THE GEAR
OF
THETA TAU

FALL 1922

Volume XIII Number 1

THE GEAR
OF
THETA TAU

FALL 1922

Volume XIII Number 1

GRAND OFFICERS
OF
THETA TAU FRATERNITY

Founded at the University of Minnesota,
October 15, 1904

FOUNDERS

ERICH J. SCHRADER — ELWIN L. VINAL
W. MURRAY LEWIS — ISAAC B. HANKS

GEORGE D. LOUDERBACK, Epsilon	*Grand Regent*
J. STOKEY MARINE, Eta	*Grand Vice Regent*
ERICH J. SCHRADER, Alpha	*Grand Scribe*
PHIL LAWRENCE, Alpha	*Grand Treasurer*
REES W. DAVIS, Lambda	*Grand Marshall*
ROBERT J. ANDERSON, Delta	*Grand Inner Guard*
JAMISON VAWTER, Zeta	*Grand Outer Guard*

THE GEAR

Official Publication of Theta Tau

A PROFESSIONAL ENGINEERING FRATERNITY

Published under the direction of the Executive Council of Theta Tau

FRANK E. MOONEY, Alpha '24 . . . . . *Managing Editor*
ALBERT W. MOSS, Alpha '25 . . . . . *News Editor*

1320 7th St. S. E., Minneapolis, Minn.

TABLE OF CONTENTS

RESCUE WORK AT ARGONAUT MINE 5
THE CONVENTION 21
THE LAST CONVENTION 30
THE INSTALLATION OF XI 32
EDITORIALS 34
PUBLICATIONS AND PAPERS 37
OBITUARY NOTICES 38
CHAPTER LETTERS 46
AMONG THE ALUMNI 77
THE MINING ENGINEER 91

THE GEAR is published in the months of April and October.

Subscription for GEAR and Directory $2.00 per year in advance.

Advertising rates sent upon application to the Managing Editor.

All members of the Fraternity are invited and urged to contribute articles, news items, notes and verses. We would especially appreciate information regarding the alumni. In submitting clippings from newspapers it should be noted thereon the name and date of the paper.

Matter intended for publication should be in the hands of the Editor by the first day of the month preceding month of publication.

Changes of address should be promptly reported.

Foreword

This Gear is an effort to bring up to date the news of Theta Tau.

Chapter letters published are for the year 1921-1922, the convention news is a year old; but the Gear has not been published since October, 1921. Many of the alumni have been out of touch with the fraternity since that time, consequently the matter herein contained should be of general interest.

We feel that the alumni and actives are interested in articles of a semi-technical nature as an indication of the work Theta Taus are doing throughout the world, and that underclassmen may benefit in some small way through such articles by getting into closer touch with the engineering world. Therefore we are begging some of you alumni to volunteer some Gear material. Some of you will be appealed to personally soon.

The representation each chapter has in the Gear is an indication of the interest each chapter has shown throughout the time this issue was being prepared. We hope a spirit of rivalry may be created which may spur every chapter on to further effort.

The issue is inexcusably late, its lateness can only be blamed on our lack of a plan whereby the Gear organization can be carried over continuously from year to year. The Gear has become too big a matter to be published over night.

*Rescue Work at Argonaut Mine**

By Byron O. Pickard, Beta, '07

District Mining Engineer, United States Bureau of Mines

At midnight of Sunday, August 27, 1922, a fire was discovered in the main shaft of the Argonaut mine, Jackson, Cal. With the exception of a shift boss and two skip tenders who escaped, the entire night shift of 47 men was trapped in the mine and entombed for 22 days, when the bodies were recovered.

The entombed miners made a valiant but fruitless effort to save their lives. Rescue crews toiled strenuously day and night for 21 days to save the entombed men, only to find they had arrived too late.

From the experiences of the entombed miners and of the rescue crews, valuable lessons may be learned to prevent future catastrophes.

At the Argonaut mine there are two shafts, called the Argonaut and the Muldoon shafts. The Argonaut shaft is the main three-compartment working inclined shaft and extends 4,900 ft. to the bottom of the mine. From this main shaft levels are driven at 150-ft. intervals. Two compartments of the shaft are used for hoisting ore, men and materials. The third compartment contains a straight ladder-way, compressed air line, pump columns, water line for drilling and electric lines for power, lighting and telephones.

The Muldoon shaft proper is 800 ft. deep below the surface. At this depth there is a horizontal offset to connect with a raise from the Argonaut 2,400-ft. level. At this connection there is a second horizontal offset to connect with a raise from the 3,700-ft. level. From this point to the lower levels, raises extend only from level to level, at each level the connection being through horizontal offsets. Actually, therefore, the Muldoon shaft is only 800 ft. deep and the remainder of the second exit connection is composed of raises and drifts. The second exit, as the Muldoon shaft and connecting raises will be called in this article, is composed of two

*Published by permission of Director of U. S. Bureau of Mines.

compartments; one being used for a ladder-way, the other principally as an air-way.

On the surface at the collar of the Muldoon shaft, there is a suction fan which normally exhausts about 35,000 cu. ft. of air per minute from the mine workings. This air is pulled down the Argonaut shaft through the lower levels and is returned through the second exit raises and connecting drifts. To prevent short-circuiting of the air through abandoned levels, wooden doors have been placed at every level from the 4,500-ft. to the surface. These doors are kept closed by the suction pressure of the ventilating current and, while there is considerable leakage, the resistance is sufficient to insure delivery of limited amounts of fresh air to the hot lower workings, where the principal work of the mine was being prosecuted before the fire. The release of the suction pressure, or reversal of air current, would cause many of the doors to open and permit short-circuiting of air.

The United States Bureau of Mines maintains a rescue safety station at Berkeley, Cal., which serves the mines of California. From this station as headquarters, there is operated a large automobile truck with a special body designed to carry oxygen breathing apparatus, oxygen tanks and other emergency equipment. A light truck is used as an auxiliary. Two trained men, a foreman miner and a first-aid miner, comprise the crew that operates the station.

At the time of the fire there were 16 serviceable self-contained oxygen breathing apparatus and a large supply of oxygen and regenerating material at the station.

Also serving the Pacific Coast district, in which California is included, is a specially designed all-steel railroad car called the United States Bureau of Mines Mine Rescue Car No. 1. This car operates out of Reno, Nev., as headquarters. Its crew consists of a foreman miner, a first aid miner and a cook. At the time of the fire there were 10 serviceable self-contained oxygen breathing apparatus on the car and a large quantity of apparatus supplies. The Berkeley Safety Station and Rescue Car No. 1 are under the immediate direction of a district engineer, whose headquarters are at Berkeley, Cal. On the staff of the district engineer is a district surgeon who is also headquartered at Berkeley.

There are United States Bureau of Mines safety stations and cars in practically all of the important coal and metal-mining districts in the United States, the group control of the cars and stations being under the chief engineer of mine safety service at

Pittsburgh, Pa., who is responsible to Director H. Foster Bain, at Washington, D. C.

Mining companies in California are aware of the availability of the Bureau's emergency service. Consequently, when the Argonaut fire was discovered the mine management telephoned to the Bureau's district engineer at 3 a. m., August 28, stated the conditions and asked for all the help the Bureau could possibly give. By 5 a. m., the Berkeley Station crew was assembled, the light truck loaded and the crew had left. They drove the 130 miles by 10 a. m. The large truck loaded with supplies, driven by E. W. Bullard of San Francisco, assisted by G. M. Wiles, a University of California student, both of whom volunteered for service, followed soon after.

Car No. 1 was stationed at Elko, Nev., when its foreman miner received orders from the district engineer to proceed immediately to Jackson "Account of mine fire men entombed." Unfortunately, the crew encountered a bad washout en route and was delayed several hours, but the Southern Pacific railroad officials of their own accord furnished special fast trains and rushed the car to the Amador Central Terminal at Ione, Cal., where the Amador Central had a special engine waiting to hurry the car to Martell, which is Jackson's nearest railroad point. The car arrived at Martell at 5 p. m., August 29, making the fastest time on record for a rescue car going to an emergency.

The Bureau's district engineer and surgeon went to the mine by private automobile, arriving at 1 p. m., August 28.

On September 1, the district engineer realized that more oxygen apparatus would be required and wired his chief at Pittsburgh for assistance. Mine Rescue Car No. 2, with 16 oxygen breathing apparatus and supplies and with a crew identical to that described for Car No. 1, was immediately dispatched from New Mexico and arrived at noon, September 3. This made one of the largest representations the U. S. Bureau of Mines has had at a metal-mine fire.

The Argonaut mine is served by a cooperative company mine rescue station operated jointly by several mines in Amador County. The foreman of this station, with three additional apparatus men and with five sets of oxygen breathing apparatus, arrived at the Argonaut at 5 a. m., August 28.

The statements under this heading are taken from the transcript of the testimony at the coroner's inquest.

The Sunday night shift of 43 men, in charge of a shift boss, was lowered to the 4,500 station between 6 and 6:30 p. m., August

27. The men were distributed to the various working faces on the 4,500, 4,650 and 4,800 levels. At 11 o'clock, four additional men came to the lower levels and were assigned to special development work. The underground men ate their lunches at the stations at the usual time—about 11 o'clock—and left the stations to go to their working places. The shift boss and two skip tenders, who were not included in the total of 47 men above mentioned, decided to clean out a waste chute on the 4,200 level. During this work one of the skip tenders smelled smoke. They immediately rushed to the shaft, and noted that the shaft at this point was full of smoke. This was about half past eleven. The shift boss immediately signalled for the skip and he and the two skip tenders were hoisted through the fire to the 3,000 level. Two hanging-wall sets, 10 ft. below the 3,000 station, were burning at this time. After being hoisted to the surface, the shift boss announced the discovery of the fire and as soon as assistance could be secured efforts were made to extinguish it.

Attempts to put water on the fire from water kegs, carbide cans, skips and station tanks were continued all through the night and the following day, but the efforts with the fire-fighting equipment available were unsuccessful.

Within half an hour after the discovery of the fire, the signal lines, telephone lines, and water and air pipes were burned out and there was no communication with the lower levels. For this reason, the early attempts at fire fighting were desperate. It was found that while there was little smoke above the fire there was considrable steam and it was impossible to get closer than 200 ft. to the fire at any time. An exploration by apparatus men was made at midnight of August 28 to determine the exact location of the fire. This crew reached the 2,700 station and found themselves completely enveloped in smoke and steam and the temperature so hot that it could not be endured for more than a minute. They believed that the fire was immediately below them. The district engineer immediately went into conference with a representative of the Industrial Accident Commission and the Argonaut mine manager.

It was unanimously agreed by the conferees that there were but three possible chances of rescuing the entombed men; namely, (1) rescue-apparatus men going down the Muldoon shaft; (2) controlling the fire in the Argonaut shaft; and (3) driving connections from the adjoining Kennedy mine. As the fire in the Argonaut shaft was beyond immediate control, and even if controlled con-

siderable time would be necessary to repair it so that rescue crews could pass through the fire zone safely, it was believed that all other chances of rescuing the men should be considered seriously. The matter of the apparatus crews going through the Muldoon shaft was given first consideration.

As stated formerly, the Muldoon shaft is straight to about the 800 level; then, with an offset, extends to the 2,400 level. From here to the bottom levels the connection is through a series of raises or intermediate shafts, which are offset from one another. That is, these raises are not in a straight line; hence, hoisting is not possible through the Muldoon shaft to the bottom part of the mine. The raises leading to the Muldoon shaft and the shaft itself are equipped with ladders for escape, but even in fresh air the most hardy climbers would require a matter of hours to climb to the surface.

It was also pointed out formerly that the air from the mine returned to the surface through the Muldoon shaft; consequently, at the time of the fire the return air was carrying poisonous gases from the fire, and within a very short time after the fire was discovered the air in the Muldoon shaft was so noxious that no one could live in it for more than a few minutes. With smoke and gases present no one could climb far; hence, when the fire occurred in the hoisting shaft, preventing hoisting from the lower levels, unconfused miners naturally would not attempt to climb out such a long distance through the smoke-filled Muldoon raises and shaft. Their natural inclination would be to barricade themselves in stopes or the inner parts of the levels.

Exploring the lower levels of the Argonaut mine by mine rescue crews wearing oxygen breathing apparatus would involve going down the second exit raises and drifts and then climbing back, all within two hours to keep within the working limit of the breathing apparatus. It was pointed out by the district engineer that the oxygen and chemicals of the self-contained oxygen breathing apparatus would be consumed before the trip was half made. It certainly would be sending men to their death to undertake such exploration, as it would require four or five hours for men breathing good air without the apparatus, which weighs about 40 lbs., to make such an exhausting trip. The conferees therefore decided to abandon exploration through the Muldoon shaft.

They next considered controlling the fire in the Argonaut shaft. It was decided that this work should be done by men wearing oxygen breathing apparatus, as numerous cave-ins were occurring

in the shaft and the heat and the smoke in the immediate vicinity of the fire were intense. Accordingly, further fire fighting in the Argonaut was turned over to the U. S. Bureau of Mines and the cooperating company mine rescue men.

Earlier in the day E. C. Hutchinson, president of the Kennedy Mining and Milling Co., owning the Kennedy mines, whose workings are in the immediate vicinity of the Argonaut, proposed to representatives of the Industrial Accident Commission that plans be considered whereby a connection could be made to the Argonaut lower workings from the Kennedy side.

The chief representative of the Industrial Accident Commission, H. M. Wolflin, superintendent of safety, therefore decided to call into conference the management staffs of the Argonaut and Kennedy mines, the several local mining superintendents and mining engineers who had volunteered their services, representatives of the Industrial Accident Commission and the district mining engineer of the United States Bureau of Mines. The Argonaut management made the statement that it felt it was necessary to take advantage of all of the volunteer assistance and would be glad to do anything that seemed feasible to rescue the entombed men.

It was decided at this conference to turn over all rescue operations and administration to an executive committee consisting of three men, namely V. S. Garbarini, manager of the Argonaut mine, E. C. Hutchinson, president of the Kennedy company, and F. L. Lowell, mining engineer representing the California Industrial Accident Commission. Garbarini was made chairman and Lowell, secretary. An advisory committee, consisting of all volunteer superintendents, mining engineers, and state and Federal representatives was accepted by the executive committee. The executive committeee authorized the immediate driving of connections from the Kennedy mine and decided to continue the fire-fighting operations in the Argonaut shaft.

Daniel Harrington, supervising mining engineer for the U. S. Bureau of Mines, and in charge of the metal-mine ventilation work for the Bureau of Mines, was telegraphed for to assist the district engineer and to advise the executive committee on the ventilation problem. He arrived on September 4.

The Kennedy main shaft, which is vertical, is 1,100 ft. horizontally from the collar of the Argonaut shaft. Both mines are operating on ore shoots which are closely allied and in some places presumably are identical. Some of the upper workings of the two mines connect, but the lower levels do not connect. In March,

1919, the Argonaut mine experienced a fire in its workings which spread into the Kennedy mine for a considerable distance. In order to completely extinguish the fire, it was deemed necessary to flood both mines. The mines remained under water until April, 1921, when both were unwatered and operations were later resumed. The flooding of the mines caved most of the Kennedy workings in the immediate vicinity of the Argonaut boundary line and as there was no immediate use for them they were not reopened.

The 3,600 and the 3,900 levels of the Kennedy mines were decided upon as the best places to make connections with the Argonaut workings. The 3,600 level of the Kennedy would have to be reopened for a total distance of 530 ft. of caved workings and rock, of which 130 ft. would be virgin rock, 80 ft. of the 130 being a raise to connect with a drift driven by the Argonaut from the 4,200 station to the boundary line. The 3,900 Kennedy level required the opening of 475 ft. of rock and caved ground, 140 ft. of which would be through virgin rock and would connect with a stope in the Argonaut workings above the 4,650 level. The work of driving these drifts consisted of the tedious and difficult task of going through old caved ground, taking out not only the mud but removing timbers and in many places retimbering and even spiling had to be resorted to. It was very difficult work. The air and water lines had to be brought into the face and often the temperature exceeded 90 degrees in an atmosphere that was practically saturated. The total distance from the Kennedy 3,600 station to the Argonaut connection exceeded 1,450 ft.; the 3,900 drift was practically straight and was about 1,100 ft. to the Argonaut boundary line.

Volunteers from the Kennedy, the Argonaut and from other mines on the Mother Lode were used in the work. The 3,600 level was gone through after 21 days of concentrated effort on the part of the miners and bosses. The 3,900 level was within a few feet of breaking through but was abandoned when the 3,600 broke through on account of the possibility of encountering water in the lower levels of the Argonaut.

As soon as the executive committee gave the apparatus men in charge of the U. S. Bureau of Mines permission to control the fire in the Argonaut shaft, calls were sent in to several California and Nevada mines for mine rescue men. The following mines sent crews: The Morgan-Melones mine, seven men; Empire mine, eight men; North Star mines, five men; United Comstock mines

of Gold Hill, Nev., five men; University of California College of Mines, six men.

Orr Woodburn, director of the Globe-Miami Cooperative Mine Rescue Association, Globe, Ariz., also went to the Argonaut and volunteered his services.

The mine rescue men were divided into crews of five men each and assigned to shifts. The Empire mines crew brought with them five oxygen breathing apparatus; the North Star mine brought two apparatus. All of the oxygen breathing supplies, which had been assembled in the western states by the U. S. Bureau of Mines, was ordered sent to Jackson and, in addition, sufficient oxygen and regenerating material were purchased by the Argonaut Mine Co. to insure continual apparatus work for several days.

The total of the mine rescue apparatus available were 42 from the U. S. Bureau of Mines and 12 from California mining companies, making a total of 54 sets of self-contained oxygen breathing apparatus. This was the greatest number of breathing apparatus that was ever assembled at one time in California.

Including apparatus men from the Argonaut mine and several local volunteers, there were available at one time for the fire-fighting operations in the Argonaut shaft 60 men, most of whom formerly were trained by the U. S. Bureau of Mines in the use of self-contained oxygen breathing apparatus.

As before stated, there were numerous falls and cave-ins in the fire zone and when one occurred it drove the gas and smoke up the Argonaut shaft. The apparatus men found it difficult to work in the smoke and steam from the fire zone, so it was decided to take advantage of the suction pressure through the 2,400 south drift connection of the Muldoon shaft. A new door was built by fresh air men (under the protection of apparatus men) in the 2,400 south drift near the station and a 13-in. galvanized pipe inserted through the bottom of the door. This 13-in. pipe was carried down the Argonaut shaft by the apparatus men to a point a few feet below the 2,550 station. It was found that immediately the smoke and steam in the vicinity of the pipe was cleared. It therefore was decided to extend the pipe down the shaft as far as possible.

The fire was discovered 12 sets below the 2,550 station. All the timbers below this point had been burned out as far as could be seen with the lights available.

It was then decided to extinguish the fire by water. To do this necessitated attaching a hose to the 6-in. pipe column at the

2,400 station and carrying the hose 200 ft. down to the fire zone. To eliminate the excessive pressure a valve was put in at the collar of the Argonaut shaft and a controlling valve and a by-pass put in at the 2,400 station. A pressure gage was inserted and when the water was turned on the valves with connecting by-pass were so regulated that the pressure at the 2,400 station did not exceed 70 lb. Apparatus crews were stationed at the 2,400 station and at points between the 2,400 and the 2,500 levels and two apparatus men worked on the nozzle. Through their joint efforts water was played on the burning timbers for several minutes and the upper fire limit temporarily extinguished at a point 60 ft. below the 2,550 station.

The fire area was patrolled by apparatus men at frequent intervals. Sparks were frequently noticed so it was decided to again hose the fire zone. This was done, and the fire was watched carefully during the rest of the night. The following morning it was decided to prevent fresh air from going into the fire area and a bulkhead was put in by apparatus men two sets above the upper limit of the fire zone. This bulkhead was constructed of 3 by 12-in. plank and carefully covered with tar paper, all cracks being sealed with clay. It was necessary to patrol the bulkhead every two hours for several days to keep the clay wet and to be positive that there was little leakage. It is felt that the bulkhead assisted materially in the eventual control of the fire, and prevented spreading.

That the inclined shaft was blocked due to falls of timber and rock was taken for granted, as there was very little circulation of air through the main shaft before the 2,500 level bulkhead was put in.

About 12 hours after the discovery of the fire, a heavy cave was heard in the shaft. Soon after that the volume of air exhausting through the Muldoon was decreased from the normal 35,000 cu. ft. per minute to about 12,000. Anemometer readings in the return air at the 2,400 south drift indicated that less than 4,000 cu. ft. per minute was being exhausted from the workings below this point; that is, 8,000 cu. ft. of air was being pulled from workings above the fire and was diluting the fire gases.

At a conference between Mr. Wolfin and the district engineer, it was decided that an accurate analysis of the return Muldoon air would aid materially in the intelligent handling of the fire. Also, many of the miners and others were anxious to go down the Muldoon shaft. It was hoped that if such persons could see the

analysis of the air in the Muldoon shaft, it would be easier to persuade them that breathing the air would be suicide. It was decided that Dr. L. H. Duschak, consulting chemist of the Industrial Accident Commission, should be detailed to take care of sampling and gas analysis. With the exception of the first 24 hours of the fire, Doctor Duschak assembled data upon the return air at the collar of the Muldoon shaft, at the 2,400 south level connection with the Muldoon, and at other places where samples could be taken.

The carbon monoxide content was frequently as high as 1 per cent. The oxygen content of the return air was as low as 12 per cent; the carbon dioxide reached from 5 to 7 per cent. This gaseous condition continued for about three weeks; in fact, it was only about September 15 that depreciation in the carbon dioxide was noted. About September 17, the return air through the Muldoon was close to normal, proving that there was very little gas going through the fire zone. It is interesting to note that a M. S. A. carbon monoxide detector was used frequently to check up Orsat determinations with very satisfactory results. Both were checked by using a canary bird.

Fan pressures were measured carefully; also, the pressures of the several bulkheads and doors that had been constructed for controlling the fire; and not until the Kennedy 3,600 level broke into the Argonaut level was there any variation noticed in the fan and underground pressures. When the break through was made, pressures at all points decreased instantly, and volumes at the Muldoon fan increased to 23,000 cu. ft. per minute.

It was persistently rumored that some one in the Argonaut was trying to signal by blasting. While it was believed that this could not be possible, it was decided to use U. S. Bureau of Mines geophones for listening purposes. Consequently, crews were arranged under the immediate direction of C. H. Fry and L. H. Duschak of the Industrial Accident Commission and continuous observations were made in the south drift of the 4,050 level of the Kennedy shaft. Fry in his report states:

The dropping of water and the vibrations from the work in that part of the mine made it difficult to differentiate between the various sounds except those that were very distinct, such as drilling and blasting. Experiments showed that hammering on solid rock at 305 ft. from the geophones was not recognized when a drill was running at a distance of 510 ft. Fifteen men were used in the tests and it was found that some men were able to differen-

tiate between sounds much more readily than others. After tests lasting 51 hours, the work was stopped, as it was believed that it could not be of any assistance toward recovery of the men in the Argonaut mine without interfering with more pressing work. The tests showed conclusively that with the amount of work that was being done in the Kennedy mine the geophone would not give desired definite information (on conditions in the fire zone or signalling of entombed men in the Argonaut) for to get this information it would be necessary to stop the work in the drifts on the 3,600 and 3,900 levels of the Kennedy mine.

It is hoped that the complete geophone report will be published at a later date, as some interesting data were assembled.

In anticipation of the break through, the executive committee placed the rescue and recovery work in the Argonaut mine in charge of the Bureau's district engineer and he was given full authority to prosecute this work as was best deemed advisable. Accordingly, the following organization was perfected: director of rescue operations, B. O. Pickard; consultant, Daniel Harrington; surface representative, H. M. Wolflin; underground surgeons, Dr. C. E. Kindall and Dr. E. E. Endicott; superintendent apparatus teams, R. B. Hecox; superintendent fresh-air crews, C. H. Fry; underground assistant to director, Orr Woodburn; superintendent mine rescue apparatus station on surface, H. Crouch; superintendent first aid, recovery and other supplies, E. Bullard.

The apparatus crews were made up of a captain and four men to each crew and divided into two groups of two crews each. Group A was to enter the Argonaut workings first and be supported by group B in reserve at the fresh-air station underground. Group C was to support group B and remain in reserve on surface, going underground to the fresh-air base when group B relieved Group A in the gaseous workings. The remainder of the apparatus men were held as substitutes.

The fresh-air crews were organized by Fry, with Foreman Sinclair of the Kennedy mine and Shift Boss Murphy of the Argonaut mine, as assistants. The fresh-air crews were to support the apparatus crews and do such work in fresh air as was necessary and as would not interfere with the work of the apparatus crews. They were expected to carry the drinking water from the Kennedy 3,600 station to the fresh-air base and to bring in such timber and other supplies as might be needed by the apparatus men. It was also the duty of the fresh-air men to keep the drifts in repair to fully protect the apparatus men who were

working ahead of them. Everything was done to coordinate the work of the apparatus and fresh-air men.

At the time of the break through, there were 35 apparatus men available and an equal number in reserve at other mines in California and Nevada who had volunteered their services in case of need. It was decided not to call upon the reserve at the distant mines unless their services were actually required in the rescue of live men.

The fresh-air crews consisted of picked Kennedy and Argonaut miners who had worked in the 3,600 and the 3,900 level connection drifts and who were anxious to give every assistance in the rescue of their entombed comrades.

The final break through of the Kennedy 3,600 raise into the Argonaut 4,200 workings was expected all day Sunday, September 17, and until midnight of that day the mine rescue crews were held in readiness at the rescue station in anticipation of the event. At midnight word came from below that the break through could not possibly be made until 4 a. m. Monday morning, September 18, and the rescue crews were ordered to bed. All were called at 4 a. m., as the break through had been made and volumes of air were rushing through the connection raise into the Argonaut mine. However, it was not until eleven in the morning that the break through connection was made large enough to permit of a man's passing with oxygen breathing apparatus. The apparatus men experienced considerable difficulty in carrying their apparatus from the Kennedy 3,600 station to the Argonaut workings, as the drift that the miners had opened was very small in cross-section in many places, in fact, there were distances of several hundred feet where the drift was not over 3 feet high. The connection raise which was driven was also restricted in cross-section and it was only with extreme difficulty that men wearing apparatus could pass through it.

At 11:30 a. m., groups A and B of the apparatus men, accompanied by Pickard, Woodburn, D. Harrington, and Kindall, were lowered to the Kennedy 3,600 station. They proceeded immediately to establish a fresh-air base; one crew was sent up through the connection raise to explore a portion of the Argonaut 4,200 level. This crew discovered that most of the 4,200 Argonaut level was comparatively good air, as the suction fan from the Muldoon shaft was pulling fresh air through the workings from the Kennedy shaft and exhausting into the Muldoon. It was deemed advisable to make immediate exploration of the 4,200 station to

ascertain whether the shaft had been burned at this depth. This exploration, therefore, was made and everyone was greatly relieved when they found the station to be intact.

The doors in the cross-cut leading to the 4,200 station prevented fresh air from going to the 4,200 station, consequently the atmosphere at the Argonaut station was noxious. The doors were opened and as soon as possible the fresh-air crews were constructing doors in the drift to the Muldoon shaft to force air into the 4,200 station of the Argonaut, where a fresh-air base was established almost immediately. Future rescue operations were carried on with the 4,200 station of the Argonaut as the fresh-air base.

Meanwhile, another apparatus crew thoroughly explored all of the 4,200-level workings to ascertain whether any of the entombed men were on this level. This exploration was without result except in determining that all dead ends contained noxious gases. It was decided, therefore, to make exploration of the 4,350 level. Before this could be done, it was necessary to construct a bulkhead immediately above the 4,200 station. This was done for two purposes: (a) To protect men going down the shaft from timber, rocks, etc., which might fall from the fire zone. The lower limits of the fire zone could not be determined at this time, but it was felt that there was great danger from falling debris from the blocked fire zone; (b) To force fresh air down the Argonaut shaft to the 4,350 level.

Apparatus crew No. 1, group A, was instructed to descend carefully on the ladders and immediately upon arrival at the 4,350 station to open the door to permit sweeping out of the gases and short-circuiting to the Muldoon. Upon arrival at the 4,350 level at 4 p. m., the crew signalled (by pre-arranged code of hammering on the compressed-air pipe), and the door was opened. At 4:20 p. m., crew two of group A were called for and immediately descended the ladders to the 4,350 level. Team one reported that there was fresh air on the 4,350 station and in the Muldoon exit and everything was explored except a long cross-cut into the foot walls.

This cross-cut was explored at 4:40 p. m. and the captain of the apparatus team reported that 50 ft. in from the waste raise they discovered a bulkhead which evidently had been built by entombed miners. It was constructed of miscellaneous timbers, clothing and waste rock. In the vicinity of the bulkhead, the canary bird dropped from its perch and the carbide lamps were

extinguished. The crew knocked on the bulkhead, but received no answered. They returned to the station and asked for orders on opening the bulkhead. Orders were given not to open the bulkhead until fresh air could be brought to its face.

First aid and resuscitation supplies were immediately ordered by Doctor Kindall, who had descended in the meanwhile to the 4,350 station. The fresh-air men were ordered to bring in a compressed-air line to the 4,200 station where it was carried into the 4,350 station by the apparatus men. Also, telephones were installed to connect from the 4,350 and 4,200 levels to the main Kennedy line at the 3,600 level. Messages to the surface were relayed from the Kennedy station by separate telephone.

There was some delay in getting the compressed-air line to work, as it was hastily constructed and plugged at some point. It was decided not to wait longer for the air line, and the first bulkhead was broken. A second bulkhead 25 ft. from the first bulkhead was discovered. The air between the two bulkheads was very foul and would not support the flame of the carbide light and the canary was also visibly affected.

The second bulkhead was constructed in a way similar to the first except that it was not complete, the miners evidently having run out of material. In the upper right hand corner was a large hole; piled against the boards was a considerable amount of waste rock drawn from a chute from a dead end raise inside of the second bulkhead. A powder box evidently had been used in carrying the waste rock from the chute. It was known immediately after the second bulkhead was discovered that there was no possibility of men being alive behind it, as the canary bird fell of its perch and the carbide light was exstinguished; also, the distinctive odor from dead bodies was very strong. Later, at the face of the cross-cut where the bodies were found, a vacuum tube air sample was taken, analysis of which gave 0.21 per cent. CO; 5.71 per cent. CO^2; 14.18 per cent. O.

Crew two of group A broke down this second bulkhead and made exploration to the face of the cross-cut. They reported this exploration at 5:16 p. m. and stated that many dead bodies had been found and that it was more than likely that all of the entombed men were in the cross-cut. At 6:45 p. m. an attempt to count the dead bodies was made but one rescuer's oxygen gave out and the count was not completed. The count varied between 42 and 45 bodies.

Meanwhile, the rescue crews were endeavoring to get the fresh-

air line completed and arrangements to recover the bodies were considered. To get the bodies to the surface it was necessary to bring them from their tomb to the 4,350 station, hoist them to the 4,200 station, carry them to the Kennedy connection raise, where they would have to be lowered to the Kennedy 3,600 level and carried to the 3,600 station from which they could be hoisted in the main Kennedy skip to the surface.

To do this, special arrangements had to be made to hoist the bodies from the 4,350 to the 4,200 level. A rudely constructed board skip running on greased rails was ordered and a tugger hoist installed at the 4,200 station. This work was done by the fresh-air crews. Supplies such as stretchers, canvas, rubber gloves, disinfecting materials, etc., were being brought in by the fresh-air crews.

Altogether, six apparatus crews were used in the exploration of the 4,200 and the 4,350 levels, discovering the bulkheads, counting the bodies and in restoring ventilation so that the bodies could be recovered.

The bodies were reported to be badly decomposed and the first plans of having them wrapped in place and left for fresh-air men to carry out had to be changed. It was determined that as soon as a body was wrapped it should be placed in a Stokes Navy stretcher and carried by apparatus men to the 4,350 station and hoisted to the 4,200 station, where it was turned over to the fresh-air men to be relayed to the 3,600 station of the Kennedy. From six to eight relay fresh-air crews were utilized in getting the bodies to the 3,600 station. In the recovery of the first few bodies, from an hour to two hours were required to wrap the body and get it to the 3,600 station. This time was later cut to 30 minutes.

A complete count of the bodies was ordered and a count by three different men showed 47 bodies in the cross-cut; 46 bodies were recovered and on the surface by 9:41 p. m., September 20. It was reported about 8 p. m. by the apparatus men that there was one body missing. Evidently an error had been made by the three men who did the preliminary counting. This error can be explained by the fact that there were several piles of bodies and a correct count could only have been made by pulling them apart and distributing them in the drift—which, of course, could not be done owing to the great extent of the decomposition.

Judging from the positions in which the bodies were found and the conditions of the bulkheads, it is the general opinion that

the men were being affected by poisonous gases before they completed the second bulkhead and they retreated to the far ends of the cross-cut. It will be noted on the accompanying sketch that two bodies were found in one stub end, 24 in the breast of the main cross-cut and 20 in a longer stub drift. Several of the bodies were found in a reclining position with their heads resting on their arms or with a pillow made of underclothing; others had fallen forward on their faces; some had fallen on their sides; most of them were so closely bunched together that when they died they fell over on one another.

As has been described in the daily press, the only message that was found with the men was written with the smoke flame of a carbide lamp on the slate face of the maincross-cut. This message read "3 o'clock. Gas getting strong. 4 o'cl. Fessel 3:20".

It is quite evident that the entombed men did not live long behind their bulkheads; opinions vary from 4 or 5 hours to 16 or 17 hours. Search for the forty-seventh man was prosecuted with diligence, and all the accessible workings from the 3,700 level of the Argonaut to and below the 4,500 level were explored by apparatus men without result.

The apparatus men found on the 4,500 level that the door to the ventilation raise had been left open but that no air was circulating on account of a rush of water down a waste chute which had filled up the cross-cut to the ventilation raise. The atmosphere of the 4,500 level would not support combustion and the canary bird was almost immediately affected, several days after ventilation had been restored on the 4,350 level. The 3,900 level and station of the Argonaut had not been affected by the fire.

Upon further investigation, it was determined that the blocked area in the shaft, due to the cave-in from the fire, was in the immediate vicinity of the 3,700 station; that is, the fire area extended from 12 sets below the 2,550 level to the vicinity of the 3,750 level. The water level on September 27 was not definitely determined but was known to be between the 4,500 and the 4,650 levels.

It is doubtful if the origin of the fire will ever be known.

The Convention

Undoubtedly, the best means of acquainting the fraternity with the work accomplished by the convention is to publish completely the minutes as reported to the chapters. There is much, however, that is superfluous, more that should not be published in an open publication of this sort. The following we believe, contains everything of general interest transacted by the Fifth Bi-ennial Convention of Theta Tau, December, 1921.

REPORT OF THE GRAND REGENT

Theta Tau has now 11 Chapters and 6 Alumni Associations. In recent years the reputation of Theta Tau as a high class professional fraternity has become widespread and the students and faculty members of many institutions have become convinced of the desirability of having a chapter of Theta Tau installed. As a result, much correspondence has developed on this subject and a number of petitions have been presented. However, during the term of my Grand Regency only two chapters have been granted: one in 1920 to the U Tech Society of the University of Utah, and the other recently to the Castle Club of the University of Alabama.

Lambda Chapter, at the University of Utah, was installed April 20, 1920, by your Grand Regent and Grand Scribe, with the aid of brothers S. W. Lawson and B. N. Killbourn. The installing officers faced a big problem because there was a large group (25) to be installed as active chapter, and then a large group of alumni to be initiated, besides three honorary members. We found Lambda Chapter an earnest and enthusiastic group, and it made an excellent start as a unit of Theta Tau.

Shortly after the installation of Lambda, the Intermountain Alumni Association was organized, made up largely of Alumni of the U Tech Society, including, of course, alumni of other chapters living in its district. It has made a fine start and undoubtedly is one of our strongest alumni associations.

Last spring a group of alumni members petitioned for a charter for a New York Alumni Association. This was granted May 15th, and from reports received the association is regularly and actively functioning.

The final vote on the Alabama petition has only recently been cast and I have made preliminary arrangements to install Mu Chapter of Theta Tau on the 4th or 5th of January.

The reasons more chapters have not been chartered, is not the lack of petitions from good organizations in good colleges, but is because of the hesitancy on the part of the chapters to act, due to the lack of a clean cut national policy of expansion.

I am one of the last to wish to see Theta Tau grow like a weed, and expand merely for bigness' sake into all grades of institutions and to indifferent groups. But with only 11 chapters in the 48 States we cannot say that we cover adequately the field of the best and most desirable schools of Engineering. Our present policy would permanently keep us out of such institutions as Cornell University, the University of Iowa, the University of Michigan, to mention only three schools of recognized standing.

The opportunity is open for the best type of development. We now have a recognized position. If we do not enter the remaining strong institutions with reasonable rapidity, the pressure will ultimately induce some other fraternity to cultivate the field and take the leadership from us.

I advocate a policy of expansion under a unified national policy, which I hope this convention will adopt, controlled by a careful inspection of institutions and petitioning groups for the purpose of maintaining a high standard and assuring effective chapters.

The last Convention authorized the Grand Regent to conduct a referendum vote of the Alumni on a proposed change of policy as to eligible engineering courses and as to institutions. All chapters were to send an official list of alumni in good standing to whom ballots were to be sent. Not over five chapters sent in such lists, and the referendum was therefore not practical. I have to report therefore, that the vote was not taken, and the matter is in the hands of the present convention.

Many other matters have come before the Grand Regent during the last two years. They either were minor matters that need not be detailed, or they will come before the Convention through other channels.

I may end by expressing the hope that this Convention may bring the different units of the Fraternity more closely together and enable us to face the future with a united front, and realize the vision of our founders.

George D. Louderback,
Grand Regent.

REPORT OF THE GRAND SCRIBE

During the last two years the fraternity has made good progress and membership now stands as follows:

Alpha	216
Beta	226
Gamma	167
Delta	137
Epsilon	177
Zeta	148
Eta	155
Theta	69
Iota	93
Kappa	129
Lambda	97
Total	1,619

Since the 4th convention correspondence in regard to charters has been held with locals at the following institutions:

Brooklyn Institute of Technology.
North Carolina State College.
University of Alabama.
University of Detroit.
University of Arkansas.
Michigan State College.
University of Virginia.
Clarkson Institute of Technology.
University of Idaho.
Washington State College.
Tulane University.
University of Iowa.
Carnegie Institute of Technology.
South Dakota School of Mines.
University of Wisconsin.

There is also a local in process of formation at Leland Stanford University.

Of the above number a charter has been granted to the Castle Club of the University of Alabama and this will be installed by the Grand Regent in January.

The correspondence that resulted in actual petitions has been referred to the Extension Committee of this Convention.

The Alabama petition was presented to the chapters last May,

but not until December was the vote completed, due to the failure of two chapters to report a vote. It appears to me a useless procedure to submit petitions directly to the chapters between the Conventions unless these realize the necessity for prompt action, tempered of course by all the caution they care to exercise, but to leave the Executive Council absolutely in the dark as to their opinion is neither courteous nor fair to the petitioners.

During the last 18 months the Grand Scribe has personally written about 1,100 letters on fraternity business, not including circulars. Replies to letters sent to chapters have not been received as promptly as should be the case, and in this connection it must be pointed out that the Executive Council should be at all times immediately informed of changes in officers. A number of the chapters have been very neglectful of this.

The Lambda Chapter, installed in April, 1920, was inspected by me Dec. 15, 1921, and found to be in excellent shape and closely cooperating with the Intermountain Alumni Association, which is one of the most active we have and meets every month in Salt Lake City. Attention to fraternity matters by both these new units has been excellent.

In interfraternity affairs we have taken the active interest of the past and we have been consulted by the Interfraternity Conference on several matters. At their request Bro. H. A. Krouse, Alpha, was appointed as our representative on the interfraternity committee, in the state of Mississippi, the object of which is to restore fraternities at the institutions of that state.

Several chapters have initiated honorary members without closely following out fraternity laws. They were censured by the Executive Committee and it is the belief of the national officers that in the future, action leading to the expulsion of the officers thus offending should be taken. The election of honorary members is particularly the function of alumni and it is an honor carefully to be bestowed so that it may never be cheapened and the fraternity be not filled with useless adjuncts.

Several chapters were straightened out on the matter of competitive fraternities.

The Executive Council passed a series of resolutions numbers 26 to 49, which are in force unless this Convention should otherwise decide.

The fraternity has also passed an amendment to Art. IV, Chap. 1, of the constitution, by a unanimous vote of the chapters,

but this has not yet been resubmitted to the chapters in its complete form.

More and more it appears that this fraternity continues to be the foremost professional engineering fraternity in the country. Its future is in your hands.

Erich J. Schrader,
Grand Scribe.

REPORT OF EXTENSION COMMITTEE

Moved and carried unanimously that a charter be granted to the Gamma Mu Epsilon Fraternity at the Carnegie Institute of Technology, subject to the following written obligations of said local fraternity as filed with this Convention by Mr. Edwin H. Johnson, its president:

1. If granted a charter, they will at as early a date as possible acquire a house or meeting place.

2. They will withdraw their present law whereby certain percentages of their members are restricted to certain engineering courses.

Moved and carried unanimously that E. H. Johnson be initiated by the Convention.

Initiation of Mr. Johnson.

AMENDMENTS TO THE CONSTITUTION

The following amendment has been adopted to Art. IV, Chapter 1, by a unanimous vote.

Sects. 1, 3, and 4 to remain unchanged.

For Sect. 2 substitute the following:

Chapters of the Fraternity may be established at any first class University, College of Engineering, College or School of Mines, where such are of collegiate grade. Where the curriculum of such eligible institution subdivides the courses of engineering as listed in Sect. 1, of this article, the following interpretation shall be made.

Civil Engineering: This shall be interpreted to also include courses entitled Railway Engineering, Municipal Engineering, Sanitary Engineering, Architectural Engineering and Ceramic Engineering.

Mechanical Engineering: This shall be interpreted to also include courses entitled Automotive Engineering and Aeronautical Engineering, Commercial Engineering.

Mining Engineering: This shall be interpreted to also include courses entitled Mining Geology, Geology, Oil Geology, and Petroleum Engineering.

Metallurgical Engineering: This shall be interpreted to also include courses entitled Chemical Engineering and Metallurgical Chemistry.

Electrical Engineering: This shall be interpreted to also include special courses entitled Hydro-electrical Engineering.

The limitation to "regular students" in Sect. 1, is meant to exclude students who take only special or limited courses in engineering subjects, or whose chief interests lie in lines other than those designated in Sect. 2, and who take certain engineering courses as subsidiary to their major work.

The following amendment to Chap. 1, Art. IX, Sect. 6, has been adopted by a vote of 10 to 1.

For Sect. 6 substitute the following:

It is recommended that the action, requiring a unanimous vote of all active chapters before granting a charter to a petitioning body, be nullified. It is further recommended that a favorable vote of four-fifths of the above mentioned active chapters be required before such a charter be granted.

The following amendment to Chap. 1, Art. 5, Sect. 2, has been adopted by a vote of 9 to 2.

For Sect. 2, substitute the following:

It is moved that a chapter may elect but one honorary member for each fifty initiates. To be effective October 1, 1922.

Chap. 1, Art. XI, New Section

Every petitioning body shall in their petition manifest their intention of securing a permanent headquarters. For this purpose they shall submit a plan for the collection of the necessary funds (such as a sinking fund) which must be unanimously approved by the Executive Council.

Chap. 2, Art. VII, New Section

If a member loses his official badge he can have a duplicate ordered for him by sending an affidavit to the Grand Treasurer to that effect, together with the name of his chapter, college, year, and initiation number. The Grand Treasurer shall then have the power to O. K. such an order on the official jeweler.

The following motion failed to pass but was installed as a policy of the fraternity.

CHAP. 2, ART. VII, NEW SECTION

It is moved that every chapter of Theta Tau shall establish and maintain at as early a date as possible, a permanent headquarters; such headquarters to be in the form of the usual fraternity house or club room, as may be the most expedient for the chapter.

Many amendments governing the internal affairs of the chapters and the business of the national organization were passed, new measures which will greatly facilitate the conduct of the affairs of the fraternity. The recital of them would be of no general interest.

A manual committee went over the manual authorized by the preceding convention and prepared by Brother Schrader. The following is from the report of the chairman of the committee:

"The object of preparing such a manual in the first place is not to compile a cyclopedia of facts. The fundamental purpose of this booklet is to present clearly and completely the newly initiated brothers and prospective pledges or honorary members as much of the history, policy, ideals, organization, character, and obligations of membership in Theta Tau as it is possible to do without revealing its secrets. This manual will also be valuable to alumni, to whom the constitution and ritual are not available."

The committee on certificates and membership cards recommended a form of shingle which was officially adopted by the Convention. A further recommendation that membership cards be immediately distributed to all alumni members in good standing and in the future to each member upon graduation was again adopted.

Action has since been taken upon all these motions. The ritual has been printed and is in the hands of the chapters. The constitution as amended is to be printed in the near future and after that the manual. When these matters are off the hands of the national officers the membership cards and shingles will be prepared and distributed to the alumni.

In the matter of extension both Mu and Nu chapters have been installed. Their letters appear in another part of this number.

In order to indicate the organization of each of our chapters the following extracts are quoted from the reports of the chapter delegates:

ALPHA: "Alpha chapter still picks its men on the original basis laid down by the constitution when Theta Tau was founded.

We pick our men from the three upper classes but are sometimes willing to take good freshmen, especially in their third quarter. The basis of our judgment in passing on prospectives is primarily personal. We take those men who in our best judgment show promise of becoming good engineers and who in addition possess those qualities of good-fellowship and congeniality so necessary for the maintenance of fraternal bonds. Scholarship is secondary; we aim to have our men get average grades at least, but beyond this we do not go. However, we encourage every man to do his best work all the time, and with this in view we do not initiate men whose grades are below passing. About 25 per cent of our active members are members of social fraternities."

Beta: "Beta is not an honorary organization and does not believe that the fitness of a candidate depends entirely on his scholastic standing. We have generally found, however, that men of high scholarship give more time and thought and service to our organization than the more leisurely men who cannot be bothered with their studies."

Gamma: "Theta Tau (Gamma) may choose at will and with due consideration the men who are the live wires in the school. About seventy-five per cent of the present members and pledges belong to some social fraternity and we do not choose men for their athletic or scholastic abilities only, but for what they will mean to Theta Tau."

Delta: "During the pledging period we compete with all the other fraternities on the campus. Consequently we operate on a social basis, taking only men who are not members of any other fraternity. Our pledging this year has been a success, for although only five freshmen have been pledged, they all rank high in scholarship and are all engaged in some activity. Delta does not exclude social fraternity men from other colleges than Case."

Epsilon: "We limit ourselves to upperclass and graduate students who, in our opinion, have shown that they will make successful engineers. In connection with the subject of competition it is probably significant to state that never has an Epsilon pledge button been refused. In selecting our men we list the men in Mining and Geology who have a "B" average or better. Nominations are made from this list. Nominations are sometimes received of names not on this list, and in such cases some men are elected. We believe that most of the men who will make good as engineers have good scholastic records."

Zeta: "The policy of the chapter has been to maintain a

membership as nearly as possible of half social fraternity men and half non-fraternity men. The chapter at present has twenty-one men who are members of social fraternities and twenty-nine who are not."

Eta: "Men are going to be chosen as they always have been chosen, to the best of our ability the Juniors, who in our way of thinking, will reflect the greatest credit upon Theta Tau. All but two of the men are social fraternity men, which indicates that next year's men will belong to social fraternities, but it nevertheless is not proof that the new men will be social fraternity men. Eta chapter, as each year passes by, gains a firmer foothold on the Institute by the continuance of its work through a series of engineering papers."

Theta: "The course in engineering is a three year post-graduate course. At least one-third of the members are from colleges other than Columbia University. We are on our way to an exceedingly strong position, if we are allowed to develop according to the present constitutions and ideals of Theta Tau. We are and can only exist as a professional fraternity and firmly believe that this is the only mission our fraternity should undertake. No member not in good standing as a student is considered as a candidate, but the qualities we are after and insist upon are those of leadership and good fellowship, as these are the qualities that make for success after we have quit and forgotten our academic training."

Kappa: "Kappa chapter of Illinois is still regarded by its members as a part of a professional and honorary fraternity. Men are picked at the end of their Junior year, when they have had a chance to show the stuff they are made of. The present policy insures a membership composed of engineers known to be both capable of successfully carrying their courses and taking a hand in outside activities."

Lambda: "The men who make Theta Tau are men who will not only be good brothers, but will make first class engineers. Our chapter is getting the cream of every social fraternity on the campus as far as engineers are concerned."

The Last Convention

L. A. Guerrero, Delegate from Alpha

Lest anyone get the wrong impression, it should be stated at the outset that it is not the purpose of this article to discuss the actual business of the Convention. The object in view is to tell in words and ideas that brothers not fortunate enough to be present can understand something about *how* that business was *transacted*, to let every Theta Tau who reads these words get an intimate glimpse of the workings of our legislative body.

The writer arrived in Lawrence at 7:30 p. m. on the night before the first business session, and boarded an alleged street car—very appropriately termed the "Galloping Goose" by the local inhabitants—which bystanders assured him would eventually arrive at the campus. There was some doubt about this when the vehicle slowed down to about a mile an hour on a hill just before the campus was reached, but we made the grade and reached the Zeta chapter house on Vermont Street with no great difficulty.

The house was full to capacity with delegates, grand officers, and members of Zeta; every room was blue with tobacco smoke; and the whole gang was having one glorious bull-session. Most of the delegates had already arrived; so with no more ado the credentials committee headed by Bro. Schrader called us upstairs and made sure that we all knew the passwords and were the men our means of identification indicated—which, by the way, proved embarrassing for some of us, and for which we were very properly reprimanded the next morning. The rest of the evening was devoted to getting acquainted and generally getting a line on what would be taken up next day.

The Delta Upsilon chapter house, in which the business meetings of the Convention were held, is located on top of a steep hill about half a mile from the Zeta chapter house. Consequently we all got our breakfasts worked off on the way up, and got up an appetite for lunch on the way down. The delegates from Theta and Eta showed up in the nick of time while we were climbing the hill, and relieved considerable anxiety over their tardiness.

The University buildings and campus are likewise on top of this hill, and are beautifully situated. The campus is well laid out, the grounds well kept, and there is an excellent view afforded. But it must be h... for the poor members of Zeta who have to tear up that hill to make an eight-thirty class every morning.

The daytime was completely filled with business sessions of the Convention, and the Zeta house was a bee-hive of activity every single night till the wee small hours of the morning, while the delegates and officers were getting up committee reports, holding committee meetings, or lobbying for support of some measure to be brought up next day. And let it be known right here that in spite of all the practice we actives get staying up late nights during our college days—to study, of course!—there wasn't a man of us who could hold a candle to Eric Schrader. The Grand Scribe of this fraternity is a human dynamo, boys; his capacity for hard work and long hours is unlimited. No wonder Theta Tau has in twenty years become THE engineering fraternity of this country.

The entertainment committee of Zeta chapter treated us royally, assisted by every member. Every want was taken care of; we were fed and bunked in the chapter house; and although the great amount of business to be transacted took up most of our time we were entertained at every chance. The last night we were there we were given a banquet in the hall of a church; owing to the fact that school was closed for the Christmas holidays and the town was consequently pretty dead, this was the only available place. And some of the stories that went the rounds afterwards—whew! It will be a long time before the walls of that church echo the sounds of such a session again. Brother Potter of Theta, Dean Shadd of Zeta, head of the electrical engineering department of the University there, and the toastmaster, also of Zeta, particularly distinguished themselves. Even the delegate from Carnegie tech, though initiated only a few hours, caught the spirit and uncorked a rare one. She was a real engineers' banquet.

All in all, the 1921 convention was a huge success, not alone from the point of business transacted, but because of the good-fellowship shown and the closer contact between the chapters, scattered as they are from coast to coast. It is to be regretted that the whole of each active chapter cannot be on hand for these conventions; the chapter that gets it for 1923 will be extremely fortunate.

The Installation of XI

Another cog in the gear-wheel of Theta Tau was added Saturday, January 13, by the formal installation of Xi chapter of Theta Tau at the University of Wisconsin, Madison, Wisconsin, bringing the total chapter roll up to fourteen. Our newly initiated brothers were very fortunate in being installed by the Grand Regent, Dr. G. D. Louderback, in person; any Theta Tau who has listened to a ceremony conducted by Brother Louderback realizes completely at its close the true meaning and objects of our fraternity.

Brother Louderback was assisted by Brother P. J. Lawrence, Grand Treasurer, who acted as Grand Marshall; Brother H. H. Hopkins, former Grand Scribe, who acted as Grand Scribe; Brother R. O. Ruble, Zeta, '20, and now an instructor at Wisconsin, who acted as Grand Outer Guard; and Brother L. A. Grettum, Regent of Alpha and delegate from that chapter to the installation, who acted as Grand Inner Guard. In addition, Brothers R. W. Warner, Zeta, '18, now instructing at Wisconsin, and Wm. S. McCleod, Beta, '22, were present for the ceremony. Brother R. S. Goodridge, of Alpha, at present finishing his course at Wisconsin, was present at the dinner following the installation, but owing to an examination could not get there sooner.

It will interest every one of us to hear that Joseph E. Schrader, brother of the present Grand Scribe, was at the same time initiated as an honorary member of Xi chapter in recognition of his services in organizing the petitioning group which secured the charter and helping them reach their goal. If he can perform for Xi chapter what his brother has done for the rest of the fraternity, the success of every undertaking of that chapter is already assured.

The ceremonies were begun at five o'clock, in the Women's Club building and were completed shortly before seven. The meeting then adjourned to another room downstairs where it was served with a most excellent dinner. Brother Fred Nolte of Xi acted as chairman, and after coffee and cigars called on the grand officers present and the delegate from Alpha for short informal speeches. Brother Louderback delivered a most inspiring talk, pointing out in unmistakable words the qualifications upon which membership in Theta Tau should be based.

Following are the names and home addresses of our new brothers in Xi of Theta Tau:

Frederick W. Nolte, '23, E. E. 4, 615 N. Lake St., Wauwatosa, Wis.

Clarence F. Rasmussen, '23, E. E. ., 615 N. Lake St., Park Falls.

Edmund P. Strothman, '23, M. E. 4, 130 Iota Court, Milwaukee.

W. Vilas Hanks, '23, Ch. E. 4, 525 Wisconsin Ave., Madison.

Edmond H. Haugen, '24, M. E., 711 S. Dickinson St., Brookings, S. Dakota.

Edward C. Hegeler, '25, M. E., 130 Iota Court, Danville, Ill.

Theron T. Chapman, '24, E. E., 524 N. Henry St., Oak Park, Ill.

J. Owen Moon, '24, M. E., 524 N. Henry St., Fontana.

Harold J. Bentson, '24, M. E., 622 Mendota Court, Kenosha.

George L. Reed, '24, C. E., 615 North Lake St., Boston, Mass.

Honorary

Ernest Schrader, 2201 Princeton Ave., St. Paul, Minn.

A professor in the School of Mines at Minnesota used this one to impress a class in hydraulics before the close of the quarter, so if anyone questions the fitness of the story we can quote good authority in its support. He was expounding to the class the necessity of getting the right attitude toward classes.

"Don't get the attitude of the negro minister: It seems this minister was asked by the members to resign. In his closing sermon he dwelt at great length upon the symbolism of the mistletoe, ending by asking all present to watch him carefully as he walked down the aisle. The congregation saw as he passed them, a piece of mistletoe pinned to his coattail."

* *

First Graduate: "Our class reminds me of winter."
Second Graduate: "Why?"
First Graduate: "Not many degrees registered."

* *

Chemistry Prof: "When rain falls, when does it rise again?"
Dumb Student: "In dew time."

Editorials

THE GEAR

Thinking men of the fraternity must realize by this time that if we are to continue publishing a fraternal organ we must have a concrete plan for keeping the Gear organization together from year to year. We must publish a Gear, we must have the means of keeping the chapters in touch with each other and with the alumni, and we must have a publication which will give to anyone into whose hands it may fall a correct and a good impression of Theta Tau.

To produce a Gear with any literary merit whatsoever and to do it with the least possible wasted effort it is necessary that we have a business routine organization developed which will go on continuously with the required supervision leaving the time of the editor to the more visible and evident work of assembling news. Under the present system the incoming man spends what time he can spare from his studies during the first two or three months becoming familiar with the art of separating the alumni, and the actives too, from the price of a subscription; in assembling card indexes, and in looking up addresses of alumni; all of which had been learned in the same unscientific way by the man before him. After that he hurriedly assembles what material has dropped in on him and sends it to the subscribers.

The editor suggests a plan which, if adopted, would put the Gear on a really efficient basis.

Let the business organization of the Gear, which shall have charge of subscriptions and advertising, the files, the publication of the directory, and the printing of the Gear, remain with some chapter to be designated by the executive council. The business manager shall receive compensation and shall have an underclassman assisting him. The underclassman shall be the next manager. The editor is to be appointed by the council as in the past. Such a plan would relieve the editor of routine work, and would greatly cut down the amount of such work.

Epsilon has suggested that the editorship be rotated to the different chapters, making each issue the work of a distinct group,

and strengthening the national organization by giving each chapter an opportunity to serve the national organization. The suggestion has merit, but is only possible under a plan such as the one outlined.

EXPANSION

Mu and Nu chapters, at Alabama University and Carnegie Institute of Technology, have been installed for nearly a year, so long ago that only their chapter letters appear in this issue. Xi was installed at the University of Wisconsin only a week ago, the 13th of January. Iowa will be installed the 27th. We have placed our first chapter in the South, and in one of the best schools of which the South can boast. We should have two or three more chapters near Alabama U. Our position in the East has been strengthened, we are established in schools of only the highest professional standards. In the Middle West we are entering two of the great state universities which are being recognized as the equals in education of any in the country. In the West, since the installation of Lambda, we have not gone forward. The reputation of the western schools has been, through the past years, steadily growing. Right now there are several institutions in the West which should have chapters of Theta Tau. It is here and in the South that our future field for expansion lies.

THE CONVENTION AND FRATERNITY POLICY

The last convention marked a critical period in the life of Theta Tau. The problem of our expansion policy had been handed down to us from at least two preceding conventions, it was absolutely necessary that we reach a decision on the matter. The view, held by some few of our chapters, of our national policy, had become so distorted that a united declaration and understanding on that subject was important. Matters of chapter policy and organization had been growing upon us for some time. Finally, there was an unmeasurable amount of detail work which, though not of the importance of the major matters, is the basis upon which fraternity morale is built; the publication of a manual, reprinting of the constitution, adoption of cards and shingles, and countless other details, which had accumulated since the last convention.

Most important of all the acts of the convention was the passage

of the amendment to Art. IV, Chap. I, making it possible to install chapters at schools where mining is not taught. The amendment is published in full in another section. Many of the alumni, we fear, feel that this is a move that removes a certain individuality and personality from Theta Tau. Tradition, however, was practically the only argument for retaining the barrier. We members of Alpha and Beta have seen the fate of one fraternity that has remained strictly in mining schools. Actives, and alumni actively interested have felt the restraint imposed upon the fraternity when petitioning bodies from desirable schools were necessarily rejected. Farsighted members have recognized the limitations of Theta Tau in competition with fraternities without the restrictions we have had. The move has extended our field greatly. We had, perhaps, entered all the schools of Theta Tau calibre open to us. Probably twice that number are open to us now.

Throughout the proceedings of the convention the fact that we are a professional engineering fraternity was continually emphasized. A move to abolish dual membership was killed without a murmur. A suggestion to limit the proportion of social fraternity men was not even considered. Any tendency to make this a social fraternity of engineers is distinctly out of place. There is at least one such national fraternity; some of our chapters come into fairly intimate contact with it, and we see no future in an organization of that kind comparable with our past standing and with that which the future undoubtedly has in store for us. There is danger though, of sliding a bit too far in the opposite direction while avoiding this tendency. We must not become an honorary fraternity. The field of engineering is too well covered by that type of organization, the organizations themselves mean little but a recognition of scholastic ability, the fraternal bond between members is a weak one, the future of a further addition to this field is doubtful. We are going forward with the original ideals of our founders as a "professional engineering fraternity." In that capacity we can look forward to the same future power that the oldest of the fraternities of the earlier recognized professions are now enjoying.

Publications and Papers

By Members of Theta Tau

GENERAL ECONOMIC GEOLOGY

By W. Harvey Emmons, Ph. D., Hon. Alpha

The present volume is a textbook, not so much for the outside geologist as for the student, in or out of college. It presents in a relatively small compass the essential features of the geology, not only of the metals, but of the so called non-metallic ores, and of the fuel minerals—coal, oil, oil shale, and asphalt. The subjects are treated in the order: coal, petroleum and gas, metallic ores (genesis), non-metallics, iron, gold, silver, copper, zinc, and lead, and finally the minor metals. —From E. & M. J. P.

PETROLEUM PRODUCTION

By John R. Suman, Epsilon, '11

The book fills the long-felt need for a comprehensive treatise on this phase of the petroleum industry. Volumes have been written on oil geology where paragraphs have appeared on this highly necessary part of the art. The subject matter covers drilling methods; methods of shutting off water; operation of properties and handling of production; treating emulsions; the use of electric power; pipe lines; tanks; and is fittingly concluded with tables of useful information.

PETROLEUM RESOURCES OF CALIFORNIA

Bulletin 89, California State Mining Bureau

By Lawrence Vander Leck, Epsilon, '15

The report aims to point out the unfavorable as well as the favorable areas for the development of additional petroleum resources in California.

INCLUSIONS IN ALUMINUM-ALLOY CASTINGS

U. S. Bureau of Mines Technical Paper 290

By Robert J. Anderson, Delta, '14

ALUMINUM

Chapter in The Mineral Industry

By Robert J. Anderson, *Delta*, '14

To our Brothers who have been transferred to the Eternal Chapter

"Every golden beam of light
Leaves a shadow to the sight;
Every dewdrop on the rose
To the ocean's bosom goes.
Every star that ever shone
Somewhere has a gladness thrown.
All that lives goes on forever,
Forever and forever.

Every link in friendship's chain
Forged another link again;
Every throb that love has cost
Made a heaven and was not lost.
Every look and every tone
Has a seed in memory sown.
All that lives goes on forever,
Forever and forever.

Never yet a spoken word
But in echo it was heard;
Never was a living thought
But some magic it has wrought.
And no deed was ever done
That has died from under sun.
All that lives goes on forever,
Forever and forever.

So, O Soul, there's no farewell
Where souls once together dwell;
Have no fears, O beating heart,
There is no such word as part.
Hands that meet and closely clasp
Shall forever feel the grasp.
All that lives goes on forever,
Forever and forever."

ANNETTE ROHN.

GEORGE I. HALE

GEORGE I. HALE

Zeta '23

George I. Hale was born April 10, 1899, in Lawrence, Kans. He was the son of Mr. and Mrs. J. H. Hale. He attended the public schools of Lawrence, and graduated from the Lawrence High School in the spring of 1917.

He first saw military service in the summer of 1916, on the Mexican Border with the National Guard. After graduating from High School, he joined the Medical Corps of the 35th Division and spent one and one-half years overseas.

He entered the School of Engineering at the University of

Kansas in the fall of 1919. He was a member of the Freshman foot-ball and basket-ball teams. In the fall of 1920 he was a member of the Varsity foot-ball squad, winning his "K" at center. The following year he again started at center, but due to illness played in only one game. He was operated on for appendicitis Oct., the twenty-first, and was apparently on the road to recovery, when he suffered a sudden relapse from which he never rallied. He died Nov. 6, 1921.

The greatest tribute paid to Hale in Athletics was "He was the hardest fighting center in the Missouri Valley." He was a quiet man, without the false idea that bluster and noise mean success. He was frank and open and honest and truthful.

He was a member of Sigma Chi and Theta Tau Fraternity. Zeta Chapter and the entire University feel deeply the loss of this beloved brother.

DONALD G. CAMPBELL.

Theta '14

Donald G. Campbell was drowned at Hoggum Bay, near Olympia, Wash., on Dec. 18, 1921, while on a duck-hunting expedition. He was a member of the firm of Campbell, Wells & Elmendorf, of Seattle, and had been a member of the A. I. M. E. for five years.

Brother Campbell was born at Port Arthur, Ont., in 1887. He took the B. S. degree at Whitman College in 1912; the M. A. and E. M. degree at Columbia University, where he helped organize the body that became Theta chapter of Theta Tau. In 1914-15, he was instructor of metallurgy in the University of Washington. In 1915-16, he did exploration and development work at mines in southern Idaho, and was later connected with the A. S. and R. smelter at Tacoma, Wash. In 1916, he established the firm of Campbell, Wells & Elmendorf. During the first year of the firm, he discovered palladium in lode deposits near Ketchikan, Alaska. In 1918, he acted as consulting engineer for various mining properties being developed in the Northwest. During 1919-20 he acted as engineer and metallurgist for a company developing a lode tin property near Nome, Alaska, taking his family with him, and living for over a year at the camp. In the past year he has been engaged in work for the Wrangell Pulp and Paper Co., looking toward the development of this new industry in Alaska.

Mrs. Campbell and two sons, Donald Durant and Gordon Freeston, six and four years old, survive him.

HENRY HERIKSON CAMPION

HENRY HERIKSON CAMPION

Zeta '13

Henry Campion was born in Leavenworth, Kansas, January 22, 1891. He received his education in the schools of Leavenworth, matriculating at K. U. in 1909. Here he became a member of Theta Tau as well as a Beta Theta Pi. He took his B. S. in Electrical Engineering in 1913 going from college into the employ of the Westinghouse Electric Co. at Pittsburgh, and remaining with the same company until the beginning of the war. Upon the outbreak of hostilities he enlisted in the Navy, trained at Pelham

Bay station and at Stevens Institute in Hoboken, and in 1918 was commissioned Ensign in the Naval Reserve. He was sent to Pittsburgh to establish a school of Turbine Engineering at Carnegie Institute where he remained as Executive Officer and instructor until his discharge in Dec. 1919 upon close of the school.

After the war he went to India in the employ of the Tata Iron & Steel Co., erecting steel mills at Jamshedpur, about one hundred miles from Calcutta. His position was that of Superintendent of Piping having charge of the designing and laying of the numerous pipe lines about the plant. Campion had risen to Superintendent of Construction at the time of his death. A Beta brother of Campion has described the tragic manner of his death:*

"He was awaiting a fourth man for a game of bridge at a friend's house in company with Mr. Morton, his closest friend. They were examining a new rifle, had taken the clip out, but had failed to remove the cartridge from the chamber. Campion went over to the piano—he was an accomplished musician. Morton turned the rifle over in his hand and it was accidentally discharged as Campion walked into the line of fire. The bullet pierced him near the heart, he lived only about ten minutes. That he should thus die at the hand of his best friend adds a further touch of tragedy to the story. Morton was an ex-service pilot and should have known better.

"I came out from Honolulu with Campion, have had him here in my home and have visited him in Jamshedpur. The bond of brotherhood that binds us together was deepened by a real friendship based on sincere admiration of his sterling qualities of manhood. He was handsome, clean, fearless and an expert engineer but, above all, a perfect gentleman, unsullied by the moral laxness that blights so many young fellows out here. None lived a more blameless life or died more innocently."

* From the Alpha Nu of Beta Theta Pi.

CLYDE L. VANDERLIP

Zeta ex '17

Brother Vanderlip was born at Carbondale, Kansas. He matriculated in Civil Engineering at the University of Kansas and was initiated by Zeta chapter on October 8, 1914. He was very active in the chapter and acted a its delegate at the 3rd Bi-ennial Convention in Cleveland, Ohio. He was considered by the national

officers to be one of the best delegates at that Convention and one who would rise to prominence in the affairs of the fraternity.

Brother Vanderlip acted as Regent of Zeta until the spring of 1916 when he left college and entered the mining field. He was employed at the smelter of the Nevada Consolidated Copper Co. at McGill, Nevada, until the spring of 1917 when he entered the army. While at McGill he was instrumental of arranging several meetings of the alumni living in that vicinity.

Brother Vanderlip was in the field artillery and took part in some of the important battles in France. He attended an officers' training camp during the latter part of the war and returned as a second lieutenant.

In 1919 he went to Mexico to work in the smelter of the Mazapil Copper Co. at Concepcion del Oro, Mexico. En route he stopped in San Francisco and accidentally met Erich Schrader on a ferry boat at Oakland. Brother Schrader was just returning from an initiation and banquet held by Epsilon. They spent Sunday together with Brother A. T. Gibson, Eta '13. Later on Brother Vanderlip entered the employ of the American Smelting & Refining Co. and at the time of his death was Asst. Supt. of the Matehuala plant. He became ill on Nov. 19, 1921, and was taken to the hospital at Monterey and operated on for some sort of intestinal trouble to which he appears to have been subject for some time. He died on November 30, 1921. His mother was with him at the time of his death. His mother, Mrs. Edith Vanderlip, can be addressed at Box 172, El Centro, California. Clyde was 29 years of age at the time of his death.

Mr. J. W. Christie of the A. S. & R. Co. wrote to the Grand Scribe: "Mr. Vanderlip was one of the most promising men in our organization and was very highly thought of by the management. His death was sincerely regretted by all of us."

JAMES ALFRED LANNON

Gamma '11

James Alfred Lannon was born in Evanston, Wyo., Nov. 7, 1886. He graduated from the Colorado School of Mines with high honors in 1911 and was a member of Sigma Alpha Epsilon and Tau Beta Pi fraternities as well as a loyal and respected brother in Theta Tau. He also made an enviable reputation on the football team.

After graduation, Brother Lannon followed mining in Colorado, California and Mexico. He was foreman for a large company on the west coast of Mexico in the interior from Mazatlan, and later was agent for the Denver Engineering Co. for the sale of its products in Mexico City. He afterwards acted four years as superintendent of the Atlas Mining and Milling Co. at Sneffels, Colorado.

Jim was a man of excellent habits, and his classmates and brothers remember him as a man of exceptionally high honor and strength of character. He will be missed and his loss keenly felt by all who knew him. He was a member of the American Legion, B. P. O. E. Lodge No. 492 of Ouray, Colo., and also a member of the American Institute of Mining and Metallurgical Engineers.

His death occurred in Ouray, Colo., Jan. 21, 1922, as a result of an acute attack of appendicitis. At the time of his death and for eighteen months previous he had been with the Lucky Twenty Mining Co. as superintendent and stockholder, and had under construction an 1,800-foot tunnel on the property of the company.

Five years ago, Brother Lannon married Miss Brita Bent, daughter of E. J. Bent of Ouray; they and a daughter fours years of age survive him. He leaves also his father and mother and six brothers and four sisters, to all of whom Gamma extends her deepest sympathies. His death represents a real loss to Theta Tau.

ROBERT L. DOWLING

Beta '06

Only a small percentage of the men in this country attain positions of national prominence. Most of us function in our own, small spheres, trying to lead exemplary lives and in some measure advance the science of engineering. Robert L. Downing, B. '06, and one of the founders of his chapter, was a worthy example of the latter group. He achieved success in the field of mining engineering, and was so respected by his fellow townsmen that their high school was dedicated to him.

Brother Downing was born in St. Paul in 1884, and after completing his high school course there he entered the Michigan College of Mines at Houghton in 1903. He stood high in his classes, was a leader in the college, and was one of the men who established Theta Tau at Michigan. Graduating in 1906, he worked on the Mesaba range at Hibbing for four years. He then acted as underground superintendent for the Tennessee Copper Company, general

manager of an Arizona copper company, and finally returned to the Mesaba range as superintendent of the new Bennett mine. It was in this community that he finally established himself.

At the ceremony when the Robert L. Downing high school was dedicated, a brief sketch of his life was given by J. A. McKillican, B. '06, a warm friend for fifteen years. Brother Downing has set an example for every Theta Tau by his high ideals and professional success.

HELEN A. JOHNSTON

The members of Alpha chapter and of the entire fraternity sincerely sympathize with Ralph E. Johnston, Alpha, '16. His wife, Helen A. Johnston, died October 11, 1922, three days after the birth of a son, Scott Doran Johnston. Mrs. Johnston was the daughter of Dr. and Mrs. Frank Doran of St. Paul, Minn., and a graduate of Hamline University in 1914. They were married in June, 1917, and lived in Chicago since 1921.

Chapter Letters

ALPHA CHAPTER

For the last two years Alpha has had a large and active chapter. We started out by moving into a better and larger house. Now we can easily accommodate twenty men at the house, and have about that number staying there all the school year. With this group as a working nucleus we are able to "put over" many activities that were before impossible. Alpha unreservedly encourages each chapter to have a roomy and inviting house.

Some of the functions that we have been able to "put over" have been smokers, dances, and the encouragement of honorary fraternities. We have had several smokers, some to look over prospective members, two to entertain the local alumni, and one in honor and recognition of a recently organized "local" engineering fraternity. In encouraging honorary fraternities, Alpha has done her best by allowing these fraternities the use of the chapter house for their pledging or initiation ceremonies.

Since the last Gear was issued we have also undertaken two annual events which seem advisable for each chapter. One is the issuing of a news letter or more properly a newspaper, by which we try to keep the alumni in touch with each other and also with us. The other event is a Founder's Day Banquet. This year's anniversary was our first banquet and it was a startling success, and it seems fitting to us that at least once a year we should meet to do homage to the men who founded Theta Tau, and particularly to commemorate the spirit of that founding.

Last spring Alpha was fortunate in having Eric Schrader attending the University of Minnesota for a special course. Needless to say he attended most of our meetings and was with us around the house frequently. To him we owe much of our recent success, and we hope that the time will come when every chapter can have a close contact with him. Knowing of his college and professional achievements as we do, and having had contact with his extensive fraternity knowledge, his boundless enthusiasm, and his remarkable far-sightedness and high principles, we feel that he is one of the fraternities' greatest assets.

One of the visible results of Brother Schrader's visit is the Building Association of the Alpha chapter. The purpose of this association is to collect the building fund notes that are due to the chapter, and also to decide on the best plan toward the securing of a permanent home.

Summarizing the past two years we have passed through the inevitable war time slump and are now on the upward climb for a stronger, larger and more active chapter.

At present we have 27 actives and 6 pledges. Scholastically we rank second in the professional engineering fraternities, equivalent to fourth with the academic fraternities. In activities we are exceptionally well represented. We have only two Tau Bet's, but have three Eta Kappa Nu's, and two Pi Tau Sigma's. We have two members of the All-University Council (one is the president). One member of the Engineering Student Council, Engineering Representative on Daily Board of Publishers, Vice-President and Secretary of the Association of Engineering Students, and other similar positions.

In athletics we are well represented, having the captain of the cross-country team, acting captain of the basketball team, the captain of last year's basketball team, and two men on the swimming team as well as the middle weight champion boxer of the University. You all know how much time these various athletics take, and with engineers' heavy scholastic schedule are particularly to be commended.

Now that we have had a glimpse of Alpha's past two years as well as her present standing it might be worth while to dwell in futures. For one thing we are behind an inter-engineering fraternity organization, the purpose of which will be to unite the various engineering fraternities in order to bring about better fraternity relations, better fellowship and a stronger organization throughout the engineering colleges.

Another vision that Alpha chapter has is the ownership of a chapter house. Some notes that are due have not been paid yet and we are in hopes that the negligent brothers will come across so that the Building Association will have the necessary funds to go ahead with the buying of a lot at least.

Since you have our past, our present and future there isn't much left to tell you about, except that Alpha chapter wishes all brothers in H & T a very Happy and Prosperous New Year.

CHESTER MARSHALL,
Chapter Correspondent.

BETA CHAPTER

BETA CHAPTER

Total number of initiates	243
Active Chapter (1921-1922)	50
Members initiated since March 1, 1921	15

The interval elapsing since the last issue of the Gear has been a period of severe and uninterrupted progress for Beta. Many of the older brothers have gone, but new ones have stepped into the breach, and carry on the good work of performing the affairs of Theta Tau.

Beta has been actively interested in all phases of student life at M. C. M. It has been our constant effort to educate our brothers to the importance of engaging actively in the affairs of the college. Theta Tau is important to the degree that she is a service to the community. And every one of us realize that when we cease to function for the general advancement of the college we degenerate from the status of a fraternity to the lower phase of the boarding house.

For the fourth consecutive year the most important office in undergraduate circles at M. C. M. has been bestowed upon a brother of Beta Chapter. At the annual student election held at the end of the spring term Brother Jud Huyge was elected president of the Student Body to succeed Brother Bob Van Pelt, retiring president. The importance of the office is readily appreciated when it is understood that the president is ipso facto chairman of the Student Council and member of the Athletic Council. It is also his duty to appoint the various committees that administer the affairs of the Student Body. These include the Dance Committee, Smoker Committee, Gym Committee, and "Lode" Committee. At the same election the following brothers were elected to fill the places left vacant by retiring members of the Student Council: Brothers Guerin and Mullins, Senior members, and Jack Pratt, Sophomore member. Brothers MacArthur, Fay, and Guerin, who had been members of the Council for last year, went out of office at the close of the term.

Beta has been continuing her record for good scholarship. Since the last year the following brothers have been elected to Tau Beta Pi: Brothers Guerin, Huyge and Knaebel, last spring.

In addition there have been an unusual number of brothers active as student instructors. Brothers Van Pelt and Seaman initiated the Freshmen into the mysteries of Mechanical Drawing. Brother Guerin answers to the call of "Prof" in the Geology

Department, Brothers Knaebel and Johnson are instructors in the Mining Department. Brother Pratt is using his Peruvian experiences to good advantage as head of the Spanish Department.

The official college newspaper, the "M. C. M. Lode", had a distinctly Theta Tau cast last year. Brother Jack Holmes served as editor until his graduation at Christmas time. Brother Fay was elected to fill his place. Brother Lawson filled the post of Athletic Editor, whilst Brother MacArthur furnished many of the leading editorials.

In the realm of athletics Beta still takes front rank. The three varsity teams supported by the college were all captained and managed by brothers from Beta last year.

The football team which had a most successful season was captained by Brother Kewpie Cookson. Cookson used the fullback position as a base from which to project his one hundred and ninety-five pounds at whichever part of the enemies' line needed it most. His work last year showed him to be the speediest and strongest backfield man in this district. With Brother MacArthur at one half and Kranenberg at the other, M. C. M. presented an all-Theta Tau delivery service. Brothers Haga, Akin, Peterson, Bailey and Lauffer also held down berths on the football team. Brother Elmer Paull was manager.

In basketball the versatile Cookie was also captain of the team until press of work necessitated his foregoing athletics during the winter months. Brother Lawson, Haga, and Beck, won berths on the team, while Brother Havens played in several important games. The basketball team had a year fruitful of victory. It was capably managed by Brother Paull.

The M. C. M. hockey team created a sensation in inter-collegiate hockey circles by taking into camp some of the fastest hockey outfits in the country. The University of Minnesota went down to defeat three times, twice on our own ice and once in Minneapolis. St. Thomas College of St. Paul suffered the same fate with three defeats. Fort Snelling was given a good drubbing at Minneapolis, and the University of Michigan was defeated in a three-game series. The only setback of the year was in losing to Notre Dame at a time when the regular M. C. M. team was laid up for repairs. Brother Jack Travers, who captained the hockey team, was nominated by western sport writers as the best man in college hockey. Brother Kranenberg made the team as forward and Brother Fay was manager.

Theta Tau put two men on the champion Houghton baseball

team in the persons of Brothers Bob Zyrd and Jack Travers. With Bob pitching and Travers catching the Houghton team waltzed into the championship of upper Michigan. The college also entered a team in the local Twilight League. Seven brothers were in the regular lineup.

All signs point to a wonderful year during the forthcoming college term. The chapter is busily engaged rushing a number of very likely-looking freshmen to offset the rather severe depletion in numbers suffered since last year. It is planned to initiate at least fifteen new men before Christmas. The field is very promising, and there is no question that Beta will find plenty of material from which to recruit her ranks.

E. R. Kidd,
Corr. Secretary, Beta.

GAMMA CHAPTER

Gamma chapter started the school year 1921-1922 with fourteen men in the active chapter. At the first regular meeting three of the chapter officers announced that they would graduate at the close of the first semester, and inasmuch as it was thought best to have at the helm men who would be with us all year, an election was held to choose successors to the three brothers who had tendered their resignations. At this meeting, Gamma's delegate to the 1921 Convention was elected. Brother Strock was the man chosen.

At the meeting held just before the Thanksgiving recess, the chapter elected 32 pledges, 22 from the Class of 1923 and 10 from the Class of 1922. Both of these classes were exceptional in that they contained a large number of men of Theta Tau calibre. In fact there are still many men in these classes whom we would be proud to call brothers, but the chapter is now a little too large if anything, and of course we must stand by and see some good men grabbed up by our rival, Sigma Gamma Epsilon. The men elected were: R. J. Allan, J. R. Dorrance, C. A. Farlow, D. C. Gregg, J. K. Houssels, B. B. LaFollette, R. B. Lowe, H. H. Pratley, L. C. Rhodes, and D. C. Valdez of the Senior class, and J. V. Adams, M. J. Benjamin, G. W. Crawford, R. F. Crawford, H. P. Fidel, T. G. Foulkes, A. E. Hambly, J. C. Herron, C. F. Jordan, R. R. Knill, C. T. Linderholm, A. B. Martin, E. S. McGlone, George Mitchell, L. J. Parkinson, J. A. Peck, B. E. Price,

GAMMA CHAPTER

M. H. Robineau, J. A. Ryan, M. S. Sheriger, F. L. Tyler, and J. C. Worden of the Junior class.

Just as our Christmas recess was starting, Grand Scribe, Brother E. J. Schrader, paid Gamma chapter a visit. We regret that many of the brothers had already gone home for the holidays and did not meet Brother Schrader. Those of us who met him feel that his trip to Golden was very much worth while for the chapter, as he made many helpful suggestions and put us right on some doubtful points. We hope Brother Schrader will drop in again soon.

When the end of the first semester came, we lost six of our active brothers, Jones, Harroun, Henderson, Moreno, Connors, and Squire. The chapter felt the loss of these men keenly. We sincerely hope that they may come back to see Gamma whenever they are in position to do so.

Initiation for the new pledges was held March 9. The usual custom of having the initiates attend classes in some sort of burlesque costume was carried out. In the evening the men were put through the ritual. The next evening the annual Theta Tau dance was held in Guggenheim Hall with a very large and congenial crowd present. At Mines there are four dances recognized as school dances, the Freshmen Ball, the Theta Tau dance, the "M" Club dance and the Junior Prom.

In accordance with the new national ruling, Brother Jamison Vawter of Zeta chapter dropped in on us to inspect the chapter just as our Juniors were returning from their annual inspection trip. To have a representative of the National Fraternity call on each chapter at least once a year is, so Gamma believes, a big step forward for the Fraternity.

The Forty-eighth Annual Commencement, held Friday, May 19, took eighteen more active men from us. They are Brothers Aaron, Allan, Bunte, Clough, Dorrance, Farlow, Gregg, Guth, Houssels, Hyland, LaFollette, Lowe, McKenzie, Pratley, Rhodes, Robertson, Strock, and Valdez.

During the past school year, five of the six sport captains were Theta Taus. We have thirteen men in the chapter who have won their letters on the gridiron, ten played on the 1921 eleven and three have played on previous teams. Brother Bunte was captain during the 1921 season, Brother Linderholm was captain during the 1920 season, and Brother McGlone is the captain-elect for next year. Brother McGlone was the outstanding star of the

Rocky Mountain Conference in the 1921 season. He was chosen as All-Colorado fullback by newspapers and by the coaches.

Three of the brothers played on last season's basketball squad with Brother Rhodes as captain. Brother Bunte, center, and Brother Rhodes, guard, were chosen on the All-Rocky Mountain Conference team.

Brother Pratley was captain of the boxing team and Brother Ron Crawford led the wrestling squad in its fight for Conference honors.

In baseball, six of the nine first team men are wearers of the Hammer and Tongs. Big "Mac" McGlone is captain. Brother Henderson was captain last year and Brother Strock was captain the year before.

In track and field events there are several of the brothers taking a prominent part. Farlow is a broad jumper of no mean ability, McGlone is the fastest 220 man in school, Mitchell is a whiz in both the high and low hurdles, Peck is a consistent performer in the two-mile, LaFollette takes care of the 880 in good shape, Sheriger hurls the javelin, and many other brothers are trying out for the various events.

In minor sports we have Brother Price in golf and Brother Robinson wielding the tennis racket. Brother Price is conceded to be the best college golfer in the Rocky Mountain region.

In the field of coaches we had Brother Strock, who was ineligible because of the four-year rule, handling the boxers in first class style. Brother Benjamin coached the Freshmen basketball team and Brother Lowe was mentor of the Frosh gridiron squad.

Along managerial line Gamma was doing its share. Brother Jones, football, Brother Gregg, boxing and wrestling, and Brother Farlow, track, were student athletic managers. The Athletic Council had for its student members Strock, Squire, and Bunte, all Theta Taus.

Jones, president of the Student Council for the first semester, Foulkes, president for the second semester, and Martin, president-elect, are members of Gamma chapter. Four other brothers were on the Council as representatives of their respective organizations.

In student editorial offices were found several of Gamma's men. Brother McKenzie was editor of the 1922 Prospector with Brothers Harroun, Aaron, Jones, Raiff, and Dorrance, as members of his staff. Brother Martin was editor of the 1923 Prospector. Brothers Fidel, and Peck, were two of his able assistants. Brother Aaron was Editor of The Oredigger during the past year

and Brother Martin will hold down the job next year. Brother Parkinson was business manager of The Orediggor with Brother Peck as his assistant. Brothers Guth, Hyland, Dorrance, Gregg, and Price are others who were on the staff of the school paper.

In other activities, such as the Band, the Glee Club, the Junior Section of the A. I. M. E., and many others, too numerous to mention, the brothers of Gamma chapter are more than holding their own. At the 1922 Commencement four of the seven prizes were given to members of H. & T.

With best wishes for success to the sister chapters and a cordial invitation to all brothers to call on us when in the vicinity of Golden, we bring the school year 1921-1922 to a close.

EUGENE R. AARON.

NOVEMBER, 1922

The chapter started the school year with renewed interest and a desire on the part of every man to put Gamma on a firmer basis and bring about closer cooperation within the chapter. The installing of a rival Engineering Fraternity in school last year should do much to accomplish this through the medium of competition. Were it possible, Gamma would have her own house, but the fact that nearly every member belongs to one of the national social fraternities renders this out of the question. We do, however, have our own rooms in the gymnasium building, where regular meetings are held twice a month, and oftener if necessary, so that we are enabled to keep in close touch with each other and with the affairs of Theta Tau.

Our present outlook is exceptionally bright. We have just pledged twenty-three men who will be initiated before the end of the semester, and although we shall loose nearly all of our active members through graduation in June, we are now assured that Gamma will continue in her present position of strength. The pledging this year was a departure from the custom followed in the past. An agreement was entered into with Sigma Gamma Epsilon, whereby formal bids were extended to the prospective pledges of each fraternity through a committee representing the two chapters. The bids merely informed each man that he had been selected by one of the Engineering Fraternities and asked him to state his preference. Gamma issued twenty-three bids and pledged twenty-three men, all of them having given Theta Tau their preference. Pledging is done by both fraternities at the same time and in keeping with our usual custom, only Juniors and Seniors are eligible.

Everything points to a football championship for Mines this

season; to date no games have been lost and Gamma can well be proud of the team, as ten of the eleven are members of Theta Tau, including Captain McGlone, the outstanding star of the Rocky Mountain Conference. In other fields the chapter is as well represented, with the new president of the Student Council, all the officers of the Senior class and the editor-in-chief of The Orediggor. And since our last letter in June, Tau Beta Pi has captured four more of our men.

Notwithstanding the fact that Gamma has no house of her own, she extends to all brothers a cordial invitation to visit us whenever in this part of the country, with every assurance of a hearty welcome.

JOHN C. HERMON,
Reporter.

DELTA CHAPTER

Total Number of Initiates	144
Active Members	35
Members Initiated 1921-1922 . . .	9

This has been a very successful year for Delta. Nine men were pledged in the first few weeks of school, and these, added to the twenty-six actives who returned to school, brought the number of men well up to the recognized limit for a chapter. Three upper-classmen were initiated the first term of school, and the Freshmen were initiated the second semester, after they had passed the first semester's work, as is customary here at Case. The first dance of the year was given in honor of the pledges.

The brothers were very active on the campus, both in athletics and other activities. Brothers Gertz, Fitzgerald and Mohr were out for football. Klopsch, Rask and Tompkins all made their letters in basketball, and also on the cross country team. Tompkins is Case's best half-miler, while Rask cleans up the hurdles. Brothers Janes, Curtis, Zahaur and Pfau are members of the Leaders' Corps, a gymnastic organization. Faubel and Johnson were on the swimming team.

Ten of our men were in the Case Glee Club, among whom were Bayne, the manager, and Torreson, the manager-elect. Savage is president of the Case Senate, manager of the football team, was Case delegate to the Intercollegiate Disarmament Conference, editor of the Case Differential, president of the Junior class, and

has held other innumerable positions. He has gotten an Honor Key for three successive years, being the only man ever to have done so at Case.

We have three members at the Case Senate, two members of the Boost Case Association, two on the editorial staff of the Differential, the Case year book, and one on the editorial staff of the Case Tech. It is worthy of mention that of the eighteen Honor Keys awarded this year, five came to our chapter.

Although so prominent in student activities, we are not deficient in scholarship, as the four men elected to Tau Beta Pi can testify. Of these, Bayne and Campbell are Seniors, and Torreson and Graf are Juniors.

The chapter will lose twelve Seniors by graduation, but the under-Classmen are fully confident that they can carry on the work which has been so nobly brought forward.

The call of the mines has again gotten Brothers Grimm, Cutter and Klaustermeyer. Grimm had been going to school while Cutter and Klaustermeyer were working in Cleveland, but in February they all departed for Montana.

At the Commencement of Case School held May 25, 1922, Brothers Churchill and Barrett received post graduate degrees of C. E. and M. S. respectively.

The House Company is coming along nicely, due to the able management of Brothers Binder and Stevens, and before long we hope to be installed in a house of our own.

Any brothers who should at any time find themselves in this vicinity are assured of a hearty welcome at the house.

Delta chapter wishes prosperity to all the alumni and a successful year to her sister chapters.

PAUL F. PEAT.

EPSILON CHAPTER

Total Roll of Initiates	197
Initiates since last Gear	35
Active Chapter Roll	28

Of the thirty-five men initiated since March 1, 1921, one is an honorary member, nineteen are or were enrolled in mining, and fifteen have been students of geology. On April 25, 1922, Professor Walter Spangenberg Morley, of the department of metallurgy of the College of Mining, University of California, was initiated to honorary membership by Epsilon chapter. Professor

EPSILON CHAPTER

Morley graduated from the University of California in 1898, acted for one year as assistant in the College of Mining, and then entered the practice of the metallurgical profession. In 1913 he returned to the University faculty, and is now associate professor of metallurgy. He is a member of the A. I. M. E.

Epsilon meets regularly every two weeks, and to summarize our activities for the whole period during which the Gear has been silent is impossible, for lack of space and record. However, business meetings have tended to concern themselves with perfection of chapter government. Accumulation of a chapter fund has been decided as being important, and has been started. For elimination of useless and burdensome discussions in meeting, an executive committee has been organized and has served with wholly satisfactory results. Our greatest advance toward efficiency of this kind has been the adoption of a definite, charted procedure for selection of new men from the large number of eligibles each semester. This operates with first consideration for the quality of men and not for saving time alone.

The chapter has approved the revised constitution submitted to the Fraternity by the Executive Council. We believe that the revised form, with the new edition of the ritual and the projected pledge-form, puts the national organization on a firmer, more business-like footing in keeping with the scope and character of the Fraternity, and we hope to see the shingles and membership cards issued to all members soon.

Grand Scribe Erich J. Schrader paid a three weeks' visit to the vicinity of Berkeley during November, and attended three of Epsilon's meetings. We had the honor of his participation in the initiation of eleven neophytes, and the pleasure of hearing him recount the founding of Theta Tau at our initiation banquet that evening in San Francisco. Brother Schrader brought several alumni of various chapters to our chapter room—men we had not previously met and whom we include in our announcement list and now ask to participate in our programs. Brother Durand A. Hall, '14 Beta, has already given us a description of an examination trip made into Lower California.

Other programs of the past college semester have been semi-technical. Brother Byron O. Pickard, '07 Beta, in charge of the rescue work for the U. S. Bureau of Mines at the recent disastrous Argonaut mine fire, critically described the conditions of the work performed there, and in which several of our members —as part of the mining college's helmet crew—participated.

ZETA CHAPTER

Top Row—Diehl, Beard, H. Patterson, Clardy, C. Patterson, Hawley, Kellet, Olson, Jones, Edwards
Second Row—Bowman, Smith, Wells, Harris, Fox, Miner, Gregory, Beatty, Learned, Jones, Endacott
Third Row—Clawson, Ferguson, Alport, Mnarh, Willis, Prof. Shaad, Shelton, White, Sinnard, James, Bennet, Clawson
Bottom Row—Gray, Duneley, Rutledge, Rose, Knevaler, Beeghley, Brehm, Gane, Cornelius, Luff, Putney, Lucas

Brother Metz, '22, discussed gold mining at Randsburg, California, where he worked during the summer. At the final meeting, a description of equipment and methods used in geological reconnaissance in Southwestern Alaska last summer was given by Brothers Dr. Morse, Nelson, '20, and Leiser, '21.

Brother Edwards, a graduate of the University of Wisconsin, but an initiate of Epsilon chapter, returned last May after five years with the Cerro de Pasco Copper Corporation in Peru, as geologist and assistant superintendent. He at present is instructing in the geology department of the University of California.

Brothers John Metz and Lawrence F. Morel graduated from the College of Mining this December. Morel goes to the San Luis Mining Co.'s mines in Sinaloa, Mexico. Metz has not as yet announced his field of operations.

Grand Regent Dr. G. D. Louderback has been on leave from the University department of geology faculty during the year, but has attended most of our meetings. Our solidity undoubtedly is increased by his interest in the chapter affairs. Dean Frank H. Probert of the College of Mining—one of Epsilon's honorary members—has also been on leave, on account of severe illness, but his recent visits to the campus make us hope that he will be active again in the early future. During his absence, Professor L. C. Uren, also an honorary member of Epsilon chapter, has been acting dean of the mining college.

Epsilon sends its best wishes and regards to the chapters, and hopes for greater unity than ever in the bond.

J. B. Lansen,
Scribe.

ZETA CHAPTER

Total Number of Initiates	162
Active Members, 1921-1922 . . .	41
Number of Initiates, 1921-1922 . .	19

Zeta chapter is now enjoying its second year in a house, since we were broken up by the war. At present, the active members are working strong toward having a house of our own within a year or two. Nothing definite has been done yet, except trying to get the cooperation of our alumni.

Although the graduation of twenty members last spring, we still had twenty-one actives to start out with this year. On Oc-

ETA CHAPTER

tober 10, a smoker was held at the house and six men were chosen for pledging. On October 24, five of the pledges of last year, were initiated.

In school activities, Zeta still holds its high standing with the exception of having a majority of Theta Tau men on the football team. This year there was only one Theta Tau man on the team. However, in basketball we have Brother Endacott, all-valley guard of last year, as captain this year, with Boman playing one of the forward positions. In baseball for this spring we have Brother Wenzel as captain.

In Tau Beta Pi we have ten out of the twenty-four active members with Brother Hawley as president, Endacott as vice-president, Luff as recording secretary, and Learned as high Junior for this year. Brothers Alport and White made Sigma Xi in last spring's election.

On the staff of "The Kansas Engineer", the Engineering School publication, for last year, Theta Tau men held the following offices: Editor-in-chief, one assistant editor, circulation manager, business manager, and assistant business manager. For the coming year the editor-in-chief, two assistant editors, business manager, and circulation manager chosen, were Theta Tau men. Brother Brehm is business manager of "The Jayhawker," the University annual, this year, and was also the author of the last three chosen Senior plays.

On the Men's Student Council, there are two Theta Tau men out of the three representing the Engineering School. Also the vice-president and secretary are Theta Tau men.

The Convention, which was held in Lawrence last year, gave Zeta chapter a new and better idea of just what Theta Tau means to each and every member. We are hoping that we could have as good a representation next year at the Convention in New York.

In closing, Zeta extends its best wishes to all chapters of Theta Tau and their alumni, for their success and happiness, for the coming year.

H. G. Gregory,
Scribe.

ETA CHAPTER

Initiated, 1921-1922	21
Total Active Chapter	43

Having entirely recovered from the effects of the war, and survived the votes of the Faculty, Eta returned twenty-two men

in all, most of whom were hoping to get a sheepskin in the class of 1922.

During the first term, the regular meetings were generally held every two weeks, at which papers were given by some of the brothers or by outside speakers. Notable among the latter was a talk by "Dinty" Moore on Einstein's Theory, made as simple as possible. The writer will not, however, attempt to say just how many understood it all.

Shortly after Christmas, the annual rushing smoker was held in Walker Memorial, to which about 45 men were invited. The speakers were Prof. Miller, who spoke on CO^2 Meters; Prof. Jack, who gave a short talk on the building of submarines; and Prof. Bowman, who gave many reasons why an engineer must be honest in his work. As a result of the smoker, twenty-one men were extended bids and all accepted. At the Hotel Lenox, on March 7, these men were given the right to share the honors and work in Theta Tau.

As usual, Eta has taken a prominent part in the activities of the Institute during the past year. Some of the more important positions held were:

Bill Bainbridge, treasurer M. I. T. A. A.; Henry Bretting, varsity basketball; Chuck Brokaw, president T. A. C. and chairman of Budget Committee; Don Carpenter, president Senior class and president Institute Committee; Lee Cowie, general manager Tech Show; Heinie Horn, chairman Elections committee; Dune Linsley, chairman Activities committee; Don McCreery, president Civil Engineering Society; Art Meling, treasurer T. A. C.; Al Redway, leader of the Banjo Club; Bill Russell, chairman Point System Committee and member of the Athletic Advisory Council; Satchel Shirey, chairman Walker Memorial Committee and president of the Interfraternity Conference; Ham Williams, publicity manager M. I. T. A. A. and Tech Show Advisory Council; Hal Beadle, stage manager Tech Show; Al Brantingham, stage manager Musical Clubs; Hall Kirkham, editor-in-chief of Technique; Ben Lane, general manager The Benchmark; George Johnson, portfolio editor of Technique; Herb Flather, business manager of Technique; Joe Nowell, manager of Boxing; Herm Pike, manager of Wrestling; Bill Scofield, business manager Tech Show; Doc Smith, manager Crew; Mat Taylor, president M. I. T. A. A. and member Advisory Council; Nes Thompson, captain of Gym Team; Watty Waterman, manager Track.

The last two terms of the school year were busy ones for the

Seniors, yet meetings were fairly well attended and good talks were heard. The policy of not taking in men until their Junior year was changed with a revision of the by-laws so in the future the officers will be more familiar with their duties and the workings of the Fraternity. That a successful year is before Eta is unquestioned.

After January 1, 1923, it cannot be said that Tech is without a president, for at that time, Dr. Samuel W. Straton, director of the Bureau of Standards, will fill the vacancy left by the resignation of Dr. Nichols, who was unable to assume his duties on account of ill health. Eta eagerly looks forward to doing its share in welcoming Dr. Straton to Technology.

During the Christmas vacation of 1921, the Combined Musical Clubs made a successful trip, giving concerts in Rochester, Akron, Chicago, Rockford, and Schenectady. A trip is planned this year through New Jersey, Pennsylvania to Richmond, Va. The Tech Show is going to make a trip to New York in the spring vacation.

H. M. Surrey, '22,
Reporter.

THETA CHAPTER

Columbia's engineers leave New York in summer to run traverses by day, and search for Polaris by night in the far wilds of Connecticut. Here at Camp Columbia, two summers ago, was most of Theta's membership, acquiring knowledge, nostralgia, and amusement—the latter largely at the Red Boathouse, a social institution fruitful of varied acquaintance. The presence in the role of instructors of two distinguished brethren, Clendenin and Kreutzer, with the laurels of graduation fresh upon their brows, lent dignity to the rude life of the camp, and those who remained to the end of the season pushed the amenties to the point of organizing as a house-party, of which Brother Morris made a most charming hostess.

Re-united in the autumn, a choice culling of the incoming class led to the initiation of Brothers Gahagan, Jones, Conover, Eilers, Spence, Osborn, Freas and Dorr. With the chapter thus rounded to a pleasing size, we passed through a most prosperous year. Nothing of real note marred the tranquility of our cloistered life till the chapter smoker in the spring, when we foregathered at Keene's Chop House, one of New York's last refuges for stag parties. Here we heard jolly yarns of the old days in the mining

game from Colonel Dwight and Prof. Kemp, and entertained a very promising body of undergraduates who were preparing to take engineering. After our distinguished guests had departed, a fair proportion of the active chapter recalled the song about the last part of a party, and made it a well-rounded evening.

Summer came again, as summer will, and Camp Columbia claimed us. Graduation, however, had cost us eight men, and two others joined the alumni without completing their course. These ten have duly followed the traditions of our roaming profession, and have sought for good work in varied and remote localities. The pursuit of copper has sent Brother Osborn to Arizona, and Brother Tynan to Chile. Brother Potter toils in Ducktown, and Brother Dorr quests for oil in Mexico. The mechanicals have stayed nearer home: Fezandie is teaching at Stevens, while Schwedersky is working in Philadelphia.

Those who remained found Camp Columbia little changed, except that Theta was not as well represented, though Brother Morris upheld us stoutly on the teaching staff. Most of the chapter were losing weight and money, scouring the country to examine mines and smelters. Pittsburgh is the richer by the vanished plumpness of our metallurgists, who spent the longest days of the year following fiery blooms along the tortuous path that gives the I-beam and the channel to the world. The miners lead a more varied life, and their summer was chiefly remarkable for the color that they brought into the social life of Houghton, Michigan. Brother Joyce emerged with twenty-one addresses.

This autumn has found the chapter rather small, though no less energetic. As we have no competition, we take our rushing slowly, and have so far pledged an excellent nucleus in the persons of Messrs. Steffans, Pyle, and Hawkins. Operations on a larger scale will open after Christmas, and the first year class appears to be fruitful of good Theta Tau material. The graduate status of Columbia's Engineering Schools precludes our engaging in campus activities, and the Theta is thus unable to number its captains of crew and managers of chess. It lists no local editors or artists. In our own simple scholastic life, however, we are not without honor, and this year four of the brethren hold the major offices in the Engineering Society, the governing body of the Schools. And there are but a few of us whose waistcoats do not glitter with the keys of scholastic achievement.

New York is thickly infested with these monied people who need the help of technical men to carry on their little enterprises,

and many of our brethren from other chapters must drift through here from time to time. We wish that they would look us up.

R. L. Peek, Jr.,
Assistant Editor.

IOTA CHAPTER

The opening of the 1922-1923 school year at the School of Mines and Metallurgy, Rolla, Mo., found Iota chapter on its toes for the start of one of the most promising years in its history. There were numerous manifestations of a prosperous year both in regard to old men, and new men from which to choose.

Although graduation had taken from the chapter some seven Seniors, there were present at our first meeting Brothers R. K. Stroup, R. J. Stroup, J. F. Hosterman, W. R. Gettler, W. H. Dunlop, B. E. Charles, S. M. Haynes, S. H. Stuart, V. H. Webster, J. O. Jewell, H. E. Zoller, H. S. Pence, H. L. Leonard, M. W. Watkins, E. J. Wendell, K. A. Schmidt, T. G. Weir, E. S. Wheeler, and B. W. Adams.

These men, indeed, formed the nucleus of a very active chapter. Plans were laid to carry out the scheme of the previous year to have talks at each bi-weekly meeting by some member of the fraternity. These talks during the year proved very interesting, as most of the men gave their experiences in various fields of endeavor. Among those outstanding was an exceedingly interesting and instructive talk by Brother Dunlop on the Coeur d'Alene mining district.

Iota, also, was favored during the early part of the year with a smoker from Sigma Gamma, the competitive engineering fraternity recently installed at the School of Mines. This compliment was returned by Iota later in the year at a very successful smoker.

As is always the case, it soon became evident that Iota was to have some very active competition from the newcomer—Sigma Gamma Epsilon—and to keep Theta Tau up to its high standard of former years it behooved the chapter to gather in new "timber" to bolster up our ranks for the coming year. The efforts of the chapter to choose new men were soon rewarded by the pledging of nine new men, true Theta Tau material, who were initiated on October 15, 1921.

The spring term found the chapter again in the field of competition for new material, as the active members could see that graduation in the spring would take an extra heavy toll. In due time eight men were pledged, and initiated on March 11, 1922.

IOTA CHAPTER

Theta Tau men during the year proved themselves worthy of their school records. Of the active members during the year, ten were members of Tau Beta Pi, and six were members of Phi Kappa Phi.

The winter term of 1922 found some seventeen men answering to the first roll call. Plans were well under way to re-inforce our somewhat depleted ranks when Sigma Gamma pledged her men earlier than usual. Iota then sought to go easy and as a result only five men were pledged, their initiation being held on November 17, 1922.

For the second semester Iota plans to be more progressive, and from the promising lot of men eligible should get some choice Theta Tau material.

Since last year, Iota has had Captain Medding of Eta chapter in regular attendance at our meetings. Captain Medding is in charge of the R. O. T. C. unit at the School of Mines, and has evinced considerable interest in the activities of the chapter.

In athletics, Iota has more than played her part. Brothers Zoller, Watkins and Moodie, and new initiates Hoover and Campbell, took a very active part on the football squad. Brother Zoller was captain of the team and made an enviable record for himself and school.

Although Iota during the past two years has experienced its first real competition, it can be relied upon to give a good account of itself in the years to come, for some one has said that "competition makes life worth living," and a worthy life can be expected from every Theta Tau man in Iota chapter.

E. S. Wheeler,
Reporter.

KAPPA CHAPTER

The scholastic year of 1921-1922 was rather an uneventful one for Kappa chapter. The new idea of a dinner being served by one of the brothers before each meeting was inaugurated, and proved very successful. Our visits to the various fraternity houses about the campus were successful, not only in the culinary line, but we also found that a much better attendance could be looked for when a "feed" was promised. The dinners also promoted a closer relation between the members.

Our initiations were carried out in a highly successful manner.

KAPPA CHAPTER

Kappa chapter extends a hearty welcome to all visiting brothers to Champaign, and urges them to attend our meetings.

The coming year promises to be a very successful one for Kappa chapter. A new expansion policy is in force, in which more men will be taken in earlier in their school life. The plan is to take Sophomores at the end of the spring term so that they may have a longer period of membership in Theta Tau during their school careers, and thus will be able to make a stronger and better organized chapter than ever possible before.

With this idea in mind, Kappa chapter is endeavoring to make this the best and biggest year that Theta Tau has ever had at Illinois.

R. P. Cortis,
Secretary.

LAMBDA CHAPTER

During the summer vacation the active members of the chapter were scattered over several states, most of them getting practical experience in the engineering game. Some did not return to school. The brothers that returned to school are very active and are busy gathering the best men in school for future members of the chapter. We intend to have lectures every two weeks by prominent engineers and business men on subjects that we think most helpful.

The following are active members of Lambda chapter at the beginning of the school year of 1922-1923: Brothers William J. Cope, James C. Littlefield, Earl C. Lee, Homo J. Kjaer, Ivan L. Anderson, Austin J. Gibbons, Harvey L. Garrity, Thomas C. Browning, Wayne L. Farnsworth, L. K. Jacobson.

Ivan L. Anderson,
Correspondence Secretary.

MU CHAPTER

As Mu is the youngest chapter of Theta Tau; two days younger than Nu, the brothers will no doubt be anxious to learn more about the University of Alabama, our origin and what we are doing.

The University opened its doors to students in 1831 and has developed into one of the strongest schools in the South in almost every department. It is situated in the middle part of the state,

MU CHAPTER

near the city of Tuscaloosa, on a level stretch of country bordering the Warrior River, one of Alabama's largest and most beautiful waterways. Tuscaloosa is a typical old southern town and to an extent today brings reminiscence of that old plantation life; an ideal place for a university. Sixty miles northeast lies Birmingham, the great industrial district of our Southland; an exemplification of the rapid southern industrial development.

Our campus is one of the most beautiful in the country. It is shaded by great oaks half a century old, that welcomes all to that stately old institution that lies within.

The old Engineers' Club of the University affiliated with the American Association of Engineers in 1919, and in the midst of the rapid growth of the Engineering College the need for a strong fraternal organization was soon felt. At the beginning of the scholastic year of 1920-1921 the Castle Club was organized to supply that need. Its personnel consisted of those men of the highest standing in all-round college life at the University. A stronger and more conscientious group would be hard to find anywhere. Its purpose was virtually that of Theta Tau, but of course, in a local way, as few of us were familiar with Theta Tau at that time.

When our local was strengthened we began to look for bigger things and found only one real National Engineering Fraternity and immediately petitioned it. In the early part of December of the following year we received the great news that our petition had passed. At that point our efforts were increased in trying as best we could to meet every requirement of Theta Tau. On January 3, Dr. Louderback gave us the mysteries of Theta Tau and installed us as Mu. All twelve of the Castle Club were taken in as charter members of Mu and our seven pledges as members. We were greatly impressed by Dr. Louderback from the beginning and got from him an inspiration that will always last. We feel proud of the opportunity of being installed by such a man. Brothers C. B. Cameron, B. '11, of Bessemer, Ala., and W. P. Thomas, Eta, '19, of Birmingham, assisted him in the installation. Mu has the warmest feeling toward these two brothers and feels grateful to them for the kind advice and assistance they have given us. The officers at that time of the Castle Club took the chairs in Mu, Brother F. L. Davis as regent. Much of the success of Mu thus far is due to the ardent work of this staff and particularly to the never-ending efforts of Brother Davis. Some of the best work in our chapter was also done by Brother J. H. Windgard, scribe.

Mu has existed only five months and so much of this time would naturally be consumed in the business affairs, as the older brothers will realize, that little time was found to do many of the other numerous and necessary things, however, our brotherly and fraternal spirit was already so thorough and so strong as to bind us firmly in Mu inseparable. A more congenial and harmonious group is found nowhere.

In the way of accomplishments of Mu's members, it can be summarized as a membership of the leading men in the Engineering College and of the whole University. Two of our brothers on the football squad, Brother Leake on the basketball squad and president of the "A" Club, a club composed of all letter men in school. Two brothers in the "Jasons", an honorary club composed of the most prominent men on the campus. Fifty per cent of our members made the "Honor Roll" this year. At the beginning of the present year the Faculty picked six men to become honorary members of Tau Pi Epsilon, an Honorary Engineering Society; all six were of the Castle Club and of the six picked for next year three were of Mu. Four of Mu's men are members of Alpha Pi Epsilon, a National Honorary Debating Society. The president, vice-president and secretary of the oldest debating society of the University are of H. and T. Twelve of Mu's men hold fellowships in the Engineering College. Every officer of the University chapter of the American Association of Engineers for the past two years was at the time of his election in either the Castle Club or Theta Tau. This is the largest organization of engineers here, and is one of the strongest in school. Mu's men can be found in the chairs of almost every organization on the campus to which engineers are eligible.

Mu is aware that much is left undone and that the coming year is most vital to her future, but the younger brethren who will return are all enthusiastic and ever ready to strive toward making Mu one of the best in Theta Tau. They are all of the kind who will not accept failure and big things can be expected of them.

We hope that some of the brethren, when down our way, will find it convenient to visit us and our University, and are always anxious to meet a Theta Tau. We guarantee each and every one who comes, a most hearty welcome. Mu is proud to be of H. and T. and will ever strive to do credit to Theta Tau, and in turn make of ourselves engineers of whom our country and Alma Mater will be proud.

S. D. Moxley.

NU CHAPTER

We feel that since this is the first appearance of Nu chapter in the Gear we should first introduce ourselves to the other chapters and then tell what we have been doing since our installation.

Nu chapter of Theta Tau was installed at Carnegie Institute of Technology on January 1, 1922, by Dr. G. D. Louderback. The local fraternity from which Nu chapter was formed was known as Gamma Nu Epsilon and consisted of students of the Mining and Metallurgical Department. Previous to petitioning Theta Tau the policy was changed so as to include students from the other engineering courses.

The Carnegie Institute of Technology is concerned primarily with technical education, grouping its work into four main divisions: (1) courses in engineering, for men; (2) courses in fine and applied arts, for both men and women; (3) industrial courses, for men; (4) courses for women which combine training for the home and for a profession.

The Institute consists of our separate schools, each with its own faculty, buildings, and students, and each giving both day and night instructions. The schools are as follows:

1. College of Engineering.
2. College of Fine Arts.
3. College of Industries.
4. Carnegie College for Women.

The College of Engineering which is, of course, our field for choice of men for Theta Tau, has a student body of about twelve hundred at the start of each year, of which approximately five hundred are Freshmen. The various courses leading to the degree of Bachelor of Science offered are as follows: Chemical, Commercial, Civil, Mechanical, Metallurgical, Electrical, Mining, Sanitary, and General Science.

At the time Nu chapter was installed we had twenty-five active members, two faculty and two alumni members. Later in the year this number was increased by twelve, but due to the large number of Seniors in the active chapter we found ourselves with only twenty-one men at the beginning of this school year. We have pledged and are preparing to initiate in the near future the following men:

H. A. Baugh, Hastings, Neb.; J. Campbell, Philadelphia, Pa.; George Cooley, Kittanning, Pa.; K. T. Davis, Brownsville, Pa.; P. C. Gannon, Pittsburgh, Pa.; Edw. Gilbert, Charlestown, W. Va.;

C. N. Hollingsworth, Edgewood, Pa.; H. J. McCormick, Buffalo, N. Y.; Arthur Neff, Olean, N. Y.; E. R. Patton, Sewickley, Pa.; E. Robertson, Kean, N. H.; P. F. Schucker, Pittsburgh, Pa.

These men come largely from the present Junior and Senior classes. Since we are not in strong competition with any other professional fraternity we feel that by taking our men from the upper classes we have more opportunity to know them and can choose our men with greater confidence. Out of the present actives there are only four men who are not members of some social fraternity on the campus; of the pledges only one is not a member of a social fraternity.

Of last year's graduating members there were three members of Tau Beta Pi, honorary engineering fraternity; in our group now we have seven members of Tau Beta Pi. Our scholastic standing as a fraternity at this school ranks among the highest. In addition our membership includes some of the most active men at Carnegie. The offices held by Theta Tau men are as follows: president of Student Activities Board, vice-president of Student Activities Board; two members of Student Council, president, vice-president, and four other members of the Science Senate, president, vice-president, and secretary, of the Civil Engineering Society, president of the Chemical Engineering Society; president, vice-president, secretary, and treasurer of the Commercial Club, president, vice-president, secretary, and treasurer of the mining and Metallurgical Society. Four of our members wear the "C". We have two members of Alpha Nu, honorary literary fraternity. We have eight members of class honorary societies.

One of the most important steps taken by our chapter has been the pledging of Dr. D. A. Lyon of the Bureau of Mines as an honorary member, and he is to be initiated within the next few days. We feel that Dr. Lyon will be a real aid to Theta Tau, because of his standing in the professional engineering world, his splendid character, and very pleasing personality.

Our bi-monthly meetings, coupled with frequent social gatherings, enable us to build up a splendid fraternity brotherhood even though we do not at present possess a house. We are doing our very best here at Carnegie to be worthy of being a chapter of Theta Tau and feel that we are making rapid progress.

S. J. Duncan.

Among the Alumni

ALPHA CHAPTER

Herbert S. West, '21, was married May 22, 1922, at the Davenport Hotel, Spokane, Washington, to Miss Myrtle E. Johnson of St. Paul. Herb is still at Kellog, Idaho.

William Ripley Dorr, '14, has a son, Roger, born March 21, 1921, who, according to his father, "shows great interest in all mechanical devices from egg-beaters to automobiles." Brother Dorr moved on January 1st from La Grange, Ill., to Los Angeles, where he is district manager for the pipe organ company with which he has been associated since leaving school.

George A. Gein, '16, has resigned as captain, corps of engineers, U. S. A., and associated himself with S. W. Straus & Co., National Metropolitan Bank Building, Washington, D. C.

George M. Shepard, '09, announces the arrival of a daughter, on October 2, 1922. Brother Shepard has recently been appointed city engineer of St. Paul.

Hugh A. Smith, '18, was married on August 22, 1922, to Dorothy Neal (Sweetbriar, '19), at Ocean Park, Washington. They will live in Boise, Idaho, where Brother Smith is Boise Division engineer of the Idaho Power Company.

Edward H. Stilwell, '11, has a son, born October 16, 1922.

Verne Curtis, '22, has the wholesome position of assistant supervisor of the Garbage Dept., Minneapolis.

Ernest W. Seeman, '20, has severed his connection with the the chief engineer's office of the Elgin, Joliet, and Eastern railway to enter the employ of a construction company in Minneapolis.

Fred A. Davies, '16, is geologist in charge of the Anaconda Copper Mining Company petroleum exploration work, with headquarters in Montana. During the past summer, he has been examining properties near Salt Lake City, Utah.

Garfield Siverson, '22, was married March 12, 1921, to Miss Helen Jane Burke of Minneapolis. Guff has been "holding out" on the boys since that time.

William L. Mahoney, '13, reports that he is married and has two children.

Leslie L. Hallihay, '21, is engineering field aide of the Minneapolis city planning commission.

Benjamin B. Walling, '09, has a son, Willis Lampert, born June 16, 1922.

Henry J. Matchett, '13, reports the arrival of his second daughter, Helen Louise, on January 29, 1922.

David M. Giltinan, '15, announces the birth of a son, David Murray, Junior, on October 26, 1922.

David S. Craig, '18, has a son, Jefferson, born August 17, 1922.

Don Capstick, '22, is in the Testing Department of the Minnesota Steel Co., at Morgan Park, Duluth.

Lyn Foley, '18, and Guff Siverson, '22, are chasing antielines down in Oklahoma. Guff is running plane table for Lyn.

Don Marshall, '19, was in Minneapolis recently. Don is still with Proctor & Gamble, but the place is New York, now.

Among the Alpha men building roads with the Highway Commission are O. M. Ruysvold, '15, Wendell P. Chapman, '14, Cliff Rogers, '19, Lewis Arnold, '20, Loren Dawson, '21, Orrin Markison, '22, and Don Gray, '22.

Ken Johnston,' 21, has decided that the highway is no place for a mining engineer. He is in charge of the Wanless mine of the Oliver Co., at Buhl.

Henry Chamberlin, '21, is letting the Case underclassmen in on some of the secrets of mineralogy.

John Adams, '11, is a realtor in Minneapolis, and spends his spare time holding the position of secretary of the Hennepin Holding Company.

Ed Andersen, '17, is assistant to the works manager of the Attica Shops of the Westinghouse Co.

Thomas Askew, '16, is engineering a general mercantile business at Plainview, Minn.

M. C. Barnum, '11, is president of the Northern Machinery Co., in Minneapolis.

Hans Berndt, '20, is one of the Theta Taus working for the Minn. Steel Co., at Morgan Park, Duluth, Minn.

Ray Bros, '19, has stayed with the Wm. Bros Boiler & Mfg. Co., of Minneapolis.

Fred W. Buck, '09, may be included among the Alpha alumni who have entered the realty business. He is located in Duluth.

George Morse, '21, is with Lloyd's in Minneapolis, but is studying law in his spare time.

Pere Williams, '22, is field clerk for the American Telegraph & Telephone, working in Wisconsin and Illinois.

BETA CHAPTER

Rowland King, '16, claims that his son, born February 24, 1921, is "some Kid."

Robert R. Van Valkenburgh, '13, announces the birth of a daughter, Paula, on July 16, 1922.

William A. Conley, '19, has a daughter, Willa Jean, born October 17, 1922, at San Antonio, Texas.

John F. Holmes, '19, reports the birth of a daughter, Marjorie Grace, born September 11, 1922.

Harry S. Aldrich, '17, has a daughter, Eleanor Belles, born November 22, 1921. Brother Aldrich is a first lieutenant of the coast artillery, U. S. A., stationed at Camp Eustis, Virginia.

Fred K. Houston, '06, and Helen Duffy Mullady were married on October 16, 1922, at Missoula, Mont.

Al Ferris, '11, is super of the Yerger Canyon Mine, he gets his mail through Prescott, Ariz., Box 845.

Arthur Endress, '21, Beta, is at Cave-in-rock, Ill., with the Spar Mountain Mining Co.

Roy Earling, '08, is with the U. S. Smelting & Refining Co., in Boston.

Roy Dreer, '21, is in Louisville, Ky., selling X-ray equipment.

C. B. Cameron, '10, is division engineer on the T. C. & I. R. R., at Bessemer, Alabama.

Carl Abrahamson, '21, is at Stambaugh, Mich., as mining engineer for the Brule Mining Co.

Arthur Allen, '15, is not permitting his engineering education to interfere with his ability to make a living. He sells Chevrolets in San Pedro, Cal.

Ed L. Bemis, '18, holds down an engineer's job with the International Harvester Co., at Nashwauk, Minn.

James A. Barr, '07, is an engineer for the International Agriculture Co.

Don C. Blackmar, '12, works for the General Aluminum & Brass Co., as assistant metallurgist.

Maurice Brady, '16, is acting chief engineer for the Mahoning Ore & Steel Co., at Hibbing, Minn.

E. J. Breton, '20, is stripping foreman at Point Mills, Mich.

Delos Dobson, '18, is metallurgist for the Samson Tractor Co., in Waukesha, Wis.

GAMMA CHAPTER

Eugene R. Aaron, '22, has spent several months with us prior to sailing for Africa as an engineer on the staff of the Sinclair Exploration Co.

Donald L. Bailey, '21, is a member of the engineering staff of the United Comstock Mines Co., at Gold Hill, Nevada. He was in Denver recently, because of the death of his father.

Samuel J. Burris, '15, is manager of the Anna Beaver Mines Co., at Cardin, Okla.

S. D. Cunningham, '21, is now employed by the Crane Co. in Los Angeles, Cal. On September 18, he became the proud possessor of a baby girl.

George V. Dunn, '20, was a recent visitor to Golden. He is at present employed as geologist by the Roxana Petroleum Co. at Ponca City, Okla.

Thomas G. Foulkes, '22, has become a member of the faculty since his graduation last June. All the freshmen call him "Prof" now.

David J. Graham, '21, is spending the fall with us before embarking for Clifton, Ariz., where he has some mining interests.

Daniel S. Harbour, '22, is chief engineer for the Tigre Mining Co., at El Tigre, Sonora, Mexico.

Domingo Moreno, '22, is employed as engineer by the Denver Tramway Co. His headquarters are in Golden, Colo.

Louis C. Rhodes, '22, stopped off a few days with us on his way to Arizona to accept a position with the Arizona Copper Co.

Maurice H. Robineau, '23, again won the school championship in tennis this fall. Bud wields a wicked racket.

Frederick L. Tyler, '23, was presented with a baby boy on Armistice Day. We hope this means another H. and T. for Gamma.

Charles M. Schneider, '20, who has been working in Bolivia for the past two years, returned to Golden this fall for an extended visit. He is at present in Colorado Springs.

Russell J. Parker, '19, has returned to the Belgian Congo after visiting his home during the summer.

Lincoln Ehnbom, '17, announces the birth of a daughter, Mary Fredrique, on February 17, 1922, at the home of her grandmother.

W. B. Case, '20, is an engineer for the Treasury Department, at Washington, in the Oil and Gas Valuation Section of the Income Tax Unit.

J. J. Burns,' 16, practices mining engineering at Hurley, New Mexico.

Rex Allan, '22, is at Cananea, Mexico, on the engineering staff of the Capote Mine.

DELTA CHAPTER

William A. Liebing, '17, received the degree of M. E. at Case School of Applied Science in June, 1922.

Homer L. Hunsicher, '19, reports three boys in the family now.

Hoy Stevens, '22, the last Gear editor, was married August 15, 1922, to Miss Aris Coultas. We hope the former editors are not seeking to establish a precedent, as Budde, too, has fallen.

Z. C. Kline, '10, tries to announce the birth of a daughter without seeming to be too proud of the fact.

John F. Groselle, '17, was married November 11, 1922.

G. E. Alderson, '09, writes: "Have finally overcome my weakness for globe-trotting and settled down in the smoky city to raise a family; but I haven't given up my intention of spending my old age on a coffee plantation."

Cedric Fabel, '22, is in the aluminum die casting business with the International Permold Co., Cleveland.

Russell Fish, '22, is encroaching on the territory which Beta and Alpha men regard as their own, the Mesabi. He is at Buhl, Minn., with the Hanna Mining Co.

Clarence Diemer remains in Cleveland. He is foreman with the Champion Rivet Co.

Paul Cutter, '18, is a mining engineer out in Butte. Some of the Alpha miners met him this summer.

Carl David, '17, is doing research for the Butterworth Judson Co., in Newark, N. J.

Henry Campbell, '22, is a mechanical engineer for the Toledo Furnace Co.

G. E. Alderson is now assistant superintendent of the Duquesne Reduction Co., at Pittsburgh.

Allen Badger, '14, is still at the Watertown Arsenal.

Fred W. Bayne, '22, is instructing the boys at Yale.

Otto Bendr, '12, after sending his sympathies to the editor, mentioned the fact that he is still instructing in the Cleveland Heights Schools.

Ed J. Buell, '17, manages the Niagara Wire Weaving Co., Ltd., over in Canada.

Donald Frisbee, '11, manages the Southern Sales District of the Barber-Greene Co.

Carl Ganzenmueller, '17, is with the U. S. Gypsum Co., in Cleveland.

John Groselle, '17, is at the Rock Island Arsenal, as auto engineer.

Herbert Haserodt, '18, is still in Cleveland.

Russ Greenslade, '15, remains in the Air Service—seems to like it.

Elbert Griggs, '20, can be reached through the Stephens Adamson Mfg. Co., Aurora, Ill.

Harley Freeman, '17, is in Cleveland as president of the Industrial Machine Co.

EPSILON CHAPTER

Sam Grinsfelder, '20, has returned to the Shasta Zinc and Copper Co., Winthrop, Cal., after being with the Bureau of Mines, during the temporary shutdown.

Carlton Hulin, '20, has returned from South America and is now a teaching fellow in the Geology Department, U. C.

George L. Klingaman, '21, and Theo. Crook, '16, are in South America on geological exploration work for oil interests.

Harvey Harrison, '21, is now in Coalinga with the Associated Oil Co.

J. M. Rogers, '21, after being in the Kentucky coal mines for a while, returned to California and is now with the Plymouth Gold Mining Co.

Tom Bailey, '17, is now teaching geology at Pomona College, while Brother Woodford is absent on leave. Brother Woodford is active in the chapter this semester while completing his work for the Ph. D. degree.

D. H. Thornburgh, Ex. '21, is with the Shell Oil Co., as geologist. His report on the Signal Hill area in the Los Angeles Basin led to the drilling of this region.

A. M. Sperry, '18, is now in Tonopah with the Tonopah Belmont Mining Co.

Dick Kerr, '19, has just returned from the Great Slave region in Canada, doing exploration work for an oil concern. He had to pack in on foot, fighting mosquitoes all the way. He says geology is a great life if you don't weaken. He is now with the Shell Oil Co.

R. C. Eisenhauer, '14, is engineer for the Carson Hill Gold Mining Co., at Melones, Calif.

R. T. Salsbury, '21, is now in Berkeley.

Donald Collins, '20, is with an evaluation engineer in San Francisco.

Marcus Peterson, '20, is in San Francisco with the Bethlehem Steel Co.

"Heinie" Howe, '16, is taking post graduate work in geology at Stanford.

Lewis Bond, '16, is now an employee of the Standard Oil Co. His address is Berkeley Y. M. C. A.

Frank O'Neill, '20, is at Elk Hills.

"Charlie" Knox, '17, is reported to be at Long Beach.

Howard Franklin, '21, is at Los Angeles, teaching high school.

C. E. Waldner, '13, is still located at Tonopah.

Geo. Milburn, '21, is at Selby, California.

W. H. Geis, '14, is geologist in charge of all exploration work for the various oil interests of the Consolidated Royalty Group. His address is 306 Consolidated Royalty Building, Casper, Wyo.

J. M. Douglas, '14, ("Pete") still continues his geological exploration work in the Rocky Mountain Region. He recently made an exhaustive survey of the oil resources of Utah. His address is 306 International Trust Building, Denver.

"Len" Obynski, '14, recently returned from one of his periodical and interesting expeditions to Mexico for oil interests. He can be reached at 523 Wells Fargo Building, San Francisco.

A. R. Whitman, '11, has recently forsaken the open sea for the shoals of matrimony. Here's luck, Brother A. R.

J. P. Buwalda, '12, has recently resigned from the staff of Yale University to accept an associate professorship at U. C. He is scheduled to present some new courses on the physiographic side of geology next semester.

N. L. Taliaferro, '13, is again in Mexico on examination of oil properties.

E. F. Davis, '10, has closed up his office in Cheyenne, Wyoming, and is now in San Francisco with the Shell Co.

Mr. and Mrs. Doug McMillan, '13 (the Mr. part of it anyway), were in Berkeley last semester on a short visit. They have returned to the Belgian Congo, where Doug is in charge of separating valuable diamonds from worthless rock.

"Shorty" Barkis, '17, is in Ventura County, California.

John Obynski, '14, is in Mexico on oil work.

Jack Feely, '14, is also reported to be in Mexico.

Dick Nelson, '19, has returned to Berkeley, and is an active this semester.

F. S. Hudson, '12, is geologist for the Ventura Oil and Gas Co. He is in Los Angeles now.

S. J. Ogilvie, '17, is in the auto insurance business in Los Angeles, but the important thing is the announcement of a son born back in September.

C. M. Wagner, '16, writes of the acquisition of a Mrs. C. M. She was Miss Marion Black of San Francisco.

Herbert Folger, '19, married Eluned Ann Evan, Pi Delta Phi, of Racine, Wis., in August.

Ernest A. Hersam, Hon., is absent on leave from Berkeley as secretary of and acting with the Committee on Milling Methods of the A. I. M. E. He is representing the U. S. Bureau of Mines.

Art. R. May, '17, was married in May to Lucille Ynez Brown, at Santa Maria, Cal.

R. W. Pack, '08, married Miss Evelyn Pew Lockhart of Grove City, Pa., in December, 1921.

W. S. W. Kew, '13, announces the birth of Steven Marston Kew, January 29, 1922.

Roy R. Moser, '13, is acquiring a real family. His third son was born in September, 1922.

Frank M. Smith, '14, is resident geologist at Maricopa, Cal., for the Union Oil. His marriage to Miss Elsie McIntosh of Edgbaston, Birmingham, England, took place in March, 1922.

Omar Cavins, '15, is down in Mexico City as a petroleum geologist.

Hugh L. Berchfield, '22, is with the California Oil Co., working out of Shelby on geology.

Tom Bailey, '17, is associate geologist at the U. of Texas.

Stanley Arnot, '13, runs the Plymouth Consolidated Gold Mines, Ltd., at Plymouth, Cal.

ZETA CHAPTER

Dael S. ("Tony") James, '15, is master mechanic of Swift & Co., at Kansas City, Kans.

Lucius Perkins, '21, is unaffected by the glory of being the father of a "firstborn son."

Kenneth H. Gedney, '18, has established one of the largest architectural and engineering offices west of Chicago. Drop in and see him at the Kipp Building, Hastings, Nebraska.

H. E. Samson, '16, after easing his mind on the subject of traveling cards, adds that he is the father of a son born in September. There is information about the cards elsewhere in this issue.

Chas. M. Coats, '13, is in the oil game, with the White Eagle Co., at Wichita. Also, one boy, born January 1, 1922.

Jamison Vawter, '16, was married in February, 1922, to Miss Theresa C. O'Brien of Lawrence, Kansas. Vawter is assistant professor of civil engineering at the U. of Illinois.

L. C. Angevine, '14, writes a real letter to the Gear. He is superintendent of the municipal water and electric plant of McPherson, Kansas. Had to rebuild the plant when he took charge, built a pet standpipe which he claims is the biggest in the country (any arguments about that?), and remodeled the whole electric plant. Angevine is mighty proud of his burg. Maybe this is blarney, but we would like to get more of it:

"Anyway, I'm so darn glad to get your letter that I am answering it right away and enclosing a check for $2.00 for the Gear. I have been out of touch with the fraternity for so long that I will await the Gear anxiously to find out all that has happened. And when I get caught up to the present I resolve not to let my interest lapse again and to take a greater interest in our fraternity. I have often thought that the Gear should be published oftener so that the interest of the alumni would be kept alive."

Elwood J. Washburn, '16, is a contracting engineer, he can be reached through J. Goldberg & Son Structural Steel Co., Kansas City, Mo. A daughter was added to his family in April, 1921.

Leon Edwards, '22, is with the A. T. & S. F. R. R. in Topeka.

Homer Eagles, '20, is in New York as a valuation engineer.

Clifford Diehl, '22, is at Wichita, with the Kansas Gas & Electric.

J. S. Butler, '14, is vice-president of the Missouri Valley Auto Co., at Kansas City.

A. J. Allport, '22, lays claim to the title, contractor and builder. His shingle may be found at Bedford, Iowa.

Glenn Alt, '16, has taken leave of absence from the U. of Michigan to become resident engineer for the Ann Arbor R. R. at Toledo.

Harold Anderson, '21, now uses his keys to impress the undergraduates at Lawrence.

John L. Bliss, '16, manages the Michigan Sales Office of the Detroit Steel Products Co.

Arthur L. Boman, '16, is assistant engineer of Shawnee County, Kansas.

W. Forrest Brown, '21, is in the engineering department of the Kansas City Railway Co.

ETA CHAPTER

H. M. Shirey is training with the Eastman Kodak Co.

E. P. Etter is working with the Bemis Bag Co., St. Louis.

H. L. Bretting is now at the American Optical Co.

A. R. Gatewood is sailing the high seas.

H. J. Horn, Jr., is working in the sheet metal industry at Wilkes-Barre, Pa.

Bob Harlin is in Denver, Col., with the department of revenue collection.

E. M. Howard is a resident engineer at Ottawa, Ill.

G. R. Johnson is in Hartford, Conn.

L. M. Nelson and A. E. Melino are doing construction work in Chicago, Ill. "Art" wants to get in touch with all '22 men. Write him and see why. Address 2411 N. Kedzie Blvd., Chicago.

L. K. Cowie has a fellowship in the U. of Washington School of Mines.

W. W. Russell is working for the Walworth Mfg. Co. in Boston.

J. C. Nash is with the F. A. Sales Co., Pantucket, R. I. (One bouncing boy.)

D. L. Fiske also has a fellowship at the U. of Illinois.

Frank Russell is with the Peters Butting Wheel Co., Boston.

H. J. Flather is in Detroit with the Maxwell Motors Co.

W. Huger is here in Cambridge with the Worthington Pump Company.

W. W. Bainbridge is with the Dennison Mfg. Co., New York City.

George Owens is at the Philadelphia Sales Office of the General Electric Co., Philadelphia, Pa.

O. G. Williams is a student engineer, New Jersey Public Service.

William L. McPherrin, '14, is sales manager for the Globe Plaster and Mining Co. Bill reports the birth of a son, April, 1921.

L. J. McGrath, '21, is with the Standard Oil Co., at Casper, Wyoming. He was married in May, 1922, to Jean M. Fleming of Truro, Nova Scotia, from Simmons College, Boston.

Lyman S. Baird, '14, has forsaken the engineering profession for the less strenuous one of a mortician, in St. Paul, Minn. He was married in August, 1921, to Pauline Kegg of Detroit, Mich., a daughter was born in August, 1922.

Leslie W. Snow, '14, is credit manager of Bond & Goodwin, New York. His marriage to Emily Royer of Greensburg, Pa., took place in June, 1921.

W. H. Kayser, '18, is now production manager of the Federated Engineers Development Corp. He announces the birth of a son, October, 1921.

Don F. Carpenter, '22, is doing special work for the E. I. du Pont de Nemours Co., at Arlington, N. J.

Norris Abbot, '20, is an engineer with the Manufacturers Mutual Fire Insurance Co., at Providence, R. I.

Fred Barney, '19, helps the Columbia Graphophone Co., at Bridgeport, Conn., stay in business.

Edward H. Barry, '16, manages the factory of the McKee & Bliven Button Co., at Muscatine, Iowa.

IOTA CHAPTER

E. Ross Householder, '18, now helps pass laws for the wooly state of Arizona. Ross is member of the House for Mohave County. He was married to Miss Katherine Raines of Meridian, Mississippi, in June, 1921.

Ronald Swayze, '20, is geologist for the General Petroleum Corp., of Taft, Colo. He married Miss Charlotte B. Gervais of Bakersfield in November, 1921.

Lorain Cunningham, '20, has a little dope to hand all highway engineers. In February he built 2,720 feet of gravel road in one day, using 406 teams with an eight mile haul; a state record for Kansas. Another cause of his pride is Gordon Rowe Cunningham, born in May, 1922.

Tony Golick, '18, is a chemist for the Am. Brake Shoe Co., at the Burnside Works in Chicago.

Warren Gettler, '22, is on the Missouri Highway.

James Gill, '18, in Latrobe, Pa., works for the Vanadium Alloy Steel Co., as metallurgist.

Wm. H. Dunlop, '22, is on the Veterans' Board in Kansas City, Mo.

Kenneth Aid, '20, seems to agree well with the tropics. He is at Maracaibo, Venezuela, chief geologist for the Venezuelan Sun, Ltd.

Dan C. Beyer, '19, is with the U. S. Smelting & Refining Co., in Boston.

M. P. Brazill, '20, has been with the United Last Co., at Crystal Falls, Mich.

Leslie Harlowe, '20, geologist, Invincible Oil Corp., Fort Worth, Texas, that is his official title and address.

KAPPA CHAPTER

Ken. W. Carr, '18, manages the Rochester territory of Ditto Inc. Carr was married to Miss Laura E. Canode of Northwestern U., in September, 1922.

John E. Ott, '17, is with the Acme Steel Goods Co., in Chicago. He was married in March, 1920, to Miss Kathleen Llewellyn Wright of Portsmouth, Va.

Frank W. Voight, '20, is with the Wm. F. Kemp Co., of Chicago. He married Miss Lillian Wilson, Alpha Gamma Delta, in June, 1921.

Wm. O. Nelson, '17, is in the Remig Division of the General Motors Co., at Anderson, Indiana. He announces the birth of a son in November, 1920.

Jack V. Lund, '16, is with Parsons Klapp Brinkerhoff & Douglas, Consulting Engineers, in New York. He announces the birth of a daughter in June, 1922.

Charles Flannery, '17, is down in the Southwest, Roswell, New Mexico, is his address, Box 322.

Paul Burley, '21, is an estimator for the Illinois Central, at Chicago.

Carl Davis, '21, is a mechanical engineer at the Stock Yards, Chicago, but he fails to state what duties a mechanical engineer may have there.

Sylvester Derby, '15, is with the Public Athletic League, at Baltimore, Md.

Frank Foster, '18, is on the Illinois Commerce Commission as assistant engineer. You will find him in Springfield.

Ronald Foulke, '18, engineers sales for the U. S. Gypsum Co., in Chicago.

Hollis Frey, '18, is sales manager, whether the sales are of mouse traps or railroads he does not state, but he is in Bloomington, Ill.

Clifford Gould, '21, engineers sales for the Barber-Greene Co., out of Aurora.

John Green, '22, is with the North Iowa Brick & Tile Co., at Mason City, Iowa.

LAMBDA CHAPTER

Maurice Roche, '19, is at Vipont, Utah, as assistant super of the Vipont Mining Co. He has announced the birth of a daughter in November, 1922.

William J. Walker, '21, was married to Leone E. Haslam, in November, 1922, at Salt Lake. Mr. Walker recently accepted a position as assistant engineer of the Tintic Standard Mine.

J. Perry Erickson, '17, has a private engineering practice in Salt Lake. Box 24 is his address.

Arvid Anderson, '20, has entered the Tuscon station of the U. S. Bureau of Mines, as junior chemist.

Frank Allen, '12, is in the U. S. Forest Service, headquarters Ogden, Utah. His specialty is highways.

E. S. Bonoquist, '11, is resident engineer on Concrete Road Construction at Price, Utah.

C. W. Burningham, '22, is on the U. S. Reclamation Service, working out of Salt Lake City.

Jean Driggs, '16, is resident engineer on the Utah Road Comm. His headquarters is Salt Lake.

Lawrence Anderson, '18, is working for the Phoenix Utility Co., as assistant engineer on construction.

Wesley Gohd, '22, is a draughtsman with the Utah Power and Light Co., in Salt Lake.

J. A. Frank, '17, does everything from managing a furniture store to grubstaking prospectors and financing mining leases in Eureka, Utah.

Ray Gillis, '19, is a construction engineer with headquarters in Salt Lake.

Harold Groesbeck, '17, is with the International Smelting Co., in Salt Lake.

NU CHAPTER

William R. Cuthbert, '22, boasts of the best position held by anyone. He is "seeing the country." At present at Grafton, Cal.

John B. Bean, '22, is superintendent of the T. K. Morris Lime & Limestone Co., at West Winfield, Pa.

Wm. W. Dartnell, '22, is following his profession in Morgantown, W. Va.

H. H. Burdick, '22, is with the Cutler Hammer Mfg. Co., of Milwaukee, as commercial engineer.

Alphonse Broshy, '21, is Bituminous Editor of Coal Age.

In Japan you can get a wife for fifty cents.
Well, a good one is worth it.

* *

He: If you keep looking at me that way I'm going to kiss you.
She: Well, I can't hold this expression long.—The Log.

* *

When we sprang from monkeys somebody tripped.

* *

First Stew: Shay, all them girls have got awfully wide belts on.
Second Stew: Belts (hic)! Them's dresses.

* *

Don't you love this dance?
Wait till we get home.

* *

In the Aeronautical: "Does anyone know the name of the first aeronautical journal?"
"Fly paper."

* *

Uh: "What do you think of the short skirts women are wearing now?"
Huh: "The principle is all right—it's the interest they draw."

The Mining Engineer

If you have been to any school or college,
And possibly you've got a sheepskin, too;
If you absorbed a fair amount of knowledge,
Or, knowing not, can look as though you do;
If you can run a survey like a civil,
Or analyse an ore by wet or dry;
If you can build with neither square nor level,
And lay out towns with just the naked eye;

If you can wear a dress suit, sack, or jumper,
And look at ease in each one just the same;
If you can take the job of "supe" or pumper,
Or any other man who quits the game;
If you can set a bone or tie a sinew,
Or later preach a sermon to the dead;
If you can talk of Webster, Clay, or Depew,
And turn a dinner table on its head;

If you can go to some far-off land-end,
And see its glorious future from the start;
If you can stick through troubles 'till the grand end,
And never lose your patience or your heart;
If you can run a buck saw or a kingdom,
Or turn a petty kingdom inside out;
If you are there to see the final thing done,
That justifies the blows you dealt about;

If you can hold a board of cross directors,
In happiness against their gauzy schemes;
If you can dodge the wrath of the electors,
'Till dividends will flow as in their dreams;
If you can make a mine pay from the grass-roots,
No matter what the time, the place, the year;
Then on my soul, until the final blast shoots,
We'll add the title *Mining* when we call you *Engineer*.

—Darlington, Philadelphia.

We do not wish to show favoritism to any of the engineering branches represented in the fraternity; but we sincerely hope some civil or electrical will become sufficiently peeved to send in something extolling his own profession. Helps make a Gear.

LOUIS P. WOLF, Mem. Am. Soc. C. E.
GEORGE M. SHEPARD, Mem. Am. Soc. C. E.

CONSULTING MUNICIPAL ENGINEERS

1000 Guardian Life Building, SAINT PAUL, MINN.

Water Works—Sewerage—Water Power—Power Plants
Appraisals—Bridges

AMERICAN TEXTILE BANDING CO.

GERMANTOWN — PHILADELPHIA
PENNSYLVANIA

DAVID S. CRAIG, Alpha '18, Superintendent

THE CRAUN-LIEBING CO.

Merchant Engineers

30 EUCLID ARCADE ANNEX, CLEVELAND, OHIO

Power Plant and Heating Equipment

A. HASSELBRING

Consulting Mining Engineer

SAULT STE. MARIE, ONTARIO

Surveys Examinations Reports

E. ROSS HOUSHOLDER

Engineer of Mines

KINGMAN - - - ARIZONA

Complete Assay and Chemical Laboratory

Maximum Economy in Construction without Sacrificing Strength, Utility, Durability or Appearance is Successful Engineering

WALTER HALL WHEELER

E. M., Mem. Am. Soc. C. E.

Designing and Consulting Engineer

Buildings, Bridges, Dams, Grain Elevators, etc.

112 MET. LIFE BLDG. MINNEAPOLIS, MINN.

JAMES A. BARR

Consulting Engineer

MT. PLEASANT, TENN.

FRED K. HOUSTON

Mining Engineer and Geologist

Specializing in Examinations and Reports of Petroleum Fields and Mining Properties in Montana

36 National Bank of Montana Bldg. HELENA, MONTANA

K. H. GEDNEY COMPANY

Architects
Engineers

HASTINGS, NEBRASKA

Whitney B. Wright
PETROLEUM ENGINEER
1578 Gaviotra Avenue
Long Beach California

Frank S. Hudson
GEOLOGIST
Ventura Consolidated Oil Fields
458 South Spring Street
LOS ANGELES, CAL.
NO ENGAGEMENTS SOLICITED

W. S. EK E. A. WILSON
Let's "Gopher" it
Gopher Transfer Company
2115 Chicago Avenue,
Minneapolis, Minnesota
DY 1563

Rowland King
MINING ENGINEER
The C. M. Fasset Co., Inc.
ENGINEERING LABORATORIES
Spokane, Washington

Extract from a recent letter to THE GEAR

¶ "Please publish a more complete list of consulting engineers. I, myself, have considerable consulting work which I must turn over to engineers in other towns who are complete strangers to me. A list of general contractors would be of value also, inasmuch as I could direct business to them, when I'm engaged away from my own organization. In this way we could help one another, and get better acquainted with members outside our own chapter."

The appointment of the L. G. Balfour Company as Sole Official Jeweler to Theta Tau is contingent for its successful fulfillment upon the "Service" the company can render its individual members. We will, therefore, be deeply grateful to have your earnest co-operation and to receive suggestions which will aid our efforts to make the term "Service" more effective. Our desire for your continued patronage is no stronger than our intention to deserve it.

All Balfour made Theta Tau badges contain larger and better pearls, more hand work, and are sold at surprisingly low prices. Your inspection is cordially invited.

Our 1923 Blue Book illustrating various novelties which may be mounted with the Theta Tau insignia will be sent on request.

L. G. Balfour Company

Attleboro, Mass.

Sole Official Jeweler to Theta Tau

BADGES — JEWELRY — STATIONERY

Branch Offices

Richmond – Indianapolis – Pittsburg – San Francisco

L. G. BALFOUR COMPANY

ATTLEBORO, MASS.

Sole Official Jeweler to
Theta Tau

Badges - Stationery
Jewelry

BRANCH OFFICES

RICHMOND PITTSBURG
INDIANAPOLIS, SAN FRANCISCO