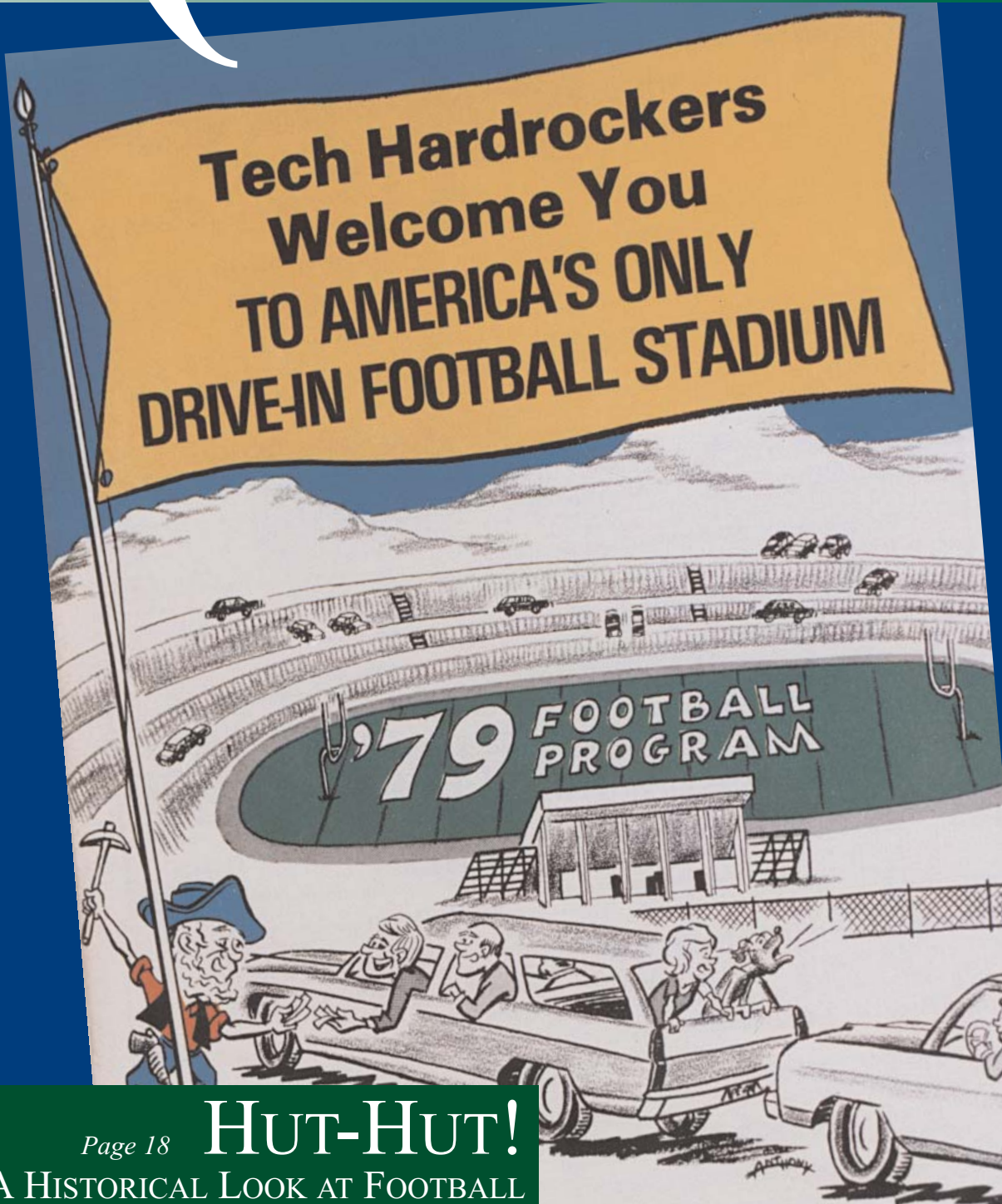


# QUARTERLY

SOUTH DAKOTA SCHOOL OF MINES AND TECHNOLOGY

FALL 1999



South Dakota School of Mines and Technology  
RAPID CITY, SOUTH DAKOTA

Page 18 **HUT-HUT!**  
A HISTORICAL LOOK AT FOOTBALL

## Perspectives



Dear Friends,

The Black Hills of South Dakota are beautiful as we enter the fall season. The change of color of the trees and the crisp nights welcomed the return of students and faculty. The many new students continue the proud traditions of the

South Dakota School of Mines and Technology for preparing our graduates as leaders in engineering and the science professions.

For many fall is the time for football. We opened the season with a triple treat - the excitement of a talented new team, the joy of a winning score, and the privilege of hosting a very special football exhibit.

The traditional football programs provide a link between fans and the team. In this issue of the Quarterly, you are treated to a unique historical perspective of the changes in the culture and traditions of America as reflected in the way that football programs were prepared. Thanks to the dedication and generosity of Edson Bearg (GenE '58) our university has displayed an exciting selection of football programs from his extensive collection. The artwork and featured focus of these programs are a powerful summary of the people and events of our last century.

This issue of the Quarterly provides an overview of the many interests and activities of the faculty and students who are the heart of our university. Through activities ranging from helping others to paleontological discoveries of new specimens, we are able to offer our students exciting and unique opportunities to prepare themselves for a lifetime of success in their chosen profession.

Thanks for your continued friendship and support as we prepare another group of students to join our alums in building on the traditions of excellence at the South Dakota School of Mines and Technology.

Sincerely,

A handwritten signature in black ink, appearing to read "Richard J. Gowen".

Richard J. Gowen, President

# SOUTH DAKOTA SCHOOL OF MINES AND TECHNOLOGY QUARTERLY

Fall 1999

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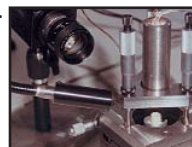
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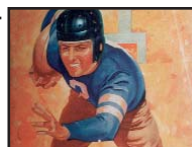
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## CAMPUS

## Profile

The South Dakota School of Mines and Technology, founded in 1885, has been a national leader in preparing world-class engineers and scientists. Our graduates design, construct, and operate modern technology to meet complex challenges such as global warming, health care delivery, energy resource development, mineral extraction and processing, environment quality, futuristic transportation, and national defense. Our alumni are held in the highest regard by their fellow leaders in industry, consulting, government, health and education.

Tech has diversified to meet the needs of engineering and science throughout the world. South Dakota Tech's intellectual environment was shaped a century ago by the ingenuity and rugged individualism of pioneers in science and technology. Tech's present day pioneers provide inspiration and remain on the cutting edge in the fields of engineering and the sciences.

**ACADEMIC PROGRAM:** SDSM&T is a state-assisted university providing graduate and undergraduate degrees in science, engineering, and interdisciplinary studies.

### BACHELOR OF SCIENCE DEGREES

Chemical Engineering	Industrial Engineering
Chemistry	Interdisciplinary Science
Civil Engineering	Mathematics
Computer Engineering	Mechanical Engineering
Computer Science	Metallurgical Engineering
Electrical Engineering	Mining Engineering
Geological Engineering	Physics
Geology	

### MASTER OF SCIENCE DEGREES

Atmospheric Sciences	Materials Engineering and Sciences
Chemical Engineering	
Civil Engineering	Mechanical Engineering
Computer Science	Paleontology
Electrical Engineering	Technology Management
Geology and Geological Engineering	

### DOCTORATE OF PHILOSOPHY DEGREES

Atmospheric, Environmental and Water Resources  
Geology and Geological Engineering  
Materials Engineering and Sciences

**ENROLLMENT:** The University has a diverse enrollment of approximately 2,200 students from nearly 30 states and 20 countries. Our 13 departments offer 30 degree programs in engineering and science disciplines at the baccalaureate, masters, and doctoral levels. Students enter the university with the highest ACT composite in the state and more than half graduating within the top 25 % of their high school.

**COSTS AND FEES:** Annual undergraduate costs for tuition, fees, room and board total less than \$8,000 per year for residents of South Dakota, Alaska, Colorado, Hawaii, Idaho, Minnesota, Montana, Nevada, New Mexico, North Dakota, Oregon, Utah, and Wyoming. Annual total costs for all other undergraduates is less than \$11,000 per year.

**RESEARCH:** High quality research is conducted in departments and in our research institutes.

**FACULTY:** There are approximately 100 faculty with degrees from more than 150 institutions, eighty five percent of which have earned doctoral degrees.

# HOSPITAL ALBERT SCHWEITZER

## receives check-up

### Tech faculty mends Haitian environmental systems



treatment plant pumps and valves had completely broken down, and the digester was being bypassed; and the hospital incinerator had suffered an explosion due to improper operation resulting in all solid waste from the hospital and the campus being burned in low-temperature mass burn units.

"When Dr. Mellon built the hospital he envisioned it as this hospital that was stand-alone and had everything it needed," said Berdanier. "So, he built it with a sanitary sewer system, its own wastewater treatment plant, water collection, treatment, and storage systems. He recognized the need for accessible, safe drinking water in the surrounding communities and built water distribution lines and community fountains throughout the valley. These were built with an operational life of 30 years, and it has been 45 years since they were put in. It is time that they all be updated and replaced," he added.

On his first trip to HAS in early 1996 Berdanier did a feasibility study to examine all of the environmental problems at the hospital. A staff engineer at the time remarked how they were supposed to be helping to improve people's lives but instead are polluting the environment they live in due to the failing systems. The environmental support systems at the hospital needed to undergo major renovation or replacement immediately.

Berdanier's study tried to rank the environmental problems based on a variety of factors: how they impacted the people; how they impacted the environment; whether they were long-term or short-term; and how much it would cost to fix. A cost to benefit analysis was derived out of the study which led to a list of projects that could improve the situation.

Together with Ulrich Beck representing the Swiss government, Berdanier wrote a proposal in 1997 to solicit funding for specified projects. The proposal called to rebuild the wastewater plant, build new sanitary sewers, new water lines, a new centralized water

treatment system, and a new hospital incinerator. After submitting the proposal to the Swiss Government's international crisis relief group and various private foundations in the United States, HAS received \$375,000.

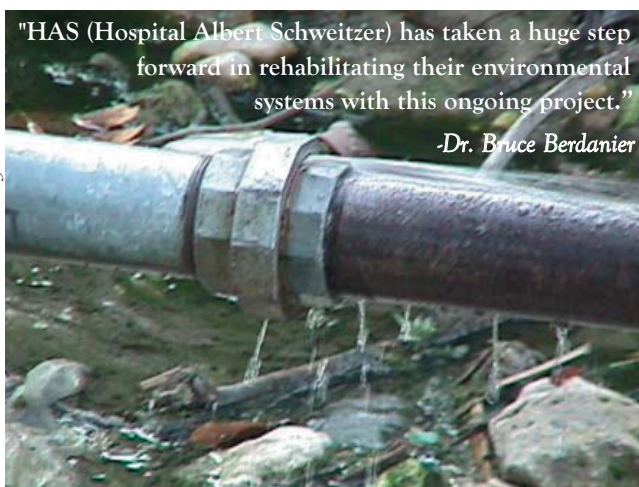
In their rehabilitation and replacement efforts Berdanier and HAS personnel needed to take into account the remote location of Deschapelles, along with the unstable economy and political uncertainties of Haiti. Each system needed to be fairly simple in

Tucked away in the Artibonite Valley of Haiti sits one couple's humanitarian effort to improve the lives of people living in the poorest country in the Northern Hemisphere. Hospital Albert Schweitzer (HAS) was established in 1954 by Dr. and Mrs. William Larimer Mellon. Under the supervision of Dr. Mellon, HAS was conceived, planned, and built as a state-of-the-art hospital for a tropical region.

Serving an area of approximately 620 square miles, HAS provides medicine, pediatric services, and surgery to approximately 280,000 individuals. Each morning a woman approaching her 90's who wears her hair back in a headband, tanned skin from the Haitian sun, and a smile that stretches from ear to ear, greets the many who have traveled by foot to see her and the doctors at HAS. Gwen Mellon has been running the hospital since her husband passed away in 1989 and continually seeks the help and support of individuals like Dr. Bruce Berdanier, Assistant Professor of Civil and Environmental Engineering at SDSM&T, to keep HAS operational.

Berdanier was introduced to HAS in 1995 through Tim Dutton, the hospital administrator at the time. When Dutton first traveled to the village of Deschapelles, 80 miles from the Haitian capital of Port-au-Prince, he was welcomed by failing environmental systems at HAS. The sanitary sewerage system had failed and bypassed in several locations overflowing into the streams; the drinking water treatment plant had completely failed leaving the hospital unable to treat water for medical use or for consumption in the homes on the campus; the waste water

Photo by Bruce Berdanier



"HAS (Hospital Albert Schweitzer) has taken a huge step forward in rehabilitating their environmental systems with this ongoing project."

-Dr. Bruce Berdanier

Waterlines installed in the 1950's are now completely exposed due to watershed erosion. The waterlines are subject to nearly constant disruption due to environmental conditions like flash floods and erosion.



*Berdanier viewed a typical home near Deschapelles, Haiti, above Hospital Albert Schweitzer. The countryside in Haiti is approximately 98 percent deforested in Haiti.*



*Dr. Bruce Berdanier*

installation, very durable in its ongoing operation, and easily maintainable. Obtaining replacement parts or installing a complicated system would be very difficult, if not impossible to accomplish.

The replacement of operational systems at HAS began in September 1998 and continues on today. Berdanier travels to Haiti approximately every three months to meet with HAS staff and representatives of the Swiss Government. During each meeting, the project progress is reviewed and mid-course corrections are made as necessary. To date the sanitary sewer system is completed, a new hospital incinerator is being installed, and the centralized drinking water system is under construction. The re-construction of the waste water treatment plant will have to be addressed this fall and into next year.

"HAS has taken a huge step forward in rehabilitating their environmental systems with this ongoing project. I have worked with the operational staff to select simple, robust treatment options that will serve them throughout the next 50 years," said Berdanier. "I am especially pleased with the work we have accomplished in improving the wastewater treatment and collection, and the drinking water treatment systems. The new hospital waste incinerator is the most technically complicated unit and will be the system most susceptible to failure in the environmental conditions in Haiti."

Berdanier's work in Haiti is funded through the Grant Foundation, named after Gwen Grant Mellon. The Foundation pays for his travel and expenses while in Haiti and Berdanier volunteers his time and expertise. Berdanier has already written another proposal to the HAS Board of Directors in response to their recent directive that they wish to continue operation of the original water supply system for Deschapelles and HAS. When funded, this proposed study will result in a comprehensive watershed quantity and quality study along with cost estimates and prioritization of projects to rehabilitate and protect the springs and raw water collection lines which bring the water to the village and hospital. Berdanier is hopeful that this project may be funded in the year 2000.

The work in Haiti is truly an international volunteer effort. In addition to the main environmental systems rehabilitation project

*Photo by Bruce Berdanier*




that Berdanier is working on, there are simultaneous projects ongoing in the valley sponsored by other foundations. The Rotary International Foundation is one of the main funding agencies for the work on rehabilitating the irrigation dam and distribution structures over the past five years. RI is currently embarking on the "100 Wells Program" to site 100 drinking water wells over the next four or five years for the area villages. Additionally, RI is considering co-sponsorship of Berdanier's proposal for 2000. The Lions International Foundation is also a co-sponsor in the "100 Wells Program."

Larry and Gwen Mellon founded Hospital Albert Schweitzer on Dr. Schweitzer's ethic of "Reverence for Life." It was Dr. Schweitzer who inspired Dr. Mellon to enroll in medical school at the age of 37 and eventually select Deschapelles, Haiti as the site to begin a hospital. Dr. Mellon, the son of Gulf Oil founder W.L. Mellon and Mary Taylor Mellon, financed the development of HAS through money from inheritance and trust funds.

Since its conception, HAS has been dedicated to not only improving the health and lifestyle of the Haitian community, but also improving the environmental conditions of the area. The hospital's mission not only encompasses health education but public health and community development as well. Education in the areas of agriculture, tree planting, well drilling, and latrine construction assistance are available through the HAS community development program. Initiatives are underway to improve forestry, animal husbandry, water supply, sanitation, and local economies.

When HAS opened in 1954 it was important to Dr. and Mrs. Mellon not to take over the community, but to become a neighbor in the community. Though this effort, the Mellons have provided training and advancement to local residents which in turn has led to the success of the hospital. Today, 90% of the personnel at HAS are Haitian, including most technical and supervisory staff.

Haiti is a developing country in a state of constant political unrest. With a population of 4.5 million, and an average yearly income of \$300 U.S., people do not have the means to receive adequate health care and maintain and operate working environmental systems. With the establishment of Hospital Albert Schweitzer in 1954, individuals world-wide are using their expertise to help improve living conditions in the Artibonite Valley. One such individual is found here at Tech, Dr. Bruce Berdanier, who is using his expertise in environmental engineering to rehabilitate and rebuild operational systems at HAS and improve the environmental conditions in the Haitian community. 

*Photo by Bruce Berdanier*



*The wastewater treatment plant once consisted of a digester with pumps, controls, and spray bed filtration. The system is now in complete failure. The new system will be very simple and will include reusing the existing digester followed by a lagoon.*



**T**ech students come from across the United States and the world. While a majority are South Dakota residents, the students come from as far away as India and Norway. Despite their diverse background, the graduate and undergraduates have one common bond, their university and the city they lived in. Two alumni in particular, one a Rapid City native, and the other now living in Venezuela, contributed to the community of Rapid City in more ways than they themselves probably realized.

Damon Matter, a 1938 graduate in civil engineering, and Luis Roca, a 1981 graduate with a masters degree in geological engineering, have both made large contributions to a historical landmark in Rapid City, Hangman's Hill, also known as Skyline Drive. Matter designed the amphitheater which now sits ½ mile off of Skyline Drive, and Roca wrote his masters theses on a geological survey of the land.

The historical significance of Hangman's Hill dates back to 1877 when three accused horse thieves, Louis "Red" Curry, A.J. "Doc" Allen, and James "Kid" Hall, were killed in a botched hanging just north of what is now Dinosaur Park. While being held in the town jail, a lynch mob broke in, dragged the three men up the hill and attempted to hang each of them. Consequently, they were all pronounced dead before the hanging took place, they died of strangulation, and Hangman's Hill was so named.

Over fifty years later the Works Progress Administration (WPA) was created and landmarks which now decorate Hangman's Hill were built. The WPA was implemented in 1935 in an effort to provide work for the millions of victims of the Great Depression. In addition to the construction of more than 650,000 miles of roads, 125,000 public buildings, and 8,000 parks, the WPA would help stimulate the recently impoverished economy by creating increased purchasing power.

In Rapid City, South Dakota the WPA built a road later to be called Skyline Drive, the stone walls that align parts of the road, Dinosaur Park, and an amphitheater. We do not know how or why it came about, but for his senior design project at the School of Mines, Matter designed the amphitheater which was to be constructed by the WPA.

"I remember driving down from Belle Fourche with Damon to look at the land," said Babe Tinant, Matter's sister. "Damon would walk me up to the amphitheater and talk to me about it, but being 10 years younger I didn't listen much," she added smiling. "I remember it was built the same time the dinosaur was done."

"When first built the idea behind the amphitheater was to bring in entertainment," said Chuck Tinant, Matter's nephew. "The original intent was to build it into the hillside, terrace it off and people could come in, bring their blankets, and enjoy the entertainment and the mountains," he added.

*Student projects connect SDSM&T with  
Rapid City community*

*Developing Lasting Relationships*







*Benches in the amphitheater designed in the 1930's by SDSM&T alum Damon Matter can still be seen today.*

Upon completion of the amphitheater there was talk of bringing the Black Hills Passion Plan to Rapid City and develop the WPA project into a community theater Rapid City and surrounding communities could enjoy. To Matter and all who were involved in the project, it came to no avail. The amphitheater still sits ½ mile off of Skyline Drive but it is overgrown with brush and trees. If you hike to the site in the morning or late afternoon hours the benches etched into the hillside can still be seen when standing on the 'stage.' It does not serve as a mecca of entertainment like initially hoped, but rather serves as a hiking destination and favorite place to 'hang out' for the local teenagers.

Tinant would like to see the amphitheater restored and put back into its original use as a park site. What could be better than having an amphitheater that can seat over 5,000 people in a picturesque mountain setting, and be only a ten minute drive from town, Tinant asks.

"It is natural to want to turn the land into a park, not just for us, but for every other generation into the future," said Tinant. "I envision church groups gathering at the amphitheater teaching fellowship and civic responsibility. Each group can adopt an area to pick-up and keep clean, developing an appreciation for public park space," he added.

Initially stemming out of the South Dakota School of Mines & Technology as a senior design project, the amphitheater has been a spotlight on Hangman's Hill since 1938. With dreams of grand performances tucked away in the Rapid City hillside, the amphitheater has never lived up to its original billing. Decendents of Matter's together with community members hope to eventually enjoy an Easter sunrise service, or a concert in the park at the amphitheater sitting atop the hill dividing Rapid City's east and west sides.

It continues to be a mystery how Matter chose to design the amphitheater on Hangman's Hill, just as it is unknown why Luis Roca, a graduate student in geological engineering, wrote his thesis in 1981 entitled "Engineering Geology and Relative Slope Stability of the Inyan Kara Hogback, Rapid City, South Dakota." Both

*"The original intent was to build it (Skyline Drive amphitheater) into the hillside, terrace it off and people could come in, bring their blankets, and enjoy the entertainment and the mountains."*

*-Chuck Tinant*

alumni took an interest in the historical landscape of Rapid City and are unaware today of the impact their work has had on the community.

The Inyan Kara Hogback is an area otherwise identified as Hangman's Hill. In his introduction at the beginning of his thesis, Roca identifies what appears to be why he chose this particular topic:

"...The most important factors responsible for instigating this investigation are: 1) the occurrence of two large land-slides in the Inyan Kara hogback in the Rapid City area... involving extensive damage to private and public property; 2) rapidly spreading hillside developments upon the ridge; and, 3) the considerable strategic position of the hogback in Rapid City..."

Now living in Venezuela, Roca probably has little knowledge of the impact his thesis has had over the past 15 years. No other geological surveys have been performed on the Inyan Kara hogback or Hangman's Hill area of Rapid City so as a result Roca's theses has served in their absence.

Despite their diverse backgrounds and cultural traditions, Tech students and alumni come to the School of Mines to obtain an education. An integral part of that education is hands-on involvement

in their field of study. For Matter it was his senior design project, and for Roca, his masters thesis. Both project and paper have survived and been of use long past their time proving that not only do students come to Tech to learn, but also become an invaluable part of Rapid City's history.



*The amphitheater is tucked away in Skyline Drive-this view of the city can only be seen from a small hill behind the stage of the amphitheater.*



*Dinosaur Park on Skyline Drive is one of the most recognized landmarks in the Rapid City area.*



Working eight hours a day, sitting in the dirt, looking for animals millions of years old, and tolerating temperatures between 80-100 degrees is not what most would think of as a wonderful experience. They obviously have not

participated in the Big Pig Dig at Badlands National Park. The Big Pig Dig is a cooperative project between the Museum of Geology and Badlands National Park. Each summer it is one of the field dig opportunities offered to the public through the Museum of Geology at the South Dakota School of Mines and Technology (SDSM&T).

Carrie Herbel, Collections Manager and Preparator at the Museum, oversees the dig supervising a group of students, volunteers, and visitors to the Black Hills who came to participate in the field dig. Students from SDSM&T, either employed to work at the dig or earning course credit for their time spent at the site, are large contributors to the success of the dig each year. During this past summer's dig, July 19-30, five students kept busy each day excavating and digging for fossils, mapping the locations of new discoveries, and preparing fossils in jackets to transport to the lab at SDSM&T. In addition to the field dig a total of ten students worked at the site throughout the summer.



"I've hired students who have good interpersonal relations with others, especially since they all have to do some interpretation at the site with Park visitors," said Herbel. "Most of these students have had some experience in the lab or other field sites, which gives them added confidence at the Pig Dig.

"I am really proud of our students this year as it has been one of our more successful field seasons to date. Their efforts have met and exceeded the goals set by both the park and the Museum," she added.

Discovered in 1993 by two park visitors, the Big Pig Dig is primarily excavated by SDSM&T students, staff, and faculty. The Museum of Geology also hires students to work at the site under a cooperative agreement with the National Park Service. The dig represents the largest number of fossils discovered in one area at the Park and gives visitors a look at the Badlands approximately 32 million years ago.

Although the exact conditions of what the site was like is unknown, researchers believe the Pig Dig was a

spring-fed watering hole. During times of drought, animals were attracted to the water and would get trapped in the mud and die. Later predators would come and scavenge their bodies. Bones of the dying animals would eventually be preserved at the site.

Since its discovery in 1993 over 5,000 fossil bones have been removed from the Pig Dig, including at least 32 individual animals. Remarkably, the remains of only five different animals are found at the site, they are: Archaeotherium - a large pig-like animal; Subhyracodon - a large homeless rhinoceros; Meshippus - a small three-toed horse the size of a Collie; Leptomeryx - a small cat-sized deer like creature; and Ischomys - a rodent.

When the students excavating at the site discover a bone their first task is to carefully map its location and record other pertinent data such as bite marks, orientation, and association to other bones nearby. They then expose the bone with the use of dental picks, trowels, and paintbrushes and trench around the bone to isolate it. Next with the use of tissue paper, burlap, and plaster they cap the bone and surrounding earth in a jacket in order to protect it while they transport it back to the Museum where they begin prep work in the lab during the school year. Once in the lab, students will spend an

# BIG PIG DIG

## No BBQ for Tech Students

*Story photos by Kari Larese*



average of 12 hours prepping for every hour spent out in the field.

"It is important to document where each bone came from, its location, what level it is lying at, and its position," said Gerald Mundt (SPEC, Minneapolis MN). "By carefully recording the information you maintain its scientific value. Once you force a bone from its location or fail to record specific detail, the bone loses its scientific value," he added.

"It is a learning process for everyone," said Dan Lien (GEOL, Rapid City), an undergraduate student who is in his second year of working at the site. "As far as an educational or training point of view, we are gaining great field experience. This is one of the premium sites you can work at," he added. "It is a hard thing to top."

Students who are hired to work at the Pig Dig site are well trained before they get out into the field. All have spent many hours working in the lab prepping different jackets that have come from any one of the many previous field digs conducted in the summer. If lucky, a student will be able to prep fossils from the Pig Dig as well as work out in the field during the summer. During the school year Herbel will hire four graduate students and two undergraduate students to prep the fossils that were uncovered during the summer at the Pig Dig.

"We are all students that volunteer, give our time in the lab, and then we get the opportunity to come out in the field," said Cayce Lillesve (GEOL, Kasson MN). "By the time we get in the field we have been trained so well in the lab that we know what we are doing, what to expect, and what we need to focus on."

"Just by working out here every year we are gaining more practical, real experience," she added. "There will be new problems that arise each day, difficult bones that need to be taken out, and thanks to time spent in the lab, we as students can handle it."

Students are taught how to save bones for research and display by participating in both prep work and field work. Just as spending a couple months or years working in the lab prepares

students to move into the field and be knowledgeable about their work, field work allows students to learn how to make things easier for the preparators in the lab.

Lillesve implemented a new color coding system for tagging bones because she saw a way to make work easier for those in the field. With rotating crews it is often hard to keep track of what



*Cayce Lillesve excavates for fossils at the pig dig.*


bones have been mapped, recorded, and are ready to be capped. Small fossils are difficult to see and the tags alert students of its presence. As a result, Lillesve implemented a color-coding tagging system identifying which step of the process each bone was at. Those that have been located but not mapped are bright orange, while those that have been recorded and are awaiting a jacket are yellow.

Students and researchers from SDSM&T, and the Museum work from June-August each summer provided funding availability. During the summer of 1997 no funding was received and the site remained covered until the following year when Canon Corporation's "Expedition into the Parks" funded the dig. In 1998 Canon donated \$50,000 to Badlands National Park to continue with excavations at the site and foster public education about the importance of preserving the valuable fossil resources in the Park. Canon's two-year support was supplemented by fee enhancement

dollars, that is, Badlands National Park uses a portion of its entrance fees to support the project. Future years are to be funded by the Park and hopefully other granting institutions as this site has become one of the more popular stops for tourists visiting the area.

At the end of each summer it is important to re-cover the entire dig site to save it from exposure to cold winter weather. An exciting discovery was made this summer - the students located one of the original test pits from 1995 where a Subhyracodon skull was found. Since the pit had been covered with dirt at the end of the '95 dig, the test pit had not been reopened until this year.

The Big Pig Dig is just one of many field dig opportunities available for students to be involved with through the Museum of Geology. Students gain invaluable hands-on experiences through lab and field work which many individuals pursuing their masters degrees do not have access to. SDSM&T has a unique ability to give students real-life experience in paleontology helping prepare them for their future careers.

For more information about the field dig opportunities offered through the Museum of Geology contact Director Phil Bjork or Ruth Fontenot-Prince at 1-800-544-8162, ext. 2467, or via e-mail: [pbjork@msmailgw.sdsmt.edu](mailto:pbjork@msmailgw.sdsmt.edu). 

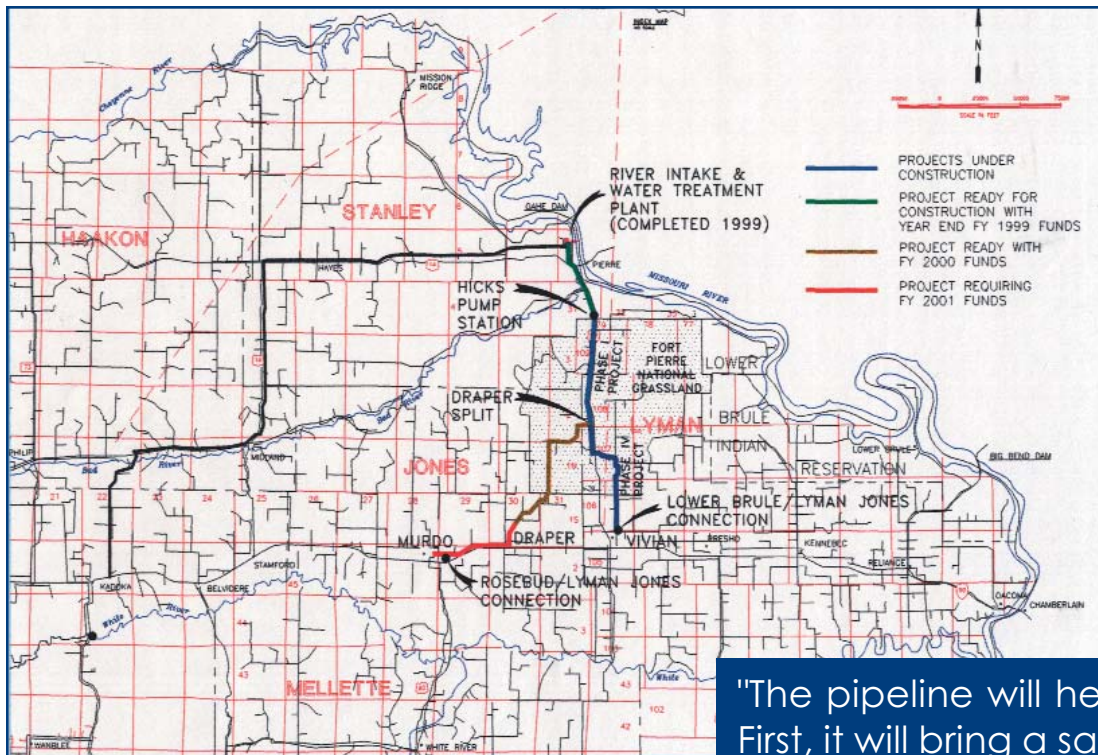
*Gerald Mundt maps out the location of fossils.*





# MNI WICONI

“WATER IS LIFE”



"The pipeline will help in two ways. First, it will bring a safe water supply to those who had a marginal or poor water supply before, and secondly, it will bring them a way of life that most people take for granted."

The development of the largest rural water system in the United States is stemming out of South Dakota. The Mni Wiconi rural water pipeline is a project between four partners to provide a water pipeline to 1/5 of the state of South Dakota - making it the largest rural water system in the United States and possibly the world.

Four sponsors, Lyman Jones/West River, Rosebud Sioux Tribe, Oglala Sioux Tribe, and Lower Brule Sioux Tribe, are combining their efforts to provide water to individuals living on the reservations in rural South Dakota, and to county systems for ranchers, farmers, and cattle.

The name, Mni Wiconi, indicates the importance of the project, and the importance of water in our life. Loosely translated Mni Wiconi means 'water is life.' The impact the pipeline will have is summed up in an Oglala publication which states, "Water is the source of life to the two-legged, four-legged, the plants and the winged. The children, the elderly, the infirm, the young, all need, depend on and deserve good water for survival and for the yet unborn."

The Oglala Sioux are building the treatment plant and the core system that will be supplying water to the other three sponsors. Each of the sponsors is responsible for development of the pipeline in their land. The water treatment plant is being built just north of Fort Pierre, below the Oahe Dam. Water for the pipeline is being drawn out of the Missouri River at Echo Point.

Three graduates from the South Dakota School of Mines and Technology (SDSM&T) are key players in the project. Gerald Clifford (GEN E '59) is Director of the Oglala Sioux Rural Water System, Craig Nowak (MS CE '82) of Morrison Maierle, Inc. out of Montana is a design project manager for the Oglala Sioux System, and Syed Huq (GEOL '84) is Director of the Rosebud Sioux Rural Water System.





*Workers prepare to install a water main under a highway by boring and jacking.*

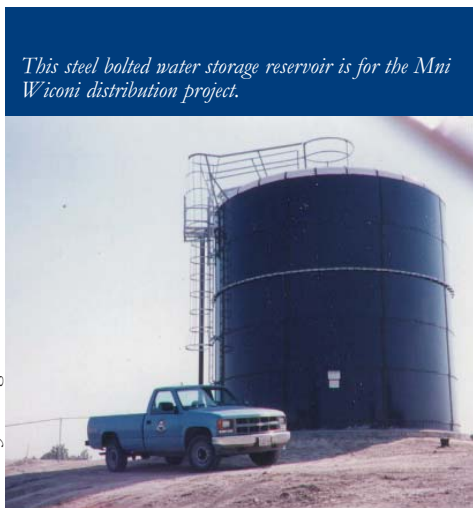


*Directional drilling takes place under the White River for service line installation on the United States largest rural water project.*

As far as Nowak himself, he feels his education has been of great help as well. "The technical background I gained here at Tech and the general engineering background gained here by seeing a project from the development stages through to implementation was a great help. To be able to work on a project of this magnitude where I grew up and went to school is very rewarding," he added.

The evolution of the Mni Wiconi project stems over 30 years. Individuals in the West River/Lyman Jones area had been trying to get a federal project into the West River area for over 30 years but to no avail. It was in the late 80's that the Oglala's acknowledged they had a water supply problem and joined forces with West River/Lyman Jones in an effort to attract the attention of a federal project. Two years later in 1988 the initial Mni Wiconi law was passed through congress and the water pipeline project began. The Rosebud Sioux and Lower Brule Sioux Tribes became interested in the project and in 1994 an amendment was passed to include them in the Mni Wiconi Rural Water System.

"The way the project was structured was for each of the sponsors to take advantage of their groundwater, or wells, as well as the new pipeline," said Clifford. "Each of the areas has a certain amount of groundwater



*This steel bolted water storage reservoir is for the Mni Wiconi distribution project.*

available, so for instance, the Oglalas will access 50% of their water through the wells, and 50% will come from the Missouri River. Each area will utilize the groundwater available to them," he added.


The total project is estimated at over \$300 million, and is projected to serve 52,000 people, a number that is growing steadily. The water treatment plant, which is currently under construction, is costing \$16.5 million. When finished in March 2000 the plant will be capable of handling 13 million gallons of water each day.

On the Pine Ridge Indian Reservation there are many homes which do not have water. Shannon County is the poorest county in the nation and their need for water has reached drastic levels. In the past people have had to find someone with a well and then haul water back to their homes.

Once funding was obtained for the water pipeline, the Oglalas purchased two trucks with water tanks on the back of them. A full time staff distributed water with the use of the trucks every day to those that do not have water at their homes. Clifford acknowledges that it is not an adequate solution because many of the homes are located miles from any freeway, but it was a temporary fix.

With the construction of the pipeline, each contract identifies all of the homes located in a particular area. Those individuals are then given the opportunity to give the Oglalas an easement to go through their land, and the contractor will then hook up water to their house.

"The pipeline will help in two ways," said Nowak. "First, it will bring a safe water supply to those who had a marginal or poor water supply before, and secondly, it will bring them a way of life that most people take for granted."

When you take a close look at the positive impact the construction of the Mini Wiconi Rural Water System will have on the lives of the individuals living in the four different areas, it becomes a tremendous project not only for the number of miles of pipe laid, but for the new way of life it gives to those benefiting from the pipeline. Mni Wiconi, or 'water that gives life', takes on a whole new meaning for everyone that is involved in and learns about the project. The water pipeline may directly effect individuals living in 1/5 of the state of South Dakota, but will indirectly effect thousands of others who learn of its impact. 



*Workers on the Mni Wiconi project are trenching and installing pipe for water distribution on the Pine Ridge Reservation.*

# Technology for Teaching and Learning

The education you received while in elementary and high school was largely a result of the neighborhood you grew up in and the ingenuity and desire of the teacher whose classroom you were assigned to. We like to say that everyone receives the same quality of education no matter where they live or go to school, but has this really been the case? In the state of South Dakota it will be.

Governor Bill Janklow initiated a Connecting The Schools Program in April 1999 in an effort to connect all educators, K-12 student body, public university students, state and local government employees, and state libraries to the internet. The

The Technology for Teaching and Learning - Network Administrators academy at SDSM&T is the first attempt by a state to provide extensive training in network administration. If K-12 education is going to be connected statewide, it is vital to have trained network administrators in each district.

During the summer of 1999 Tech hosted two four-week training sessions. Each 'boot camp' trained approximately 88 public school administrators and teachers to be network administrators. Participants were taught the basics of networking, and Microsoft NT official curriculum. During the four-week session participants worked on Compaq Prolinea 3000 servers,

bought by the Governor's office. Once training was complete the teachers and public school administrators were able to take the servers they had been working on back to their school districts. Each server is equipped with Compaq on-line for hardware assistance to answer questions or problems that arise once they are at work during the school year.

"The training prepared the individuals to be capable of going in and doing

day to day tasks," said John Abbott, LanCom Training Coordinator. "Each participant will be able to effectively plan and implement their school networks once they have completed the TTL academy."

A network server will give each district the ability to store user accounts, their applications, manage a network, and connect all classrooms. Teachers and students will have internet access, be able to share applications, and have access to video distance learning opportunities.

The Technology for Teaching and Learning academies help the state to become one large interactive classroom. The potential of truly individualized education will become a reality across the state of South Dakota. Through the training provided in TTL academies, school districts will have the capability to challenge each student individually.

"There is a place for group work, but there is also a place to challenge each student at his or her own level," said Dr. Karen Whitehead, Vice President of Academic Affairs for SDSM&T.

"TTL is the first step in an effort to enhance individual education,"

-Dr. Richard Gowen

Sharon Eggers (Wakonda), Robert Rasmussen (Emery), and Christina Friedrich (Marion) gained valuable networking experience at the TTL Network Administrators Academy.



Story photos by Kari Larese

goal of the program is to connect all of South Dakota's K-12 schools, providing enhanced classroom educational opportunities throughout the state.

A very important element of the program involves three different Technology for Teaching and Learning Academies. The first type of academy, which has been held each summer since 1997, was for teachers. It focused on how to use technology in the classroom. A second type of academy, which began this summer, taught superintendents how to manage technology; and a third type of academy was held this past summer at the South Dakota School of Mines and Technology (SDSM&T) for network administrators.

"TTL is the first step in an effort to enhance individual education, and enhance what goes on in the classrooms in South Dakota," said Dr. Richard Gowen, President of SDSM&T. "We are connecting classrooms in a way so that we can continue to grow," he added. "It opens up the state for all sorts of possibilities."



## TTL readies South Dakota schools for new educational era



*Ray Slava (Bonesteel Fairfax) benefits from hands on experience learning Microsoft NT curriculum.*

Students will be challenged by course work via the internet, video distance learning, and shared applications. By taking a test or quiz, the computer will be able to identify where the student is at and develop a program that is

appropriate for their level of learning. By identifying the most effective means of learning for each child, by seeing, writing, or hearing, computers will aid in developing the student's knowledge and teach in the most effective way.

In addition to individualized learning, the TTL academies give the districts the capability to work together, develop statewide coursework, and better address and educate children of all ages and learning capabilities. Contacts have been made that can lead to educational opportunities between classrooms, districts, and with the South Dakota School of Mines & Technology.

A 2nd grade classroom in Vermillion could work on a project with a 2nd grade classroom in Belle Fourche, or a high school student in Lake Andes could tutor an elementary school student in Custer. Just as easily a teacher in a New Underwood Country School could have a student with a learning handicap whose problems a teacher in Rapid City could help address.


"The TTL academies are especially wonderful for small schools," said Caroline Jensen, English and Spanish teacher from Wessington and participant in the TTL academy at SDSM&T. "It helps schools have access to technology like video conferencing that the larger schools have a budget for. It equalizes technology learning across the state," she added.

The TTL academy at Tech was led by an instructor from LanCom, Incorporated, a professional consulting firm out of Minneapolis, Minnesota. Four classrooms ran concurrently during each session with nine instructors from LanCom rotating through the 8 weeks. The LanCom instructor was accompanied by a Tech faculty member, and Tech graduate and undergraduate students.

The participants in the TTL at SDSM&T were from schools across the state and ranged from never having touched a computer to fully certified network engineers. By working hands-on in small classroom settings each participant was able to get the individualized attention and training necessary to send them back to their schools capable of working as a network administrator.

"By coming to Tech and participating in the TTL we are linking the schools together, making contacts, and developing a support group for technology," said Jensen. "We are helping students be prepared for whatever they do. Network computers are a part of their lives."

The training teachers and administrators are receiving on network administration allows each participant the ability to give students an opportunity to grow to the fullness of their ability. What they are learning at Tech allows them to enable others in their district to bring new methods of teaching into the classroom.

Governor Janklow's Connecting The Schools initiative will ultimately connect 176 school districts, 552 locations, 11,000 teachers and administrators, and 135,000 students across the state of South Dakota. By training network administrators, teachers, and superintendents at Technology for Teaching and Learning Academies, school districts will be equipped to become one state-wide classroom through internet access, shared applications, and video distance learning. Students in South Dakota will have the opportunity for equal education regardless of the neighborhood where they live or the classroom they are assigned to. 



*TTL Network Administrator Academy allows school districts statewide to share applications and function as one large interactive classroom.*





Photo by Julie Smoragiewicz

A team from ABC Discovery News films paleontology students working on a mososaur dig on the ranch of Ken Brown.

Christopher Sauer makes a ferris wheel during Little Miner's Summer Science Program.



SDSM&T hosted SKILL's four week residential program in June. Over 60 high school students participated in the program designed to enhance interest in science, technology, and math.



## SDSM&T REACHING OUT

Faculty, students and staff at SDSM&T lend a hand in educational and cultural activities throughout the region. These outreach efforts will forever unite Tech with K-12 education and the community as a whole.

Photo by Amanda Rothbarth



Timothy Iverson of Sioux Falls test drives the Mini-Indy on display at Meet the Teams.

Cheryl Johnson and her daughter Annie talk about the Mini-Baja with Dan Dolan, Professor of mechanical engineering, at Meet the Teams at the Children's Science Center.



Photo by Kari Larose



Tech hosted an Advanced Literature and Composition workshop June 21-25, 1999.





Photo by Kari Larese



Photo by Kari Larese



Photo by Kari Larese

Advanced Placement Institute on English  
position for high school teachers the week of

Dr. Bruce Berdanier teaches students how to set up a watershed  
water quality study.. Berdanier was a curriculum and field  
consultant on this project made possible by the Davide and Lucille  
Packard Foundation grant to Si Tanka College in Eagle Butte.



Photo courtesy of Bruce Berdanier

Hayley Brooks of Rapid City competes in the bubble gum blowing  
contest at the Children's Science Center Bubble Festival.



Photo by Kari Larese



# GREEN BEANIES

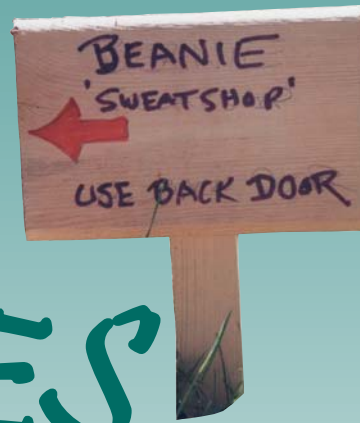


Photo by Kari Larese

1934 Freshmen



Photo courtesy of SDSM&T Alumni Office

## A Freshman Tradition For More Than 75 years

Traditions come and go as time passes by but one tradition that students at the South Dakota School of Mines and Technology (SDSM&T) will carry on forever is that of the freshman beanies and senior hats. The CK Chapter of the PEO Sisterhood has been ironing the gold 'M' on to the green felt since 1988 when one of its members overheard the sad fate of the student's tradition, the company who has been sewing the beanies was going to stop doing small orders.

Every summer since then the ladies get together every Tuesday morning to sew the freshmen beanies, tell stories, and enjoy coffee and snacks. Each week anywhere between 10-15 ladies can be found busy among the noise of three sewing machines fast at work. For those women in the chapter who are not physically able to make it each week, they do things from their

homes to help finish the project. "This is a no guilt project," says Jan Rathbun, member of the CK Chapter of PEO. "It is ok if you can't come on Tuesdays but we like to say you really miss a good time if you do."

The sign in front of Jean Hermann's house that reads "Beanie Sweatshop" is a little deceiving. After walking around to the back door and making your way downstairs, you enter a room of women busy chatting away while they sew green felt, iron the 'M' on the front, or affix the green band to the bottom of the beanies. Hiding out in the kitchen is "Inspector-10", otherwise known as Jewel Tatum, busy inspecting the needlework of fellow PEO members.

"So far this year we have found a beanie with two 'M's, no 'M's, and an upside down 'M,'" said Tatum. "We need to make these very carefully so the freshmen can go out and play in the mud," she added.

Now in their 12th year of beanie making, the PEO Sisterhood has learned exactly to the inch the number of yards of green felt to buy each year, and the amount of gold felt required to cut an 'M'

out of a square. Once on a road trip while her husband was driving Rathbun figured out that she could cut two 'M's for every mile driven at 65 mph.

The first summer of beanie making for the women's group was a trial run. "We started out by paying someone to silkscreen the 'M' onto an individual triangle," said Rathbun. "The second year she wanted too much money to do it so we started ironing the 'M's on ourselves and have been doing so ever since."

"Each summer is a re-learning process too", said Evelyn Merrill. After 12 years of beanie making the group always begins the summer by going over how to make the green freshman beanies with the gold 'M.'

Since beginning the Tuesday morning summer ritual, the group has used 300 yards of green fabric measuring 72" wide, 115 300-yard spools of thread, 296 ½ yards of gold felt (1 yard can be used for 18 beanies), earned \$11,937.75, minus

Photo by Kari Larese



P.E.O. Sisterhood has been making SDSM&T beanies for 12 years. Pictured from left to right Jewel Tatum, Donna Kingsley, Carole Riddle, Janet Rathbun, Billie Brown, Winola Neal, Ruth Hottmann, and Jean Hermann.



# M

expenses, and sewn an average of 450 beanies per year totaling 5,338 beanies since 1988. The largest number sewn during the summer of 1990 was 600, with the fewest number totaling 150 in 1997.

The money earned each summer is used to sponsor the education of needy women to assist them in their pursuit of higher education. The PEO Sisterhood maintains five educational projects through which women can receive aid in reaching their educational goals.

"It is exciting to know that all of our hard work goes to helping some needy girls to continue their education," said Merrill. In addition to their fundraising efforts, the hours spent in the beanie sweatshop each summer prove worthwhile time spent together as a group.

"There is more to it than the financial part," said Arlyce Sebastian. "It is the socializing and getting to know each other. It is nice because during the meetings we do not have an opportunity to talk much.

"And the coffee and cookies are pretty good too," adds Merrill jokingly.

The beanie tradition at SDSM&T dates back to 1921, and may have started before that. In the first handbook produced that same year it states, "The Freshmen are expected to wear the regulation caps during the prescribed time." It was not until the handbook for 1960-1961 did rules for freshmen initiation become laid out in a formal manner. Seven rules are listed among the initiation rites. The rules state that freshmen are expected to: (1) "Buy and wear a beanie with a name tag from the time of issuance until the end of the football game on "M" Day; (2) Attend all football games; (3) Study the Student Handbook and learn all college songs and yells; (4) Observe regular hours for study; (5) Carry out all "M" day tasks assigned by seniors; (6) Present a neat appearance at all times, including shined shoes, trim haircuts, and clean shaves (unless an entrant to the Beard Derby); and (7) Extend and appropriate and polite greeting to any senior who is met if that senior is wearing his Miner's Cap."

Today the beanie tradition is still carried on but freshmen do not feel the pressure to wear the beanies as was once the case 20, 30, or 40 plus years ago. The tradition of senior hats has also evolved into a committal-free tradition. The hats, which resemble a miner's cap, display the students' department initials on the front and provide a way for seniors to be recognized.

"The loyalty and friendship of SDSM&T alumni spans time and distance. Green beanies and senior hats are the most visible signs of this association," said Tim Vottero, Alumni Director. "It follows that, whether current students or senior alumni, these

traditions show our connection to SDSM&T and each other."


Although freshmen no longer have to bow to seniors donning the miner's cap, the long tradition of freshmen beanies and senior hats is alive and well at Tech. Come orientation week each fall the green beanies are distributed and new students get their first taste of what it will be like to be a student at SDSM&T. Thanks to the CK Chapter of the PEO Sisterhood age-old traditions at Tech are alive today and will continue to be well into the future. 

Photo by Kari Larese



*Sally Krittenbrink (standing) and Janet Rathbun (sitting) are sewing the green felt hat band to the freshman beanies.*

"The Freshmen are expected to wear the regulation caps during the prescribed time."

-1921 SDSM&T Student Handbook

Photo courtesy of SDSM&T Alumni Office



Photo by Kari Larese

This 1963 Corvette could be yours!

Photos courtesy of Dean Oliva



Dean (GenE '56) and Marlene Oliva

# Corvette Raffle Converts to Scholarship

Imagine yourself cruising through the Black Hills in a 1963 Corvette. With the radio blasting you're taking the corners like Jeff Gordon in the Indy 500. If you think this can only happen in your dreams, it is time to wake up.

Thanks to the generosity of Dean (GenE '56) and Marlene Oliva, a 1963 Corvette Split Window Coupe will be raffled off at the South Dakota School of Mines and Technology (SDSM&T) All School Alumni Reunion in July, 2000. All proceeds from ticket sales will benefit the recently established Dean and Marlene Oliva Athletic Scholarship Fund.

Dean and Marlene established the Oliva Athletic Scholarship in order to provide one athletic scholarship annually for a student from Huron or Tyndall, South Dakota. The recipient would preferably be a multi-sport athlete in basketball, football, and track and field. The fund is being established in recognition of the impact SDSM&T had on the Olivas' lives and the lives of Dean's three brothers, Don (EE '51), Ralph (GE '51), and Tom (EX, '58). The scholarship is dedicated to Dean's father, Mike R. Oliva, a high school athlete from Tyndall, South Dakota, in recognition of his athletic accomplishments as well as

his belief in growth and advancement through hard work and commitment to both athletic and educational opportunities.

"I see the Oliva Athletic Scholarship as a way to remember my father, Mike Oliva, who himself was a star athlete," said Dean. "The scholarship will assist great young athletes and give back to the institution that gave me the opportunity to succeed academically and athletically."

Dean graduated from the School of Mines with a Bachelor's Degree in General Engineering in 1956. He went on to receive a Masters of Engineering Degree in Engineering Management from UCLA in 1970. Dean pursued his passion for sports during his time at Tech, becoming the first freshman athlete ever to letter in football, basketball, and track in one year. Although his football career was cut short after a right shoulder separation ended his ability to play quarterback, he was a four-year starter on the Tech basketball team, which won the 1955 SDIC Conference championship. Dean also continued to be a successful pole-vaulter and hurdler on the track team and was named captain of the team in 1955. He was an M-Club officer and member throughout his time at Tech.

After graduating from SDSM&T, Dean

worked for Lockheed Aircraft for 35 years, retiring in January 1990 as Chief Engineer of Engineering Research and Test and Plant Manager of the Lockheed Kelly Johnson Research and Development Center. In these capacities, he directed the testing and development efforts of over 1,100 engineers, technicians, and supported personnel in the development of such noteworthy aircraft as the 117A Stealth Fighter, U-2 SR71 Blackbird, and the Polaris and Trident missile delivery systems. He worked on other aircraft including the L1011 airliner, P3 and S3A antisubmarine aircraft, and Cheyenne and Apache helicopter main and tail rotors.

Dean and Marlene are now retired and living in Granada Hills, California. The two enjoy spending time with their four children, Steve, Kim, Kari and David, as well as their nine grandchildren who all reside in the near vicinity. In addition to being around their family, Dean and Marlene enjoy golfing. Another of Dean's hobbies is restoring Corvettes, and he is currently working on two Corvette restorations.

Dean's interest in Corvettes started shortly after he graduated from SDSM&T. "I needed a new vehicle to drive to work," he said. "The Corvette immediately caught my eye, but it wasn't a practical choice at the time. I've been restoring Corvettes since the mid-seventies. It's been a great hobby that takes as much time as I want to give it."

When Dean began the restoration of



# BACK TO BASICS

## Robb Winter Uncovers the Building Blocks of Composites

When constructing a plane, automobile, or spacecraft, engineers are concerned with utilizing durable, strong, and lightweight composites. While designing something sleek, powerful, and efficient, the ultimate goal is safety. In selecting composites to build a panel or wing, one factor which comes into play every time is the composite's past success. Engineers will assess that if a composite works well in one particular application then it is likely to be useful in another similar application. In the current use and application of composites the fundamentals of how a composite functions are not well known.

Robb Winter, Professor of Chemistry and Chemical Engineering at the South Dakota School of Mines & Technology (SDSM&T), has been concerned with this dilemma for the past seven years. What are the building blocks that make a polymer composite function? How do mechanical properties relate to interface chemistry at the nano level, ( $1 \times 10^{-9}$  meters)? This is where a new microscope comes into the picture, the Interfacial Force Microscope or IFM. While reviewing Chemical and Engineering News published

by the American Chemical Society, Dr. Winter first learned of the IFM, a scanning probe microscope, that was under development at Sandia National Laboratories in Albuquerque, New Mexico.

"The IFM is an experimental microscope," said Dr. Winter. "It is comprised of electronic components from several different manufacturers which are then assembled into the IFM. It is truly a research instrument in that the instrument itself is still in development."

In 1997, Dr. Winter was on sabbatical at Sandia National Laboratories working with Dr. J.E. Houston, the inventor of the IFM. While at Sandia, Dr. Winter was investigating polymer matrix composites and developed the newest version of the IFM sensor head. The heart of the IFM, the sensor, can be thought of as a teeter-totter on which one end is attached the sensing probe. The entire sensor is attached to a piezo ceramic tube, which allows nano positioning of the probe at any desired location on a sample. Whether it is very close to the surface, on the surface, or actually applying force against the surface, the IFM is beneficial in that you can

measure mechanical properties unambiguously with a simple contact mechanics analysis.

The IFM can obtain mechanical properties of a material, look at friction, perform surface imaging at the near atomic level, and determine its creep and relaxation response - (when force is applied does the material creep away or relax).

Once the mechanical property of a material has been identified with the IFM, Dr. Winter tries



Story photos by Amanda Raibarth

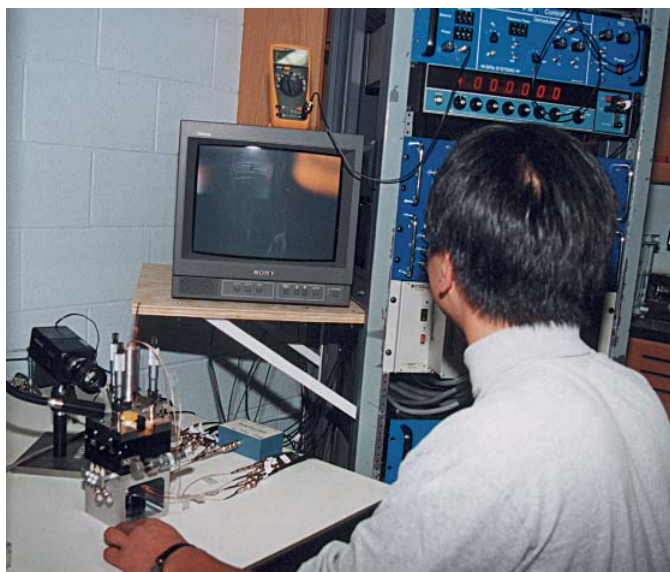
*The IFM is essential in developing lighter yet stronger composites for applications such as military, automotive, or aerospace applications.*

to relate it to the chemistry that has been measured by Fourier transform infrared (FTIR) spectroscopy. The next step is to find out if the chemistry is varied in a systematic way, does that influence the mechanical properties systematically? The goal is to identify the correlation between the mechanical and chemical properties of a material ultimately allowing researchers to alter the fundamental properties of a composite to reach a selected outcome.

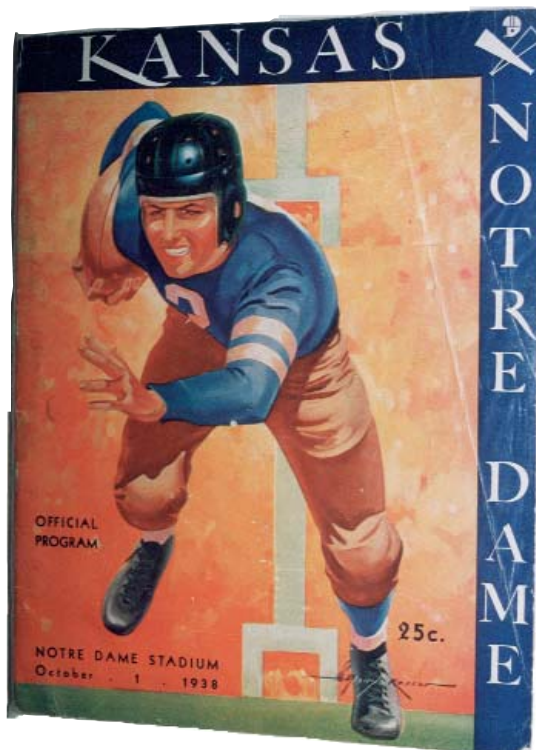
"Recently, enough tools have become available like the IFM, which allows us to seriously start addressing the fundamental materials questions," said Dr. Winter, "We can now actually begin to think about engineering properties of a material at the fundamental level in applications that cut across all facets of human life, i.e. medical devices, aerospace structures and automobiles, to name a few."

"For me, as an engineer, the ultimate goal is to be asked for a polymer composite with a certain functionality and certain performance features, and be able to respond with a recommendation of the changes required at the microscopic level in order to obtain those outcomes".

Current trends require engineers to develop lighter yet stronger composites for many applications such as recreational, medical, automotive and aerospace. Developing polymer composites, as have been used in the Corvette, or racing



Graduate student Isamu Kitabara (M.E.S) works with the Interfacial Force Microscope.



In American college football one will not find an older rivalry than the one between the Kansas Jayhawks and the Missouri Tigers. Until 1911 games in this series were played either in St. Joseph or Kansas City. But in 1914 the Missouri athletic director, Chester Brewer, moved the game to Columbia and called it "Coming Home." So began the Homecoming Game tradition in American college football. A record crowd of 9,000 overflowed Missouri's stadium for that first homecoming game.

This is just one of the many traditions, memories, and stories that can be told through age-old college football programs. SDSM&T alumnus Edson A. Bearg (GE '58) has one of the largest private collections of college football programs in the United States, and says that there are many stories that can be told from each. Bearg recently loaned 180 programs from his collection of 6,000 to be put on display in the APEX Gallery on the SDSM&T campus in an exhibit entitled The History of College Football: Seen Through Historic Programs.

# HUT-HUT!

## ATHLETIC PROGRAM EXHIBIT PROVIDES HISTORICAL LOOK AT FOOTBALL

"The collection of college football programs dating back to the 1920's show so how much of how our views have changed," said Deborah Mitchell, Director of the APEX Gallery. "The programs mirror American culture and what was happening in the world at the time," she added.

In addition to the programs, the exhibit also included old pennants and a Nebraska football blanket from Bearg, old Tech programs from the SDSM&T athletic department, and vintage helmets, shoes, and jersey on loan from the College Football Hall of Fame. Also on loan from the Hall of Fame was a reproduction of the first known college football program dating back to 1873. The Hardrock Club got into the spirit and painted the carpet to resemble the astroturf of a football field. Original paintings from Lon Keller, the Norman Rockwell of college football, are also included at the exhibit and are on loan from the collection of his daughter, Lonna Keller Heffington. Keller, who drew over 5,000 individual covers, also developed many of the recognized sports logo's including the New York Yankees and Air Force Falcons.

Of the 180 programs on display visitors could view portions

of various categories in Bearg's collection. A few that were included with the display are:

- Nebraska University programs including many of their famous games played at the turn of the century
- Famous people on the roster or pictured on the cover including Bobby Kennedy, George Bush, Richard Nixon, John Wayne, Amos Alonzo Stagg, and Winner, SD native Frank Leahy
- Early programs from the turn of the century including several from the 1890's
- The untold story of Lon Keller and syndicated football programs from the 1930's-1970's.

"Observation of the program covers

*continued on page 21*



*Photos by Kari Larese*

*Photo courtesy of Edson Bearg*

"Through the collection I continually learn an appreciation for the game of football, its evolvement throughout the years, and the talented people who coach and play the game."

- EDSON A. BEARG



SDSM&T alumnus  
Edson A. Bearg



## CAMPUS BRIEFINGS

The Career Service Traditions of Excellence Award (TEA) winners for the months of June, July, and August were **Debra Rowse**, **Barbara Ogaard**, and **John Lofberg** respectively. Debra works in the Business and Administration office as a Senior Accountant, Barbara is a secretary for the University Scheduling Center, and John is an Administrative Assistant II in the Vice President's Office.



**Professor Jan A. Puszynski**, Professor of Chemical Engineering, attended three-day National Aeronautics and Space Administration

(NASA)-Microgravity Panel in Washington, DC. Dr. Puszynski reviewed 12 proposals in the area of combustion synthesis, ceramics, and metal solidification under microgravity conditions. Dr. Puszynski also attended the Fifth International Symposium on Self-Propagating High-Temperature Synthesis in Moscow, Russia the week of August 16-20, 1999. Dr. Puszynski presented two papers and two short communications in the round table discussions. He also served as the member of the Publishing Committee for that meeting and he chaired one technical session. Dr. Puszynski has been also selected as the member of the editorial board for the International Journal of Self-Propagating High-temperature Synthesis. This fall Dr. Puszynski is staying at the Naval Surface Warfare Center in Indian Head, MD as a part of his sabbatical leave.

**Dr. Roger Johnson**, Associate Professor of Mathematics, presented the paper "Use of TI-83 and Related Technology in an Introductory Statistics Course" at the annual Joint Statistical Meetings held this year in Baltimore August 8-12. The paper describes the redesign of the Math 281 class accomplished with the aid of a 1998 Governor's Grant and will appear in American Statistical Association: 1999 Proceedings of the Section on Statistical Education.

**Dr. Francine Campone** was an invited participant in the Institute for South Dakota Leadership and Participation

Roundtable on "The Future of Media in Democracy." The first of the two-part roundtable was held on June 3; the second will take place in October. The Institute is a non-partisan think tank supported through the Chiesman Foundation for Democracy.

**Dr. Robb Winter** has returned from a sabbatical at the University of Texas at Austin where he worked in the lab of Professor J.M. White, the Norman Hackerman Professor of Chemistry and Director of the NSF sponsored Microelectronics Science and Technology Center. Dr. Winter brought on-line the third Interfacial Force Microscope (IFM) outside of Sandia National Laboratories where it was originally invented. He also has an IFM which is located in the Chemistry/Chemical Engineering building. Dr. Winter spearheaded the development of a collaboration between Prof. K. Liechti, Professor of Aerospace Engineering and Prof. White. This effort resulted in the submission of two proposals to NSF and one currently being prepared by invitation for DOE. If funded this work will investigate the inter-relationship between interphase chemistry and crack initiation and growth in composite materials and provide significant interinstitutional collaboration.



**Dr. Kerri Vierling**, Assistant Professor of Chemistry and Chemical Engineering, presented a paper entitled "Effects of Suburbanization and

Haying on Grassland Bird Reproductive Success" at the international conference of the Society for Conservation Biology meeting June 17-21 at the University of Maryland at College Park. Her presentation (a poster) was on June 18, 1999.

**Dr. V. Ramakrishnan**, Distinguished Professor of Civil Engineering, gave two invited seminars at the World Wide Forta Engineers meeting held recently in Pittsburgh, Pennsylvania. The seminars were mostly based on the research work done at SDSM&T during the past ten years

using Forta Fiber Reinforced Concrete. Dr. Ramakrishnan was a consultant for Forta Fiber for the past twenty years. The titles of these seminars were "State of the Art of Fiber Technology" and "Recent Research in FRC Based on the 4-C's Formula".

**Dale Nickels** attended the Regents Career Service Advisory Council meeting, held in Pierre on April 16, 1999. This is a semi-annual meeting held in April and October of each year. The meeting is held with a representative from each South Dakota campus, South Dakota School for the Deaf, and South Dakota School for the Blind and Visually Impaired.



**Dr. Manuel Penaloza** presented a paper entitled "Data Mining Approach for Predicting the Likelihood of a Disease" at the 14th

International Conference of Computers and Applications held in Cancun, Mexico, April 7-9, 1999. Dr. Penaloza is also working on a research project with two local medical doctors about Osteoporosis.

Four faculty and staff members from Tech are participating in the 1999 Leadership Rapid City class. Those participating include **Donna Hughes-Hargrave**, United Campus Ministry; **Michelle Howell**, Director of Surbeck Center and Student Activities; **Vojislav Kalanovic**, Associate Professor, Department of Mechanical Engineering; and **John Lofberg**, Administrative Assistant II in the Vice President's office.

Condolences to the family of **Renee Froelich** on the loss of her father.

Congratulations to **Brad and Brenda Johnson** on the birth of their new daughter on July 14. **Bailey Rose Johnson** weighed 7lbs. 14oz. Brad is a Senior Development Officer in the SDSM&T Foundation office.

*The east edition of the CM building will house the new Caterpillar Student Excellence Center due to a generous donation from Caterpillar.*



# Building Renovation Creates Living Laboratory

The difference between 1950 and 1999 are more than the 49 years that span between them. The cost of a loaf of bread that once cost \$0.14 can now run you \$2.50. Enrollment at the South Dakota School of Mines and Technology (SDSM&T) has more than tripled from 600 to 2,200 students, and the new technological age of the 90's has moved us from writing letters to sending e-mails. When we look at the advances that have been made over the past 50 years, it is no wonder that SDSM&T is renovating the Civil Mechanical Engineering Building first built in 1950.

"The curriculum has swung so far from what the building was originally built for," said Mike Mueller, Interim Director of Physical Plant. "The departments now need better utilization of labs and spaces to better serve both students and faculty."

Both the Civil and Mechanical Engineering departments have been bursting at the seams while trying to share a building too small and outdated for them to work in. When first constructed the building was primarily a hands-on facility with a machine center housing lathes, and mills. In an effort to change with the times a wood floor in the machine center has been covered up by concrete, and what was once a hands-on department has moved to the terminal and computerized milling and lathe equipment.

The Engineering for a New Millennium Task Force was developed in the fall of 1997 by Drs. Richard Gowen and Karen Whitehead, President and Vice President of Academic Affairs at SDSM&T. Mike Mueller was elected task force chair in December of the same year, and together the group began to look at the needs of the building.

"We wanted a core group together that could define what the program needs were for all of the departments effected by the building," said Mueller. "So we started out by talking about what are the needs, what are the wants, and what are the what ifs, if we had



*Renovation of the building includes gutting the interior and adding 12,000 square feet.*

enough money."

Four groups would be effected by the renovation: civil and environmental engineering, mechanical engineering, industrial engineering, and the Center for Advanced Manufacturing and Production (CAMP). Each area was given the task to work with their own faculty and groups to determine how their programs would be established in a new facility and how many square feet they need for their labs and work space. The task force quickly realized the building needed additional space.

The need for extra square footage came under the student project space or CAMP projects. As a result, Caterpillar agreed to fund \$150,000 over a three year period for an east addition of approximately 4,200 sq. ft. to the building, the Caterpillar Student Excellence Center. The east addition would house all of the student projects, cars, concrete canoe, and CAMP projects, which are done with student work groups.

With the east addition funded and planned the building met half of the additional square footage needed to accommodate the changing programs. The task force decided not to stop half-way and moved forward with the design of a west addition to match that on the east side. The next step is to find a donor to fund the additional square footage in the amount of \$150,000, equal to the contribution by Caterpillar.

When addressing the needs and what ifs of the renovation, the task force decided to try and pattern the building after an integrated teaching and learning laboratory. In essence, the building would become a living laboratory in which students would be able to utilize different parts, such as the HVAC system, as part of their lab. Ideally students would be able to monitor and manipulate controls, do thermal science calculations, energy calculations, and use the whole building as a lab. Likewise, civil engineering could utilize the structural beams, and look at the deflection of snow



*Story photos by Kari Larese*



## Building Renovation

*continued from page 20*

load or wind load. It would create a user-friendly facility that would allow students the opportunity to do lab work after hours if they ran out of time during the structured lab time.

The mechanical engineering department will be able to utilize an energy management system workstation similar to the one in the Physical Plant. Faculty will have the ability to integrate the energy management system into classroom work and be able to manipulate controls of some of the building to measure temperature, airflow, and different aspects of the HVAC system.

Civil engineering will be able to install strain gages on open beams throughout the building. A strain gage measures what is happening to the fibers in an I-beam when something is put on it, such as snow.

In addition to the east and west additions, the renovation will include the installation of an elevator, 3-story atrium, central air conditioning, restrooms on each floor, and the complete re-design of the interior. Once completed CM will have an additional 12,000 sq. ft bringing the total size of the building to 58,800 sq. ft.

With the technological age leading us and the approach of a new century, it is hard to say what changes in program demands will be seen over the next 50 years. The renovation today of the Civil Mechanical Building will aid Tech faculty and students to change with the times, and learn new technologies and methods in engineering helping the campus and South Dakota community as a whole prepare for the new century. 🦄

## Spotlight on Students

Two students in the Materials and Metallurgical Engineering Department received outstanding external scholarships. **Paulo Van Den Berg** (Met, Lincoln NE) received a \$2,000 scholarship from the Iron and Steel Society (ISS), and **Bert Cantu** (Met, Rapid City) received a \$4,000 scholarship from the Minerals, Metals and Materials Society-Light Metals Division.

## HUT-HUT!

*continued from page 18*

reflect differences in equipment, uniforms, teams, stadiums, styles of fans' clothing, war/peace, famous people, and art," said Bearg. "Through the collection I continually learn an appreciation for the game of football, its involvement throughout the years, and the talented people who coach and play the game." Bearg's interest in American college football programs stem from his romance with Nebraska Cornhusker football. It is no surprise then that a program from a 1927 game pitting Nebraska vs Syracuse is one of his favorites - Nebraska won 27-0. The game falls during a four-year period when Bearg's father's double cousin, Ernie Bearg, coached the Cornhuskers from 1925-1928. During that span fans saw Nebraska beat Notre Dame, and shut out the University of Illinois and the great "Red" Grange in the same year.

"Ernie Bearg was Nebraska's head football coach for only four seasons but during those years his teams ran up a commendable 23-7-3 record," said Bearg. "He believed in power football and keeping it simple. He was contemptuous of finesse and anything more than a minimum use of the forward pass. Blocking, tackling, and straight ahead running were his stock in trade."

Another favorite program of Bearg's could be found in the exhibit at the APEX Gallery, a 1921 contest between Centre College "Praying Colonels" and Harvard "Mighty Crimson." This favorite program stems from the tradition of rooting for the underdog. The encounter in Boston is remembered as one of the greatest upsets in college football history with Centre stunning the gridiron world by beating Harvard 6-0. Harvard was not even impressed enough by Centre's football team to spell their name right on the program. The program cover for the game depicts a handsome Harvard player with a torn jersey.

American college football programs depict a reflection of the history of our country. Looking back 100 years we can see how women's roles have changed, the representation of war and peace, and the evolution of the game of football itself. Ed Bearg's collection preserves a pictorial history of the times and we are thankful he shared his collection with us. 🦄

## Corvette Raffle

*continued from page 16*

the 1963 Corvette Split Window Coupe (considered a classic due to its split rear window), he knew that the vehicle would ultimately be given to SDSM&T. He worked tirelessly on this restoration with a deadline in mind and completed the entire vehicle restoration in about a year and a half.

The vehicle, a 326 cc/250 HP four-speed, is ermine white with black interior. It has power windows and is in excellent condition. A drawing for the Corvette will be held on July 7, 2000, during the SDSM&T All School Alumni Reunion. Tickets are currently on sale through the Foundation Office for \$100. Ticket sales will continue until 600 tickets have been purchased or until July 2000. The raffle winner has the choice of taking the Corvette or an alternate prize of \$18,000 cash. Proceeds from ticket sales will be used to fund the Dean and Marlene Oliva Athletic Scholarship Endowment.

Raffle tickets may be purchased by telephoning the Foundation Office at (605) 394-2436 or (800) 211-7591. ✂

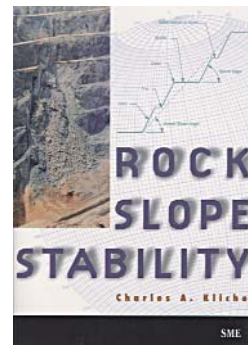
## Publications

**Dr. Gordon Bell**, Museum of Geology, recently published a paper entitled "The origin of snake feeding," in the August 12 publication of Nature magazine.

**Dr. Christopher Jenkins**, Professor of Mechanical Engineering, edited a book entitled Manual On Experimental Methods of Mechanical Testing of Composites, Second Edition, recently published by The Fairmont Press.

**Dr. Chuck Kliche**, Associate Professor of Mining Engineering, recently published a book entitled "Rock Slope Stability," through the Society of Mining, Metallurgy and Exploration (SME). For information about the book visit:

<http://www.smenet.org/books/rockslope.html>





# RESEARCH NOTES

**Dr. Francine Campone**, Associate Dean of Students, was recently awarded \$45,296 in additional funds from the National Aeronautics and Space Administration for her project entitled "Provide for Scientific Knowledge for Indian Learning and Leadership for Mission to Planet Earth."

**Dr. Sanjeev Khanna and Robb Winter**, Professors of Mechanical Engineering and Chemistry and Chemical Engineering respectively, were recently awarded \$144,480 from the National Science Foundation for their project entitled "Development and Manufacturing of Highly Damage Resistant Fiber Glass Reinforced Window Panels for Buildings in Hurricane Prone Areas."



**Dr. Edward Duke**, Manager and Research Associate Professor of Engineering and Mining Experiment Station, was recently awarded \$23,900 from the National Science

Foundation for his project entitled "Upgrading of Scanning Electron Microscope for Chemical and Morphological Feature Analysis."

**Dr. Chris Jenkins, Sanjeev Khanna, Fernand Marquis, and Robb Winter**, were recently awarded \$200,000 from the National Science Foundation for their project entitled "Improving the Linkage Between Applied Mechanics and Materials Science in the Engineering Curriculum: Model Curricula and Multi-Media Courseware."

**Dr. William Roggenthen**, Professor of Geology and Geological Engineering, was recently awarded \$22,016 from Black Hills State University for his project entitled "A Black Hills Science Teaching Project to Prepare K-8 Teachers for the new Millennium."

**Dr. Cathleen Webb**, Associate Professor of Chemistry and Chemical Engineering, was recently awarded \$7,500 from the West Dakota Water Development District for her project entitled "Development of a New Treatment Technology for Arsenic in Drinking Water."

**Dr. Sherry Farwell**, Dean of Graduate Education and Research was awarded \$17,432 in additional funds by the University of North Dakota (prime-NASA) for his proposal entitled "A Public Access Resource Center (PARC) Empowering the

General Public to Use EOSDIS - Implementation Phase; \$225,000 from the National Aeronautics and Space Administration (NASA) for his project entitled "NASA EPSCOR: Preparation Grant Proposal;" \$315,388 in additional funds from South Dakota State University for his project entitled "South Dakota EPSCoR Cooperative Agreement (Round 4);" \$31,092 in additional funds from the National Science Foundation for his project entitled "A Mobile Test Gas Generation Facility for the Atmospheric Chemistry Community;" and \$6,800 in additional funds from the University of North Dakota (prime-NASA) for his project entitled "Public Access Resource Center (PARC) Empowering the General Public to use EOSDIS."

**Kata McCarville**, Director, Instructional Technology Services, was awarded \$89,514 in additional funds from North Dakota State University (prime-NSF) for her project entitled "SDSM&T Abilene Connectivity." She was also awarded \$10,000 from North Dakota State University (prime-NSF) for her project entitled "Supplemental REUs (2): NSF Connections Grant," and \$158,624 from the Board of Regents for her project entitled "Technology Plan for Futures Fund Allocation."

**Carrie Herbel**, Collections Manager, Museum of Geology, was awarded \$40,282.14 from the Department of the Interior-National Park Service for her project entitled "Excavation, Preparation and Curation of Pig Dig."



**Dr. Sangchul Bang**, Dean of the College of Earth Systems, was recently awarded \$50,000 in additional funds from the Office of Naval Research for his project entitled "Use

of Suction Piles for Mooring of Mobil Offshore Bases."

**Dr. Alvis Lisenbee**, Professor of Geology and Geological Engineering, was awarded \$8,000 from the West Dakota Water Development District for his project entitled "Proposal for the Compilation of 1:24,000 Scale Geologic Map of the Pactola Dam Quadrangle."

**Dr. Bruce Berdanier**, Assistant Professor of Civil and Environmental Engineering, was awarded \$8,000 by the West Dakota Water Development District for his project

entitled "Proposal for Contaminant Inventory of the Rapid City West 7.5 Minute Quadrangle, Pennington County, South Dakota."



**Dr. William Capehart**, Assistant Professor, Institute of Atmospheric Science, was recently awarded \$10,200 from the National Oceanic & Atmospheric

Administration for his project entitled "Improved Representation of Snow and Its Subgrid Distribution in a Coupled Model System."

**Dr. Scott Kenner**, Associate Professor of Civil and Environmental Engineering, was awarded \$20,121 from the City of Rapid City and \$45,855 from the South Dakota Department of Environment & Natural Resources for his project entitled "Lower Rapid Creek Watershed Assessment and TMDL Development;" \$24,481 from the City of Rapid City and \$56,965 from the South Dakota Department of Environment & Natural Resources for his project entitled "Development of a BMP Demonstration Project in Wonderland Drainage Basin for Control of Stormwater Runoff to Rapid Creek;" and \$24,011 from the USDA Forest Service-Black Hills National Forest for his project entitled "IRI Common Water Unit Pilot Study."

**Dr. Robb Winter**, Professor of Chemistry and Chemical Engineering, was awarded \$50,000 in additional funds from the United States Department of Energy for his project entitled "Investigation of the Interphase Region in Polymer Matrix - Glass Fiber Reinforced Composites Using the Interfacial Force Microscope."

**Dr. John Helsdon**, Professor of IAS/Atmospheric Science, was awarded \$145,000 in additional funds from the National Science Foundation for his project entitled "Numerical Studies of Thunderstorms Electricity and Lightning - A Look at the Paradigm," and \$125,000 from the National Science Foundation for his project entitled "3-D Cloud-Scale Model and Satellite Study of the Transport and Evolution of Lightning-Produced Nitrogen Oxides."

**Dr. Srinivasa Iyer**, Professor of Civil & Environmental Engineering, was awarded \$14,623 from South Dakota Technology Assistance for Manufacturers TEAM, and

\$15,500 from Dakota Steel for his project entitled "To Design, Test & Develop Fabrication Techniques of New Steel Joist for Dakota Steel Trusses Company.

**Dr. Sookie Bang**, Associate Professor of Chemistry & Chemical Engineering, and **Dr. V. Ramakrishnan**, Distinguished Professor of Civil & Environmental Engineering, were awarded \$11,410 in additional funds from the National Science Foundation for their project entitled "Application of a Microbial Immobilization Technique in Remediation of Concrete Cracks." Dr. Bang was also awarded \$70,437 in additional funds from the National Science Foundation for her project entitled "Application of a Microbial Immobilization Technique in Remediation of Concrete Cracks."

**Julie Smoragiewicz**, Vice President of University Relations, was recently awarded \$1,825 from the Mountains/Plains Office of the National Trust for Historic Preservation. The grant funds will be used to complete a Children's Science Center Historic Structures Report.

**Dr. James Martin**, Professor/Curator of Vertebrae Paleontology Museum of Geology, was recently awarded \$48,000 in additional funds from the US Army Corp of Engineers for his project entitled "1999 Paleontological Survey of the Missouri River," and was awarded \$25,000 from the USDA Forest Service-Nebraska National Forest for his project entitled "Igloo Mosasaur."

The State of South Dakota has awarded the following SDSM&T faculty members Governor Janklow's Faculty Awards for Teaching with Technology: **Dr. Dale Arrington**, Professor of Chemistry, \$24,176; **Dr. David Boyles**, Associate Professor of Chemistry, \$21,791; **Dr. Roger Dendinger**, Assistant Professor of Social Sciences, \$17,492; **Dr. Chris Jenkins**, Professor of Mechanical Engineering, \$28,297; **Dr. Stuart Kellogg**, Associate Professor/Program Director of Industrial Engineering, \$27,932; **Dr. Carter Kerk**, Assistant Professor of Industrial Engineering, \$22,796; **Dr. Sanjeev Khanna**, Assistant Professor of Mechanical Engineering, \$23,368; **Dr. Fernand Marquis**, Professor of Metallurgical Engineering, \$26,852; **Dr. James Munro**, Professor of Chemistry & Chemical Engineering, \$31,502; **Dr. Glen Stone**, Professor of Metallurgical Engineering, \$29,563; and **Dr. Henry Mott**, Associate Professor of Civil & Environmental Engineering, \$26,293.

## PERSONNEL CHANGES

### WELCOME:

**Kent Brown**, CSA, Cook, Faculty/Staff Lounge (8/16/99)

**Kelly Gaidmore**, CSA, Child Care Worker, Little Miner's Clubhouse (8/19/99)

**Jerome Goetz**, CSA, Custodial Worker, Surbeck Center (8/9/99)

**Donald Hapward**, Exempt, Manager of Admissions, Academic and Enrollment Services (8/9/99)

**Christal Krein**, CSA, Secretary, Physics (8/2/99)

**Shawn Mechling**, Exempt, Certified Athletic Trainer/Athletic Equipment Manager, Athletics (8/1/99)

**Connie Mettelle**, Exempt, Intramural Director/Women's Volleyball Coach, Intercollegiate Athletics (8/16/99)

**Deborah Mitchell**, Faculty, Assistant Professor, Director of Apex Gallery, Humanities (8/16/99)

**Dr. Sally Palmer**, Faculty, Assistant Professor, Humanities (8/16/99)

**Lora Phillips**, CSA, Accounting Assistant, Business and Administration (8/23/99)

**Dr. Rodney Rice**, Faculty, Associate Professor, Humanities (8/16/99)

**Dr. Kyle Riley**, Faculty, Assistant Professor, Humanities (8/16/99)

**Lee Vierling**, Faculty, IAS, Assistant Professor (6/15/99)

**Spring Hussey**, CSA, Child Care Worker, Little Miner's Clubhouse (7/6/99)

**Phyllis Bloomberg**, CSA, Administrative Assistant I, Academic and Enrollment Services (7/1/99)

**Karl Lalonde**, Exempt, Research Scientist I/Computer Systems, IAS (7/1/99)

**Barbara Hughes**, CSA, Secretary, has accepted a position in Academic and Enrollment Services (8/20/99.)

**Donald K. Lefevre**, Faculty, Assistant Professor, Electrical and Computer Engineering (8/16/99)

**Daniel Mulally**, Faculty, Assistant Professor, Electrical and Computer Engineering (8/16/99)

**Leonard Licking**, Faculty, Assistant Professor, Electrical and Computer Engineering (8/16/99)

**Roger Schrader**, Faculty, Assistant Professor, Math and Computer Science (8/16/99)

**Barbara McCormack-Dunfee**, CSA, Library Clerk, Devereaux Library (9/1/99)

**Jill Gray**, CSA, Senior Secretary, President's Office (8/30/99)

**William Hughes**, Faculty, Professor, Electrical and Computer Engineering (9/1/99)

### FAREWELL:

**Dr. Michael Day**, Faculty, Humanities (6/30/99)

**Larry Horn**, CSA, Surbeck Center (7/30/99)

**Dr. Shrikant S. Panwalkar**, Faculty, Industrial Engineering (7/26/99)

**Roman Pientok**, CSA, Physical Plant (8/5/99)

**Christa Trautman**, CSA, Academic Services (8/6/99)

**Doug MacTaggart**, Exempt, Graduate Education and Sponsored Programs (7/16/99)

**Annmari Merager**, Exempt, Graduate Education and Sponsored Programs (7/21/99)

**Heather Schilling**, Exempt, SKILL (7/22/99)

**Geraldine Becenti**, CSA, Little Miner's Clubhouse (8/30/99)

### RECLASSIFIED:

**Cynthia Christensen** has been reclassified to a Senior Secretary in Career Planning. This is retroactive to 6/10/99.

**Sandra (Santee) Meier** has been reclassified to a Senior Claims Clerk in the Debit Card/Cashier's Office. This was retroeffective to 5/7/99.

**Carol Hirsch**, Institute of Atmospheric Sciences, has been reclassified to an Administrative Assistant I. This was retroeffective to 3/29/99.

### CHANGE IN POSITION:

**Jeanie Eatherton** has accepted a position as Financial Aid Assistant in Academic and Enrollment Services.

**Barbara Hughes**, CSA, Secretary, has accepted a position in Academic and Enrollment Services (8/20/99.)

**Jeanette Nilson** has accepted the position of Administrative Assistant I in Graduate Education and Sponsored Programs.

**Wendy Boomer**, CSA, has accepted a position as secretary in Electrical and Computer Engineering (9/7/99)

### RETURNING:

**Patrick Fleming**, Faculty, Instructor, Math/Computer Science (8/16/99)

**Fredrick Ellwein**, Faculty, Instructor, Humanities (8/16/99)

**Henry Waldman**, Faculty, Instructor, Math/Computer Science (8/16/99)



## You Are Invited . . . Calendar of Events

For information on these events contact University and Public Relations at (605) 394-2554.

### OCTOBER

#### FRIDAY, OCTOBER 1

12:00 All-School Picnic and Climb M-Hill  
SD Tech Volleyball Invitational Tourney

#### SATURDAY, OCTOBER 2

10:00 M-Day Parade  
2:00 Football against Montana State University  
Homecoming Game

#### SUNDAY, OCTOBER 3

2:00 p.m. Soccer against National American University, Home

#### TUESDAY, OCTOBER 5

Volleyball at Chadron

#### TUESDAY, OCTOBER 5 & WEDNESDAY, OCTOBER 6

Academic Advisory Council/BOR at SDSM&T

#### THURSDAY, OCTOBER 7 & FRIDAY, OCTOBER 8

South Dakota Board of Regents at SDSM&T

#### FRIDAY, OCTOBER 8 & SATURDAY, OCTOBER 9

Volleyball at Jamestown College

#### SATURDAY, OCTOBER 9

Football against BHSU, Home  
11 a.m. Soccer against North Dakota State University at Sioux Falls

5 p.m. Soccer against University of North Dakota at Sioux Falls

#### SUNDAY, OCTOBER 10

10 a.m. Soccer against Moorehead State University at Sioux Falls

#### MONDAY, OCTOBER 11

Native American Day - No Classes

#### WEDNESDAY, OCTOBER 13

DGS Lecture

#### FRIDAY, OCTOBER 15

Volleyball at Briar Cliff triangular

#### SATURDAY, OCTOBER 16

Volleyball at Dordt  
Football at Huron  
Noon Soccer against University of Minnesota, Morris at Brookings  
5 p.m. Soccer against South Dakota State University at Brookings

#### SUNDAY, OCTOBER 17

1 p.m. Soccer against Augustana, Home

#### TUESDAY, OCTOBER 19

Volleyball at National American University

#### FRIDAY, OCTOBER 22

Volleyball against Mount Marty, Home

#### FRIDAY, OCTOBER 22 & SATURDAY, OCTOBER 23

All Campus Leadership Retreat

#### SATURDAY, OCTOBER 23

Football at Northwest Iowa  
Volleyball against USF, Home  
6 p.m. Soccer against National American University, JV

#### FRIDAY, OCTOBER 29

Volleyball against BHSU, Home

#### SATURDAY, OCTOBER 30

Football at USF

#### SUNDAY, OCTOBER 31

Halloween

### NOVEMBER

#### FRIDAY, NOVEMBER 5 - SUNDAY, NOVEMBER 7

Tech Family Weekend

#### FRIDAY, NOVEMBER 5

Football against DWU, Home  
Men's Basketball Alumni Game

#### WEDNESDAY, NOVEMBER 10

DGS Lecture

#### THURSDAY, NOVEMBER 11

Veteran's Day - No Classes

#### FRIDAY, NOVEMBER 12

Men's Basketball at Mary College

#### FRIDAY, NOVEMBER 12 & SATURDAY, NOVEMBER 13

Volleyball Conference Tournament

#### MONDAY, NOVEMBER 15

Children's Science Center Grand Opening  
Children's Science Center

#### MONDAY, NOVEMBER 15 & TUESDAY, NOVEMBER 16

Men's Basketball at Western Montana

#### TUESDAY, NOVEMBER 23

Men's Basketball at Chadron

#### THURSDAY, NOVEMBER 25 & FRIDAY, NOVEMBER 26

Thanksgiving Holiday - No Classes

#### FRIDAY, NOVEMBER 26

Men's Basketball against BHSU, Home

#### SATURDAY, NOVEMBER 27

Men's Basketball vs. Mt. Tech and Western Mt.

### DECEMBER

#### WEDNESDAY, DECEMBER 1

Men's Basketball against Dickinson State, Home

#### THURSDAY, DECEMBER 2

1:00 p.m. Open House & Parade of Trees Contest

#### FRIDAY, DECEMBER 3

Men's Basketball against Minot State, Home

#### SUNDAY, DECEMBER 5

Concert Choir and Master Chorale Concert at Lead

#### MONDAY, DECEMBER 6

Men's Basketball vs. Kearney, Home

#### WEDNESDAY, DECEMBER 8

DGS Lecture

#### THURSDAY, DECEMBER 9

6:30 p.m. Annual Children's Christmas Party at Surbeck Center

#### FRIDAY, DECEMBER 10

Symphonic and Jazz Band Concert

#### Saturday, December 11 & Sunday, December 12

Concert Choir and Master Chorale Concert  
Men's Basketball vs. South Dakota State University, Home

#### TUESDAY, DECEMBER 14

Men's Basketball vs. Chadron, Home

#### THURSDAY, DECEMBER 16 - WEDNESDAY, DECEMBER 22

Final Exams

#### THURSDAY, DECEMBER 16 & FRIDAY, DECEMBER 17

Board of Regents at Northern State University at Aberdeen

#### FRIDAY, DECEMBER 17

Graduation Reception, Surbeck Center Ballroom

#### Saturday, December 18

Graduation, Civic Center

#### THURSDAY, DECEMBER 23 - TUESDAY, JANUARY 11

Holiday Break

#### SATURDAY, DECEMBER 25

Christmas

#### WEDNESDAY, DECEMBER 29 & WEDNESDAY, DECEMBER 30

Men's Basketball, Black Hills State Tournament  
Women's Basketball, Grand Canyon Tournament

#### SATURDAY, DECEMBER 25

Christmas

### JANUARY

#### MONDAY, JANUARY 3

Men's Basketball at Dickinson State University

#### FRIDAY, JANUARY 7

Men's Basketball vs. Sioux Falls, Home  
Women's Basketball vs. Sioux Falls, Home

#### SATURDAY, JANUARY 8

Men's Basketball vs. Dordt College, Home  
Women's Basketball vs. Dordt College, Home

#### THURSDAY, JANUARY 13

Classes Begin

#### FRIDAY, JANUARY 14 & SATURDAY, JANUARY 15

South Dakota Future Fair

#### FRIDAY, JANUARY 14

Men's Basketball at Huron University  
Women's Basketball at Huron University

#### SATURDAY, JANUARY 15

Men's Basketball at Dakota State College  
Women's Basketball at Dakota State College

#### MONDAY, JANUARY 17

Martin Luther King Day

#### FRIDAY, JANUARY 21

Men's Basketball vs. Mount Mary, Home  
Women's Basketball vs. Mount Mary, Home

#### SATURDAY, JANUARY 22

Men's Basketball vs. Dakota Wesleyan University, Home  
Women's Basketball vs. Dakota Wesleyan Uni., Home

#### THURSDAY, JANUARY 27


Men's Basketball vs. Black Hills State University, Home  
Women's Basketball vs. Black Hills State Uni., Home

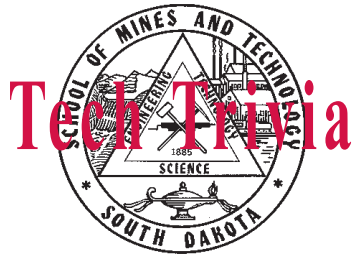
## BACK TO BASICS

continued from page 17

bicycles, is something that works today but has not necessarily been optimized because people do not understand the fundamentals. Fiberglass composites have worked for many years, but what happens when they start to break down or crack? Dr. Winter suggests that without understanding the fundamental relationships between the chemical and mechanical properties, engineers often resort to over engineering materials for reasons of safety, environmental protection, and longevity.

There are investigators all over the world attempting to understand the fundamental relationships of the chemical and mechanical properties of composite materials. In the past decade activity has increased greatly around this topic as people think of different ways to tackle the problem. Although there are many strategies, the IFM is one of the most direct routes to obtain this information. The catch: not many people are familiar with the IFM because it is a new instrument that is still being developed. Up until 1998, Sandia National Laboratories (SNL) was the only place the IFM was being built, and today there is only one company that has been licensed to start making the instrument and the operating software is still being developed at SNL. Due to a National Science Foundation grant to SDSM&T, the Tech campus now has one of only five Interfacial Force Microscopes in the world, outside of Sandia National Laboratories!

In the future, the automotive, aerospace, military, and medical industries will be equipped to engineer lighter and yet more durable composites while simultaneously addressing safety concerns thanks to the development of the Interfacial Force Microscope. Conservation of our precious energy resources, by creating lighter, stronger, and more corrosion resistant materials will also be aided by the IFM as we enter into the new millennium. These advances will be made possible by the utilization of instruments like the IFM. The IFM opens up a variety of new possibilities for the future; it is time to start dreaming. 



### *Did you know...*

- October 5, 1912 was the first M-Day and the beginning of the construction of the "M" on M-Hill.



- The first M-Day queen was selected in 1958.
- On October 24, 1963 the Surbeck Student Center was dedicated.



- In 1973, a box was found with the Prep Building cornerstone. Contents included an invitation to laying the cornerstone, copies of local newspapers, and tin from Keystone Etta Mine.



7:40 a.m. Rush Hour



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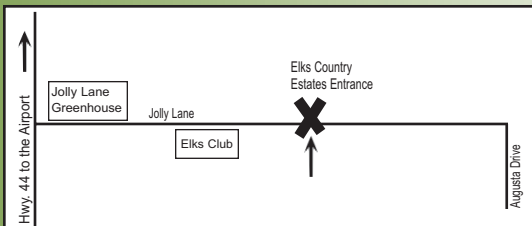




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