



# THE SIGMA ZETAN

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VOL. X

STEVENS POINT, WISCONSIN, MAY, 1939

NO. 3

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## YEAR'S END

We have come to the end of another year. It has been a fairly successful year for Sigma Zeta, if we can judge by the reports we got at the Conclave, and by those that are included in this issue of the SIGMA ZETAN. There is one blot on our 'scutcheon, however, and that is the demise of Eta chapter. Eta seems hopelessly lost in spite of the personal efforts of Master Scientist Gould to effect a revival.

But that blot is greatly overshadowed by that exceptionally fine Conclave Nu chapter put on for us at DeKalb. Those of us who were there will remember it as the best yet. Of course, we say that about each one, but they keep getting better, so what can a fella do? One thing bothered us considerably all during the conclave. We knew that Rose Petal got Brother McClure to DeKalb, but we couldn't help wondering whether Brother McClure would get Rose Petal back to Lebanon. (For the benefit of those who missed it, we might add that Rose Petal is Brother McClure's Buick Coupe of ancient vintage — it has seen better days, but we don't know when.) Seriously, though, that Conclave did cover a lot of things. You'll be able to read about them in this issue, which includes a copy of the minutes, and digests of the student reports which were given at the conclave. These reports range from the metaphysical meanderings of Cady's place in time to Ruth's down-to-earth marcasite concretions.

One thing Cady *didn't* tell was how to make time stand still until the editor catches up. The trout season caught up with us, but all we got was mosquito bites and sunburn—but the scenery was wonderful. You haven't seen anything until you've seen Wisconsin's trout streams.

Well, anyway—we hope this gets to you before school's out.

## THE CHAPTERS

### ALPHA

Shurtleff College, Alton, Illinois  
 Affiliated 1925  
 Master Scientist, Willard Miller  
 Recorder-Treasurer, Betty Blair  
 Membership: Active 16, Associate 19,  
 Faculty 4

In March, members of Alpha chapter heard a lecture by Dr. J. L. Glothart, head of the physics department, on the new 200 inch telescope which is under construction at Mount Palomar, in California. At the April meeting, Professor E. E. List, head of the geology department, presented an illustrated lecture on Astronomy. Demonstrations of polarized light were also given. Later in the month, initiation of new members was held. A delegation from Alpha chapter attended the Conclave at DeKalb on April 21 and 22.

On May 14, the annual Sigma Zeta picnic was held at Chain-of-Rocks Park in St. Louis, Missouri, and was attended by a large group which elected the following officers for 1939-40:

Master Scientist, Willard Miller;  
 Vice Master Scientist, Richard Rutz;  
 Recorder-Treasurer, Marilyn Stanton.

Alpha chapter looks forward to a very successful year, since only a few active members will be lost by graduation.

### BETA

McKendree College, Lebanon, Illinois  
 Affiliated 1926  
 Master Scientist, Lester Wilson  
 Vice Master Scientist, Ralph G. Ruth  
 Recorder-Treasurer, S. M. McClure  
 Membership: Active 8, Faculty 4

At the end of the first semester, two students became eligible for membership in Sigma Zeta and at the present time are pledged to Beta chapter. One of these is Carl N. Beard, Akers Scholar in Chemistry, and the sixth consecutive holder of the scholarship to be initiated into the chapter. Beard is a junior and is employed out of school hours in the research laboratory of the Aluminum Ore Company in East St. Louis. The other pledge is Emma Bergdolt, biology major and a member of the senior class, who returned this year to college after teaching for three years. It is expected that at least a few other students will be eligible for consideration at the close of the school year in June.

Three years ago, Beta decided to center its activities about a memorial project honoring Professor Edwin Baker Waggoner, McKendree's pioneer science instructor. The details of this project were outlined in the January, 1939, issue of the SIGMA ZETAN. Beta believes that by centering its activities around a project that continues from year to year, many advantages have been gained that make it possible more nearly to attain the objectives of the fraternity in the advancement of science on the McKendree campus.

### GAMMA

Medical College of Virginia, Richmond,  
 Virginia  
 Affiliated 1927  
 Master Scientist, Jack Wexler  
 Vice Master Scientist, P. R. Milton  
 Recorder-Secretary, Zalmon I. Blachman  
 Treasurer, Jessie Jeffers

No report.

### DELTA

State Teachers College, Kirksville,  
 Missouri  
 Affiliated 1927  
 Master Scientist, Henry Roberts  
 Vice Master Scientist, Nina Clare  
 Recorder-Treasurer, Anita Begole  
 Membership: Active 9, Associate 8,  
 Faculty 4

Delta chapter sponsored an exhibit at the All School Carnival, including the making of phosgene and oxygen, and a demonstration of the Tesla coil. Delta has continued its monthly dinner meetings, and for programs has had a motion picture, a demonstration lecture on cold light, and a talk by Dr. Jesse Wimp, an alumnus of Delta chapter, on medical schools—their entrance requirements and courses of study.

### EPSILON

Otterbein College, Westerville, Ohio  
 Affiliated 1929  
 Master Scientist, Ralph Ernsberger  
 Vice Master Scientist, Berle Babler  
 Recorder-Treasurer, Mary Beth Cade  
 Program Chairman, Dorothy Steiner

No report.

(Continued on page 6)

# THE SIGMA ZETAN

Published in the interest of Sigma Zeta, National Honorary Science Society

Gilbert W. Faust, Grand Editor

Stevens Point, Wisconsin

## CONCLAVE MINUTES

The fourteenth annual Conclave of the Society of Sigma Zeta was held at Northern Illinois State Teachers College, DeKalb, Illinois, April 22, at 10:30 a.m. with the Nu Chapter as host.

The annual business session was called to order by the presiding officer, Dr. H. W. Gould.

The chairman called for a report by chapters to indicate the number of delegates present from each chapter. A summary of the report follows:

Alpha 2, Beta 5, Gamma 0, Delta 1, Epsilon 0, Zeta 11, Eta (inactive) 0, Theta 0, Iota (inactive) 0, Kappa 10, Lambda 1, Mu 3, Nu (host) 41, Xi 5.

The minutes of the previous meeting were read and approved.

### Reports of Grand Officers

The chairman called for the reports of various committees. The first report called for was on the history of the Society.

Professor S. M. McClure proposed in his report than an auxiliary history be compiled which would include interesting material of the various chapters and which would be of the nature of a scrapbook. The Grand Historian invited discussion on the major history.

Professor Schreiber made the motion that a suitable sum be set aside for the use of the Grand Historian to compile and edit a history of the Society of Sigma Zeta for the use of publicity and for the information of members and interested schools, with the suggestion that the sum be twenty-five dollars. Seconded.

Mr. Schreiber moved that the motion be amended to read that an amount not to exceed \$50.00 be set aside for the use of the Grand Historian in the compilation and edition of a history of the Society of Sigma Zeta for the use of publicity and the information of the members, interested schools, and others. Seconded. Passed.

The chairman called for the report of the Grand Editor.

Mr. G. W. Faust reported that there was to be one more issue of the Sigma Zetan, published in May, giving an ac-

count of the proceedings of the Conclave and chapter reports for the last half of the year.

The chairman called for the financial report.

Mr. T. A. Rogers read the detailed itemized financial report for the year April, 1938-April 1939. The receipts were as follows: Balance \$241.85, Total \$516.25. The disbursements were read as totalling \$221.90, leaving a balance of \$294.35.

The motion was made that the report be accepted and placed on file. Seconded. Passed.

The chairman called for the report of the auditing committee.

Professor Edwards stated that the auditing committee had found that one dollar was due Mr. T. A. Rogers and that after that correction had been made, they had signed the report unanimously.

The chairman called for the report of the ritual committee.

The ritual committee stated that it was not ready to submit a report.

### Old Business

The chairman then called for items of old business.

Mr. Faust stated that the Grand Council had been instructed at the 1938 Conclave to try to get larger representation of chapters to the Conclaves. The Grand Council submitted this resolution: Since the fundamental legislative and policy forming actions, vital to the very existence of the Society, are considered and decided at Grand Chapter Meetings, the Grand Council earnestly requests that each chapter establish a fund to defray the expenses wholly or in part of the chapter's official delegate to the annual Conclave.

And that the Grand Recorder-Treasurer be instructed to transmit this resolution to the appropriate officers of each chapter together with a brief statement of the reasons for its adoption.

The motion was made that the resolution as stated be passed. Seconded. Passed.

### New Business

The chairman called for items of new business.

The first item of new business was the formal voting on the petition to form a chapter of Sigma Zeta at Wilson Teachers College, Washington, D. C.

Mr. Eller brought up the matter of keys as the second item of new business. He made the motion that the Grand Recorder-Treasurer contact the various chapters to see whether a guarantee can be obtained. Seconded.

Mr. Faust suggested a substitute motion. Second to first motion recalled. First motion recalled. Mr. Faust moved that the Grand Council be instructed to negotiate with jewelers with power to act. Seconded. Passed.

### Merger

The next item of new business to be brought up was the proposed merger with Delta Epsilon. Mr. Rogers submitted the following resolution: That the Grand Council be authorized to appoint a delegate to represent Sigma Zeta and meet with a similar representative of the Delta Epsilon Society for the purpose of formulating definite plans for a possible merger of the two organizations, and to report back to the Grand Council. Seconded. Passed.

Mr. Faust brought up the next item of new business by presenting to the group a coat of arms designed by Mr. Olson, Wilson Teachers College, to be considered by this assembly for the official seal of the Society. He presented the following resolution: That the Grand Council be instructed to have completed and to adopt, as official, a coat of arms and seal for the Society, and the Grand Council shall prescribe the usage of such coat-of-arms and seal. Seconded. Adopted.

A resolution was brought up that the Grand Council be instructed to establish a committee on expansion and promotion; which committee shall consist of three members to determine a policy for future growth of the Society. Seconded. Passed.

### Amendments

Mr. Faust then presented the following amendments to the constitution which had been previously submitted to the Grand Council, and approved by a majority of the Council: That Article VI, Section 3, be amended to read: The national officers shall be a Grand Master Scientist, a Vice Grand Master Scientist, a Grand

Recorder-Treasurer, a Grand Historian, a Grand Editor, and a Past Grand Master Scientist. These officers shall constitute the Grand Council.

That Article VI, Section 4, be amended to read: The national officers shall be elected by the Grand Chapter and shall hold office for one year or until their successors are elected. The Grand Master Scientist will automatically become the Past Grand Master Scientist the year following his term of office as Grand Master Scientist.

That Article VIII, Section 2, be amended to read: The duties of the Vice Grand Master Scientist shall be to perform the duties of the Grand Master Scientist in the absence or disability of that officer. The duties of the Past Grand Master Scientist shall be supplementary and advisory to the Grand Master Scientist.

That in Articles VI, Section 2, VII, Sections 1 and 2, VIII, Section 6, and wherever else the word appears, Konclave be changed to Conclave.

Seconded.

### Nominations

The nominating committee, represented by Mr. Schreiber, recommended the following persons for office next year:

Grand Master Scientist, Mr. D. P. Edwards, Xi; Vice Grand Master Scientist, Mr. P. Beyer, Lambda; Grand Recorder Treasurer, Mr. T. A. Rogers, Zeta; Grand Editor, Mr. G. Faust, Zeta; Grand Historian, Mr. S. McClure, Beta.

Recess was taken for lunch.

After the recess, the meeting was again called to order by the presiding officer. A vote by chapters was taken on the proposed amendments to the constitution. The amendments were adopted unanimously.

### Xi Chapter Invites

Mr. Edwards issued an invitation to the Society to hold its Conclave for 1940 in Muncie, Indiana, with Xi chapter as its host.

A motion of acceptance of the invitation was made and seconded and unanimously passed.

A motion was made that the secretary cast a unanimous ballot for the slate as proposed by nominating committee. Seconded. Carried.

Mr. Schreiber suggested a rising vote of thanks to Nu chapter. The vote was given.

The 1939 Conclave was adjourned.

## STUDENT PAPERS

### TRANSMISSION OF SOUND ON A BEAM OF LIGHT

(Demonstration constructed by Robert H. Heidel, and presented at the National Conclave at DeKalb, Illinois, April 22, 1939, by Donald Anderson, Paul Quast, and Orville Lais. All are members of Mu chapter.)

Transmission of sound on a light beam is accomplished by the use of two amplifiers; one of which is used to light a neon bulb, and the other to amplify the light variations affecting a photoelectric cell. Located on one side of the room is the transmission apparatus which consists of an electric phonograph pick-up connected to an amplifier. The output of this amplifier, instead of operating a loud-speaker, is applied to the terminals of a neon lamp which glows in accordance with the amplified electrical impulses set up by the phonograph pick-up. By means of a lens the light from this bulb is focused into a narrow beam of parallel rays directed toward the receiving apparatus. A lens placed in front of the photocell focuses a concentrated spot of light on the photosensitive surface of the cell. Since a photocell responds to a wide range of frequencies, it is capable of producing current variations proportional to variations in light intensity. The cell responds to light variations in the same manner as it does when the sound track on a film produces light variations. These tiny currents set up in the photocell circuit are amplified by means of a sensitive, high gain amplifier to produce sound from the vibration originally set up in the phonograph pick-up.

### MAN'S PLACE IN TIME

(Presented at the National Conclave at DeKalb, Illinois, April 22, 1939, by Roland Cady, Zeta Chapter.)

Man, both collectively and individually, has an exaggerated idea of his importance. When we view such large things as solar prominences we feel our insignificance in the tremendous space of the universe. But we are as small in the scheme of time as we are in space. The motion pictures which we saw of the solar prominences were slowed down at a ratio of 500 to 1. In other words, what happened in five hundred minutes was shown on the screen in one minute. In attempting to

examine our position in time, let us compress time so that we have a ratio of six hundred thousand to one. Thus, one minute represents two years. Let us see what has happened to history now:

The entire age of the earth, as recorded by geological time, is still three thousand years.

Man has been on the earth for one and one-half years; using implements, even crude ones, for only one year.

The several chills which you noticed last month were the ice ages.

We have had Christianity only a little over sixteen hours.

Rome fell last evening; the dark ages occurred at midnight.

Columbus made his historic voyage three and three-quarters hours ago.

One hour and twelve minutes ago we won our independence from England.

Faraday discovered the laws of electricity only one hour ago, and within thirty minutes Edison had given us the electric light.

The World War ended ten minutes ago; it lasted only two minutes.

We have had air mail but seven and one-half minutes.

So it is that we find man is small in time as well as space.

### MARCASITE CONCRETIONS ASSOCIATED WITH THE BELLEVILLE COAL NEAR LEBANON, ILLINOIS

(Presented at the National Conclave at DeKalb, Illinois, April 22, 1939 by Ralph G. Ruth, Beta Chapter.)

The mineral marcasite, not previously reported from this area, has been identified from the roof shale of the Belleville ("No. 6") coal, where it occurs as discoid, radiating concretions ranging in size from 2-6 cm. in diameter and less than 1 cm. in thickness.

Determination of the physical properties indicated that the mineral was either pyrite or marcasite; quantitative analysis showed almost theoretical proportions of iron and sulphur and confirmed this finding. As the physical structure of the mineral aggregate made determination of the crystal form difficult if not impossible, chemical tests were sought to differentiate the two minerals.

On removal of the tarnish with dilute hydrochloric acid, the specimens showed the tin-white color characteristic of mar-

casite instead of the brass-yellow of pyrite. On solution of the coarsely broken mineral in cold concentrated nitric acid, a copious precipitate of free sulphur resulted. As these two tests are the most characteristic of those used to distinguish between these two minerals, the positive results indicate the mineral to be marcasite.

These tests, when applied to other forms of concretions occurring in or near the Belleville coal, indicate the possibility that much of the material previously reported from this area as pyrite may, in reality, be marcasite.

### NOTES ON THE CIRCULATORY SYSTEM OF THE CRAYFISH

(Presented at the National Conclave at DeKalb, Illinois, April 22, 1939, by Owen Willimas, Beta Chapter.)

The internal circulation of the crayfish (*Cambarus diogenes*) has never been fully described in the available literature. While the principal arteries, veins and sinuses are well known, the course of the blood in the appendages has been traced much less accurately. This paper describes the circulation in the appendages and the technique developed to observe it.

The young crayfish, before the yolk is absorbed, is removed from the swimmerettes of the mother to a pitted slide and a cover slip placed directly over the animal. Under the low power of the microscope, the movements of the heart and of the minute ametoic corpuscles are plainly visible, since both the body and the appendages of the young animal are transparent.

In the walking legs, the blood enters the protopodite through a definite branch of the subnural artery; this vessel continues down one side of the protopodite,

giving off minute branches at frequent intervals, until the first main joint of the appendage is reached, where it abruptly turns to the opposite side of the appendage. On reaching the point of branching into the exopodite and endopodite, the artery itself divides into a larger branch to the former and a smaller to the latter.

At this point, the vessels are very small and could be followed only with difficulty; occasionally, an entire passage could be traced by the presence of motionless blood corpuscles on its walls. (The reason for the motionless state of these bodies is not definitely known but it appeared as if the passage had become clogged with the corpuscles; eventually, motion would be started in the group of bodies and the passage-way would soon be clear of them and become invisible.)

In the antennae, a distinct artery passes down one side of the appendage and an equally distinct vein returns to the body sinus.

Another technique used in tracing the circulation was the selection of an individual corpuscle and the noting of its course through portions of the appendage. The courses so noted were many and varied, so that it is difficult to state whether the circulation followed definite capillary courses or merely filtered through the tissues. Single corpuscles were observed at almost all points in the tissues of the appendages.

In adult specimens, injection of the non-poisonous dye, carmine, into the ventral sinus of the abdomen of the living animal, enabled the major channels of the circulation to be noted readily; even in the thread-like antennae, the outward and return circulation could readily be traced by this method.

## CHAPTERS . . . .

(Continued from page 2)

### ZETA

Central State Teachers College, Stevens Point, Wisconsin

Affiliated 1929

Master Scientist, Roland Cady

Vice Master Scientist, Eileen Marx

Recorder-Treasurer, Ruth Johnson

Membership: Active 29, Associate 11, Faculty 10

Chapter activities have been carried on as usual. Dr. E. F. Pierson, of the biology department gave a lecture on "Microscopic Aquatic Plants and Animals."

Zeta chapter was again represented at the National Conclave with the largest delegation outside the host chapter. The annual picnic was held on the grounds of the Wild Rose fish hatchery and was attended by about 30 happy, hungry members, who did justice to the feed the home ecs fixed. At the picnic meeting the following officers were elected for 1939-40:

Master Scientist, Ethel Hill;

Vice Master Scientist, Reuben Belongia;

Recorder-Treasurer, Ray Wiersig.

**FINANCIAL REPORT OF THE GRAND RECORDER TREASURER  
FOR THE YEAR ENDING APRIL 22, 1939**

Submitted to the Grand Chapter of the National Sigma Zeta Honorary Science Society at the Annual Conclave session held at Northern Illinois State Teachers College, De Kalb, Illinois on April 21 and 22, 1939.

**RECEIPTS**

Balance on hand April 16, 1938		\$241.85
Charter fee, Xi chapter		10.00
Chapter dues, 1938-39, Lambda	(8 members)	10.00
Chapter dues, 1937-38, Delta	(3 members)	3.75
Chapter dues, 1938-39, Xi	(35 members)	43.75
Chapter dues, 1938-39, Theta	(2 members)	2.50
Chapter dues, 1938-39, Xi	(2 members)	2.50
Chapter dues, 1938-39, Mu	(1 member)	1.25
Chapter dues, 1938-39, Gamma	(40 members)	50.00
Chapter dues, 1938-39, Xi	(1 member)	1.25
Chapter dues, 1938-39, Lambda	(5 members)	6.25
Chapter dues, 1938-39, Xi	(10 members)	12.50
Chapter dues, 1938-39, Xi	(4 members)	5.00
Chapter dues, 1938-39, Beta	(4 members)	5.00
Chapter dues, 1938-39, Kappa	(12 members)	15.00
Chapter dues, 1938-39, Gamma	(24 members)	30.00
Chapter dues, 1938-39, Delta	(6 members)	7.50
Chapter dues, 1938-39, Xi	(1 member)	1.25
Marjorie Shade, sale of key		6.90
Chapter dues, 1938-39, Theta	(4 members)	5.00
Chapter dues, 1938-39, Zeta	(16 members)	20.00
Chapter dues, 1938-39, Mu	(7 members)	8.75
Chapter dues, 1938-39, Nu	(21 members)	26.25
		\$516.25

**DISBURSEMENTS**

Grand Recorder-Treasurer, expenses to Macomb	16.00
E. W. Schreiber, postage	2.74
George A. Scherer, printing and postage	47.25
Grand Recorder-Treasurer, postage	2.74
Journal Printing Co., letter heads	6.25
Grand Recorder-Treasurer, telegrams	1.50
Journal Printing Co., Sigma Zeta folder	20.00
Beckley Cardy, filing cabinet	19.95
Grand Editor, Sigma Zetan	33.20
College Shop, Sigma Zeta key	4.50
Missourian Printing Co., Membership certificates	16.50
Grand Editor, Sigma Zetan and postage	6.65
Grand Recorder-Treasurer, postage, express, telegrams, clerical help	12.85
	\$221.90
Balance on hand	\$294.35

Respectfully submitted  
T. A. ROGERS,  
Grand Recorder-Treasurer

**THETA**

Elizabethtown College, Elizabethtown,  
 Pennsylvania  
 Affiliated 1932  
 President, H. L. Leister  
 Vice President, Ralph Duncan  
 Recorder-Treasurer, Lester Manbeck  
 Membership: Active 4, Associate 4,  
 Faculty 3

The regular meetings of Theta chapter have been concerned with the discussion and demonstration of important and recent developments in science. The discussions were led by instructors in the various departments, who were assisted by representative students interested in the particular field of science under discussion.

The chapter sponsored an afternoon trip to the Gilliland Laboratories, makers of biological products. All science students in the college were invited to go along on this trip.

**KAPPA**

Western Illinois State Teachers College,  
 Macomb, Illinois  
 Affiliated 1935  
 Master Scientist, Kenneth McGee  
 Vice Master Scientist, Don McClellan  
 Recorder-Treasurer, Verna Pittard  
 Editor, Clyde Graham  
 Historian, James Nelson  
 Membership: Active 19, Faculty 8

Each of Kappa's programs has been sponsored by one of the science departments represented in Sigma Zeta. The most outstanding of these was presented by the physics department which gave talks and demonstrations on "Light" and "Crystal Structure."

**LAMBDA**

Mansfield State Teachers College  
 Mansfield, Pennsylvania  
 Affiliated 1936  
 Master Scientist, Charles Anderson  
 Vice Master Scientist, Janet Alger  
 Recorder-Treasurer, Jeanette Anderson  
 Membership: Active 25, Associate 9,  
 Faculty 5

Lambda chapter has sponsored two of the college assembly programs, one a demonstration of liquid air, the other on the marvels of the Tesla coil. One highlight of the semester's activities was the initiation and banquet on May 4. Four new active and eight new associates were initiated on that night, and the banquet was

attended by 47 members and alumni. The master scientist reported on the Conclave and announced the election of Mr. Beyer as Grand Vice Master Scientist.

The officers of the chapter for 1939-40 are:

Master Scientist, Theodore Nowak;  
 Vice Master Scientist, Ralph Schwab;  
 Recorder-Treasurer, Barbara Armstrong.

**MU**

Mankato State Teachers Collge, Mankato,  
 Minnesota  
 Affiliated 1937  
 Master Scientist, Finn Larsen  
 Vice Master Scientist, Ira Johnson  
 Recorder-Treasurer, Robert H. Heidel  
 Historian-Editor, Orville Lais  
 Membership: Active 12, Associate 5,  
 Faculty 4

Mu chapter is sponsoring a Science club for all college students who are interested in science—no other qualification is necessary. One radio broadcast on new developments in industry that will affect man's living was written and presented by Sigma Zeta members.

In January, eight active and four associate members were initiated into Mu chapter. Since then both old and new members have been instrumental in organizing a class for radio amateurs which may lead to a license to operate a short wave transmitter. Sigma Zeta, together with a social studies club in the college, organized a "College Day" for high school seniors of the surrounding territory. Sigma Zeta members presented many displays in all the fields of science to the high school students who came and participated in this day of contacts between college and high school students. A report and demonstration of the transmission of sound on a beam of light was presented at the National Conclave by three members. The equipment for this demonstration was constructed by a fourth member of the chapter. (See article elsewhere in this issue.)

Again this year Mu chapter is offering a prize of a Sigma Zeta key for the best demonstration, paper, or combination, presented at one of the meetings. A prize is also offered at graduation exercises to the graduating senior, with a major in science, who has the best scholastic record.