Chapter. These two men were assisted by Brother R. J. Anderson, instructor of metallurgy in the Missouri School of Mines, and Brother E. Ross Housholder, a student of the same institution, both being members from Delta Chapter at the Case School of Applied Science, Cleveland, Ohio.

A petition for a Chapter was prepared and presented at the last bi-annual convention of the national fraternity, which was held in Cleveland, Ohio, December 29th, 30th and 31st, 1915. Brother Anderson and Brother Housholder made the trip to Cleveland to represent the petitioners at the convention.

The petition was granted, along with one from a body of engineering students from the University of Illinois. Following are the names of the successful petitioners: James L. Head, '16; G. E. Johnson, '16; Louis W. Ehlers, '16; James A. Worley, '16; Fred Grotts, '16; Wm. H. McCartney, '16; Robert S. Burg, '16; James J. Dowd, '16; Carl G. Stifel, '16, and Francis H. Geib, '18.



Because of their unavoidable absence from Rolla at this time Brother Fred Grotts and Brother Carl Stifel could not be initiated, but were taken in a few weeks later.

Brother Anderson, upon accepting his position as instructor in the School of Mines, persuaded Brother Housholder, who was then in Cleveland, to come out to Rolla with him. Shortly after their arrival, they conceived the idea of establishing a Chapter of Theta Tau in the local college, where there seemed to be such a good opportunity. The Missouri School of Mines has been able to boast for several years of having the largest enrollment of any strictly mining school in the country. Brother Housholder took the matter up with Grand Regent Schrader, who favored the plan. Following his directions, which were received from time to time, a local organization was formed, whose sole object was to petition for a Chapter of Theta Tau. So carefully were the plans carried out that no one outside the petitioners and a few faculty members knew anything about the affair until the petition had been granted. Plans were then made for the entertainment of the two official delegates while in Rolla.

Prof. Rice and Van Derlip arrived in Rolla Friday afternoon. In the evening they attended the Rollamo picture show in Parker Hall with the above group of Brothers, after which a general get-together reception was held at the Baltimore Hotel.

Part of the Saturday forenoon was spent in showing the visitors about the campus. At 10:30 o'clock Saturday forenoon Professor Rice delivered a very interesting lecture, illustrated with a number of slides upon the manufacture and use



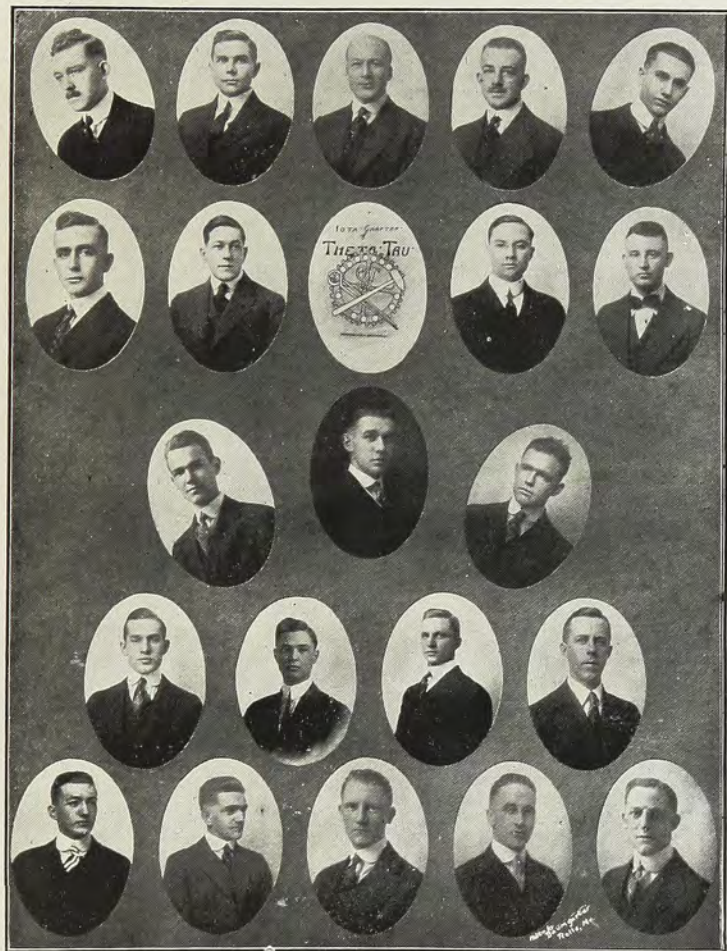
of Portland cement, to the upper classmen of the local college. At four o'clock in the afternoon a faculty reception was held in the parlors of the Baltimore Hotel in honor of the two visitors from Lawrence.

The installation ceremonies started at 7:30 Saturday evening. The banquet celebrating the installation of the chapter was held at the Baltimore Hotel following the ceremonies.

Besides the members of the fraternity there were present: Director A. L. McRae, State Geologist; H. A. Buehler, Dr. G. H. Cox, and Professor C. R. Forbes when Toastmaster W. H. McCartney gave the signal to be seated. After disposing of the feast, provided in an excellent manner by the hotel management, the banqueters turned their attention to the programme of the evening. Director A. L. McRae was the first speaker. He welcomed Theta Tau to a place in the life at the School of Mines and expressed his confidence that the new Chapter would do much to further the interests of the institution. Professor Rice was the next speaker and he said that he had been greatly impressed with the School of Mines and was glad to have been able to install a Chapter of Theta Tau at such a progressive technical institution. His words were seconded by Mr. Van Derlip in a short talk. Professor Forbes and Dr. Cox each welcomed the new Chapter, paid a tribute to the men composing it, and expressed in a forceful manner their appreciation of the value of such an organization. State Geologist Buehler added a word of welcome and advice. Brother Anderson then told something of the nature of the fraternity and its relation to other organizations. Brother James L. Head, the

newly elected Regent, spoke on behalf of the initiates. He expressed the Chapter's appreciation of the welcome given by the members of the faculty and pledged the support of Iota Chapter to the best interest of M. S. M. Brother G. E. Johnson, the new treasurer, in a short talk closed the programme.





# IOTA CHAPTER

|          |        |         |           |            |
|----------|--------|---------|-----------|------------|
| Anderson | Grotts | Johnson | Ehlers    | Housholder |
| Worley   | Stifel | Head    | Burg      | Geib       |
|          | Dowd   |         | McCartney |            |
| Reilly   | Barton | Adams   | Pierce    |            |
| Gerber   | Bowles | Ambler  | Hérivel   | Turnbull   |





## IOTA CHAPTER

|                                  |    |
|----------------------------------|----|
| Total number of initiates.....   | 19 |
| Active members 1915-1916.....    | 17 |
| Members initiated 1915-1916..... | 19 |

## CHAPTER ROLL

(See N. B. Alpha)

|                              |     |
|------------------------------|-----|
| <i>Adams, Bernard W.</i>     | '16 |
| <i>Ambler, Harry</i>         | '17 |
| <i>Barton, Joe</i>           | '17 |
| <i>Bowles, Martin F.</i>     | '17 |
| <i>Burg, Robert S.</i>       | '16 |
| <i>Dowd, James J.</i>        | '16 |
| <i>Ehlers, Louis W.</i>      | '17 |
| <i>Geib, Francis H.</i>      | '18 |
| <i>Gerber, Theodore C.</i>   | '17 |
| <i>Grotts, Fred</i>          | '16 |
| <i>Head, James L.</i>        | '16 |
| <i>Herivel, Harold T.</i>    | '17 |
| <i>Housholder, E. Ross</i>   | '18 |
| <i>Johnson, Gunnard E.</i>   | '16 |
| <i>McCartney, William H.</i> | '16 |
| <i>Pierce, Colwell A.</i>    | '16 |
| <i>Reilly, J. H. G.</i>      | '17 |
| <i>Stifel, Carl G.</i>       | '16 |
| <i>Turnbull, Louis A.</i>    | '17 |
| <i>Worley, James A.</i>      | '17 |

## IOTA CHAPTER

By E. R. HOUSHOLDER, Associate Editor



**W**HAT'S the good word?" To this Iota wishes to answer, "Everything is well at Rolla." Altho only a few months old, Iota feels that she is already upon a sound foundation as the only Greek letter professional engineering fraternity at the Missouri School of Mines and Metallurgy. Together with the charter members who were initiated at the installation, February 5th, 1916, and one affiliated member from Delta, we now have an enrollment of twenty active men, all upperclassmen.

The first meeting following the installation, like those preceding, were held in the quarters of Anderson and Housholder, where the members found plenty of "Snapping" literature to read before and after the meetings. Brother Grotts and Brother Stifel were unable to be present at the installation, and so were initiated later, the first on February 10th, and the latter on March 15th. Regular meetings have been held every second Thursday. Special meetings have been called at the discretion of the regent.

During March arrangements were made to hold meetings in one of the lecture rooms of the Metallurgy Building, until more suitable quarters can be obtained. Iota is on the lookout for apartments where they may arrange permanent quarters, and you may expect to find us located at the beginning of next year.

Nine new members, the first since the chapter members organized were initiated Saturday evening, March 25th in the Geology lecture room of





PARKER HALL



Mechanical Hall



Woodward Hall



Auditorium of Parker Hall



Metallurgy Building



CHEMICAL HALL

Buildings  
a  
Campus  
at  
Missouri  
School of  
Mining &  
Metallurgy



Jackson Gymnasium

Iota  
Chapter

Installed  
Feb. 5, 1916

IOTA CHAPTER



Norwood Hall, consisting of the following: Brothers Adams, Pierce, Turnbull, Reilly, Bowles, Gerber, Barton, Herival and Ambler. A smoker and luncheon was given the new members in the parlors of the Baltimore Hotel afterwards. This get-together did not break up until the wee' sma' hours of the morning, even tho our too married members stayed with us until the last.

Socially Iota has been unable to do much so far. The reason for this is that the time has been so short since the installation, and there has been little call for social activities among the members. Saturday evening, April 22nd, 1916, all the Brothers left over the Frisco for Jerome, Missouri, which is on the Gasconade River. The following day was spent in having a general good time.

At the regular meeting April 13th, Brother Johnson presented a paper on: "The Electrolytic Deposition of Zinc from Sulphate Solutions." In a very pleasing and able manner.

Editor Budde has requested that something be said about the college in general.

The Missouri School of Mines and Metallurgy while not quite the oldest mining school in the country (the School of Mines of Columbia University, New York City, enjoying that distinction) is, none the less, the first distinctly mining school established in America. For a number of years its growth was slow, but at the present time its progress exceeds that of any similar institution. It has a faculty of twenty-five members, and a student body of two hundred and fifty-three.



The School of Mines and Metallurgy is located at Rolla, Phelps County. Here, in November, 1871, the school was formally opened. The statutes fix the status of the school as one of the colleges of the State University. Its affairs are under the immediate supervision of an Executive Committee, consisting of three members of the University Board of Curators, selected by that body. The need of general culture as a foundation and accompaniment of specifically technical training led to the establishment in 1885, of an Academic Course.

Rolla is on the crest of the Ozark uplift, at an elevation of eleven hundred and forty feet above the sea level, and has an agreeable and notably healthful climate. Its position on a great trans-continental railway system makes it readily accessible. The school is within easy reach of the important mining districts of the state which offer splendid facilities for the study of mining geology, mining methods, ore dressing and mining machinery. The grounds of the School of Mines are situated in the highest part of the town and are over twenty-seven acres in extent. The campus contains beautiful lawns, groves of native oak and many shade trees, shrubs and flower beds, which unite to produce a pleasing landscape. The Jackling Athletic Field has two splendid diamonds, a football gridiron, the ten tennis courts and a 440 yard running track.

The sophomores have their mine surveying practice term trip each year in the coal region at Edwardsville, Illinois, during the first part of June. The juniors take a trip each year through the mine districts of Missouri and the Western States. During the first part of May, following

the senior examinations the fourth year men take an inspection trip through the Central Western States, visiting various manufacturing and power plants, together with different mills, smelters and mines.

Membership in the Missouri Mining Association consists of alumni and students in the School of Mines who have to their credit eighty-five semester hours. It is affiliated with the American Institution of Mining Engineers. Many prominent members of the engineering profession have addressed this body during the past year due to the untiring efforts of Brother Ehlers, who is president of the Association.

It might not be out of place to say here that out of the twenty-seven members in the A. I. M. E. in the college. Iota has the following members: Brothers Head, Johnson, Ehlers, Housholder, Dowd, Burg, Stifel, McCartney and Pierce.

By far the most important student activity about the college is the Rollamo Board. The college annual is called the Rollamo. Its purpose is to review the activities of the college year and to record the events in a form suitable for presentation.

In order to produce the annual of the quality of the Rollamo the board has found it necessary to find some means of obtaining money other than the small sum paid in as subscriptions. As a result of this the social activities of the school as a whole have come under the supervision of the Rollamo Board. The school Picture Show, the Lyceum course, the School dances, Annual Plays, and other social activities are in charge of the Rollamo.



Among the officers of this year's Rollamo Board, Iota can boast of the following: Brother Johnson, Treasurer; Brother Grotts, Associate Editor; Brother Ehlers, Staff Photographer; Brother Dowd, Assistant Business Manager; Brother Reilly, Feature Editor. Among the members of next year's Board we have: Brother Ambler, Business Manager; Brother Bowles, Advertising Manager; Brother Housholder, Art Editor and Brother Turnbull, Associate Editor.

Every Friday and Saturday evening the Rollamo picture show is given in the auditorium of Parker Hall. Due to the loyal support of the student body a class of pictures is shown that are seldom equalled in the motion picture houses of our larger cities.

The annual Rollamo play, "Bricks and Barons" written by this year's Editor-in-Chief, was produced before a packed house, April 27th, Brother Ambler was Director and Brother Housholder had a place in the cast.

The Miner is the School Weekly, published every Friday of the school year. The miner was planned and promoted through the efforts of Fred Grotts, J. L. Head and G. E. Johnson, all Theta Tau men. Brother Turnbull is now advertising manager of the Miner Board.

There is a student branch of the Y. M. C. A. established at the school. Brother Head is president.

The school has been fortunate in having a number of students possessing marked musical ability. Brother Dowd has been leader of the school orchestra during the past year.



The mandolin club has been quite popular with the fellows this past year, possibly due to the able leadership of Brother Ambler.

Brother Grotts is president and Brother McCartney business manager of the Athletic Association, which is an organization of all the students.

Brother McCartney was our only Varsity man on the gridiron this past year. Brother Barton made his letter in track this Spring. A number of the remaining Iota men have been taking an active part in athletics also.

The event which stands preeminent on the college calendar is St. Patrick's Day. Tradition tells us that St. Patrick was an engineer, and he is accordingly accepted by engineers as their patron Saint. St. Patrick's Birthday is always celebrated at the School of Mines with the most imposing and interesting ceremonies, of which the most important features are the monster parade, the knighting of the seniors by St. Patrick himself, the carnival on the campus, the show in the afternoon and the Brilliant Masque Ball given in honor of St. Patrick in the evening.

It is the custom for all freshmen to wear green caps of standard pattern for a certain prescribed period in the Fall. The other classmen see that this rule is obeyed implicitly. No freshman is permitted to wear corduroy, khaki or moleskin trousers at any time for any purpose during the school year. Infractions of this rule invariably result in the immediate removal and destruction of the objectionable garment. Needless to say infractions are extremely rare. No students except seniors are allowed to wear mustaches or

any other form of hirsute adornment upon the face. This privilege is jealously guarded by the seniors and the rule rigidly enforced.

Four Greek letter fraternities are established at Rolla, and each maintains a Chapter House. They are:

| Name           | Chapter     | Chapter<br>Established |
|----------------|-------------|------------------------|
| Sigma Nu       | Gamma XI    | Jan. 23, 1903          |
| Kappa Alpha    | Beta Alpha  | Apr. 27, 1903          |
| Kappa Sigma    | Beta Chi    | Dec. 19, 1903          |
| Pi Kappa Alpha | Alpha Kappa | Dec. 2, 1905           |

Tau Beta Pi established their Beta Chapter in the School of Mines in 1908. For 1915-1916 Brother Johnson is president and Brother Dowd treasurer of this organization. Brothers Pierce, Ambler and Adams are also members of Tau Beta Pi.

In closing Iota wishes to extend her most sincere wishes to her Sister Chapters and assure any H. & T. man a most hearty welcome should they ever visit Rolla.

F. H. GEIB,  
Rolla, Mo.





# KAPPA CHAPTER

|               |              |               |               |
|---------------|--------------|---------------|---------------|
| E. McEvers    | H. T. Rogers | J. P. Tuthill | J. H. Needler |
| J. H. Heindel | H. L. Owen   | R. L. Peck    | K. B. Bush    |
| G. Geib       | C. P. Ernst  | W. M. Wilson  | E. Shelby     |





## KAPPA CHAPTER

|                                   |    |
|-----------------------------------|----|
| Total number of initiates.....    | 14 |
| Active members, 1915-1916.....    | 12 |
| Members initiated, 1915-1916..... | 14 |

## CHAPTER ROLL

|                               |     |
|-------------------------------|-----|
| <i>Bush, Kenneth B.</i>       | '16 |
| <i>Derby, Sylvester R.</i>    | '15 |
| <i>Ernst, Carl P.</i>         | '16 |
| <i>McEvers, Ernest</i>        | '18 |
| <i>Heindel, John H.</i>       | '16 |
| <i>Lund, Jack V.</i>          | '16 |
| <i>Miller, Harry W., Hon.</i> | '07 |
| <i>Needler, Julien H.</i>     | '17 |
| <i>Owen, Harry L.</i>         | '16 |
| <i>Peck, Roy L.</i>           | '17 |
| <i>Rogers, Harry T.</i>       | '16 |
| <i>Shelby, Jr. Edwin</i>      | '16 |
| <i>Tuthill, James P.</i>      | '17 |
| <i>Wilson, Wilbur M.</i>      | '00 |

## THE CLEVELAND ALUMNI ASSOCIATION

By E. A. TAYLOR, Associate Editor



THE Cleveland Alumni Association sends greetings to the active Chapters and other Alumni Associations. The past year has seen more than usual activity and interest in the Cleveland Association. The 1915 Convention being transferred from 'Frisco to Cleveland had the very beneficial effect of bringing nearly all of our resident and near-resident members together, even some of the married ones, and allowing us to get acquainted with the delegates and visitors from the other Chapters. The manner in which most of our out-of-town members responded to the request for help and suggestions was very gratifying and showed that their interest, which at times seemed dead, had only been sleeping.

It is passing strange that when a man gets married he should fold up his tent, like the Arab and silently crawl into a hole and pull the hole in after him, yet such seems to be the case. We do not hope to reform the world nor make the sun rise in the West, but we are hoping that eventually we can get our resident married alumni around to the meetings and get an occasional peep out of the non-resident ones.

The building fund carried along in connection with the Cleveland Association is building up slowly, but surely. Unfortunately the war stock fluctuations did not make any millionaires in our midst, or we would undoubtedly have a fine Chapter House at this writing. We wish to thank our alumni, our financial backers, and while we seem backward at times in acknowledging their contri-



butions, they are all credited on our little book and when our dreams are realized, full credit will be given them. We have several hundred dollars in the fund now and the vision of our own Chapter House and Club Rooms comes nearer to a reality every day.

The publication of the Gear this year has been undertaken by one of our members and we feel assured it will be as big a success as it has been in the past.

## CHICAGO ALUMNI ASSOCIATION

By H. H. HOPKINS, JR., Associate Editor



THE activities of the Chicago Alumni Association have been limited because so few members of the fraternity have been located in this vicinity. The only permanent residents of Chicago have been together often informally but no regular meetings have been held. This Association justifies itself occasionally by acting for some chapter initiating an alumnus for them. We were pleased to have occasion for a regular business meeting on December 27th, 1915, at which John W. Young was initiated at the request of Beta Chapter. Those present were: B. B. Walling, Alpha; W. H. Geis, Epsilon; W. F. Carroll, Beta and H. H. Hopkins, Jr., Beta. The meeting was held at the La Salle Hotel in Chicago. At the same meeting, H. H. Hopkins, Jr., was elected the representative at the Convention. The following officers were elected for the ensuing period:

President, W. F. Carroll, Beta.

Sec. & Treas., H. H. Hopkins, Jr., Beta.

The Chicago Alumni Association wishes to urge all brothers to visit them when passing thru Chicago. We also wish each chapter and Alumni Association, a successful year during 1916.

## SOUTHWESTERN ALUMNI ASSOCIATION

By C. A. KUMKE, Associate Editor



Our Phoenix Convention in 1913, which was a great success, nine brothers attending, we voted One Hundred (\$100.00) dollars, expense money to the delegate elect to the 1915 reunion at San Francisco. I was elected first choice delegate. Brother Ferris was elected president and Brother Mangelsdorf, secretary and treasurer. A short time after this Brother Mangelsdorf left the Clifton District and the Southwest, so he turned his records over to Brother Ferris.

I timed my vacation this year so that I could go back home to Michigan, and then take in the Convention of Theta Tau at Frisco on my return West. The expense money of One Hundred (\$100.00) dollars, was not forthcoming when I left Jerome for the Convention, but I had nevertheless planned to go thru with the program.

At present there are three Theta Tau men in our department at this mine, Brothers J. E. Wagner, Beta; C. E. Mills, Beta; and myself. Brother W. V. DeCamp is only a short distance from here as Superintendent of the Blue Bell Mine. The four of us met at Prescott, December 4th, 1915, and had an enjoyable time. We discussed Theta Tau affairs and laid our plans for another Southwestern reunion. We had planned one for Phoenix, at Fair Time, (November), but shortly after making plans the strike broke out at Clifton. We have several Brothers in that camp so we decided to wait until the labor troubles at Clifton had been settled, which we thought would be soon. When it appeared certain that the strike would be a



long drawn out affair the different mining companies closed down absolutely and all of our Brothers left the district.

We have again changed our plans and I am now in communication with Brother Ferris, who left Clifton for the East, to have all the Brothers when they return to Clifton, as they all expect to after a settlement, start back at an appointed time and come by way of Ash Fork to Jerome. We have, as I said before, four Brothers here, a fair nucleus to begin with and we will try to get the boys from Phoenix, Globe and Miami to run up and then we will have another rousing reunion.


In discussing Theta Tau affairs with as many of the Southwestern Brothers as I have seen I find that they all seem satisfied with the present policy pursued by the Fraternity. They all favor the present restrictions in favor of mining and do not care to yield any further ground. Considering that they are all miners, this is not very surprising.

You may assure the rest that the Southwestern Brothers are not dead, but that they have been asleep. As you know the various camps in this country are so isolated that it is very difficult to keep in touch other than by mail and most of the boys are not good writers; if they were they probably would have been authors and would not have to be mining engineers.

Trusting that the Cleveland Convention was successful in all the Fraternity affairs, we are extending our best wishes for future development of the entire Fraternity thru the efforts of all of its parts.

## TWIN CITY ALUMNI ASSOCIATION

By N. S. KINGSLEY, Associate Editor

HE Twin City Alumni Association of Theta Tau, which, due to the annual addition of the younger Brothers just out of College, now numbers over 40 members on its roster, has continued its policy of a real existence by means of the monthly gatherings at dinner at a down town hotel. Last year's program of interesting and highly instructive talks on engineering and kindred technical subjects were not continued at the first meeting of the present year due to a combination of unavoidable circumstances, but it is expected that the programs will be resumed at the meetings for the remainder of the year. The talks delivered last year including such subjects as "Wood Preserving" the uses of "Photography in Engineering" "Business Efficiency in Engineering" and motion pictures of "The Steel Industry" were enthusiastically received by the members. All the talks were given by members of the Association and set a standard to be followed in subsequent years.

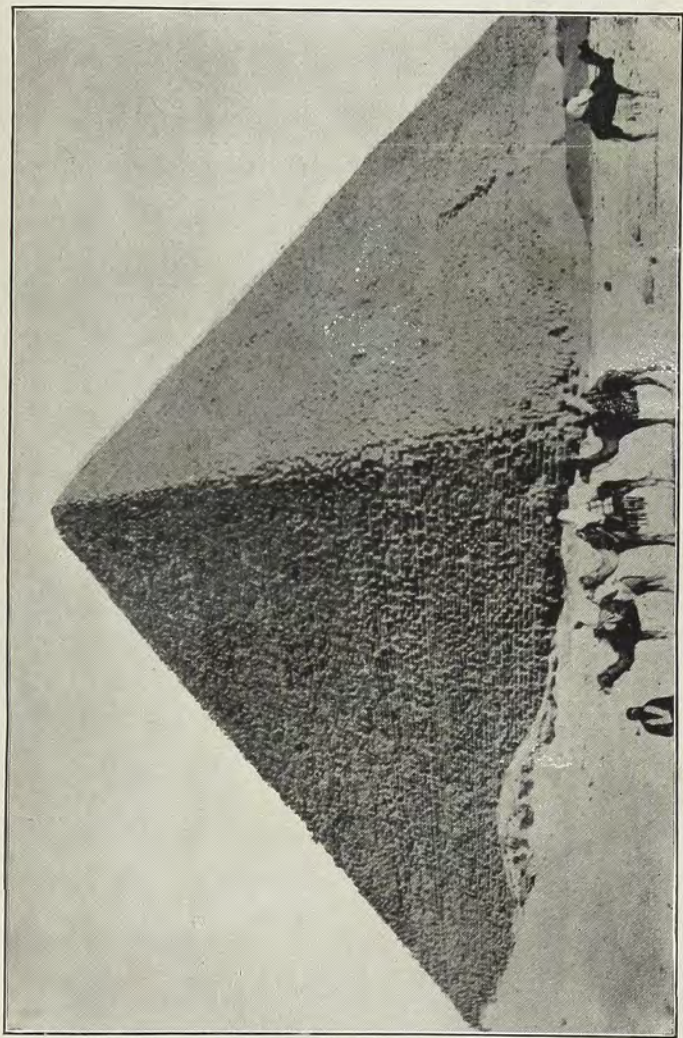
At our first meeting of the season held at the Andrews Hotel in October, the following officers were elected for the ensuing year: Arthur E. Larkin, President; Eldreth L. Sawyer, Treasurer and Neil S. Kingsley, Secretary. Several of the active Brothers from the Local Alpha Chapter were present at the time and the meeting was in the nature of a good social "get-together" rather than a lengthy or formal business session. Our best turnout of the present year was in January just after the National Convention at Cleveland, when over forty Theta Tau men, alumni, actives



and University of Minnesota Faculty Honorary members met at dinner to honor Brother Schrader, our president, and to absorb the news of the Convention as reported by Brother Schrader and Brother Ben. Walling, our Association Delegate.

Our regular meeting time is on the first Wednesday of each month and is usually held in connection with a "get-together" at dinner directly after business hours at a down town hotel so any touring Theta Tau men who find themselves in either of the Twin Cities of Minnesota on any of these days are urged to dig their copy of the "Gear" out of the hand bag and get in touch with one of the Association's officers so that said travelers may be duly conducted to the meeting place and Fraternize a bit with the boys. We have men in nearly every branch of engineering and technical work as well as several in other lines outside of these fields so that it ought to be easy to find some one out of the bunch to talk shop to you or to give you any local information you may be looking for. After the dinner and a brief business session it is seldom difficult to find some of the bachelors who are free to head for a show and be a "bit sociable," so look us up when you are in the Twin Cities.





THE GREAT PYRAMID OF GIZEH, EGYPT



## THE GREAT PYRAMID OF GIZEH

In the Nile Valley, Egypt

From "THE AMERICAN FREE MASON."



THE Pyramids of Egypt were the mystery of mysteries for countless ages; there seemed to be nothing left to tell us how or why they were built: when we call to mind that today their shadow creeps across the sand as when Moses was a boy, as when Abraham tended his flock, we dimly perceive something of their greatness and majesty in time. For a long period no means of ingress could be discovered. There are in all some 37 or 38, some exceedingly large and some small. At last a consensus of opinion was arrived at that these monumental structures were the tombs of kings, the resting places of a long line of Pharaohs of a mighty empire.

It remained for modern-day scientific engineers and explorers to find the means of shedding some light on this very abstruse subject; and they began by finding, after much search, an opening into the Great Pyramid of Gizeh.

The Great Pyramid of Gizeh stands on limestone rock, surface levelled, 130 English feet above the level of the Nile Valley, on 14 English acres of ground. It has a square base, each side measuring over 760 feet long, its four sides sloping inward and upward at an angle, meet at a point 486 feet from the base or ground-line of the erection. There is great difficulty in forming a mind-picture of such a huge construction. The mass of the building contains upwards of five million tons of hewn stones, and the whole is the highest, old-



est and largest stone building ever erected on the earth. The sides of the Great Pyramid are so built that they truly point North, East, South and West, that is, it is truly Oriented astronomically, not magnetically, or by the point of the needle, which varies from age to age.

To enter into a description of its internal construction would be quite impossible in a short paper; suffice it to say that its interior consists of passages, galleries and chambers. There are only two chambers of note: The larger is called the King's; the smaller, the Queen's. Professor Smyth, in his endeavor to find out for what purpose the building was intended, began by taking measurements, and continued to do so from morning till night, and day after day, for four months. Other enthusiasts afterwards assisted in carrying on the work, and seem to have come to the conclusion that "all interpretations of the Great Pyramid are founded either on measurements, number, weight, or certain unique architectural peculiarities in different portions of this mighty monumental structure, and which are discovered to be co-ordinate with many of the principal astronomical, mathematical and physical facts in present day science."

The results of these measurements are very interesting. For example, the four sides of the base of the pyramid are each exactly 9,131.05 Pyramid inches long. If that number be divided by 25 inches, or one Pyramid cubit, the answer comes out 365.242, which is the exact number of days, hours, minutes and seconds in the solar year.

How did the Pyramid architect know that fact, seeing it was only ascertained by the learned

nations of the world between 3,000 and 4,000 years after his day?

Each side of the base of the Pyramid, we notice is 9,131.05 Pyramid inches long; dividing this number by 25 we obtain the number of Pyramid cubits in the base side namely 365.242 as before. Supposing the cubit to represent one solar day, the fraction .242 in each side length, multiplied by the number of sides (i. e., four) gives us approximately one full day, being the type of our leap-year reckoning of one day added in every four, subject to a reduction of one day in 100 years.

Again, the Pyramid base has four corners. If the lines from corner to corner be measured diagonally, these two lines measure together 25,827 Pyramid inches, and this is just the number of years any particular star in the heavens, on the meridian on a particular night, will take to appear again on the exact spot. This period of time is called the "Precession of the Equinoxes." How did the Great Pyramid architect know that number and that fact, which Hipparchus the Grecian astronomer is said to have first discovered many centuries after the Great Pyramid was built?

The puzzle of squaring of the circle is also said to be solved in various ways by some of the measurements taken.

Another measurement gave, when reduced to British measure and British miles, 91,840,000, that is, no other than what the latest investigations at Cape Observatory show is the exact distance of the sun from the earth in British miles. The solution of astronomical and mathematical



puzzles that have exercised the minds of men for 3,000 years are said to have been obtained by measuring the Great Pyramid which leaves little doubt in some minds that those who designed the work were acquainted with astronomy, and leads to the supposition that it was intended for the use of astronomy.



## WHO SHOULD STUDY ENGINEERING?

By ROBERT J. ANDERSON, B. S. '14

## 1.



At the outset let the statement be made that anything which concerns the welfare of the engineering profession is the business of every engineer. In pursuance of recent notable efforts of engineering educators and others to raise the standards of the profession, the question is naturally brought, "Who should study engineering?" Apparently, in the minds of some people, there is something wrong with the present methods of engineering education, but such contradictory statements have been made relative to them that they nullify one another. The busy life which many men in the practicing profession are constrained to lead causes them to lose sight of the actual facts concerning the schools. Those in actual contact with the situation have come to a realization of the fact that there is needed improvement, but that this can only be effected as time proceeds.

It would seem to some that the sole mission of the engineering schools was to train and educate competent and efficient engineers as effectively as possible with the exigencies of allotted time, but their scope is broader than that. The broader mission of these institutions consists in the promotion of the advancement of science and in the wide dissemination of knowledge. These are the functions of the engineering school, and yearly the technical institution is assuming a role of increasing importance. The subject of engineering education is therefore a wide one and worthy of attention.

Conservatively speaking, there is an annual exodus of some seven thousand graduates from the engineering schools of the country, and many of these graduates are totally unfit for the profession which they are about to enter. Not that their training has been inadequate or insufficient, but that the best institution cannot transmute the plainly unfit into engineers. In passing, it may be stated that the time has arrived for the truthful education of the public regarding the ideas and ideals of engineering. Charitably stated, there can be but little doubt that the well-informed public and even first and second year engineering students hold extremely hazy notions concerning the profession. It behooves those who have the welfare of the profession at heart to rectify this condition.

In discussing this subject there are two viewpoints which may receive mention, viz., the narrow view and the broad view. In the narrow, restricted sense, an engineering education prepares for the actual use of the specialty studied; broadly, it prepares for entrance into that flux of phenomena called life. The engineering school produces as efficient a graduate as possible, other things being equal, but it is nothing short of startling to think that it can take that variegated product of the preparatory schools of the country with no other qualification than the possession of a diploma and by the processes extant turn out competent and efficient engineers. This is a presumption of special divine fiat.

Assuming, for the sake of simplicity, that the educational staff of a given institution is approximately ideal, then the graduates of that school should have engineering ability of which unmis-



takeable indications are plainly evident and the power to use their knowledge with adroit exactness. But the naked truth of the matter is that men are graduated who, if they pursued the study of any engineering science for a life time, would possess no iota of engineering intelligence. The ruling contention is that boys who patently display neither the interest nor ability prerequisite to engineering work should be guided into other more suitable fields of endeavor, for the sake of themselves and ultimately of the profession. Well informed people are aware of the fact that the engineering profession is, to use the common parlance, virtually "loaded to the mudguards" with embryo engineers. It should therefore be the earnest endeavor of educators to determine upon entrance into the school, or as soon after as possible, who is fitted for the profession. This is difficult on the very face of it, and nothing is implied that the methods extant are non-efficient; yet they could unquestionably be improved upon.

Truly are the schools hampered with the unfit, and altho vigorous weeding out systems are in operation, in some places, they often fail to accomplish their purpose. The graduation of incompetent engineers shackles the other members of the profession indefinitely. Plainly the cry is, "Not quantity of engineers, but rather quality." The graduation of the unfit leads nowhere but to a prostitution of the profession.

There is graduated some twenty-five to fifty percent of the entering freshman classes, men who have survived elimination by divers means, but are these the men who are fit to assume the responsibilities of the next engineering generation? The answer to this question is possible only ten



or more years after graduation of a given class. Surely it entails an undue and excessive waste of time and resources for an individual to follow or attempt to follow, a given line of endeavor for half a life time and then discover that he is a misplaced atom.

## 2.

The recognition of the facts mentioned in the foregoing gives rise to the specific problem of the admission of engineering candidates. Casually recognized, this may not seem a matter of vital import, but the fact remains that there can be little question regarding the inefficiency of some schools in this respect. This is a seriously objectionable feature of our present system of education, and is definitely proved to exist by the statistical evidence submitted by the rapid shrinkage in numbers of an entering freshman class in a year's time. Effort is made to select candidates on the basis of entrance examinations in some places, on the possession of preparatory certificates in others, or a combination of both; but these methods scarcely supply sufficient criteria. The mere knowledge of a certain amount of prescribed amount of preparatory work does not fit a boy to study engineering any more than law, medicine, business, or any other branch of the world's work. Surely more efficient means might be employed to ascertain whether or not a boy has latent signs of engineering ability. Means should be employed at the very outset to discover whether or not a given boy should enter upon the study leading to the engineering degree. It seems as tho engineering tendencies are more or less innate, and there seems to be no reason why it should require one, two, or three years for the

boy or his teachers to discover that he is lacking in the essential qualities.

In the present order of affairs, many boys enter the schools and select courses with very vacuous ideas regarding the work and less desire for the education, thru the stress of the influence of their misguided friends and relatives who excite their desires. Many of these boys are not adapted to the work from any of the following standpoints; viz., funds, mentality, natural desires, physical condition, or preparation. This is not only true of engineering but more or less of all professions, for, a superabundance of young men are trained for work in which they never can succeed. The statement (The Bent of Tau Beta Pi, July, 1915, p. 36) has been made, "Dead timber cannot be carried thru any well-regulated school"; yet it may be and often is carried thru the school to graduation and even into the practicing profession beyond where it wanders aimlessly about for a long time until the force of heredity overcomes that of environment and it drops from sight.

### 3.

Generally speaking, the contention now is that the entrance requirements should be raised and that a method be employed which will distinguish definitely in the individual boy the difference between positive aim and aberrant desire, and actual inclination and mere hazy idea. The methods of psychology as applied to industrial efficiency so ably set forth by Hugo Munsterburg\* should be applicable here. (Hugo Munsterburg in his *Psychology and Industrial Efficiency*, Cambridge, 1913.)



Curious as it may appear, the members of the younger generation hold the erroneous idea that an education is "coming to them" by natural right; and they come flocking into the schools year after year with little thot of the future and even less of the present. The people of this country have never been famed for a willingness to accede to any rules which prevent personal desire and pleasure. The sign "Do Not Walk On The Grass" immediately suggests tramping all over it and even tearing up the sod; so that the guiding of boys into fields more suitable to them will undoubtedly meet with opposition on the part of all concerned.

A rough estimation places the cost of an engineering education at from \$1,500 to \$40,000, in addition to the four or five years time necessary to complete the course. Such an outlay of resources cannot be regarded as a "mere bag of shells"; it is a positive loss if the man is not adapted to the calling. By relinquishing the idea of becoming an engineer those not fitted for the work will confer an unmistakable benefit on themselves and on the members of a poorly paid profession. Many of the boys going into engineering have really neither a deep love for the work nor interest in its manifold sciences, but are simply imbued with the erroneous idea that there is a purse of gold at the other end. Nothing could be further from the truth than this latter.

Entering a profession whose ideals are so high and whose toil is so arduous, the worker must have a definite love for his profession, and, like Floris Osmond, the French scientist, give to the world the best of his efforts and genius without thot of pecuniary reward or fleeting fame.



## DESIGN OF CONCRETE LINE SHAFT SUPPORTS

By JAMES A. BARR, E. M. '07



THE following formulæ and designs were developed during six years of construction work. While they may be more or less empirical still no failure or dissatisfaction has resulted from their use.

The first step is to plot out the line shafts in their relative positions, at the same time locating each drive and driven pulley or sprocket with the horsepower of each.

The intensity of the pull on the shaft may then be calculated from the following:

$$P = F \times \frac{\text{H.P.} \times 33000}{3.1416 \times D \times \text{R.P.M.}}$$

P = Total pull on shaft at center of pulley.

D = Diameter of pulley, or pitch diameter of sprocket or rope sheave.

R.P.M. = Revolutions per minute of shaft.

F = Factor depending upon nature of drive, using 4 for ordinary belt drives, 6 to 7 for chain drives, and friction clutches.

H.P. = Horsepower of drive, maximum.

From the direction and intensity of the individual Ps of each drive, the combined figure for each support may then be calculated or determined graphically. In this connection it is well to provide for the possibility of all of the drives, leading off in one direction, being either accidentally destroyed or disconnected, and the piers being called upon to support all of the drives on the opposite side without any counterbalancing effects. The bents should be designed with a view to future additions and overloads.

The next step is to decide upon a tentative design of pier and its weight calculated. Plot a parallelogram of forces for each pier, see Fig. 1, using weight of pier as vertical component through the center of the shaft.

If the resultant does not come within the middle third then the overturning force may be economically taken care of by a resultant leg, designed as a simple column. See Fig. 1, opposite page.

The type of pier as shown in Fig. 1, is especially suited to unusual elevation of shaft above foundations, say 10 feet or more.

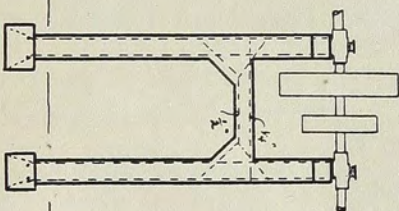
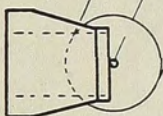
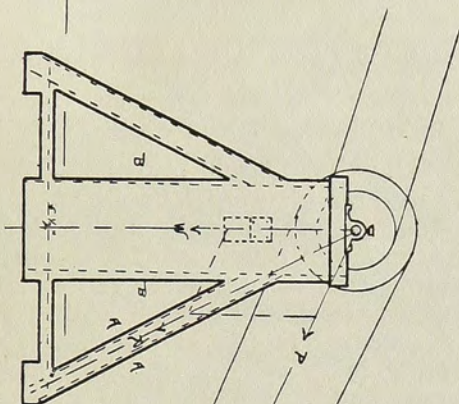
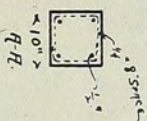
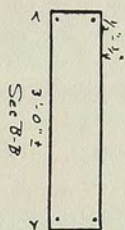
If the pier is for a main drive where the pull can never be other than in one direction, then only one resultant leg should be used.

For small shafts a convenient cap for top of pier is a 10" x 10" oak block or one of the other hard woods may be used. For larger shafting, say 5" and more, wedge and end adjustable base plates would make a desirable installation.

The end thrust of the shafting, which should be small, is taken care of by X bracing between two or more of the bents. One design of this bracing is shown in end view, Fig. 1. The location and design of this bracing will, however, be determined by the clearance demanded by the drives. In case bevel gearing is used on the shafting, then the end thrust from this drive should be isolated by using angle base plates, preferably.

The design of the foundations for the piers depends upon the character of the soil or rock. This phase has been amply discussed in papers and text books so that it is necessary only to state that care should be taken to provide not only for the weight of the piers but to guard against vibration.





N. Scale

Fig 1

# DESIGN OF CONCRETE LINE SHAFT SUPPORTS



REFINING AT PITTSBURG SILVER PEAK  
MILL

By LYON SMITH, E. M., Reno, Nev.



THE following article may be of interest to those members of Theta Tau engaged in the milling of gold and silver ores. The method described is essentially a modification of the Tavener process which has been extensively used in South Africa with much success. The use of the blast furnace for producing a lead bullion was not, however, Tavener's idea, and so far as I am aware, this feature of the process was first tried out on a commercial scale at the mill of the Pittsburg Silver Peak Gold M. Co., Blair, Nev. At present several of the larger gold mining companies of this country are using the process, notably The Goldfield Consolidated M. Co. and The Homestake M. Co.

The cyanide precipitate produced at the plant of the Pittsburg Silver Peak G. M. Co., Blair, Nev., is acid treated, washed, fluxed and briquetted, after which it is reduced to lead bullion in a blast furnace. This is cupelled and the resultant gold bullion remelted with borax in a tilting furnace, the final product averaging 980 total fineness. The detail of operations, as outlined below, has been compiled from normal cleanups and represents a fair average of conditions and results.

Precipitation is by the zinc-dust method, using the usual Merrill equipment. One 30-frame, 52-in. press, having a filtering area of 420 sq. ft. and storage capacity of 35 cu. ft., is used to precipitate all solution, 750 tons per day being the average amount precipitated. The press is cleaned three times per month and yields at each cleanup

from 800 to 1,000 lbs. of product, wet weight, as removed from the press. The precipitate, as cleaned from the frames, drops into a lead-lined car, mounted upon suitable rollers, and is transferred directly to a lead-lined acid-treating tank, 6 ft. in diameter and 5 ft. deep, the charging floor of which is on the same level as the press foundation.

The tank is provided with a mechanical agitator, consisting of two wooden paddles mounted on a central shaft and driven by bevel gears from below. A suitable hood, connected with an electrically operated exhaust fan, is also provided for carrying away the gases generated in treatment. Sulphuric acid of 66 degrees Baume is used, in amounts varying from three-quarters to one and one-quarter parts to one of dry precipitate. The object of acid treatment is to reduce, as far as possible, the excess of zinc contained in the precipitate, thus making a smaller amount of product to be smelted. Acid treatment also reduces the subsequent volatilization losses of gold and silver. The raw precipitate at this plant contains from 15-25% of zinc, which is reduced to 3-5% by treatment. The treatment requires from three to five hours, after which the mixture passes through a 2-in. line to an 18-frame Shriver press, on the main floor of the refinery. The frames are 28 in. square. The filtering medium is a light drilling over which is placed a 6-oz. canvas. The 2-in. line is provided with a monteju.

From five to eight separate washes of hot water are given the precipitate in the press. The water is heated in an oil-fired vertical boiler, from which it is passed through the press by displacement. Cold water may be used for this purpose



but as the primary object of the wash is to remove all zinc sulphate, the hot water wash is much more effective. The effluent solution from the press averages from 25 to 50 cents per ton and is settled in a 6 by 6 ft. wooden tank, the overflow from which passes to a zinc box packed with excelsior and thence to waste.

The life of the original frames furnished with the Shriver press was three years, at the end of which time they were discarded. The corrosive action on the bearings and other parts exposed to the acid rendered the frames useless. Upon the installation of a second set, the practice of painting the frames every six weeks or two months with a coating of black asphaltum varnish, was adopted, with the result that after two years' service the frame bodies and bearings have not been affected in the least by the acid.

Following the final wash water, air under a pressure of five pounds is passed through the press, the precipitate containing 38% moisture when discharged and transferred to the drier. This is an all-iron container, 11 ft. long, 6 ft. wide and 26 in. deep, provided with a false bottom 14 in. from the top, the inclosed space acting as a steam chamber. The precipitate is dried sufficiently to screen and sample, after which it is weighed on adjacent platform scales and spread evenly over the drier surface for the addition of fluxes, which are added in the following proportion: dry precipitate, 100 parts; litharge, 125; borax, 25; soda, 15; coke, 4. The mixture is turned several times with a shovel and is then briquetted at a pressure of about 1,000 lbs. per sq. in. The briquettes, cylindrical in shape and weighing slightly less than one pound each, are



returned to the drier and subjected to a slow heat.

The blast furnace, which is operated once a month, is of the cylindrical type with suspended jacket and a removable curb mounted on wheels. The diameter at the tuyere line is 22 in. and the height of jacket 5 ft. 10 in. The blowing in of the furnace requires from two to three hours and presents no departure from the usual practice. After several blank charges of coke have been fed, 200 lbs. of pig lead are added to fill the crucible and float the ash, the siphon in the meantime being kept closed. When the crucible has been filled with the molten lead, the ashes are removed and the siphon opened, following which charges of coke and slag are added until the furnace is slightly more than half full.

The furnace charge is now added, four such additions per hour being the normal charging rate. The regular furnace charge is as follows: briquettes, 100 lbs.; slag, 30 lbs.; cupel bottom, 7 lbs.; furnace crust, 7 lbs.; coke, 30 lbs.; total, 174 lbs. The following outline, taken from the records, gives a good idea of the furnace operation and results obtained. Blowing in, 3 hrs.; total time consumed, 18 hrs.; number of charges, 64; lead recovered, 1,780 lbs.; matte recovered, 257 lbs.; slag recovered, 3,500 lbs.; crust recovered, 360 lbs.; coke used, 2,500 lbs. The value of the products recovered is as follows; lead bullion, \$12.00 to \$18.00 per pound; matte, \$300.00 to \$500.00 per ton; furnace crust, \$300.00 to \$500.00 per ton; slag, \$1.25 to \$2.00 per ton. The lead bullion is dipped from the lead well and cast into bars weighing approximately 27 lbs. each.

The cupellation of the lead bullion is carried on in a single English cupellation furnace of

usual pattern, using crude oil as a fuel. The furnace is provided with a removable test, and the cupel is made by thoroughly mixing 450 lbs. of Portland cement with 150 lbs. of limestone of from 20 to 30 mesh size. The mixture is rendered plastic by the addition of water, 14% of the total weight being used. The cupel, 2 ft. 10 in. long by 2 ft. wide and 6½ inches deep, is seasoned for one month previous to use and lasts for one run. Air for the blast and cupellation furnaces is furnished by a Connersville blower operating at 230 r.p.m. and displacing 3¼ cu. ft. of air per revolution. A blast of from three to five ounces per square inch is used on both furnaces.

The table given below supplements that given under blast furnace details and has been compiled from the record of cupellation of the lead bullion obtained in that particular run.

|                           |                   |
|---------------------------|-------------------|
| Furnace fired .....       | 10:00 P. M. 4th   |
| Melt started .....        | 10:00 A. M. 5th   |
| First lead drawn off..... | 3:00 P. M. 5th    |
| Last lead drawn off.....  | 9:00 A. M. 6th    |
| Poured (bullion) .....    | 10:00 A. M. 6th   |
| Total lead cupelled.....  | 1,780 lbs.        |
| Time consumed .....       | 18 hrs.           |
| Rate of cupellation.....  | 98.1 lbs. per hr. |

It should be explained that the cupellation furnace has only recently been equipped with an oil burner, and that the above data were taken when wood was used as a fuel. The use of oil effects a saving of from 30 to 40% in fuel cost and reduces the attendant labor required one-half. A marked increase in the rate of cupellation is also noted.

The bullion obtained is melted in a No. 60 Donaldson oil-fired tilting furnace, using borax as a flux and yields a final bullion averaging 665



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parts fine in gold and 315 in silver. This shipped direct to the U. S. Mint in San Francisco.

The matte obtained from the blast furnace is fluxed with litharge, borax, soda, and coke and is treated in a separate run in the tilting furnace. A scavenger run in the blast furnace is made twice a year for the cleanup of accumulated by-products and residues. The cost of precipitation and refining is \$0.080 per ton of ore treated, \$0.035 being charged to precipitation and \$0.045 to refining. These figures are based on the milling of 15,000 tons of ore per month.



## EDITORIAL



IF you had your previous copies of THE GEAR before you now, you would realize the steady but rapid growth of our Fraternity Publication. This has been due to the strides made by the Fraternity from year to year. Just this past year the Fraternity has grown by adding two Chapters, "Iota," established at the Missouri School of Mines Feb. 5, 1916, and "Kappa" at the University of Ill., March 25, 1916. Ten active Chapters and four Alumni Associations are now established and all have reported a prosperous as well as successful year.

Theta Tau welcomes the two sister Chapters into the active ranks of the fraternity and looks forward to the time when a personal meeting may be planned with them at their Chapter house.

It will be interesting to note that the active membership of the fraternity plays an important part in the yearly makeup of the fraternity. This year the total number of active members has passed the two hundred mark and lacks but a few of coming up to the two hundred and twenty-five mark. Of this number about ninety will graduate, leaving a nucleus of one hundred and twenty-five to begin the duties of the ten active Chapters next fall.

It was a pleasure to record the replies from all the brothers who responded to the circular letter sent out early in February. There are quite a few who have not as yet been reached because of changes in addresses during the year. Let us make it our aim to get in touch with every brother possible before the tenth issue goes to press. This

the ninth annual issue has been possible only thru the combined co-operation of the associate editors as well as the officers and the alumni. They realized the immensity of the task before the editors and aided in all ways possible. The able and experienced way in which the older Chapters replied thru their associate editors speaks well for the Chapters and we look forward to another year when the newer Chapters' associate editors will be included along with the rest.

One or two departures have been made with the hope of including the necessary information suited to the growth of the fraternity. You will find a classified geographical index of all the members who took time to correct or verify their present addresses. If yours is not there send it in and when enough are at hand a supplement will be issued, bringing the directory up to date.

The Editor takes this opportunity of thanking those members who so generously contributed articles for this issue.

You will find a copy of the Convention Report of the last convention, held at Delta, December, 1915. There are enough for all of the members. If you know of any one in your locality who has not received his by this time, address the editor and one will be sent post haste.

Theta Tau will graduate about ninety brothers this year and is sending these out to all parts of the country. If you are in a position to be of any assistance to any one of these brothers won't you get in touch with either the active Chapters or the Editor?

The Editor would like to complete his files by adding copies of the following issues of THE



GEAR: 1908, 1909, 1910. If you know of anyone who may have an extra copy that he would be willing to spare let the editor know that he may get in touch with him.

It will be next to impossible for you to go to the war-torn country this year, so why not see the points of interest in your own country first. Take a kodak along with you and then have your lantern slides or prints made up by Brother Jack E. Haynes at his St. Paul Studios. Read his advertisement in the latter pages of this issue.

The Republic Creosoting Co. of Minneapolis again offers the services of its engineering departments to those who are interested in everlasting timbers. We know that you will refer to their advertisement in the last pages of the book.

The unvarying quality of the fraternity jewelry furnished by The Hoover & Smith Co. warrants your consideration. You will be interested in the new designs offered at most reasonable prices, which will be quoted upon application to them direct. If you have not as yet your new fraternity pin you can obtain one thru Asst. Treasurer Bro. Phil. A. Johnson, 624 Plymouth Bldg., Minneapolis, Minn.



GEOGRAPHICAL LIST OF ALUMNI

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## ALABAMA

Bessemer  
C. B. Cameron  
Ensley  
W. C. Settle  
Mobile  
C. D. Batson  
New Orleans  
E. P. Luce

## ARIZONA

Ajo  
G. Elliott  
Copperville  
L. B. Smith  
Globe  
E. M. Marshall  
Golconda  
J. D. Wanvig, Jr.  
Humboldt  
B. T. Rocca  
Jerome  
C. A. Kumke  
Metcalf  
R. B. Earling  
A. L. Ferris  
C. Hoag  
F. H. Wood  
Miami  
W. G. Sweeney  
Morenci  
O. L. Andrews  
R. W. Prouty  
C. M. Staples

## Phoenix

K. K. Koontz  
B. O. Pickard

## Prescott

W. V. De Camp

## Tucson

B. B. Ellis  
T. H. Garnett

## CONNECTICUT

## Torrington

W. M. Lewis

## Waterbury

O. P. Camp

## CALIFORNIA

## Alturas

D. C. Billick

## Atulia

E. K. Craig

## Berkeley

S. E. Bretherton, Jr.  
J. P. Buwalda  
E. F. Davis  
E. A. Hersam

## Eureka

C. E. Waldner

## Keeler

T. W. Callahan

## Los Angeles

A. A. Brett  
R. Countryman  
B. E. Crocker  
J. L. Dunn  
G. B. Moody  
B. A. Ruth

## CALIFORNIA—Continued

Mammoth  
J. H. East, Jr.  
Oxnard  
A. T. Gibson  
Plymouth-Amador Co.  
S. L. Arnot  
San Francisco  
H. L. Coles  
G. C. Gester  
W. L. Moody  
L. VanderLeck  
F. L. Wilson

Skidoo  
L. W. Orynski  
Taft. Kenn. Co.  
J. B. Kerr

Willows  
W. H. Geis

## COLORADO

Boulder  
T. D. Benyousky  
Breckenridge  
P. Hillsdale  
Canon City  
J. F. Myers

Denver  
C. R. Hill  
E. R. Ramsey  
E. G. Snedaker  
E. H. Strong  
S. M. Walker  
P. M. McHugh

Golden  
E. J. Dittus

Silverton  
I. Schafer

Sugarloaf  
H. H. Howry

## Telluride

T. S. Abbott

White Pine  
D. Dryenforth

## GEORGIA

Savannah  
L. F. Riegel

## IDAHO

Gem  
A. S. Hill

## ILLINOIS

Chicago  
A. A. Alsip  
G. A. Apell  
G. A. Beach  
W. F. Carrol  
C. R. Dorr  
O. W. Fick  
P. P. Furber  
H. H. Hopkins, Jr.  
E. E. Polley  
H. B. Shick  
J. F. Simpson

Blue Island  
B. J. Curtis

Champaign  
B. L. Templin

## INDIANA

Gary  
J. C. Bush, Jr.

Indianapolis  
H. W. Eidemiller

## IOWA

Sioux City  
J. V. Harvey

## KANSAS

Argentine  
J. S. Butler  
Chanute  
C. M. Coats  
Lawrence  
H. H. Rice  
G. C. Shaad  
Ottawa  
C. T. Geiger  
C. E. Painter  
Potter  
A. H. Mangeldorf  
Richmond  
H. H. Staley  
Topeka  
A. L. Boman  
W. F. Price  
D. M. Rankin

## LOUISIANA

New Orleans  
E. P. Luce

## MARYLAND

Baltimore  
G. E. S. Bayless  
C. M. Brister, Jr.  
Elkton  
M. C. Drake

## MASSACHUSETTS

Boston  
C. P. Fiske  
T. H. Huff  
J. J. Kennedy  
Cambridge  
D. H. McLaughlin  
F. Rockwood  
J. C. Scott, Jr.

Pittsfield  
T. H. Granfield

## MICHIGAN

Alpha  
W. J. Perkins  
Calumet  
R. A. Loveland  
Detroit  
G. A. Anderson  
J. B. Armitage  
D. C. Blackmar  
D. I. Dobson  
P. E. Hinckley  
D. L. Newkirk  
E. H. Stilwell

Flint  
R. A. Stickney

Hancock  
J. I. Ballard  
R. R. Bryan

Houghton  
A. J. Houle  
O. Potter

Iron River  
J. P. Schemmel

Loretto  
H. F. Mills

Ontonagan Co.  
E. H. Gould

Pontiac  
A. L. Smith

Saginaw  
R. B. Wagner

Wakefield  
C. M. Fellman  
R. B. Wortley

Winona  
A. P. Allen  
J. David



## MINNESOTA

Barnesville  
W. B. Atkinson  
Buhl  
C. H. DeVey  
Crosby  
G. K. Urquhart  
Duluth  
E. P. Alexander  
R. Jaques  
G. J. Ringsred  
L. Rood  
W. A. Rose  
J. L. Strong  
D. McD. Westbrook  
Faribault  
W. P. Chapman  
Fairmont  
T. H. Curtis  
W. F. Kasper  
Hibbing  
K. J. Duncan  
Minneapolis  
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J. A. Colvin  
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P. A. Johnson  
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G. A. Kristy  
H. S. Lueffler

R. E. Lutz  
G. M. Shepard  
W. D. Timperley  
B. B. Walling  
A. E. Larkin  
W. H. Wheeler

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E. Kopper, Jr.  
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R. H. Milne  
C. W. Mowery  
P. B. Palmer  
A. H. Warren, Jr.

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J. P. Boesche  
C. W. Harding

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G. C. Harding  
G. R. Murphey

## St. Louis

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E. Klepetko  
C. R. Kuzell

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O. A. Dingman  
A. F. Duggleby

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T. J. Welker

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G. F. Weisel

## Southern Cross

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R. L. Goetzenberger  
W. L. Mahoney  
R. I. Parker  
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Utica  
R. I. Miner

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H. J. Wasson  
Rhyolite  
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G. P. Hansen  
Z. Jeffries

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N. H. Stevens  
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## Houston

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Spokane  
K. D. Houser

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A. R. Whitman  
E. I. Williams

Weedon Quebec  
G. E. Alderson

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K. H. Matheson

Nicaragua  
R. R. Wiggins

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G. A. Buddle

## MEXICO

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W. A. Wasley  
O. W. Young

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Chili  
L. Brooke

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Manila  
R. R. Morse

# DIRECTORY

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 3325 Glenwood Ave., Toledo, O.  
 Asst. Engr. with The Aetna Machine Co.,  
 Toledo, O.
- ABBOTT, THEODORE S. E. M. '11 ALPHA  
 Chi Psi.  
 425 Dayton Ave., St. Paul, Minn.  
 Chief Engineer, Liberty Bell Mine, Tellu-  
 ride, Colo.
- ACKERS, DEANE EMMETT '16 ZETA  
 Beta Theta Pi.  
 Beta Theta Pi House, Lawrence, Kans.  
 Abeline, Kans.
- ADAIR, SAMUEL '16 EPSILON  
 3913 Brighton Ave., Los Angeles, Cal.
- ADAMS, BERNARD WILLIAM '16 IOTA  
 Tau Beta Pi.  
 Hamilton, Mo.
- ADAMS, JOHN W. C. E. '11 ALPHA  
 Chi Psi.  
 30 Kent St., St. Paul, Minn.  
 Hennepin Holding Co., Minneapolis, Minn.
- AFRICA, WALTER M. S. B. '15 ETA  
 Sigma Alpha Epsilon.  
 764 Chestnut St., Manchester, N. H.  
 Asst. Engineer, Peoples Gas Light Co., Man-  
 chester, N. H.
- ALDEN, JOHN W. Met. E. '15 THETA  
 Delta Tau Delta.  
 125 13th St. N. E., Canton, O.  
 United Steel Co., Canton, O.  
 Metallurgist.

- ALDERSON, GEORGE EDWARD   B. S. '09   DELTA  
Montauban, Portneuf Co., Quebec, Canada.  
Roaster Supt., Weedon Mining Co., Quebec,  
Canada.
- ALDRICH, HARRY STARKEY   Student '17   BETA  
174 Chandler St., Detroit, Mich.
- ALEXANDER, EDWARD PORTER   S. B. '14   ETA  
Phi Kappa Psi.  
1211 East First St., Duluth, Minn.  
Civil Engineer, 418 Manhattan Bldg., Duluth,  
Minn.
- ALLEN, ARTHUR POTTER   E. M. '15   BETA  
Tau Beta Pi.  
323 E. 4th St., Flint, Mich.  
Mining Engineer, Winona Copper Co.,  
Winona, Mich.
- ALLEN, CHESTER ARTHUR   '13   EPSILON
- ALSIP, ALBERT ARTHUR   E. M. '08   BETA  
Sigma Nu, Tau Beta Pi.  
4937 Woodlawn Ave., Chicago, Ill.  
Helen Mine, Ontario, Canada.
- ALT, GLENN L.   '16   ZETA  
Sigma Phi Sigma.  
Sigma Phi Sigma House, Lawrence, Kans.
- AMBLER, HARRY   Student '17   IOTA  
Sigma Nu, Tau Beta Pi.  
4050 Russell Ave., St. Louis, Mo.  
Sigma Nu House, Rolla, Mo.
- ANDERSON, EDWARD I.   Student '18   ALPHA  
Kappa Sigma.  
1201 Dayton Ave., St. Paul, Minn.



- ANDERSON, GEORGE ANDREW BETA  
B. S. and E. M. '06  
301 Hudson Ave., Detroit, Mich.  
Consulting Mining Engineer.
- ANDERSON, RAY B. '16 GAMMA  
Kappa Sigma.  
11 Cliff St., New York City.
- ANDERSON, ROBERT JOHN B. S. '14 DELTA  
Tau Beta Pi, Sigma Xi.  
10839 Pasadena Ave. N. E., Cleveland, O.  
P. O. Box 609, Rolla, Mo.
- ANDREWS, OLIVER L. B. S. '12 ZETA  
Pi Kappa Alpha.  
Morenci, Ariz.  
Banking.
- ANDREWS, WORTH BRIGGS E. M. '06 BETA  
Pres. and Genl. Manager, Oro Belle Mines  
Co., Hart, Calif.
- ANGEVINE, LELAND CHARLES B. S. '14 ZETA  
1521 New Hampshire St., Lawrence, Kans.  
Care Burns & McDonnell, Interstate Bldg.,  
Kansas City, Mo. Supervising Engineer.
- APELL, GIDEON A. '15 BETA  
Tau Beta Pi.  
2558 Iowa St., Chicago, Ill.  
Camp 37, V. & R. L. Co., Cusson, Minn.
- APPLEGATE, JOHN SAM B. S. '15 DELTA  
1523 Millicent Ave., Youngstown, O.  
Metallurgy.
- ARMITAGE, JOHN B. B. S. and E. M. '10 BETA  
222 Marston Ave., Detroit, Mich.  
Engineer, Detroit, Mich., Cor. Woodward and  
Horton.  
Steere Engineering Co.

- ARMS, CHARLES SEELYE DELTA  
B. S. and Met. E. '11.  
512 Midvale Ave., Philadelphia, Pa.  
Midvale Steel Co., Philadelphia, Pa.  
Bar Steel Dept.
- ARNOT, STANLEY L. B. S. '13 EPSILON  
Pi Kappa Alpha.  
Plymouth, Amador Co., Calif.  
Mining Engineering, Plymouth, Cal.
- ASKEW, THOMAS A. '16 ALPHA  
308 18th Ave. S. E., Minneapolis, Minn.
- ATKINSON, WILLIAM B. M. E. '10 ALPHA  
Psi Upsilon.  
Barnesville, Minn.
- ATWOOD, CHARLES RENO Student '18 DELTA  
Phillips, Me.  
1900 East 90th St., Cleveland, O.
- BADGER, ALLEN CARL B. S. '14 DELTA  
Tau Beta Pi.  
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The following men, Rhombohedrons, Alumni of the present Beta Chapter, are eligible to Theta Tau, but have not yet been initiated:

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| DOUGLAS, JR., THOMAS J. | '03 |
| JOHNSON, JOHN L.        | '04 |
| MERRY, HENRY M.         | '07 |
| SPERRY, E. L.           |     |

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Tau Beta Pi, Sigma Xi.

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