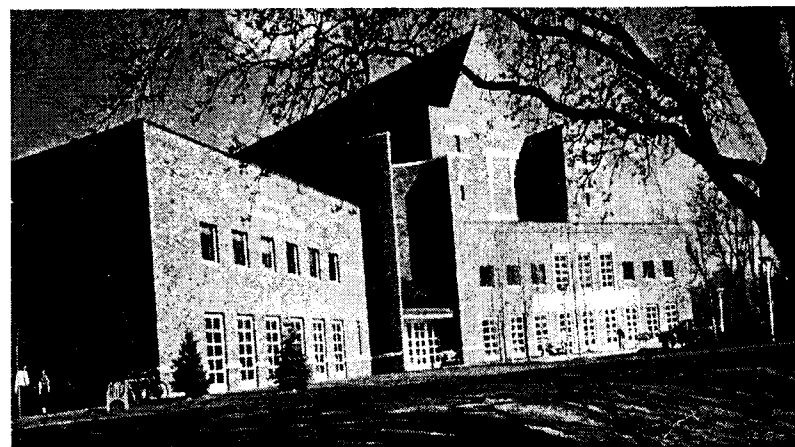


# The Sigma Zetan

Volume LXVI

2000

Proceedings of the National Convention  
Bethel College: St. Paul, Minnesota  
April 27-29, 2000



## **Sigma Zeta 75 Years**

Sigma Zeta celebrates 75 years of encouraging and recognizing scholarly achievement in the natural sciences, computer science, and mathematics.  
1925-2000

# The Sigma Zetan

The Official Publication of Sigma Zeta

Volume LXVI

Angela Hare, National Editor  
Messiah College, Grantham, PA

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## Roll Call of Chapters 2000 National Meeting

### **Alpha Beta:** Campbellsville University

Richard Kessler, Chapter Advisor and National President

Anthony Grafton, Chapter Advisor

Kristy Jones

Jessica McFarlin

Neil Mills

Debbie Mudd

Jennifer Villella

### **Beta Lambda:** Messiah College

David Foster, Chapter Advisor and National Treasurer

Angela Hare, Chapter Advisor and National President-Elect

Joseph Sheldon, Chapter Advisor

Leanne Whitesell, Chapter Secretary

Keisha Adkins

Candice Caviechici

Julie Engelbrecht

Rebecca Nolan

Lloyd Reitz

Hope Tobey

Rachel Tudor

Robert Weiman

**Beta Iota:** Bethel College

Robert Kistler, Chapter Advisor  
James Reynhout, Chapter Advisor  
Bryan Anderson  
Laura Bates  
Brian Beeken  
Sarah Boswell  
Angela Brandes  
Amanda Bristow  
Melissa Christofferson  
Rob Dahlin  
Doris Daramola  
Andrew Fast  
Seth Friese  
Karla Hansen  
Weldon Jones  
Melissa Karter  
Matthew Lang  
Matthew Leafblad  
Christin Lundblad  
Ingrid Nelson  
Richar Peterson  
Aaron Rendahl  
Kenneth Rohly  
Cami Sahli  
Nolawit Tesfaye  
Jhonesia Trandem  
Karysse Trandem  
Sarah Verbridge  
Jack Waas  
Mozella Williams  
Jeff Winter

## Abstracts of Student Papers

### Effects of Swim Training at Varying Intensities on the Immune Systems of Rats

Keisha Adkins  
Beta Lambda  
Messiah College

The goal of this study was to examine the effects of different intensities of exercise on the immune system of rats subjected to a 9-week swimming program. The extent of the training was determined by measuring the lactic acid levels in the blood, and the strength of the immune system was monitored by measuring the lymphocyte to neutrophil ratio. Twelve 6-month-old male rats were separated into 4 groups of 3 rats each. The groups had different weights attached to their tails as they swam. They swam for 30 minutes 5d/w. At the beginning of the 5th week, the tail weight was increased by 3 grams for all the weighted groups (Groups B-D), but the weight was returned to normal on the days that blood was taken. Their blood was taken weekly within 15 minutes of the completion of a swim period. The results showed a gradual decline in lactic acid levels over the 9-week period. After the 5-week mark when the weights increased, the three groups that were weighted showed a decrease in the L:N ratio within the next two weeks while the one group without tail weights showed no such decrease.

### Variability of Snow Depth on Sea Ice in the Southern Ocean

Sarah Boswell, Department of Physics  
Beta Iota  
Bethel College

In 1998, Markus and Cavalieri published the first algorithm for deriving the depth of snow on sea ice from satellite passive microwave data. At Goddard Space Flight Center, the snow depth algorithm is the key for using satellite data records spanning nearly two decades to study variabilities in snow depth distribution. For this project we considered the snow depth distribution in the Southern Ocean poleward of about 60 degrees South. This involved writing data manipulation programs to create plots, tables, and movies for analyzing patterns in snow depth distribution, and finding correlation coefficients between snow depth and sea ice concentration, near-surface air temperature, and wind speed. The project was the beginning of an investigation exploring the relationship between snow depth and other climatological factors.

### The Effects of Nitric Oxide on Rat Aortic Smooth Muscle *in vitro*

Angela Brandes, Department of Biology  
Beta Iota  
Bethel College

This study examined the effects of nitric oxide (NO) and phenylephrine (PHE) on isolated rat aortic rings in a smooth muscle bath preparation. PHE ( $10^{-5}$  M) was initially applied to all tissue to provide a control contractile response. When nitric oxide ( $10^{-5}$  M) was applied to tissues, significant relaxation was always produced. When PHE was reapplied after NO had been administered, a contractile response was observed, similar to that of the initial response to PHE. When NO was applied to a tissue that had been precontracted with PHE, a relaxation of the tissue was observed again. These results indicate that NO has a relaxing effect on aortic tissue, and may play an important role in the management and regulation of blood pressure.

### N-L-alpha aspartyl-L-methyl ester) on the Water Consumption and Blood Glucose Levels of a laboratory rat (*Rattus Norvegicus*)

Melissa Christofferson, Department of Biology  
Beta Iota  
Bethel College

The hypothesis of this research was that the artificial sweetener, Aspartame, will have an effect on water consumption and blood glucose levels of rats. The objective was to determine the effects of this sweetener on water consumption and blood glucose levels. The experiment was conducted using nine female rats. Each rat served as its own control. They were randomly split into three separate groups. In the initial control period, the rats drank only water. In the second experiment, aspartame was added to the water at a low dose (1 gram/100 ml of water), a medium dose (2 grams/100 ml of water), and a high dose (4 grams/100 ml of water). In the third experiment, the rats were given water that contained aspartame; however, the preparation was boiled to 100 degrees Fahrenheit for approximately 5 minutes to examine the possible effects of aspartame breakdown products. In the fourth and final experiment they were given water with increased doses of aspartame at low (6 grams/100 ml of water), medium (9 grams/100 ml of water), and high (12 grams/100 ml of water) concentrations. During each experiment, the rat's water consumption and blood glucose levels were checked on a daily basis and recorded. The results showed sizeable increases in water consumption basically increasing with aspartame concentration and small but significant increases in blood glucose levels at all aspartame concentrations. Further research is needed to determine whether these changes are meaningful and whether aspartame is safe to use as an artificial sweetener.

### Cost Analysis and Effects of Chemical Nutrient Additives and Earthworms, *Lumbricus terrestris*, on Crop Output of *Brassica rapa* (Brassicaceae)

Robert Dahlin, Department of Biology  
Beta Iota  
Bethel College

Growth of plants for agricultural purposes is critical for human survival on this planet. Industrialized countries have the technology to theoretically feed the world. With this abundance of food comes negative side effects. Many recent studies have shown that fertilizers used to stimulate and improve agricultural crops are becoming pollution problems. Soil and fertilizer runoff, due to poor irrigation techniques, is gaining entry into our streams and river systems causing decreased water quality for water organisms and humans alike (Hausenbuiller 1985). Eutrophication of waterways due to excessive algal blooms have caused drastic effects in water quality and organism populations (Moffat 1998). In a society driven by cost-effective methods of gaining goods, we are being tempered by an outcry among groups to attend to the ecological impacts of our actions. A test to compare the economic benefits of various agricultural variables is needed to help in the solving of current ecological problems.

### Comparison of the hydroboration of two possible isomers of 1,5,9-cyclododecatriene

Seth Friese, Department of Chemistry  
Beta Iota  
Bethel College

Previous hydroboration of 1,5,9-cyclododecatriene has only been thoroughly studied using the *trans, trans* isomer **1**. In our study, hydroboration was carried out on the *cis, trans, trans* isomer **2** as well. High field NMR and MS data of the product were analyzed to show that using the *cis, trans, trans* isomer may be preferred over the *trans, trans, trans* stereoisomer, for it not only produces the desired *cis, trans*-perhydro-9b-boraphenylene **3**, but also is a tenth of the price. Oxidation of **3** to the 1,5,9-cyclododecatriol **4** confirmed the possible use and advantage of **2**.

### **The Effect of Serum Factors on the Expression of the Prostate-Specific Gene, NKX3.1**

Melissa Karter, Department of Biology  
Beta Iota  
Bethel College

The development of the human male prostate is dependent on many factors, including hormones and other regulatory proteins. These factors help to regulate expression of specific genes in prostate cells. NKX3.1 is a gene whose expression in the human male is prostate-specific. It is a member of homeobox gene families that are thought to play a central role in the development of organs and body patterns in a variety of organisms. This research attempted to begin understanding how the NKX3.1 gene's expression is regulated. The prostate cell line, LNCaP, was used in experiments in which the cells were exposed to a combination of growth factors from fetal bovine serum to determine if they affect the NKX3.1 gene activity. Gene expression was analyzed by Northern blotting and hybridization to appropriate probes. Phosphorimager results reveal that growth factors present in serum increase expression of NKX3.1

### **Applications and Improvements of a Stabilized Heterodyne Interferometer**

Matt Lang, Department of Physics  
Beta Iota  
Bethel College

The intent of this research was to investigate the applications and improve the operation of a stabilized heterodyne interferometer designed to optically measure differential air pressure. Optically measuring air pressure via index of refraction changes allows for remote, very fast, and high-resolution observations on the order of  $10^{-20}$  N/m<sup>2</sup> (maximum sensitivity), not possible with conventional barometers or manometers. Applications have included studying pressure differences above and below an airfoil in a wind tunnel, pressure nodes and anti-nodes in a closed acoustic resonance cell, and currently, intense sound pulses emanating from sparks. This research's attempts at improving the system focused on creating a feedback loop to counteract the inherent non-linear regions of the interferometer output. Frequency dependence of Piezo-electric mirror motion and exotic mechanical resonances were also investigated.

### **Inhibition of Sensory Neurons: CSPG and Laminin Interactions**

Jessica McFarlin  
Alpha Beta  
Campbellsville University

During neuronal development, neurites are exposed to cues from molecules in the extra cellular matrix. These cues can be positive and promote outgrowth, or negative and inhibit outgrowth. One such inhibitory molecule is chondroitin sulfate proteoglycan (CSPG). CSPG is an extracellular matrix molecule found during development in regions where axons do not grow. CSPG is reexpressed following nervous system injury inhibiting neurite outgrowth. Previous work done in this lab has shown that neurites can grow into areas where CSPG is present, if combined with laminin, a molecule that promotes neurite outgrowth. The goal of this study was to determine the mechanism(s) of CSPG inhibition. We grew embryonic chick dorsal root ganglia explants on a substratum consisting of alternating stripes of CSPG and laminin. Given that CSPG interacts with laminin in this assay, and in vivo, we used anti-laminin antibodies to determine the role of laminin in the neurite response. My research has found that antibodies that block specific laminin epitopes affect laminin-CSPG complex, and abolish the ability of neurons to grow into CSPG rich regions. Overcoming the inhibition of outgrowth by CSPG would be an important step in recovery of function following nervous system injury.

### **The Modulation of Platelet Activating Factor Activity Following Contusive Spinal Cord Injury**

Neil P. Mills, Department of Science  
Alpha Beta  
Campbellsville University

As a part of the inflammatory response, Platelet Activating Factor (PAF), a component of human and animal blood, initiates the expression of endothelial cell adhesion molecules and allows for the attachment of macrophages and neutrophils. Once attached, the macrophages and neutrophils migrate through the capillary endothelium and travel to the site of the injury, where they engulf damaged cells. Besides the onset of the injury itself, the development of post-injury secondary damage is one of the most detrimental effects of spinal cord injury. Mediated in part by PAF, secondary injury occurs when macrophages and neutrophils become hyperactive, digest healthy material around the primary damage, and oxidatively burst. Previous studies have indicated that modulation of macrophage and neutrophil influx would spare tissue and increase recovery of motor function. In this study, a PAF antagonist, WEB 2170, was administered to live rats. The efficacy of WEB 2170, within certain time intervals, was observed. Preliminary data suggests three-day caudal antagonist treatment spares more spinal cord tissue than three-day rostral antagonist treatment. Further data collection is ongoing.

### **Modeling Diffusion and Drift in Dielectrics under High-Energy Bombardment and the Resulting Secondary Electron Emission**

Aaron Rendahl, Department of Physics  
Beta Iota  
Bethel College

The bombardment of dielectrics within spacecraft by high-energy electrons leads to destructive electrostatic discharges. These events occur because the incident high-energy electrons generate electron-hole pairs deep within the dielectric. It is commonly held that the electrons move through the dielectric material, accumulate on the surface, and then discharge in a pulse. A model of the flow due to drift has been previously accomplished. This research adds understanding of the flow due to diffusion, with the goal of eventually creating a computer simulation of the transport of the charges through the dielectric by means of diffusion and drift. The model includes the vacuum/dielectric surface and provides for the analysis of secondary electron emission from the surface before electrostatic discharge events occur. An improved understanding of how this secondary electron emission occurs may enable appropriate measures to be taken to minimize discharge.

### **Promoter Analysis of the Human NKX3.1 Gene to Demonstrate Tissue-Specific Expression**

Cami Sahli, Department of Biology  
Beta Iota  
Bethel College

In the United States, prostate cancer is the second leading cause of cancer deaths in human males. Learning more about how the prostate develops and is maintained may help in our quest for a cure of prostate cancer. Understanding the development of the prostate would in part require learning what genes are expressed in this organ. NKX3.1 is a recently discovered gene that is expressed exclusively in the prostate. The goal of this research is to identify what DNA elements in the NKX3.1 promoter region are responsible for this prostate-specific expression. Different segments of the NKX3.1 promoter region were cloned into a luciferase reporter vector and the constructs were transfected into cell lines of two different cell types: LNCaP, a prostate cell line, and T47D, a mammary cell line. A promoter segment as short as approximately 1000 base pairs was able to direct expression of luciferase in a tissue-specific manner. The results described should lead to the further identification of the NKX3.1 prostate-specific elements and could contribute to methods that lead to prostate cancer therapy.

### **A Qualitative Study of NO-purged Biomedical Polymers Comparing Immersion in Cobalt Chloride Solution and Water**

Nolawit Tesfaye, Department of Chemistry  
Beta Iota  
Bethel College

Polymer insulation, used in some implanted biomedical devices, triggers H<sub>2</sub>O<sub>2</sub> delivery from the immune system to create hydroxyl radicals. Feeding Fenton-like reactions, these radical cations attack the polymer insulation at its polyether linkages (in the case of polymers PR and PS) and carryout metal-induced oxidation. Likewise, these radicals can also attack the aliphatic linkages of polymer A in the presence of NO. This study was conducted to further examine the effects of NO on the degradation of polymers A, PR and PS. Two degradation studies were designed. NO was delivered to two sealed systems, within which the polymers could be fully exposed to NO while immersed in cobalt chloride solution or water. Pictures were taken at fixed increments to monitor the degradation of the polymers. The results indicated that degradation prominently occurred in the A polymers. The PR and PS polymers showed degradation to a lesser degree. The polymers purged with NO in cobalt chloride solution demonstrated less degradation than those purged with NO in water.

### **A Study of Peroxide and Cobalt Chloride Diffusion through Three Polyurethane Films Used in Medical Devices**

Mozella Williams, Department of Chemistry  
Beta Iota  
Bethel College

Degradation of the polymer insulation used in some medical devices is thought to be due to metal induced oxidation (MIO) via a complex 10-step Fenton Reaction. The Fenton Reaction, well studied in the literature, demonstrates how a metal cation (in this case of this particular medical device, a cobalt alloy) transitions through several free radical states, simultaneously catalyzing oxidation in the presence of an oxidizing agent (in this case peroxide). Three types of diffusion studies were conducted using 1-mil films of three polymers: A, PR, PS. The first was a peroxide study using all three polymers; the second, a cobalt chloride study using PR only; and the third, a peroxide/cobalt chloride study, again using all polymers. Individually, the peroxide and cobalt chloride were detected quantitatively by UV-Vis Spectrophotometry with a vanadium test and atomic absorption, respectively. The peroxide/cobalt chloride results were gathered qualitatively by photographing the films under a microscope and observing the affects of silica addition upon the oxidation rate. Peroxide diffusion occurred as expected according to the polarity of the polymers, with a general trend of: PS>PR>>A. The addition of silica gel in the peroxide/cobalt chloride study seemed to unexpectedly protect the portion of the film covered by the silica from increased oxidation as predicted.

## Honor Awards

**Candace McGregor**  
**Millikin University**  
**Pi Chapter**

The Pi Chapter of Millikin University nominates Candace McGregor for the Sigma Zeta Honor Award. Candace is a Senior Biology major who has served as the President of the chapter for the 1999-2000 school year and as the Secretary for the 1998-99 year. Candace has been an incredible supporter of our group. She also serves as an officer in the Alpha Epsilon Delta pre medical/dental group and is a James Millikin Scholar. Candace has been involved in a long term research project in the Biology Department studying the paternity mechanisms of spiders using RAPD PCR techniques and is presenting her work at the Millikin Senior Honors Day. She has been accepted into the University of Chicago Medical School and plans to pursue a career as an obstetrician. She has been the recipient of a number of university wide awards and was recently honored with a scholarship from the National Honor Society of Phi Kappa Phi.



**Leanne Whitesell**  
**Messiah College**  
**Beta Lambda**

The Beta Lambda chapter of Messiah College nominates Leanne Whitesell for the 2000 Sigma Zeta Honor Award. Leanne is currently a junior at Messiah College, in the Department of Natural Sciences. She is the first student in the department to pursue a dual education certification in Biology and Environmental Science. Leanne has been very active in our chapter, beginning in her sophomore year when she attended the National Convention at Hillsdale College and returned as an enthusiastic supporter of Sigma Zeta membership and conference participation. As chapter secretary in 1999-2000, Leanne has encouraged other students to join our local chapter as sophomores, attend National Meetings, and take advantage of opportunities to prepare research talks and share them with peers. Due to her encouragement, our chapter was able to bring 12 members to this year's convention, close to 1200 miles from home. Leanne graciously stepped in to fill a leadership role when our chapter President was unable to attend. Leanne also serves at Messiah College as an officer in the Biology club and a volunteer for the Oakes Museum of Natural History. She has been elected President of the Beta Lambda chapter of Sigma Zeta for 2000-01, and she is already planning a summer/fall research project to present at the 2001 National Meeting. Our chapter looks forward to Leanne's leadership, underpinned by her heart for service.



**Amanda Bristow**  
**Andrew Fast**  
**Melissa Karter**  
**Matthew Leafblad**  
**Christen Lundblad**  
**Bethel College**  
**Beta Iota**

The Honor Award is intended to recognize the *individual* who has been the most active and productive within their chapter. We here at Bethel have had to rely on several individuals to come forth and work to help plan and organize this convention. It is therefore difficult, if not impossible, to single out one individual for recognition. Therefore, we would like to nominate the officers of our chapter as a group of individuals who have shared the work and thus should share in the recognition. The quality of the arrangements and smooth running of the meeting is due to their wholehearted commitment and dedication.



## Chapter Reports

### Alpha Mu:

#### Officers for 1999-2000:

President - Jill Barton  
Vice President - Sara Chybinski  
Secretary - Lauren Campbell  
Treasurer - Anne B. Cook  
Public Relations - MaryBeth Kline

#### Officers for 2000-2001:

President - Kate Maurizi  
Vice President - Bernadette Thomas  
Secretary - Catherine Pettit  
Treasurer - Katie Boyle  
Public Relations - Dana Rigby

Advisor: Sister Marie Cooper

#### Activities of the Year:

-Ice cream social planned (later cancelled)

#### Special Events

-2 Induction Ceremonies (Fall & Spring)  
-Preparation for Science Bowl

Submitted by Anne B. Cook

## Chapter Reports

### Beta Nu:

To fulfill our goals for academic excellence and community service, Beta Nu undertook several projects in the 1999-2000 academic year. New students with interest in science and mathematics were welcomed by student and faculty members of Beta Nu at an informal gathering early in September. The fall semester became a planning time for events that reached fruition during the spring. In March, a group of local girl scouts participated in student-led activities that helped them gain a science badge. Our annual banquet for the induction of new members, appreciation of former members, and election of officers was held in April. This year's final major project focused on beautifying the Paine Science Building by hanging art work on the mathematics floor. A senior art major was commissioned to create a mural on the subject of science and mathematics, and she is scheduled to complete the work by January 2001. Since the new student welcome and the girl scouts event are both on the agenda for next year, our accomplishments include introducing annual events that promote science and mathematics among members of our campus and community.

### Beta Xi

#### Chapter officers for current year (1999-2000):

President Rebecca Justice  
Vice President/SGA Representative Glistina Adams  
Secretary/Treasurer Kelly Curry

#### Chapter officers for 2000-2001 academic year:

President Crystal Compton  
Co-Vice Presidents Sharlonda Sammons Carroll and Glistina Adams  
Secretary/Treasurer Olivia Gannon  
SGA Representative Harold 'Doug' New

Chapter Advisor: Bernadine Cochran

#### Chapter Activities of the Year:

Co-sponsor of speaker (Dr. Jay Lockman) for Astronomy Seminar  
Fund Raising Activities; Bake Sale  
Community Activities: Sponsored a clothing drive; several members participated in annual Pikeville College community blood drive; several students do volunteer work at their churches.

#### Chapter Member Activities:

Two student members did internships during summer of '99 - one of which was at UK where the research done will be published.  
One member was Young Women in Science and Math Mentor at UK  
Two students attended the Argon Science Symposium  
3+ Members assisted with Physics Science Olympics  
4+ Members are hospital volunteers  
One member was a volunteer for HOPE (perishable food kitchen)

**Proceedings of the National Convention**  
**March 4-6, 1999**  
**Hillsdale College**  
**Hillsdale, Michigan**

Thursday April 27, 2000

Executive Council Meeting

Meeting Convened at 7:35 pm. The meeting was brought to order by President Elect Angela Hare.

**Roll Call**

Officers: Harold Wilkinson Executive Director. Richard Kessler President, Angela Hare President Elect, David Foster Treasurer.

Chapter Representatives: Anthony Grafton, Alpha Beta; James Reynhout, Beta Iota; Joe Sheldon, Beta Lambda.

**Approval of Previous Minutes:** Minutes for the convention March 4-7, 1999 were reviewed. The following changes were made: A missing website address was added, the spelling of Bethel College was corrected and a missing report from the Auditing and Resolutions Committees will be added to the next Sigma Zetan publication. Uncompleted assignments were reviewed. Minutes were approved and accepted.

**Old Business**

**Reports from National Officers**

**Executive Director Harold Wilkinson** reported on the activity of the National Office by distributing a handout. From March 31, 1999 to April 1, 2000, the number of new student initiates joining the society is 370. Faculty initiates total 8. 197 items of jewelry were distributed. 24 of 50 chapters had submitted Officer report forms. 29 chapters communicated with the National Office. As a web site gets established reports and other forms will be available on the web.

**Treasurer David Foster** reported that there is currently \$34,337.00 in the two Sigma Zeta Accounts. \$21,343.00 is in the Development Fund Account. There was considerable discussion about investing some or all of the money in the Development Fund in a money market account. Further discussion focused on using only \$10,000 as an investment. Dr. Foster indicated a written report would be submitted at the first business meeting on Friday. He reminded us that as a non-profit organization we need to spend the annual income each year. Travel costs were discussed along with other convention expenses and it was felt that the treasurer should develop a budget for the next year based on the income of the current year. That way we could serve the needs of the convention better.

**Historian Kemuel Badger** Absent. No report submitted.

**President Elect Angela Hare:** no report submitted

**President Richard Kessler** Late to meeting. No report submitted

**Past President Jim Peters** Absent. No report submitted.

**Publicist Terry Cianci** Absent. No report submitted. A discussion regarding the web site was conducted. It was suggested by Jim Reynhout that Bob Kistler, a member of the Bethel faculty, be approached about being web master. The suggestion was adopted. Joe Sheldon expressed concern about the booklet "Introducing you to Sigma Zeta." He felt it needed updating. The consensus seemed to be that efforts move in that direction but that the material it presents does not seem to have time dependence.

**Sigma Zeta Handbook** Nothing has been done to make any improvements to the Handbook since its inception in 1998. The website <http://www.houghton.edu/academics/sigmazeta/sigmazeta.html> contains an approved copy from which chapters can gain information.

**Constitution Revision** The constitution has been revised and was presented to the Executive Council for approval. It will be copied and distributed to chapters this fall.

**New Business**

**Convention Preparation Report - Jim Reynhout** - All is ready for the meeting. Field trips will leave promptly at 12:00 in order to get back in time for the banquet. The following list of field trips were offered: Minnesota Zoo, Science Museum, Mall of America, Minneapolis Institute of Art, Museum of Questionable Medical Devices, Raptor Rehabilitation Center, University of Minnesota. In discussion of the convention it was pointed out that Host Chapters should arrange for a means for visiting chapters to cash travel reimbursement checks.

In a discussion regarding convention attendance, it was suggested that monetary awards be given based on high percentage of attendees, or number of papers being presented. The money would go to the chapter to aid with travel costs. It was also felt that awards for new non-prior-attending chapters be considered. A motion was passed that a plan be developed to award chapters who generate high chapter attendance and paper presentation at the national meeting. Dedicating \$2000 per year was discussed but not resolved.

Motion - to call chapters in each region with the most increase in numbers and see what they are doing to promote activity. Passed

Motion- to call chapters not attending and offer monetary awards from earlier discussion was tabled until a formula could be developed that seemed equitable.

Motion - Send one anniversary mug and pen to all advisors as a token of appreciation for their service to the organization. Passed provisionally depending on postage cost.

**Committee Assignments - Richard Kessler** - Forms were distributed for sign-up of students for the following committees: Founder's Cup, Nominations, Honor Award, Auditing, and Resolutions. It was suggested that each chapter provide one or two names of students to serve on the various committees.

**Founders Cup Committee**  
No petitions were submitted

**Honor Award Committee**

Richard Kessler, Alpha Beta  
Harold Wilkinson, Pi

**Nominations Committee**

Angela Hare, Beta Lambda, Co-Chair  
Joe Sheldon, Beta Lambda, Co-Chair  
Christin Lundbald, Beta Iota  
Nolawit Tesfaye, Beta Iota  
Lloyd Reitz, Beta Lambda  
Debbie Mudd, Alpha Beta

**Auditing Committee**

Anthony Grafton, Alpha Beta, Chairman  
Andrew Fast, Beta Iota  
Matthew Leafblad, Beta Iota  
Leanne Whitesell, Beta Lambda  
Hope Tobey, Beta Lambda  
Jessica McFarlan, Alpha Beta  
Kristi Jones, Alpha Beta

**Resolutions Committee**

Jim Reynhout, Beta Iota, Chairman  
Amanda Bristow, Beta Iota  
Melissa Kester, Beta Iota  
Keisha Adkins, Beta Lambda  
Begecca Nolan, Beta Lambda  
Rachel Tutor, Beta Lambda  
Neil Mills, Alpha Beta  
Jennifer Villella, Alpha Beta

**Fall Meeting Plans** - Motion to hold the fall meeting will be on October 28th was approved.

Meetings will begin at 8:00 a.m. All National Officers are to attend. Advisors from any chapter may also attend at their own expense. It is suggested that ways be sought after to assist the attendance of as many advisors as possible.

**Future Convention Sites** - Year 2001 - Campbellsville College. Year 2002 - Messiah College. Year 2003 - Our Lady of the Lake University, TX. Year 2004 - Millikin University.

**Friday April 28, 2000**

**Opening Session**

Dr. Richard Kessler opened the meeting with the Historic Gavel. He invited the Host chapter to make introductions. Jim Reynhout welcomed the group to Bethel and introduced the University Provost, Dr. Jay Barnes. Dr. Barnes talked of science at Bethel being a historic strength. He attributed that strength to the faculty and students. He gave a warm greeting to the members of the attending chapters.

President Richard Kessler gave an opening address in which he welcomed the group. He feels the direction of Sigma Zeta is in the hands of the local chapters. There is a need to increase activity, enrollment and participation at national conventions. We need to sell Sigma Zeta as a collegial organization and to promote scientific exchange. He asked for input of attendees for how we might do this.

Executive Director Wilkinson presented information on the outcome of the Executive Council meeting. Key points are summarized in the council minutes. He presented a summary report on the activity of the National Office to the convention.

Treasurer David Foster gave an accounting of the financial activity of the organization over the past year (see separate report). The organization is in good shape financially. He informed the group that travel checks could be picked up from him at anytime after the meeting had adjourned. A location for cashing checks would be announced later.

President Elect Angela Hare is looking forward to service as next year's President.

Dr. Wilkinson announced the members of the various committees and the meeting was adjourned to allow the committees to get organized and plan their agendas.

Friday afternoon was spent attending field trips. Destinations included: The Raptor Center, Museum of Questionable Medical Devices, Mega Mall, and Minnesota Zoo.

**Evening Banquet**

At approximately 6 p.m. President Kessler welcomed the members and guests. The banquet was conducted at the Holiday Inn with about 50 in attendance. After an enjoyable buffet dinner the guest speaker was introduced. Dr. Robert McKinnell of the University of Minnesota, spoke on "Dolly: the Prehistory and Current Promise". He is a nationally known pioneer of cloning. A delightful talk on the origins of Cancer research and his involvement in some of the first cloning experiments with frogs was enjoyed by all. His talk left the attendees with the feeling that they too could do great things in science if they just continue to apply themselves.

Dr. McKinnell's talk was followed by the presentation of 2 honor award keys to Leanne Whitesell of the Beta Lambda chapter and Candace McGregor of the Pi Chapter. Honor award recognition was extended from the Beta Iota Chapter to Amanda Bristow, Andrew Fast, Melissa Karter, Matthew Leafblad, and Christen Lundblad. Dr. Harold Wilkinson read the petitions and President Kessler presented the awards.

**Saturday April 29, 2000**

The closing business meeting was called to order by President Richard Kessler. He extended a special thanks to all the participant in attendance at this convention. There was a special thanks for the work of the National Officers, to Jim Reynhout and the students of the host chapter for their efforts, and to all students who presented papers. After this brief welcome, Dr. Kessler introduced Dr. Wilkinson who presented a plaque to the officers of the Beta Iota chapter recognizing their service as the host of the 2000 convention.

A roll call of chapters was conducted by Dr. Wilkinson with the following results:

<u>Chapter</u>	<u>Number of Attendees</u>
Beta Lambda	3 faculty, 9 students
Pi	1 faculty
Alpha Beta	2 faculty, 5 students
Beta Iota	5 faculty, 25 students

Committee reports**Founders Cup-**

There was no report submitted to the committee for consideration. The cup will be retained at the National

Office until next year. Dr. Wilkinson presented a plaque of recognition to Alpha Beta chapter representatives for having received the founders cup at the 1999 convention. Dr. Richard Kessler was presented with a paperweight in recognition of his service as President.

#### **Auditing Committee**

The Auditing Committee has reviewed the financial records of Sigma Zeta for the period from March 3, 1999 to April 26, 2000. We have made recommendations to the Treasurer, David K. Foster, that would correct five minor errors in the Chapter Income Summary and one very minor error in the Petty Cash total.

##### Corrections to the Chapter Income Summary

1. The Alpha Gamma chapter should be listed as still owing \$50.00 on the 4/7 invoice.
2. The Alpha Phi chapter should be listed as owing \$280.00 not \$180.00
3. The Beta Iota chapter should be listed as having paid \$350.00 on 3/10 not \$325.00.
4. The Beta Theta chapter should be listed as owing \$128.00 not \$80.00
5. The Pi chapter invoice #042899d should be accompanied by proof of payment of \$300.00

##### Corrections to Treasurer's Report

1. The report should be updated to reflect the recommended changes in the Chapter Income Summary.
2. The Petty Cash total should be \$133.37, not 133.27.

The Committee notes the existence of \$2175.00 in checks payable to Sigma Zeta that are now void due to the length of time that has passed since they were written. The committee recommends that the checks be copied, and that the copies be returned to the original writers and /or the chapter with requests for new payments. The committee requests that prior to the 2001 national meeting, a report be made to the members of the Sigma Zeta National Council detailing the progress of the recovery efforts.

Overall we find that David Foster has done a good job in a difficult and demanding position, and we thank him for his work.

The report was accepted by the members of the committee

Motion- Establish a fund starting with \$10,000 for the purpose of investing in a good mutual fund. The fund may be added to by a vote of the National Officers or Chapter. It was seconded and passed. Dr. Foster was assigned to proceed.

#### **Nomination Committee-**

The Nominations Committee is pleased to announce the following slate of National Officers for 2000-2001.

Executive Director - Harold Wilkinson, Pi  
Treasurer - David Foster, Beta Lambda  
Publicist - To be filled pending Officers & Advisors Meeting in October 2000  
Historian - Kemuel Badger, Xi  
President Elect - To be filled pending acceptance by Jeanne Barnette  
President - Angela Hare, Beta Lambda  
Past President - Richard Kessler, Alpha Beta

It was moved, seconded and voted to approve this slate of officers for the next year. It was recommended that the Publicist's responsibilities be to oversee the services of a Webmaster. The name of Robert Kistler, Beta Iota chapter, was suggested as a possibility.

#### **Resolutions Committee Report**



Be it resolved that:

1. A new office be created with the title of "Technology Guru"
2. Messiah college groups be given a two hour "birding allowance" before scheduled events so that their advisors can complete their required number of sightings.
3. Cosmology and the mechanics of moving objects (bowling) be heretofore combined in all physics curricula.
4. Poor bowlers be given a 50 pin handicap during cosmic bowling.
5. Standard laboratory safety procedures be observed such that breakfast not be served in view of preserved specimens.
6. The laser pointer and powerpoint changer buttons be carefully designated so that student presenters are not additionally confused during their research papers.
7. The definition of an "intimate meeting" not include being locked in the room.
8. Chapters coming from a significant distance with greater than 15 hours of travel be given travel vouchers for airline tickets instead of 15 passenger vans.
9. Mileage for this trip be converted into frequent flyer miles for future trips.
10. Ramp lights on Minnesota freeways be given increased time on green, two cars can enter each time, and less time in between.
11. Minnesota highways have their names changed from letters to real names.
12. The Mounds View Inn be encouraged to provide an ice machine on the second floor.
13. That residents of the Mounds View Inn be required to wear adequate clothing while obtaining ice from their machines.
14. Lickety Split television program be limited to only two commercials per evening.

### Resolutions, continued

15. That the "mega" Mall of America be made smaller so one can see all of it in under three hours.
16. The time allotment at sites like the Mall of America be extended so that the designated driver can watch the end of the movie.
17. An Introduction to Questionable Medical Devices be included in the curriculum of all premedical programs of member chapters.
18. Dr. Robert McKinnell be thanked for his interesting and entertaining presentation and especially for his enthusiasm and encouragement of students.
19. Other chapters be notified that we missed them at this convention and hope to see them next year at Campbellsville.
20. Being watched "like a hawk" be reserved to visits to the Raptor Center and not in classrooms.
21. The Beta Iota chapter be thanked and congratulated for their fine efforts in helping this convention to be successful.
22. The national convention be scheduled during weather that is as nice as it has been for this one.
23. Luke, the bald eagle, and Dolly, the cloned sheep, be officially designated as the mascots of the 75th anniversary convention of Sigma Zeta.
24. Napping be designated as an official field trip and that individuals choosing to do so report on their experiences in dreamland.
25. Extra salt shakers, water pitchers, and PIE be provided at all tables during future Sigma Zeta banquets.
26. Every student's research be labeled as "significant", even though the data might be less so.
27. That coffee mugs be given at all Sigma Zeta conventions in the future.
28. Future members of the resolutions committee be well compensated for their creativity and hard work (Donations to current members gladly accepted).

### Announcements

Curt Grafton announced the site of next year's convention to be Campbellsville, Kentucky, Alpha Beta Chapter, Host.

Chapters should also be reminded that students could publish their paper in the Sigma Zetan.

The gavel was passed by President Kessler to Dr. Angela Hare who gave a short speech of appreciation to Dr. Peters and his chapter for their service. The meeting adjourned at 12:10 p.m.

**Sigma Zeta National Office Activity Report: 30-March-1999 to 1-April-2000**

Chapter	New Memberships	Dues	Officer Report	Jewelry	Jewelry Type
Alpha Beta			Yes		
Alpha Chi	10	\$250	Yes	20	Pins
Alpha Epsilon			Yes		
Alpha Gamma	27	\$450	Yes		
Alpha Kappa			Yes		
Alpha Mu	31	\$775	Yes		
Alpha Nu	4	\$100	Yes		
Alpha Phi	29	\$725	No		
Alpha Pi	5	\$125	Yes		
Alpha Psi	26	\$650	Yes	26	Pins
Alpha Rho	21	\$525	Yes		
Alpha Sigma	13	\$325	Yes	13	Pins
Alpha Theta	14	\$350	Yes	5	Pins
Alpha Upsilon	16	\$400	Yes		
Alpha Xi			Yes		
Beta	21	\$525	Yes		
Beta Beta			Yes		
Beta Delta	4	\$100	No	5	Pins
Beta Iota	44	\$1425	Yes	30	Medallions
Beta Lambda	6	\$150	No		
Beta Mu	7	\$175	Yes		
Beta Nu	26	\$650	No	50	Pins
Beta Theta			Yes		
Beta Xi	17	\$475	Yes	21	Pins
Lambda	9	\$225	Yes		
Phi	11	\$275	No	18	Pins
Sigma	12	\$300	Yes		
Summerset CC	9	\$225	Yes	9	Pins
Xi	8	\$200	Yes		
Totals	370	\$9400	29	197	11

Sigma Zeta Treasurer's Report 3 March 1999 - 26 April 2000  
David K Foster- Treasurer

<b>Balance Forward 03-March-99</b>	<b>\$25,312.64</b>
<b><u>Income</u></b>	<b><u>\$11,024.70</u></b>
Chapter Income	\$10,216.30
Total Invoiced	
Dues	\$11,325.00
Jewelry etc.	\$886.30
Donations	\$75.00
Unprocessed Checks	(\$2,175.00)
Chapter Overpayments	\$105.00
Other Income	
Dividends 1/19-12/31/99	\$643.77
Dividends 12/31 /99-4/26/99	\$164.63
<b><u>Disbursements</u></b>	<b><u>(\$4,932.40)</u></b>
National Convention Travel 1999	(\$3,766.00)
National Officer Travel	(\$266.40)
National Office Expenses	(\$300.00)
Pre-conference advance Beta Lambda	(\$600.00)
<b><u>Petty Cash</u></b>	<b><u>\$133.27</u></b>
forward from 1999	\$100.27
from Convention Memorabilia Sales 1999	\$33.00
<b>Balance 26 April 2000</b>	<b>\$31,538.21</b>

## Rules for Presentation of Student Papers

The following recommendations concerning the presentation of student papers at national conventions of Sigma Zeta were passed by the thirtieth annual Convention in Decatur, Illinois.

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/her 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 join paper either author may present the paper.
3. The paper should show some degree of originality and preferably should involve experimentation, or it should be creative in nature or involve a new approach.
4. The first abstract must be presented to the editor at the national meeting before the paper is presented. Such an 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 to to 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.

## Founders Cup Competition

Each chapter submitting an annual report to the convention for the purpose of competing for the Founder's Cup will be judged on a scale of one to ten in areas one and two. The chapter with the highest total score will be the winner.

To be eligible for consideration for the Founder's Cup, a chapter must have activities in both area one and area two.

### Area One: Local Activity

- 1) Local meetings - number, quality, originality.
- 2) Local activities - sponsorship or assistance with science fairs, competitions, service to community, social activities promoting local chapter.
- 3) Recognition from outside groups.
- 4) Utilizing outside resources such as speakers, field trips, etc.
- 5) Innovative ideas useable by other chapters.

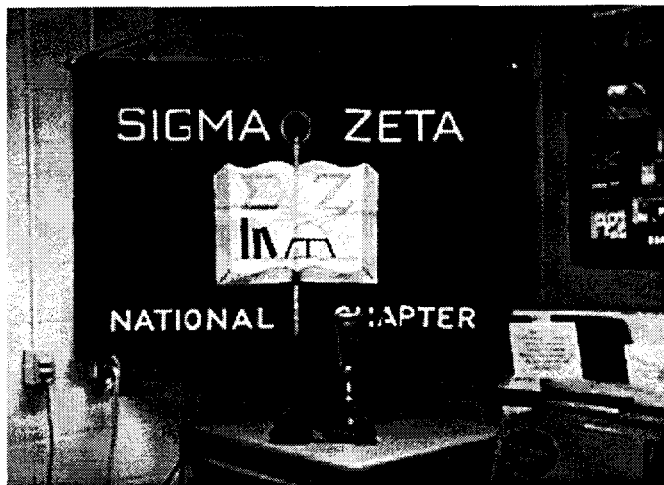
### Area Two: National Activity

- 1) Attendance at National Convention.
- 2) Paper presentation at National Convention - quality and quantity.
- 3) Cooperation with National Chapter - answering mail, sending in reports, etc.
- 4) Recruitment of new chapters.
- 5) Promotion of inter-chapter activities.
- 6) Cooperation with other chapters.

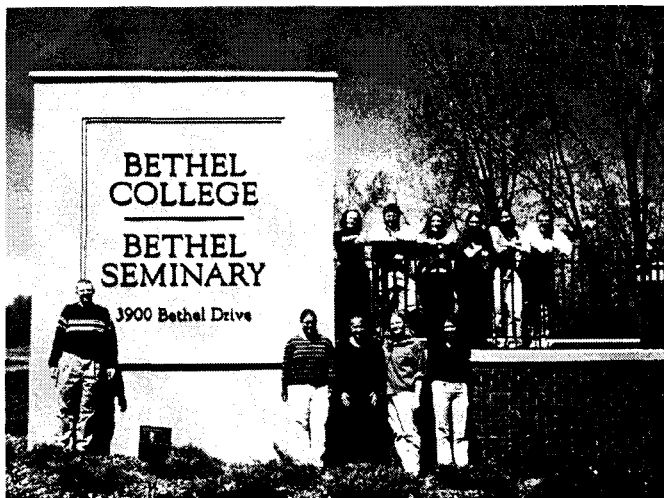
Any chapter wishing to compete for the Founder's Cup must submit to the Founder's Cup Committee at the Annual Meeting, an evaluation of their activities organized in outline form and using the above criteria as outline headings. This document will be in addition to a chapter report for the Sigma Zetan.

Photos of Events and Happenings

Our 75<sup>th</sup> National Convention



students and advisors from Beta Lambda chapter, Messiah College



Bethel College Provost Jay Barnes welcomes Sigma Zeta

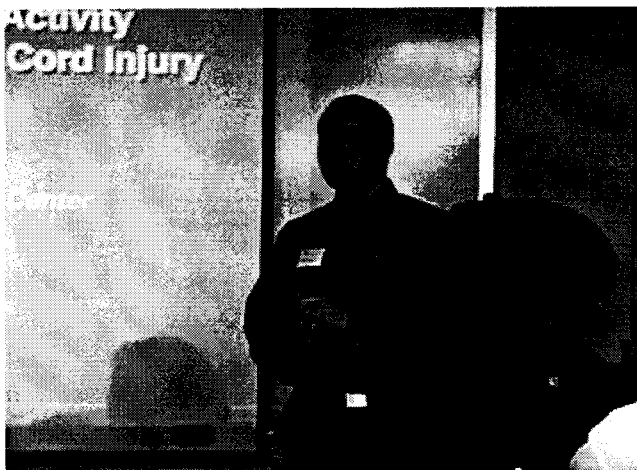


Members of Beta Iota at Cosmic Bowling

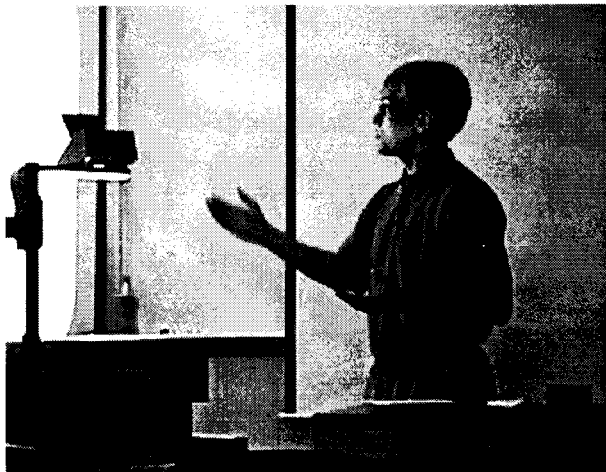


## Student Presentations

Neil Mills  
Alpha Beta  
Campbellsville University



Aaron Rendahl  
Beta Iota  
Bethel College



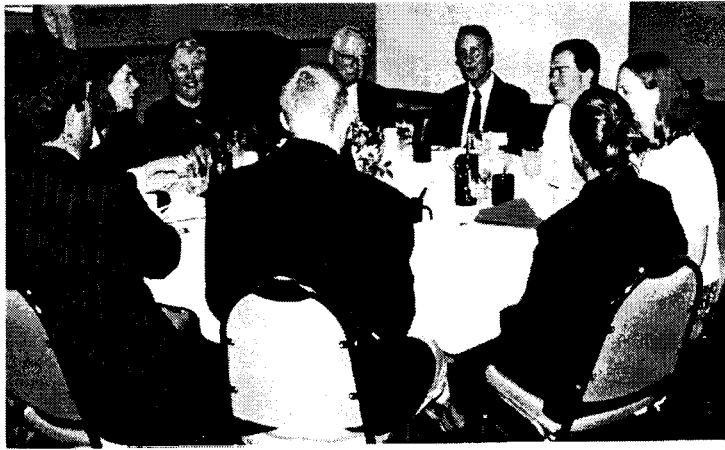
Joe Sheldon (Beta  
Lambda) enjoys a close-  
up view at the Raptor  
Center



Live surgery at the Raptor  
Center

Dr. Robert McKinnell  
University of Minnesota  
"Dolly: the Prehistory and Current  
Promise"





Dr. McKinnell and his wife enjoy conversation with Sigma Zeta members



President Richard Kessler  
passes the gavel to President-elect Angela Hare

## School/Chapter Cross Reference Alphabetical by School Name

Anderson University .....	Upsilon
Asbury College .....	Alpha Theta
Ball State University .....	Xi
Beaver College .....	Beta Epsilon
Belhaven College .....	Beta Theta
Bethel College .....	Beta Iota
Cabrini College .....	Beta Zeta
Campbellsville College .....	Alpha Beta
Central Missouri State University .....	Psi
Clinch Valley College .....	Alpha Xi
Coastal Carolina University .....	Beta Mu
Columbia College .....	Beta Gamma
Dakota Wesleyan University .....	Alpha Sigma
Eastern College .....	Alpha Chi
Eureka College .....	Phi
Evangel College .....	Beta Eta
George Fox College .....	Beta Beta
Gwynedd-Mercy College .....	Beta Delta
Hillsdale College .....	Alpha Psi
Houghton College .....	Beta Nu
Immaculata College .....	Alpha Mu
Indiana Wesleyan University .....	Alpha Epsilon
Kansas Newman College .....	Alpha Delta
Kentucky Wesleyan College .....	Beta Kappa
Lyndon State College .....	Beta Alpha
Malone College .....	Alpha Gamma
Mansfield University .....	Lambda
Marist College .....	Alpha Phi
McKendree College .....	Beta
Messiah College .....	Beta Lambda
Millikin University .....	Pi
Missouri Valley College .....	Chi
Oglethorpe University .....	Alpha Nu
Otterbein College .....	Epsilon
Our Lady of the Lake University .....	Sigma
St. Mary of the Woods College .....	Alpha Omega
Somerset Community College .....	Associate
Stonehill College .....	Alpha Rho
Suffolk University .....	Alpha Lambda
Trevecca Nazarene College .....	Alpha Pi
Union University .....	Alpha Upsilon
University of Indianapolis .....	Rho
University of So. Indiana .....	Alpha Kappa
VCUMCV School of Pharmacy .....	Gamma

*GOING  
INCOMPLETE!*

## Chapter/School Cross Reference Alphabetical by Chapter

Alpha Beta	Campbellsville College
Alpha Chi	Eastern College
Alpha Delta	Kansas Newman College
Alpha Epsilon	Indiana Wesleyan University
Alpha Gamma	Malone College
Alpha Kappa	University of So. Indiana
Alpha Lambda	Suffolk University
Alpha Mu	Immaculata College
Alpha Nu	Oglethorpe University
Alpha Omega	St. Mary of the Woods College
Alpha Phi	Marist College
Alpha Pi	Trevecca Nazarene College
Alpha Psi	Hillsdale College
Alpha Rho	Stonehill College
Alpha Sigma	Dakota Wesleyan University
Alpha Theta	Asbury College
Alpha Upsilon	Union University
Alpha Xi	Clinch Valley College
Associate	Somerset Community College
Beta	McKendree College
Beta Alpha	Lyndon State College
Beta Beta	George Fox College
Beta Delta	Gwynedd-Mercy College
Beta Epsilon	Beaver College
Beta Eta	Evangel College
Beta Gamma	Columbia College
Beta Iota	Bethel College
Beta Kappa	Kentucky Wesleyan College
Beta Lambda	Beta Lambda
Beta Mu	Coastal Carolina University
Beta Nu	Houghton College
Beta Theta	Belhaven College
Beta Zeta	Cabrini College
Chi	Missouri Valley College
Epsilon	Otterbein College
Gamma	VCUMCV School of Pharmacy
Lambda	Mansfield University
Phi	Eureka College
Pi	Millikin University
Psi	Central Missouri State University
Rho	University of Indianapolis
Sigma	Our Lady of the Lake University
Upsilon	Anderson University
Xi	Ball State University

BETA XI PIRGALLE, KY  
 BETA OMICRON MADONNA UNIV.  
 ZEARBORO