THE SIGMA ZETAN

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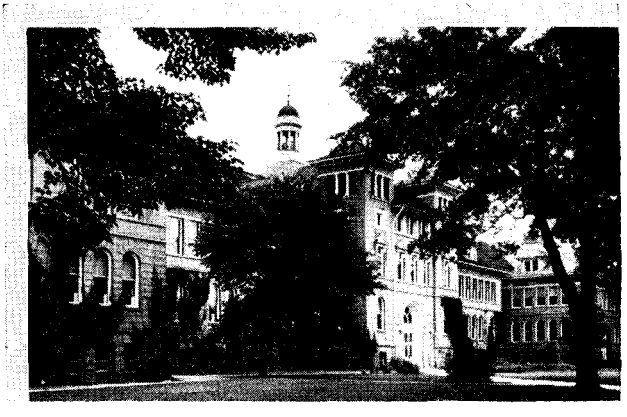

CENTRAL STATE TEACHERS COLLEGE

Stevens Point, Wisconsin

THE SIGMA ZETAN

Official organ of Sigma Zeta, a National Honorary Science Society.

A MESSAGE FROM THE NATIONAL PRESIDENT

A Message to all Chapters of Sigma Zeta

As a society, we are now emerging from the seclusion we were forced to accept for the last few years. We had a good meeting in St. Louis and I think it will serve to open the way for increased activity and interest during the coming year. Altho this meeting was far less fruitful to the interests of the society than were the two-day conclaves of former years, I feel it was the best we could do this year and it would have been a mistake not to have had a meeting. Everyone present seemed assured that by next year we shall again have our two-day conclave and expressed hopes that some chapter will invite the National to its campus.

Our student membership is increasing rapidly now because many of our former men are returning to college. Their extended experience constitute a source of rich material for many interesting programs for their respective chapters. We must not fail to use this. The prospects are good for the individual chapters and also for the national organization.

The present council members who have served with me during the past few years have been especially helpful and prompt in the performance of their duties and I wish to extend my thanks to them. Now that the new group of national officers will soon take over their duties, I wish them a most successful year and assure them of my cooperation and help whenever possible.

W. H. Eller
National President
Sigma Zeta

Minutes of the 1946 Conclave, St. Louis, Missouri, March 30

The meeting was called to order at 1:30 P.M. by W. H. Eller, the National President. After a roll call of chapters was taken the national officers were asked to give reports. S. M. McClure, National Historian asked permission to send in to the National Office a written report later. The National Editors report was next given and accepted. The National Treasurer reported a balance in the treasury of $420.71. An Auditing Committee consisting of C. W. Bennett, Chairman, Robert J. Burke and Floy Hurlbut was appointed to audit the treasurers books.

The next item of business taken up was reports from committees. The Alumni Committee had no report. C. J. Stowell gave the report of the Policy Committee which was accepted. The Committee on Expansion and Promotion had no report. The report of the Ritual Committee was accepted.

The president appointed a nominating committee consisting of H. W. Gould, C. J. Stowell and Earlene Kimler.

Unfinished business;— Nothing was presented.

New Business:—President Eller brought up the matter of having our society affiliated with a national association of honor societies. It was moved, seconded and carried that a committee be appointed to investigate the proposition. The President reported that our society was incorrectly named. Sigma Zeta is not a correct name. This matter was left for the new National Council to decide. It was moved, seconded and carried that a new, wide band be placed on the gavel to include the names of all the new chapters. It was moved, seconded and carried that hereafter the blanks for the annual reports be printed and not mimeographed as in former years. It was moved, seconded and carried that all inactive chapters be investigated by the National Council and if there is no prospect of their being revived they should ask for a revocation of their charter at the next Annual Conclave. It was moved, seconded and carried that the Policy Committee be discontinued. Mr. T. A. Rogers is now deceased and nothing has been done recently by the committee. Vacancies on the Ritual Committee made by the departure of Mr. List and Mr. Glathardt were reported but no action was taken to fill them. It was moved, seconded and carried that the new officers take office on the next July 1st succeeding their election. Discussion as to times and places for holding the National Conclave was terminated by the suggestion that this be left for the National Council to decide. By an almost unanimous vote the students present favored one of the colleges as the most desirable place for a National Conclave.

After a brief recess the report of the Nominating Committee was called for. There was no response when nominations from the floor were asked for. It was moved, seconded and carried that a unanimous ballot be cast for the slate. By this method the following were elected:

National President: D. E. Miller (Xi)
National Vice President: Leonard A. Ford (Mu)
National Recorder-Treasurer: Gilbert W. Faust (Zeta)
National Historian: S. M. McClure (Beta)
National Editor: Sister Mary Clarence (Sigma)
Past National President: W. E. Eller (Kappa)

It was moved, seconded and carried that A. S. Lyness continue to act as National Recorder-Treasurer until the return of Mr. Faust. It was moved, seconded and carried that the report of the Auditing Committee be accepted. It was moved, seconded and carried that $50.00 be set aside from the treasury and used in the best possible way to encourage student delegates to attend the national meeting next year. It was moved, seconded and carried that this meeting go on record as favoring the plan of one student delegate per chapter on the basis of man-miles travelled. The gavel was presented by President W. H. Eller to the newly-elected president, Dr. D. E. Miller.

The meeting adjourned.

Arthur S. Lyness
National Recorder-Treasurer

DELEGATES ATTENDING ST. LOUIS CONCLAVE

NAME	CHAPTER
Becker, Martha	Kappa
Bennett, C. W.	Kappa
Brittingham, Bertha	Xi
Burke, Robert J.	Nu
Clarence, Sister Mary	Sigma
DeClark, Gene	Nu
Dannenbrink, Robert J.	Beta
Dice, Mary L.	Xi
Eller, W. H.	Kappa
Feille, Onice	Sigma
Gould, H. W.	Nu
Hurlbut, Floy	Xi
Kimler, Earlene	Kappa
Layton, Helen	Xi
Loy, James L.	Beta
Lyness, Arthur S.	Zeta
McClure, S. M.	Beta
Miller, D. E.	Xi
Moulton, William	Kappa
Nigbor, Edward	Zeta
Ren, Gerald	Kappa
Simmons, Harriet	Xi
Stowell, C. J.	Beta
Bennett, Dr. Mary	Kappa
Cole, Ruth M.	XI

A LETTER FROM E. E. LIST, FORMERLY FACULTY SPONSOR OF THE ALPHA CHAPTER AT SHURTLEFF COLLEGE, ALTON, ILLINOIS

Ottawa University, Ottawa, Kanasas
March 1, 1946

Dear Editor:

This year I am teaching here. Ottawa science students have indicated an interest in Sigma Zeta. Naturally I am eager to establish a chapter here. Will you send us the necessary papers and information that we need to consider the formation of a chapter of our own? Since I am not connected with Shurtleff College any more I would be happy to work in the society at this school.

I hope things are going nicely with you and Sigma Zeta in the various chapters everywhere.

Thanking you for your kindness, and with best wishes.

Very sincerely yours,
E. E. List, Department of Biology & Geology

MESSAGE FROM THE NATIONAL PRESIDENT

(Elected to take office July 1, 1946)

April 4, 1946

Considering the circumstances the 1946 convention was a success. Unfortunately several chapters were not represented. It is to be hoped that next year there can be representatives from every chapter. Let us do our best to maintain a real interest in our organization both local and national.

Although I consider it an honor to be National President of Sigma Zeta, I do not consider the presidency or any other office to be honorary only. If there is a feeling that the presidency should be only honorary I hope that I can change that feeling. Mr. Faust should be glad to hear this since, in my opinion, the Recorder-Treasurer often has to carry too much responsibility for his good or for the good of the organization.

Let me emphasize that it is most important that at least one faculty member in each chapter take a really vital interest in Sigma Zeta. It is obvious that all faculty members cannot take such an interest. There are too many organizations and committees in the modern college. Preferably there should be at least three faculty members, who show some interest, at least enough interest to know what is going on. But one faculty member should feel particularly responsible and should see to it that there is someone to take his place if and when he goes. Chapters become inactive largely because there are no faculty members to give the necessary stimulus and continuity. In at least one inactive chapter we found students who were interested but not a single faculty member who would take the necessary interest. We all know that a science honorary helps to develop morale amongst science students. Circumstances differ in different instances but generally the influence of a science honorary is for the good.

One of the best ways to develop interest in your organization is to have a national meeting on your campus. Our Chapter at Ball State served as host in 1940. Also, Xi Chapter assisted materially in preparing for the conclave in 1942 at Turkey Run State Park. I think that we have been helped very much by these efforts. It is perhaps trite to say that an individual or a chapter gets good out of Sigma Zeta only in proportion to what is put in by that individual or chapter.

The students want to meet on a College Campus as was shown by the vote at St. Louis. Let us hope that by next September some chapter will have decided to make this the big year by having the national meeting on its campus.

We have many organizations on every campus. It doesnt look as though the number would get fewer. However, let us set up goals, but **limited goals** that we have some chance of reaching; then set up a program to meet these goals and carry out the program in a systematic and effecient way. This can be done without expending too much time and energy. Students who do that will have a worthwhile experience.

And one last point. Chapters are electing officers now or have just recently elected them for the next year. You officers, decide now to do a good, efficient piece of work next year. If you do this your chapter will progress and you will be better prepared for leadership tomorrow.

D. E. Miller

NEWS FROM THE CHAPTERS

BETA

McKendree College, Lebanon, Illinois

Dear Editor:

The membership of the Beta chapter has been increased during the second semester by three members. Mr. Robert Dannenbrink and Mr. James Loy have returned to active membership after several years in the armed services, and Mr. Cecil Albright has been elected as a new member. Mr. Albright was in the service.

At the business meeting of the National Society at St. Louis the chapter was represented by six members. We found the business meeting very enjoyable and profitable.

The officers of the chapter are James Loy, President, and the undersigned.

Fraternally yours,
C. J. Stowell,
Recorder-Treasurer

GAMMA

Medical College of Virginia, Richmond, Virginia

Dear Editor:

It will be impossible for us to send delegates to the National meeting in St. Louis, March 30th, since most of our members have been or are having final examinations. We wish very much that we could have sent them.

Your sincerely,
Frances Stanton, Treasurer

DELTA

State Teachers College, Kirksville, Misouri

Dear Editor:

It was six months ago that I returned from the service of our country. Since my return I have tried to find if there were any former members of Sigma Zeta in school, and just what the status of the organization was. There is not a former member now in school. We have several likely candidates, but it will be fall before they can meet the requirements for initiation. As soon as a chapter can be organized again, it will be.

I am sorry that it was not possible for me to be present at the Sigma Zeta meeting in St. Louis at the time of the A.A.A.S. meetings. I should have enjoyed seeing you all again. To build up our departments in all our schools will take time, and I dare say that Delta Chapter is not the only inactive one. You may be assured of my continued interest and support.

Sincerely yours,
Dr. Wray M. Rieger, Head
Science Division

EPSILON

Otterbein College, Westerville, Ohio

Dear Editor:

The Epsilon chapter has elected twelve new associate members. This brings our membership to thirty-five, including twelve active members, seven faculty members, and sixteen associate members.

The last meeting of the chapter featured an interesting talk on "The Language of Science by Professor J. H. McCloy of the Physics department.

We are looking forward to our annual formal banquet which is to be held in the near future. The award to the outstanding senior member will be presented at this event.

We will need thirty-five copies of the Sigma Zetan for our members.

Sincerely,
Marylu Keller,
Recorder-Treasurer,
Epsilon Chapter

The following are the new officers of the Epsilon Chapter reported by the Recorder-Treasurer January 18, 1946:

President .. Marian Henderson
Vice-president . Lucille Walters
Recorder-Treasurer .....
Marylu Keller
Program Chairman .. Dick Rich

Nine active members are reported for the chapter for the year 1945-46.

Six Sigma Zetans Travel to Austin For Installation

At the invitation of Dr. Fred A. Barkley of the University of Texas, six members of Sigma Zeta attended the activities held on Saturday, February 2, on the University campus in honor of the installation of the I. M. Lewis Biological Society as Alpha Sigma Chapter of Phi Sigma, national biological research society.

The day's program included registration, open house of the biological departments, meetings of members of the Collegiate Academy of the Texas Academy of Science, a lecture by Dr. E. C. del Pozo of Mexico City, installation of the new chapter, a tea for visiting scientists and students, the initiation banquet, and a lecture by Dr. Leon J. Cole, of the University of Wisconsin.

Students attending were Alda Gianotti, Angie Howard, Helen Hoyo, Pat Johnston, Nancy Morris, and Pat Salzman.

The group was accompanied by Sister Mary Berenice and Sister Mary Clare who were received as members of Phi Sigma.

KAPPA

Western Illinois State Teachers College, Macomb, Illinois

Dear Sir:

The following is news of Kappa Chapter of Sigma Zeta at Macomb, Illinois.

Officers:

President .... ..Earlene Kimler
Vice-President .....
Gaylord Zimmerman
Secretary-Treasurer .....
Virginia Thomas
Historian .... William Moulton
Editor ..... Martha Becker

We meet once a month with varying types of programs and occasionally refreshments.

People usually think of Mathematims as a dull subject but not when our mathematics department finished with their program. The theme of the meeting being "Math can be Fun". There were all types of mathematical jokes and catch problems. By the end of the evening the general feeling toward mathematics was improved.

The Home Economics department gave us a hopeful outlook on the foods and textiles of the future.

One of our returned veterans gave a talk with pictures which he had taken while in service in Africa.

Another interesting program was given by the physics department. One student explained the basic principles of television.

We will have our annual spring banquet in May.

We could use 35 copies of the Zigma Zetan.

Sincerely yours,
Virginia Thomas
Secretary-treasurer

LAMBDA

State Teachers College, Mansfield, Pennsylvania

Dear Dr. Lyness:

Your note and forms for report on Lambda Chapter of Sigma Zeta were handed to me. This chapter is inactive—has been for two or three years.

It is probable that the chapter will become active during the next college year.

Very truly yours,
Leonard K. Beyer

MU

State Teachers College, Mankato, Minnesota

Dear Sir:

Your letter of April 9 was received in which you state that I was elected

national vice-president for the ensuing year. I am glad to accept the position.

The Mu chapter has been inactive this year for two reasons, the low enrollment in science courses and lack of adequate staff.

During the spring and winter quarters there has been a considerable increase in students; more students have signified an intention of majoring in science than in any other field and we hope to have an active chapter here next year.

Very truly yours,
Leonard A. Ford

NU

Northern Illinois State Teachers College, DeKalb, Illinois

Dear Editor,

This spring the Nu chapter of Sigma Zeta is very busy. The first item of interest is the inauguration the first in a series of annual lectures in honor of Mr. Ira J. Jenks, professor of chemistry at Northern, who died February 24, 1945.

The second item of business comes under the heading of the Illinois Science Club. This organization is to hold a meeting on the campus April 26. Nu chapter is making all the arrangements. Many of the high schools in this part of the state are invited to attend this meeting which will include talks and displays of interest to students in the science field.

Plans are also underway for the May meeting which will be the initiation and picnic for new members both active and associate. Fifteen new members will be initiated and seven of the active members are graduating at the close of spring quarter.

Sincerely yours,
Shirley Samuelson
Acting secretary, Nu Chapter of Sigma Zeta. Northern Illinois State Teachers College, DeKalb, Ill.

PI

James Millikin University, Decatur, Illinois

Dear Mr. Lyness:

We of the Pi Chapter would like to again resume active membership in the Sigma Zeta Society and at present have about four members on the campus. We understand that there is a charter for our chapter and as yet have not found it. Also missing are the national laws and requirements for membership. If you can help us in securing these, we feel that we could begin having regular meetings soon. We have secured all approvals by the school and need only the things mentioned above.

If there are any more requirements to our reactivation, we would like to know of them as soon as possible.

Sincerely yours,
Russell L. Oettel
Acting Secretary

SIGMA

Our Lady Of The Lake College, San Antonio, Texas

Our Lady of the Lake

Former President of Sigma Zeta Chapter Dies After Illness.

After an illness of several months, Clara Ng died at the Grace Lutheran Sanatorium, Wednesday, January 10, at 8 a.m.

An outstanding member of her class and of her Alma Mater, Clara was president of the Senior Class in '42-'43. She was also chosen to "Who's Who Among Students in American Universities and Colleges" in her senior year. Double majoring in chemistry and mathematics, she was president of Sigma Zeta and held numerous offices in the Curie Science Club, was a member of the American Chemical Society and Texas Academy of Science and also belonged to the Alpha Chi and Pi Gamma Mu.

After her graduation in '44, Clara entered Johns Hopkins in Baltimore, Maryland, in the fall of the year, her one ambition being to obtain her M.D. degree and "go to China to administer aid to my people." But, in April '45, she was forced to leave because of ill health.

Funeral services were held Friday, January 11, at 2 p.m. in St. Ann Church. Attending were members of the faculty and alumnae and students of the college.

Miss Feille Honcred by Sigma Zeta Fraternity At Dinner in Colonial Room of Menger Hotel

The Colonial Room of the Menger Hotel was the scene of a dinner honoring Miss Onice Feille, senior member and past president of Sigma Zeta, on Monday evening, December 10.

To express the gratitude of the members for Miss Feille's loyalty and fidelity to the fraternity, Alda Gianotti, president, presented the honoree with a corsage of white gardenias and reviewed the accomplishments of the fraternity under Miss Feille's leadership. Following the presentation, chicken dinner was served.

The centerpiece of the table was a cluster of white chysanthemums, which with blue candles extending the length of the table, carried out the colors of the fraternity. Cards being the insignia and colors of the organization marked the places of the guests.

Following the dinner, the honoree's mother, Mrs. Ernest Feille, who has been active chaperone of the group for the past several years, was presented with a gift from the club.

Members honoring Miss Feille at the dinner were: Eugenia FitzSimon, Alda Gianotti, Virginia Rose Hargis, Angie Howard, Helen Hoyo, Barbara Johnston, Pat Johnston, Annie Loftin, Mary Matzke, Wanda McGrath, Angelina Messa, Nancy Morris, Dorothy Jo Murray, Giovanna Richards, Pat Salzman, Mary Sartori, Mary Lou Smith, Naomi Smith, Marjorie Tarin, Mary Rose Tarrillion, Jean Tinney, and Cecilia Wright.

Sigma Zeta Plays Host To 5 Clubs

Sigma Chapter of Sigma Zeta, national honorary science fraternity, was host to the science clubs of the various city colleges and of Texas University Austin, on Saturday afternoon, March 16, beginning at 2 p.m.

Clubs invited to the meet were Incarnate Word College, St. Mary University, Trinity University, San Antonio Junior College, and Texas University.

After registration, which began promptly at 2 p.m. in Providence Social Hall, the group adjourned to the Visual Education Room in Science Hall where the meeting was opened by Alda Gianotti, president of Sigma Chapter. Dr. John L. McMahon, president of the College, welcomed the visitors.

Lieutenant Colonel Max Levine, acting chief of laboratory service from Brooke General Hospital, gave an illustrated talk on penicillin. He was introduced by Onice Feille, past president of the chapter.

Colonel Levine prefaced his talk by giving the three theories as to the cause of disease—the evil spirit, sin, and the germ.

A brief discussion of the advantages of bacteria over man and of man over the bacteria followed. Among the first are invisibility, rapid spread, and rapid multiplication; while man's advantages include his intelligence and his power of observing the physiological reaction to the germ.

Going on to penicillin and its effects on the various disease germs, Colonel Levine said that a certain concentration of penicillin must be

maintained in the blood stream for effective control, since it is rapidly excreted from the system.

Two methods in present use are injection of large doses into the muscles at short intervals and the drop method directly into the veins.

Returning after the talk to Providence Social Hall, the members of the group were served refreshments.

A tour through Science Hall and over the campus closed the day's activities.

This meeting had for its purpose the creation of a spirit of friendliness among the various local science groups. It may become an annual activity of Sigma Zeta, according to Sister Mary Clarence, chapter sponsor.

ATOMIC ENERGY

By Nancy Morris

The atomic bomb is the harnessing of the basic power of the universe. It has more power than 20,000 T. of T.N.T.

Before 1939 it was the accepted belief of scientists that it was theoretically possible to release atomic energy. But no one knew any practical way of doing it, but nations at war were working feverishly to add atomic energy to other methods of warfare.

Beginning in 1940, before Pearl Harbor, British and Americans pooled their scientists and began a race that they hoped they would win, and worked until victory was theirs.

Our common sources of power other than sunlight and water power, are chemical reactions—usually the combustion of coal or oil. They release energy as a result of rearrangements of the outer electronic structures of the atoms, the same kind of process that supplies energy to our bodies. Combustion is always self-propagating, thus lighting a fire with a match releases heat to ignite the neighboring fuel, which releases more heat, which ignites more fuel, and so on. In like manner we can imagine nuclear reactions emitting particles of the same that initiate them and in sufficient numbers to propagate the reaction in neighboring nuclei. Such a self propagating reaction is called a "chain reaction". The neutron proved to be the most effective particle for inducing nuclear changes. This was particularly true for the elements of highest atomic number and weight where the large nuclear charge exerts strong repulsive force on deuteron or proton projectiles but not on uncharged neutrons. The results of a bombardment of Uranium by neutrons had proved interesting and puzzling. The absorption of a neutron by a Uranium nucleus sometimes caused that nucleus to split into approximately equal parts with the release of enormous quantities of energy, a process that soon began to be called nuclear "fission". It was proved that an isotope of Barium was produced by neutron bombardment of Uranium.

Two general trends had been discovered in nuclear structure;—first, that the propagation of neutrons goes up with atomic number, second that the binding energy per particle is a maximum for the nuclei of intermediate atomic number. Suppose the U-238 nucleus is broken exactly into half; then, neglecting the mass of the incident neutron, we have two nuclei of atomic number 46 and mass number 119. But the heaviest stable isotope of Palladium (Z-46) has a mass number of only 110. Therefore to reach stability each of these imaginary new nuclei must eject 9 neutrons, becoming 46Pd110 nuclei; or four neutrons in each nucleus must convert themselves to protons by emitting electrons, thereby forming stable tin nuclei of mass number 119 and atomic number 50. or a combination of such ejections and conversions must occur to give some

other pair of stable nuclei. Actually, as a product of fission, the split occurs in such a way as to produce two unequal parts of mass numbers about 140 and 90 with the emission of a few neutrons and subsequent radio active decay by electron emission until stable nuclei are formed. Calculations from binding energy data show that any such rearrangement gives an aggregate resulting mass considerably less than the initial mass of the Uranium nucleus and thus that a great deal of energy must be released. Evidently, there were three major implications of the phenomenon of fission: the relase of energy, the production of radioactive atomic species and the possibility of a neutron chain reaction. Study on these possibilities was begun and it was found that:

1. That three elements—Uranium, Thorium, and Protoactinium—when bombarded by neutrons sometimes split into approximately equal fragments, and that these fragments were isotopes of elements in the middle of the periodic table.

2. That most of these fission fragments were unstable, and by successive emission of beta particles passed through a series of elements to various stable forms.

3. That these fission fragments had very great kinetic energy.

4. That the energy released per fission of a Uranium nucleus was approximately 200 million electron volts.

Work was carried on from here and finally the "chain reaction" was developed. It was known that slow moving neutrons could split the atoms of the Uranium isotope, U-235 giving a mighty gush of energy. Besides energy their "fission" produced more flying neutrons. If enough of these in turn split Uranium atoms, the reaction would maintain itself, gain momentum. It would flash through all the Uranium.

This "chain" did not happen naturally chiefly because only one part in 140 of ordinary Uranium is U-235. Most of the rest is another isotope, U-238—which instead of splitting like U-235, absorbs the new born neutrons with the result that the atomic flame goes out.

Obviously, the remedy was to separate the active U-235 from natural Uranium getting rid of the U-238. It was simple in principle but physicists found that no chain reaction could take place in a small bit of U-235, but a large enough hunk would surely explode.

The problem, once they had the big chunk, might be to keep it from exploding whenever it was struck by a wandering neutron. The explosion, they calculated, would certainly be more violent than anything yet seen on earth.

There was one more possibility. When actual Uranium is bombarded with slow neutrons, more happens than the cracking of the U-235 particles. Some of the neutrons produced by these fissions are absorbed by the more phlegmatic U-238. This forms a new unstable element, Neptunium which soon turns into Plutonium.

Plutonium is a fairly stable element. Like the rare U-235, it is also "fissionable" it can be made to explode in a violent "chain reaction". Furthermore, it is not an isotope of Uranium, but an entirely different chemical element. Therefore, it can be separated from Pranium comparatively easily by chemical means while U-235 clings to U-238 with tenacious obstinacy.

Plants were set up at, Columbia and at Knoxville, Tenn.

Both plants successfully produced large quantities of U-235.

Across from the University of Chicago football field Plutonium was produced and a strange apparatus took form. It was an oblate spheroid (doorknob-

shape), built up of graphite bricks with lumps of Uranium or Uranium oxide imbedded in their corners. This was the world's first chain reaction "pile"—a Uranium "lattice". If it worked it would produce the first chain reaction ever produced on earth.

By theory, the chain reaction should start spontaneously when nearly all the bricks were laid. Then it could be stopped short of a disastrous explosion by inserting strips of Cadmium to break the chain.

This momentous experiment—the very first chain reaction—began the atomic age.

The description of the atomic bomb is incomplete. But we know that U-235 and Plutonium do not have to be exploded by a detonator like T.N.T. They explode automatically whenever gathered together in large quantities. Therefore, a main problem in an atomic bomb is to design a mechanism which will bring small masses to the explosive "critical size". Until the explosion is well started they should be held together by a heavy material "tamper". A possible source of the material—the gold at Fort Knox. When the atomic bomb explodes it works on this principle: When a piece of paper is lighted with a match, the paper particles first heated set others on fire; these in turn ignite others, etc. The same sort of chain reaction must be started for a successful large-scale atomic explosion.

The Uranium nucleus splits into Barium and Krypton atoms, which are highly exitable and unstable and artificially radio-active. They throw off gamma and beta radiation, and finally in an effort to lose mass, they sprout neutrons. If these neutrons are slowed by such substances as graphite, paraffin, heavy water or ordinary water, they will touch off other Uranium nuclei. In a tiny fraction of a second the reaction will run through a good-sized sample of Uranium, containing trillions of atoms, and the results will be a cataclysmic blast.

Editor's Note:

The above paper was sent in for publication from the Sigma Chapter, Our Lady of the Lake College, San Antonio, Texas.