THE SIGMA ZETAN

Volume XXX ANDERSON, INDIANA, APRIL 1960 Number 1

ANDERSON COLLEGE

THE SIGMA ZETAN

Official Organ of Sigma Zeta

A MESSAGE FROM THE NATIONAL PRESIDENT

TO THE MEMBERS OF SIGMA ZETA:

After so many years and after writing so many words, as your secretary, I find that I approach the Presidency with practically nothing to say.

It seems as though Sigma Zeta must face up to some new and fundamental problems in the next few years, even to such a problem as its very reason for existence. The Society was founded in a small college to meet the needs of small colleges in honoring their outstanding science and mathematics students. Such colleges were not large enough to support honorary organizations in the various science and mathematics

fields. Sigma Zeta met their need by its method of recognition in all these fields. Now, with the growth of the small colleges until they are no longer small, the questions are: Is Sigma Zeta still needed? Does it fill a real purpose in the colleges where it operates? Would other organizations better meet this purpose and need?Should Sigma Zeta change its direction and its purpose? Would a merger with another organization be desirable and effective?

These are some of the questions which face us. I'm sure I don't know what the answers are. Those of us who have been with Sigma Zeta for a long time will have to work together to find the answers. And in this work we will need the help of all those who are interested in Sigma Zeta and its purpose--students and faculty together.

Gilbert W. Faust
National President

November, 1959

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PROCEEDINGS OF THE NATIONAL COUNCIL OF SIGMA ZETA

By Gilbert Faust

The National Council of Sigma Zeta met on Thursday evening, April 2, 1959, at Decatur, Illinois.

At the previous convention, a committee had been appointed to suggest revisions in ARTICLE IV of the Constitution. The committee submitted two constitutional revisions which are stated in full in the report of the minutes of the convention. One of these brought the provisions of ARTICLE IV up to date; the other revised the statement of ARTICLE X. Mr. Miller moved approval of the suggested amendment of ARTICLE IV. Mr. Buehler seconded. All members of the National Council present voted in favor of the amendment. Since this was more than a majority of the Council, the recommendation was referred to the convention.

Mr. Buehler moved approval of the suggested amendment of ARTICLE X. Mr. Weatherbee seconded. The motion was approved by the Council, and the recommendation referred to the convention.

The National Recorder-Treasurer presented to the Council a proposal regarding rebates to the Chapters which attend next year's convention. This proposal is stated in full in the report of the minutes of the convention. Mr. Miller moved that the proposal be approved. Mr. Weatherbee seconded. Motion carried. The matter was to be referred to the convention.

The Council also approved recommendations regarding the reimbursement of National Officers who attend the convention, and regarding the financing of National conventions. These actions are reported in the minutes of the convention.

Mr. Miller moved that, in view of the fact that the Recorder-Treasurer has indicated that he does not wish to be re-elected, the Nominating Committee be instructed to find a successor to him. Mr. Buehler seconded. Motion carried.

Mr. Buehler moved that the Recorder-Treasurer be granted $100.00 per year to carry on the secretarial duties of the office. Mr. Miller seconded. Motion carried.

Mr. Faust moved that the President appoint a special committee on presentation of student papers; this committee is to report at least tentative recommendations to the convention on Saturday morning. Mr. Miller seconded. Motion carried. Mr. Deal announced the following committee: Arlene Foley, UPSILON Chapter; David Guinn, XI Chapter; Donald E. Miller, XI Chapter; Gilbert W. Faust, ZETA Chapter; Lorraine B. Talerico, TAU Chapter.

The remainder of the session was occupied with the appointment of committees to act during the convention. For the personnel of these committees see the minutes of the convention.

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MINUTES OF THE THIRTIETH ANNUAL CONVENTION OF SIGMA ZETA

April 2, 3, and 4, 1959

By Gilbert Faust

The thirtieth annual convention of Sigma Zeta was held at Decatur, Illinois, with PI Chapter as host. Headquarters of the convention were in Scovill Science Hall at Millikin University. The convention was called to order at 8:30 a. m. April 3, by Duane E. Deal, National President of Sigma Zeta. He presented Mr. Joe E. Brown, President of PI Chapter, who presented Dr. C. E. Miller, Dean of the University. Dean Miller indicated that the Science Hall was built at a cost of about one million dollars and opened in 1954. Millikin University is known as a "20th Century" institution. It was established in 1903 by money given by James Millikin, who provided that in addition to work in liberal arts, there should also be considered emphasis on practical and technical education. So there is such a major as "Mechanical Industry," which also requires a considerable quantity of liberal arts work. He welcomed Sigma Zeta to the Millikin Campus for its convention.

Mr. Deal responded in the name of the Society. This was followed by the traditional display and description of the gavel.

The Recorder-Treasurer reviewed the minutes of the previous convention. Mr. Gould moved approval of the minutes as published. The motion was seconded and passed.

Short reports of the National officers were heard. Mr Miller said that as President he represented Sigma Zeta at the installation of the new President of Anderson College.

The Recorder-Treasurer distributed copies of the financial report. A copy is included as a part of the minutes of the convention.

The Editor commented on the lack of cooperation he had experienced from the chapters in gathering material for the SIGMA ZETAN. He pointed out also that many of the abstracts which were presented for publication were poorly written and contained a number of errors. He made a plea for more accurate and better material for publication in the future. He also asked that Chapters send a report of their activities to the Editor yet this spring, while the year's activities were still fresh in mind.

The Recorder-Treasurer reported on the actions of the National Council which were taken the previous evening. The constitutional amendments were presented and delegates were asked to discuss the amendments and be prepared to vote on them at the Saturday session.

The following committees were announced, to serve during the convention: AUDITING--Fred Fleming, BETA; James Rawlings, XI; Barbara Shields, UPSILON; FOUNDERS' CUP AWARD--Duane E. Deal, XI; Gilbert W. Faust, ZETA; Lorraine Talerico, TAU; RESOLUTIONS--Robert Shelley, XI; Alton Olson, ZETA; NOMINATING--John A. Buehler, UPSILON; Donald E. Miller, XI; John Lorentzen, BETA; Robert Snell, PI; Ronald Jacobsen, NU.

Mr. Deal announced that invitations for next year's convention would be received at any time.

The business session was then adjourned until Saturday morning. Several student papers were presented in the session on Friday morning. The afternoon was devoted to field trips, and the traditional banquet was held in the evening at the Decatur Club. After the banquet, Dr. Clarence E. Ireland addressed the group on "Carbon Fourteen." (At the Thursday evening session Mr. Loren Boatman presented a discussion of the Geophysical Year, particularly in regard to data which has some significance in weather forecasting.)

At the business session on Saturday morning, the first item of business was the consideration of the amendments to the constitution. Mr. Welker of XI Chapter moved the adoption of the amendment relating to ARTICLE IV. Mr. Goken of PI Chapter seconded. The amendment follows:

ARTICLE IV: MEMBERSHIP to read as follows:

Section 1: Membership shall be of three classes: active, associate, and honorary.

Section 2: (a) Any college student above sophomore standing, whose major is in any of the natural sciences or mathematics, who has completed the equivalent of twelve semester hours in the major, and who has a grade-point average of 3.00 (A=4.00) in the sciences and mathematics and a grade-point average of 2.75 in all subjects including the sciences and mathematics, shall be eligible for election to active membership. If other rating scales are used, an equivalent shall be required.

(b) All faculty members who teach any of the natural sciences or mathematics shall be eligible for election to active membership.

Section 3: Any college student below junior standing, whose major is in any of the natural sciences or mathematics, who has completed the equivalent of eight semester hours in these fields, and who meets the grade-point qualifications stated in Section 2, shall be eligible for election to associate membership. Associate members may participate in chapter activities, but are not eligible to vote or hold office.

Section 4: Persons of distinction in the natural sciences or mathematics may be elected to honorary membership.

The following chapters voted in favor of the amendment: BETA, ZETA, XI, PI, and UPSILON. Eleven affirmative votes are required to make the amendment effective. Other chapters will be polled by mail.

Mr. Guinn of XI Chapter moved the adoption of the amendment relating to ARTICLE X. Mr. Brown of PI Chapter seconded. The amendment follows:

ARTICLE X: FEES AND DUES The first paragraph to read as follows:

The initiation fee for each student active member shall include $5.00 payable to the National Chapter. There shall be no national initiation fee for faculty members.

There is no change in the second paragraph.

The following proposal for travel rebates to the chapters was approved by the National Council on Thursday evening. Mr. Fleming of BETA Chapter moved that it be adopted by the convention. Miss Shierling of XI Chapter seconded. The motion was carried. The proposal follows:

The following procedure is established to grant rebates to those chapters attending the National Convention. This is to be effective for the Convention to be held at Anderson College, Anderson, Indiana, in the spring of 1960:

Travel allowances not to exceed $500.00 per year will be granted to chapters according to the following priorities:

1. $25.00 will be granted to each chapter whose student delegation travels more than 100 miles to the convention.

2. An additional $75.00 (total $100.00) will be granted to each chapter whose student delegation travels more than 1,000 miles to the convention.

3. An additional $50.00 (total $75.00) will be granted to each chapter whose student delegation travels more than 500 miles, but less than 1,000 miles to the convention.

4. An additional $25.00 (total $50.00) will be granted to each chapter whose student delegation travels more than 250 miles, but less than 500 miles to the convention.

(These amounts will be paid whether or not a national officer comes from one of these chapters.)

It is understood that any chapter so reimbursed will be represented at all sessions.

The following proposal for reimbursing National Officers who attend the convention was approved by the Council. Mr. Buehler of UPSILON Chapter moved that it be adopted by the convention. Mr. Lorentzen of BETA Chapter seconded. Motion carried.

National Officers attending a convention will be granted a travel allowance equivalent to the round-trip coach fare between the convention city and the city of residence of the National Officer.

In addition, the National Officers will be reimbursed for the registration fee at the convention, and for lodging expense while at the convention and while traveling to and from the convention.

The following proposal regarding the financing of National Conventions was approved by the Council. Mr. Fleming of BETA Chapter moved that it be adopted by the convention. Mr. Olson of ZETA Chapter seconded. Motion carried.

The National treasury will reimburse the host chapter for an amount not to exceed $100.00 for expenses incurred in connection with the program of the National convention.

The host chapter shall charge sufficient registration fees to cover any other expenses of the convention. Any money collected in excess of the cost of operation of the convention shall be turned in to the National treasury.

Mr. Miller moved that the convention adopt the Council's recommendation that the Recorder-Treasurer be granted $100.00 per year to carry on the secretarial duties of the office. Mr. Ward of UPSILON Chapter seconded. The motion carried with one negative vote being recorded.

Miss Barbara Shields of UPSILON Chapter invited the Society to hold its 1960 convention at Anderson College, in Anderson, Indiana. Her invitation was accepted by the convention. (Dates for the convention have been announced as May 5, 6, and 7, 1960.)

Mrs. Foley, reporting for the special committee on student papers, moved the adoption of the recommendations of the committee. Mr. Welker seconded. The motion carried. The recommendations follow:

1. The title and a brief description, signed by the author and a faculty member, must be sent in when called for by the host chapter. This is likely to be at least 30 days before the national meeting.

2. Each student must present his own paper unless handicapped by illness or disaster. In such instances the paper will be read by title and the abstract will be published. If the paper is a joint paper either author may present the paper.

3. The paper should have some degree of originality and preferably should involve experimentation; or it should be creative in nature or involve a new approach.

4. The final abstract must be presented to the editor at the national meeting before the paper is presented. Such abstract must be signed by the student and a faculty member.

*5. Each person may present only one paper at a meeting.

6. Publication of the abstract in the Sigma Zetan will depend on:

   a. Length of abstract (250-300 words);

   b. Originality;

   c. Cooperation with the editor.

7. A list of these recommendations should be sent to chapters both in the spring and in the fall along with the other materials which go to the chapters.

8. The permanent address of the author should be attached to the abstract. The editor will send a copy of the Sigma Zetan to each author.

9. Details such as grammar, other aspects of writing, and selection of suitable papers are the responsibility of the local chapter. Previous presentation before the local chapter is recommended.

*10. Papers should be limited to a maximum of 20 minutes.

* Exceptions may be authorized by the host chapter.

The various committees made their reports to the convention. In each case the report was accepted by the convention.

The AUDITING committee reported that it found the Recorder-Treasurer's books in proper order.

The FOUNDERS' CUP AWARD Committee presented the cup to XI Chapter, mentioning the following factors in its citation:

1. There has always been a very strong degree of faculty support for the chapter.

2. The chapter has had a consistently strong program on its own campus. Some projects involved cooperation with the Muncie Technical Society; and the chapter sponsors a Sigma XI lecture each year.

3. The chapter has always maintained good relations with the National Officers and has a fine record of cooperation with them.

4. Mr. Guinn's outstanding presentation of his work on the development of a Vaccine for Rattlesnake Venom is an example of the kind of activity which is typical of the chapter.

The report of the RESOLUTIONS Committee is appended to these minutes.

The NOMINATING Committee presented the following slate of nominees:

National President -- Gilbert W. Faust, ZETA Chapter
National Vice President -- Carl Weatherbee, PI Chapter
National Recorder-Treasurer -- Duane E. Deal, XI Chapter
National Historian -- Howard W. Gould, NU Chapter
National Editor -- John A. Buehler, UPSILON Chapter
Past National President -- Duane E. Deal, XI Chapter

Mr. Goken nominated Mr. Fred Fleming for Vice President.

Mr. Beaty moved the nominations be closed. The motion was seconded and carried.

In the balloting for Vice President, Mr. Fleming was elected. Since there was no contest for the other offices, the nominees were declared elected.

Mr. Deal presented the gavel to Mr. Faust, who declared the convention adjourned at 11:00 on Saturday, April 4, 1959.

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REPORT OF THE RESOLUTIONS COMMITTEE TO THE NATIONAL CONVENTION, APRIL 4, 1959

BE IT RESOLVED by this thirtieth annual convention of Sigma Zeta:

1. That PI Chapter and Millikin University be highly commended for their hospitality and their efforts in putting on the program of the convention.

2. That we note the passing of Standleigh M. McClure, long one of the guiding lights of this society. Mr. McClure was one of the charter members of Beta Chapter. His enthusiasm for Sigma Zeta was demonstrated by his later efforts resulting in the formation of PI Chapter at Millikin University in Decatur, Illinois; of PHI Chapter at Eureka College in Eureka, Illinois; and of RHO Chapter at Indiana Central College in Indianapolis, Indiana. From 1929 to 1951, except for 1937 and 1938, he served as National Historian, and the published history of the organization is largely his work. Truly his passing is that of one of the landmarks of this organization.

3. That we express our appreciation for the long record of service of Gilbert W. Faust, National Recorder-Treasurer for the past seventeen years. We recognize that the office is invested with the most important task of coordinating the activities of the organization and holding it together, and that he has filled it well. We note with interest that he has attended every national meeting since 1937, except the one in 1946 when he was serving in the Navy. Previous to his tenure as Recorder-Treasurer, he had been National Editor for four years. We appreciate his contributions in the past, and anticipate those of the future based on his knowledge of the organization and his long experience with it.

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MAILING ROSTER, SIGMA ZETA— FEBRUARY, 1960

BETA Miss Kay Linder, Secretary, McKendree College, Lebanon, Illinois

GAMMA Miss Helen J. Beavers, Secretary, 119 W. 33rd Street, Richmond 25, Va.

DELTA Prof. Eugene Smith, Chapter Advisor, Northeast Missouri State Teachers College, Kirksville, Missouri

EPSILON Miss Judith Graham, Secretary, Otterbein College, Westerville, Ohio

ZETA Prof. Gilbert W. Faust, Chapter Advisor, Wisconsin State College, Stevens Point, Wisconsin

KAPPA Prof. John R. Bergstrom, Dept. of Geography and Geology, Western Illinois University, Macomb, Illinois

LAMBDA Dr. Newell Schappelle, Chapter Advisor, Mansfield State Teachers College, Mansfield, Pennsylvania

MU Prof. Ellsworth Beetch, Chapter Advisor, State Teachers College, Mankato Minnesota

NU Mr. Owen Wrzeszcz, President, 336 Augusta, DeKalb, Illinois

XI Prof. Thomas R. Mertens, Ball State Teachers College, Muncie, Indiana

PI Prof. James W. Drenan, Chapter Advisor, Millikin University, Decatur, Illinois

RHO Mr. Gerald Sipes, Treasurer, Indiana Central College, Indianapolis 27, Indiana

SIGMA Sister Mary Clare, Chapter Advisor, Our Lady of the Lake College, San Antonio 7, Texas

TAU Miss Lillian Brewster, Secretary, 512 King Street, Stroudsburg, Pennsylvania

UPSILON Prof. John A. Buehler, Chapter Advisor, Anderson College, Anderson, Indiana

PHI Mr. Russell DeRose, Secretary, 303 West Burton Avenue, Eureka, Illinois

PSI Mr. Charles Young, President, 704 Anderson, Warrensburg, Missouri

INACTIVE:

ALPHA Southern Illinois University, Alton, Residence Center, Alton, Illinois

CHI Missouri Valley College, Marshall, Missouri

CHARTERS REVOKED:

ETA

THETA

OMICRON

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SIGMA ZETA HONORARY SCIENCE SOCIETY

FINANCIAL REPORT, MARCH 31, 1959

RECEIPTS

Balance on hand, March 20, 1958		$1,082.95
Fees from chapters:		
Beta	$ 92.00	
Gamma	405.00	
Delta	73.00	
Epsilon	64.00	
Zeta	78.00	
Kappa	35.00	
Lambda	45.00	
Mu	83.00	
Nu	101.00	
Xi	170.00	
Pi	5.00	
Sigma	32.00	
Tau	79.00	
Upsilon	60.00	
Phi	10.00	
Psi	99.00	1,431.00
Sales of jewelry, stationery, etc:		
Cash	$ 2.00 (at 1958 convention)	
Gamma	711.90	
Epsilon	3.00	
Zeta	9.35	
Lambda	7.35	
Xi	24.05	
Tau	9.00	
Phi	10.50	777.15
Total Receipts		$3,291.10
Less Total expenses (from reverse page)		1,650.41
Balance on hand, March 31, 1959:		
Checking account	$1,190.69	
Savings account	450.00	$1,640.69

EXPENDITURES

Convention expenses:		
Officers' travel	$130.00	
Travel rebate to chapters	75.00	
KAPPA Chapter for expenses	50.00	$ 255.00
Office supplies and services:		
Postage	$ 11.41	
Corporate report	2.00	
G. W. Faust - salary	50.00	
Office supplies	7.20	
D. E. Miller- travel	2.80	73.41
Jewelry - Eisenstadt Mfg. Co.		800.00
SIGMA ZETAN (1958 & 1959)		522.00
Total expenditures		$1,650.41

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SIGMA ZETA DEVELOPMENT FUND

Balance on hand, March 20, 1958	$108.66	
R. K. Carleton	20.00	
D. E. Miller	28.00	
Interest	3.95	
Balance on hand, March 31, 1959	$160.61	

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LAST YEAR

Balance on hand, April 6, 1957	$847.27	
Fees from chapters	759.00	
Sales	161.55	$1,767.82
Convention expenses	$156.85	
Office supplies and services	306.42	
Jewelry	221.60	684.87
Balance on hand, March 20, 1958		$1,082.95

REGISTRANTS AT THE 1959 CONVENTION

OF SIGMA ZETA

BETA (3)

Fred Fleming
John Lorentzen
Ron Mauck

NU (3)

H. W. Gould
Ronald Hann
Ronald Jacobsen

PI (Host Chapter)

TAU (1)

Lorraine B. Talerico

UPSILON (8)

Paul Anderson
Larry Beaty
John A. Buehler
Kenneth E. Cook
Arlene Foley
Marie Mayo
Barbara Shields
Robert Ward

XI (8)

Duane E. Deal
David S. Guinn
Joan Michel
Donald Miller
James E. Rawlings
Robert Shelley
Phyllis Shierling
George W. Welker

ZETA (2)

Gilbert W. Faust
Alton Olson

STUDENT PAPERS

Presented at the thirteenth annual convention of Sigma Zeta:

BIOLOGICAL WARFARE

By James Gaven Hoff

Tau Chapter

Man must wage a continuous fight to maintain and defend himself in competition with insects and microorganisms. The object of biological warfare is to overcome these efforts by deliberately distributing large numbers of organisms or their toxic products.

The article that follows analyzes the selection of the biological warfare agent, and the dissemination of the biological warfare agent. The agent would be selected according to the enemy's objectives: (1) to produce a large amount of incapacitating illnesses or (2) to strike terror by causing a high mortality.

Just how potentially dangerous is biological warfare? Dr. H. Bently Glass of John Hopkins University in Baltimore, Maryland, predicted that biologists are on the verge of discoveries equal to the revolutionary and potentially devastating kind that led to the production of atomic weapons and intercontinental missiles. However, germ warfare also carries with it a domestic aspect which has been exaggerated and distorted. Those who understand little or nothing about biological warfare often speak in horrified tones of mysterious new diseases being created to wipe out mankind. The likelihood of creating an entirely new agent of unique virulence or new disease producing capacity is extremely remote.

If biological attacks are attempted, food, water, and ventilating systems seem to be the vehicles of choice. Overt attacks could be launched by dissemination of agents from aircraft, watercraft, or by direct saboteur methods.

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THE ARMY ANT

By Michael Reyda

Tau Chapter

The way of life of the Army Ant is so remarkable that it has constantly puzzled scientists. They feel that any group of insects that can build a city, manage its own government, keep slaves, and set up a chaste system must be able to reason. The Army

Ant is often compared to man because of its organized behavior and its ability to wage mass warfare. Auguste Forel, the Swiss culturist, had even gone so far as to urge the League of Nations to adopt the ant policy as the model for the world community. Among the things that they can do that man yet cannot is apparently to pre-determine the sex of their offsprings, and lay hundreds of eggs which are the same sex.

The ability of the Army Ant to wage mass warfare is spectacular. A typical battle starts early in the morning. Considering the number of individuals, it seems phenomenal that they can arrange themselves within ten minutes. Nothing stands in their way. In Africa, for example, when a swarm of Army Ants are approaching, the people leave their homes and let the ants clear out insects, rats, and mice they may find. On the other hand, cattle, horses, sheep, and poultry that are confined to pens are killed and devoured within a few hours. This is a spectacular feat considering that the Army Ant is blind, and has to rely on other senses to guide him along.

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SOME OF THE PEACETIME USES OF ATOMIC ENERGY

By Lillian M. Brewster

Tau Chapter

The atom is a minute particle so small that no man has ever seen it, and probably no man ever will. Inside the atom's nucleus are even tinier particles which are called neutrons and protons. Outside the nucleus whirl electrons, which are circling the nucleus the way the planets circle the sun, and creating their own miniature planetary systems.

For you to understand this infinitesimal world of the atom, you must discard every concept you have ever held of dimension and time. If you compared the smallest mole-hill with the mightiest mountain, you would only begin to create a mental picture of the actual size of the atom. Millions and millions of atoms compose the dot of an "i."

Even though you cannot see it, feel it, or clock it, the atom is the most important thing in the whole universe. Everything that is, is made up of atoms. Every one of the 102 known elements has the basic atomic structure of neutrons, protons, and electrons. The only thing which makes them different is the number and arrangement of the neutrons, protons, and electrons. When atoms are brought together in different proportions and numbers, they form molecules, and the molecules make compounds, and the compounds make the things you wear, the food you eat, the machines you use, and they even make you.

In addition to being the building blocks of matter, atoms are also the source of all energy. Without them there could be neither heat nor electricity. Any rearrangement of atoms to produce new elements or to form compounds causes either a release of

energy or an absorption of energy. Also, when the atom is split, energy is released. Neutrons inside the atom are also released, and they in turn penetrate other atoms, causing these to split and to release energy and neutrons.

This splitting of the atom--or atomic fission, as it is called--is the greatest scientific achievement of our time. It has produced a source of heat and power undreamed of through the ages. It has also formed the basis of a new technology and science known as atomic energy.

Under certain conditions, the splitting of the atom can be made to occur in a chain reaction so fast that a tremendous explosion results. In such a situation, you have an atomic bomb.

But if you slow down the chain reaction, you can tame the atom and make it go to work for you. You can produce heat, which in turn can power electric generators or steam boilers; you can create radioactive materials that can be put to work for the betterment of man; and you can alter some of the materials we use in our daily existence so that they last longer or do their jobs better.

Atomic energy can sterilize foods--and thus check decomposition: it can be used to destroy unhealthy cells within the body--thus battle the dreaded disease of cancer. Atomic rays upset the molecular structure of compounds, be they metal, plastics, rubber, or anything else--thus, in the proper amount, they can create new, and better materials; they are also excellent signalmen as they are always radiating their location--thus they tell the scientist how a plant absorbs fertilizer or how the body uses medicine or where a steel girder is defective. Atomic rays can measure things to the millionth of an inch--thus they make it possible to control more precisely the thickness of such things as sheet metal.

The scientists break peaceful atomic research into four classifications: agricultural, medical, industrial, and educational. In the field of medicine, atomic energy aids in diagnosis, in the treatment of diseases, and radiation therapy. In the field of agriculture atomic energy aids in the tracing of fertilizer action, plant growth studies, and cattle-feeding experiments. In the field of industry atomic energy aids in gaging sheet thickness, tracing leaks in pipes, finding flaws in metal parts, and the running of great electric generators, steam boilers, and other machines. In the field of education atomic energy aids in the exploring of fundamental principles, new experiments and tests, and the exchange and spread of knowledge.

Atomic energy can also be used to measure snowfall, detect flaws in works of art, and it checks the efficiency of soaps and detergents, and many, many other articles. If textile colors seem sharper, credit the radioisotopes that enable textile printers to prevent blurred patterns, and if your cigaret burns just right, it's because radiation has been used to control firmness. It is not news that we use atomic energy in the United States to fuel our newest submarines; but what of the future? The possibility of atomic-

powered merchant ships on the high seas, of atomic-powered planes in the air, and atomic-powered trains on the land is by no means remote.

The atomic story is just beginning, a story whose ending promises a new and better way of life for all mankind.

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THE MORPHOLOGY OF THE GENES

By Starr Smith

Tau Chapter

Understanding of the structure and functioning of the submicroscopic, intracellular determiner of the inherited characteristics of an organism may lead to a better understanding of life's most fundamental mechanisms, in health and in disease, as well as of the manner in which living things perpetuate themselves in their own image. A relatively small amount is known about this science which can tell us a lot about why we are the way we are both mentally and physically.

Since genetics is such a broad field, I have limited my paper to the morphology of genes. I have attempted to answer the following questions: (1) What is a gene? (2) What do they look like and where are they located? (3) If we cannot see genes for certain, how do we know they exist? (4) What is the physical and chemical nature of the gene? (5) Do genes cause a person's character, and if so, is a given trait due to one or several genes? (6) What causes contrasting characteristics, such as tallness or dwarfness, blue or brown eyes, etc?

Although much material has been written on the subject of genetics, there is still much uncertainty as to the nature of the gene. The most recent information available states that the active component of the genes consists either mostly or entirely of DNA (desoxyribononucleic acid). This substance is found only in the chromosomes. Each species has its own specific DNA which determines the type of organism into which the germ cell will develop. DNA is a gigantic molecule made up of many thousands of atoms. This information seems to indicate the possibility that the gene may be a structure of multiple nature rather than a unitary structure.

A team of New York scientists at the International Congress of Biochemistry at Vienna announced that this substance, DNA, has been synthesized. This achievement may be expected to open new approaches to unravelling the nature of some of life's fundamental chemical reactions and to a better understanding and possible prevention of some of the most serious and baffling diseases.

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MUTATION OF GENES

By Mary Louise Casciano

Tau Chapter

Minute bits of matter called genes, barely visible under powerful microscopes yet present in all human beings, are the tools of heredity for they alone carry the traits of mankind from generation to generation. This paper discusses mutation of the genes, the causes, occurence and frequency of these mutations, and the diverse characteristics produced as a result.

Very rarely does a mutant gene have an advantageous effect. Darwin's theory of "natural selection" offers the explanation for the opposition to the spread of the deleterious mutants in populations. However, as long as more mutant genes are produced than eliminated,the frequency of mutation will obviously increase.

Genes have assumed monumental importance in world affairs today because they are in potential danger of increased mutation due to radiation. Physiological effects such as radiation "burns" and tumors, although not curable, do die with the afflicted person. This is not so with the genetic effects for the induced mutants show up in the progeny of the exposed persons.

What price in possible mutation should we pay for defense and atomic progress? The composition of the human race depends upon the answer.

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THE DEVELOPMENT OF A VACCINE FOR RATTLESNAKE VENOM

By David S. Guinn

Xi Chapter

It is believed by this author that a suitable vaccine can be developed for rattlesnake venom. Heretofore serums used as a cure, not vaccines acting as a preventative, have been produced.

It is thought that the protein in rattlesnake venom, which accounts for 90 to 92 percent of the venom by dry weight, will react, under certain conditions, with a formalin solution to produce a modified protein. The modified protein when injected into a test animal will stimulate the production of antibodies without the harmful effect of untreated venom.

Steps used to treat the venom are as follows:

1. Add formalin to venom in a concentration of one part formalin in four thousand part of venom.
2. The pH is adjusted to 7.0.
3. The mixture is inactivated for 13 days at 36°C.
4. Excess formalin is neutralized, after inactivation, by the addition of 1.25cc. of a 3.5 percent solution of sodium bisulfite to each 100cc. of inactivated venom.

Vaccine produced in this manner was then injected into rats in varying doses. It was found that there is a critical amount, in direct proportion to weight of the test animal, that offers protection. Too small a dose did not give protection, and too large a dose was fatal to the test animal. It was found that with a specified amount of vaccine, the rat did develop immunity that was effective against large injections of untreated venom.

Further investigation of the possibilities of this vaccine will be conducted.

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DER VAN DE GRAFF ACCELERATOR

By Larry Beaty

Upsilon Chapter

Dr. Van de Graff, working at Princeton University in 1931, developed a device with which he was able to obtain voltages of about two million volts. Dr. Van de Graff's machine, which now bears his name, utilizes two facts, long familiar to physicists. They are; (1) a conducting sphere will accept any charge irrespective of its own charge, and (2) a discharge of electricity occurs readily at a pointed object.

The conventional generator employs a spherical metallic electrode which is supported by a cylindrical insulating column and charged by the action of a motor driven belt. The electrical charge to be applied to the high voltage electrode is sprayed onto the fast moving belt as it passes between a charged bar and a ground at the base of the insulated supporting column. This bolt then enters the high voltage spherical electrode where its charge is "picked off" by a brush and distributed on the high voltage electrode. If an evacuated glass tube is placed with one end inside the high voltage electrode and the other end away from the electrode we have a way to accelerate any charged particle.

In order to accelerate electrons a heated filament is placed inside the evacuated tube and the high voltage electrode around it is charged negatively. The electrons that are boiled off the filament are repelled by the electrod's high negative charge and are literally pushed down the evacuated tube to a target.

Protons may be accelerated by charging the electrode with a positive potential and ionizing hydrogen to yield protons which are accelerated in the same manner as electrons.

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"RECENT DEVELOPMENTS IN VIRAL RESEARCH"

By Arlene Foley

Upsilon Chapter

This paper considers some theories of origin of the virus; some methods of study; and some specific activities of virus particles.

Theories of Origin

Degenerative or adaptive evolution may have been involved from larger parasites in which a mutation of the entire parasite may have occurred or possibly single parasites may have broken up into a number of particles.

Dynamic forces may have caused the formation of complex molecules which could exhibit the properties of life. Synthesis of genetic material has been accomplished in the laboratory in a rudimentary way.

Methods of Study

Size

The collodion membrane allows size determination by filtration through pores of graded size.

The ultracentrifuge operates on the principal of the rate of sedimentation. Particles of different sizes are thrown out of suspension at different speeds.

Dr. Stanley's chart of graded size indicates limitations in this approach due to overlapping of sizes of virus particles and other particles (e.g. bacteria and protein molecules).

Chemical Analysis

The entire unit may be tested or the molecules separated by electrophoresis for investigation.

Immuno-chemical reactions have proven to be valuable tests which utilize the idea that antibodies are produced which are specific for certain viruses.

Tissue Cultures

Rhesus monkey tissue cultures are being used extensively. Those from reticulo-endothelial cells may have unique possibilities.

Specific Activities

A comparison of a virus with a normal bacterium helps to clarify the properties of the virus discussed, the bacteriophage. The phage has only DNA; reproduces only from its nucleic acid; and is invariably formed from material produced inside the host cell.

The phage takes over the synthesizing system of the host in order to produce new constituents for its offspring.

The life cycle may be interrupted by the formation of prophages. The genetic material of temperate phage particles may act as a normal cell constituent after infection--being replicated at each cell division. These prophages may continue for a considerable length of time and then produce new phage particles.

Virus particles have been demonstrated to cause transduction in bacteria by "carrying" bacterial genetic material from one bacterium to another.

Current viral research has tremendous implications, much of which is directly concerned with properties of virus particles just mentioned.

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MEET THE NEW NATIONAL RECORDER-TREASURER

Prof. Duane E. Deal, of Ball State Teachers College, Muncie, Indiana

For many years Prof. Gilbert Faust ran Sigma Zeta from his post at Wisconsin State Teachers College, Stevens Point, Wisconsin. Due to heavy administrative responsibilities he had to relinquish his duties with Sigma Zeta. We are going to miss Prof. Faust as our National Recorder-Treasurer. This does not mean that he won't be with us, on the contrary he expects to be active in Sigma Zeta affairs. This year he is serving as our National President.

We are happy to be able to obtain one of Prof. Deal's stature to take over this post. It is a job that requires considerable work with very little compensation or reward. A person must be dedicated to the principles for which Sigma Zeta stands to be willing to continue in this capacity year after year. I am sure all of us realize the importance of having continuity established in the office of Recorder-Treasurer. This is the office that holds our society together.

Prof. Duane E. Deal, National Recorder-Treasurer of Sigma Zeta, National Honorary Society in Science, we salute you and pledge our full cooperation as you administer the duties of your office.

Signed,

Sigma Zetans everywhere.

CHAPTER NEWS

Beta Chapter
McKendree College
Lebanon, Illinois

Dear Editor:

During the past year Beta Chapter has been active. We have sponsored field trips and science speakers for our student body. We also had a banquet for our new initiates. At present we have six active members, seven associate members and three faculty members. The officers of our Club are as follows: President, Ronnie Mauch; Vice President, John Lorentzen; Secretary, Kay Linder; Treasurer, Joyce Hudson; and Faculty Sponsor, Prof. Fred A. Fleming. We are looking forward to another successful year.

Sincerely,
Kay Linder
Secretary

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Gamma Chapter
Medical College of Virginia
Richmond, Virginia

Dear Editor:

Gamma Chapter has had another successful year. We initiated forty-three new members last year. Seventeen were from the school of medicine, fourteen from the school of dentistry, four from the school of pharmacy and eight from the school of nursing. We have at present seventy-one active members. The high light of the initiation was a banquet and speaker. Our officers for 1959-60 school year are: President, William E. Avant; Vice President, Anne C. Broaddus; Secretary, Helen J. Beavers; Treasurer, Richard J. Cleveland. Gamma chapter looks forward to another year of growth.

Sincerely,
M. D. Richmond
President

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Delta Chapter
Northeast Missouri State Teachers College
Kirksville, Missouri

Dear Editor:

During the past year Delta chapter has been active sponsoring speakers and films. We also guided the general science class of a nearby high school on a tour through our science building, giving several demonstrations and answering questions.

At present we have fifteen active members, four associate members and four faculty members. Our officers for this year have been: President, John Hawkins; Vice President, Bill Wagner; Secretary-Treasurer, Stanley M. Williams. Our Faculty Sponsor is Mr. Eugene Smith.

Delta Chapter is looking forward to the National Convention at Upsilon Chapter in 1960. We hope to be able to send representatives to this meeting.

Sincerely,
Stanley M. Williams
Secretary

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Epsilon Chapter
Otterbein College
Westerville, Ohio

Dear Editor:

Epsilon Chapter has been very busy this past year. We sponsored an Otterbein-Sigma Zeta Science Fair and invited surrounding high school students to display projects. Sigma Zeta members planned afternoon programs for the students in the fields of chemistry, biology, physics and mathematics. We received many favorable comments concerning the fair and plan to make it an annual event. We also revised our constitution and set up an award to be given to a junior or senior Sigma Zeta member who holds a 3.0 accumulative average and a 3.5 average in his major. (4. is a straight "A"). The winner will be selected by Sigma Zeta advisors or qualified faculty members. Each yearly winner will receive a sum of money to be determined annually and his name will be engraved on a plaque which will be placed in the Science Building.

During the year we also sponsored films, speakers and a banquet for the new initiates. Our present membership is thirty-six active members, eight associate members and seven faculty members.

Our officers for the school year 1959-60 are: President, John Weiffenbach; Vice President, Carol Bruns; Secretary, Judith Graham; Treasurer, Kenneth Joyce; Faculty Sponsors, Mr. Keith Crane, Prof. James McCloy, Prof. Jean Willis, and Prof. Roger Wiley.

Epsilon Chapter is looking forward to next year when we will again be active sponsoring films, speakers, science fairs, etc. We also look forward to the National Convention at Anderson College and hope to have several representatives there.

Sincerely yours,
Janet Risch
Secretary

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Zeta Chapter
Central State College
Stevens Point, Wisconsin

Dear Editor:

Zeta Chapter has had another successful year. We have been active sponsoring speakers. We have had several faculty members speak to our group regarding their work which earned them either the master degree or the doctors degree. These talks have been inspiring and helpful. Zeta Chapter sponsored a picnic which proved to be a time to get better acquainted. Perhaps the high light of the year was the Regional Junior Academy of Science Fair which Sigma Zeta sponsored. This proved to be very helpful, not only to the high school students involved but also for us.

At present we have eighteen active members, six associate, and two faculty members.

Our officers are: President, Alton Olson; Vice President, Pauline Ainsworth Albert; Secretary-Treasurer, Richard Damro and our two Faculty Sponsors, Prof. Gilbert W. Faust and Roland A. Trytten.

We of Zeta Chapter are looking forward to another year of useful activity under the inspiring leadership of our Faculty Sponsors, Professors, Gilbert Faust and Roland Trytten. We hope to see you at the National Convention in 1960.

Sincerely,
Clifford Hass
Reporter

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Lambda Chapter
Mansfield State Teachers College
Mansfield, Pennsylvania

Dear Editor:

Lambda Chapter was very active again last year. In addition to sponsoring films and a picnic, we also are buying reference books for a study room designed primarily for science majors. Our Chapter assisted with the annual Tioga County Science Fair for secondary school students.

We have sixteen active members, eight associate and two faculty. Our faculty sponsors are Dr. Newell A. Schappelle and Mr. Arthur N. Jarvis.

Our officers for the year are Wayne Madsen, President; Floyd Lounsbury, Vice President; Janice Norman, Secretary; Carl Bedell, Treasurer; and June Johnston, Historian.

We are looking forward to another year of activity for our Chapter. Several of our members would like to attend the National Convention in Anderson, Indiana, in May, 1960. We hope to see you then.

Sincerely,
Sigrid Johnson
Reporter

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Mu Chapter
Mankato State College
Mankato, Minnesota

Dear Editor:

Another year has come and gone for Mu Chapter. It has been a busy year for us. During the year we co-sponsored with the Science Club the Regional Science Fair. If you want to have a lot of fun and hard work, sponsor a science fair in your area. It is worth the effort.

During the year we sponsored field trips, speakers and had a banquet.

At present we have twenty-five active members, eleven associate members and twelve faculty members. We appreciate the faculty members, for it is through their help and guidance that we have a strong chapter.

Our present officers are: President, Bernard Burzlaff; Vice President, Douglas Berge; Secretary-Treasurer, Burdett C. Wheaton; Editor-Historian, Lorna Gehrke; Faculty Sponsor, Dr. E. Beetch.

Mu Chapter hopes to send several representatives to the National Convention at Upsilon Chapter in 1960.

Sincerely,
Burdette C. Wheaton
Secretary

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Xi Chapter
Ball State Teachers College
Muncie, Indiana

Dear Editor:

Xi Chapter sponsored speakers during the past year. We also held meetings where student reports were presented related to research projects carried out by the students. These talks were stimulating. One of our students experimented with rattlesnake venom and developed a vaccine. When one sees what can be done by one of our members, it helps to upgrade the entire group and develop a desire for creative work in each of us.

Our active membership at the close of the 58-59 school year was thirty-eight. All our faculty members in science are affiliated with Sigma Zeta; we have thirty-eight. It certainly helps our organization to know that the faculty is behind us.

We held an election of officers and elected the following: President, David S. Guinn; Vice President, James E. Rawlings; Secretary, Martha J. Miller; Treasurer, Thomas R. Mertens. Our Faculty Adviser this year is Mr. Thomas R. Mertens.

Xi Chapter is looking forward to the National Convention to be held in Anderson, Indiana, in 1960. We hope to see you there.

Sincerely,
Clinton Fuelling
President

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Tau Chapter
East Stroudsburg State Teachers College
East Stroudsburg, Pennsylvania

Dear Editor:

This past year has found us busy as usual at Tau Chapter. We sponsored scientific films opened to the student body. We also sponsored speakers on scientific topics. We en_ yed a field trip to the National Drug Company at Swiftwaters, Pennsylvania. In the spring we had an outing at White Heron Lake. This was a high light of the year.

During the year our Chapter sponsored the formation of a chemistry club which we called "The Atomium."

Members of Sigma Zeta offer free tutoring to students who need help in the fields of science and mathematics. The names of the members and their major and minor fields are posted on the bulletin boards and they may be approached for help whenever a student feels need of it.

We have an active membership of twenty-one and two associate members. Two faculty members are active in Sigma Zeta.

Our officers for this year are: President, Michael Reyda; Vice President, Susan Bright; Secretary, Starr Smith; and Treasurer, Hope Koch. Our Faculty Sponsor is Dr. William G. Moore.

Tau Chapter is looking forward to another year of activity. We are especially anxious to again send representatives to the National Convention at Upsilon Chapter in Anderson, Indiana.

Sincerely,
Starr Smith
Secretary

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Upsilon Chapter
Anderson College
Anderson, Indiana

Dear Editor:

The high light of the year for Upsilon Chapter was the annual banquet held in honor of the new initiates. Several of our members attended the National Convention at Millikin University.

We have five active members this year and four associate members. We have five faculty members.

Our officers for the year are: President, Larry Beaty; Vice President, Winston Roberts; Secretary-Treasurer, Mrs. Arlene Foley; Historian, Paul Anderson and Faculty Adviser, Prof. John Buehler.

Upsilon Chapter is looking forward to acting as the host chapter for the National Convention, May 5, 6, and 7, 1960. We hope to see each of you in Anderson at the Convention.

Sincerely
Mrs. Arlene Foley
Secretary

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Phi Chapter
Eureka College
Eureka, Illinois

Dear Editor:

We are happy to report from Phi Chapter at Eureka College. This year we were active sponsoring speakers, films and a picnic for our members. Our Chapter made possible the installation of a light near the sidewalk on our campus.

We elected as officers for the year: President, Bill Nettz; Secretary-Treasurer, Robert Stubblefield. Our Faculty Adviser is Prof. L. W. H. Charmock.

We have six active members, two associates and two faculty members.

Sincerely yours,
Robert Stubblefield
Secretary

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Psi Chapter
Central Missouri State College
Warrensburg, Missouri

Dear Editor:

Psi Chapter has had another successful year. During the year we raised money for the Chapter by sponsoring the sale of the "Handbook of Chemistry and Physics" and labatory aprons.

We sponsored science speakers and films.

Our officers for the year were: President, Charles Young; Vice President, John W. White; Secretary, Kenneth Bauer; Treasurer, David S. Campbell; and Faculty Adviser, Mr. Roy Holland.

We have twenty-one active members and two faculty members.

Psi Chapter anticipates another successful year. We look forward to seeing some of you at the National Convention in 1960.

Sincerely,
Kenneth Bauer
Secretary

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A note from the National Editor:

I want to thank each of you for cooperating with me this past year. The manner in which you responded to a call for chapter news was most gratifying. Because I shall be on a special leave of absence from my teaching position at Anderson College I will not be able to serve as your editor for 1960-61. I know you will give your next editor the same degree of cooperation which you gave me.


PRESENTED BY
PROFESSORS
SIGMA ZETA
SCIENCE SOCIETY
AT
OCTOBER