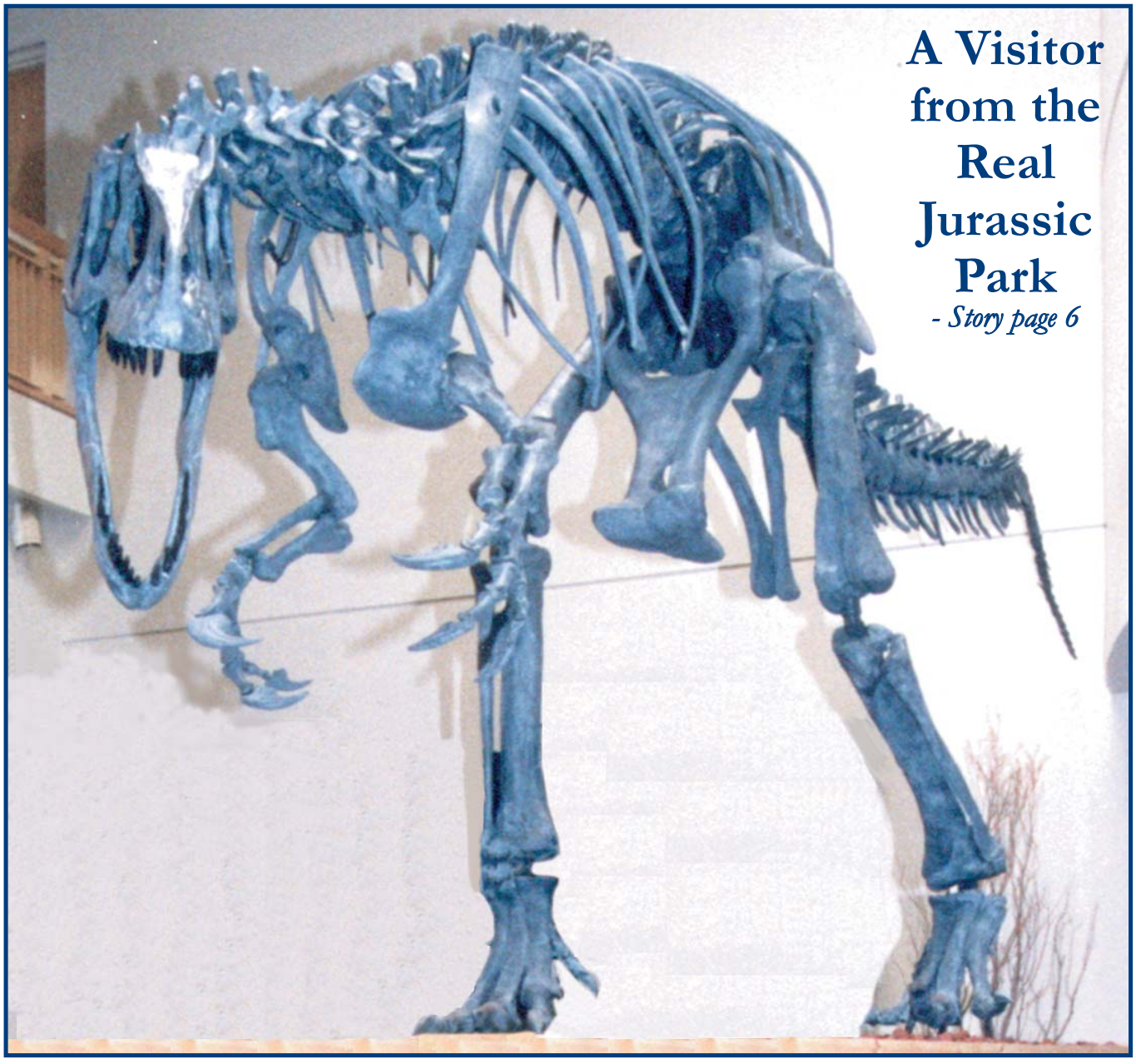
SOUTH DAKOTA SCHOOL OF MINES AND TECHNOLOGY

QUARTERLY

WINTER 2000



A Visitor from the Real Jurassic Park

- Story page 6

A PUBLICATION OF SDSM&T

Perspectives

Dear Friends,

SDSM&T has a century old tradition of developing partnerships with industry. In the early years the efforts of our founders were focused on the mining industry. Today our partnerships are with companies from across the country and cover many disciplines. In the last year alone these partnerships have resulted in more than one million dollars in funding. Companies like Cargill Incorporated, Dow Chemical, Caterpillar, and Rockwell have provided resources that update our laboratories, fund scholarships, and provide real world experiences for our students.

While SDSM&T has significant partnerships with industries across the nation, we are pleased to note the continuing growth of industry in South Dakota that offers graduates opportunities at highly competitive salaries. In the last three years engineering graduates have experienced salary growth at double the national rate of increase. The many changes in the computing and communications environment have attracted new computer related companies to the state and the salaries for computer engineering and science graduates of South Dakota now compete with national salaries.

Thanks to the efforts of these and many other companies our students can be assured they will be given the highest level of education possible to help prepare them for successful life-long careers in industry. Through the generosity of our industrial partners, we are able to leverage the funding provided by South Dakota to prepare our new graduates as leaders in the creation of new leading-edge technologies as they prepare to enter the professions of engineering and science.

Sincerely,

Richard J. Gowen, President

South Dakota School of Mines and Technology

QUARTERLY

Winter 2000

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Features

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

MASTER OF SCIENCE DEGREES

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

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.

Weather

NASA project to serve as model f

Scientists at the South Dakota School of Mines & Technology (SDSM&T) who comprise a wide variety of disciplines are taking part in a NASA project that has both regional and global implications. The Global Energy and Water Cycle Experiment (GEWEX) is an international program that is seeking to ultimately predict the consequences of regional and global climate change on the earth's radiative energy and water budgets. Through an integrated program of research, observations, and scientific activities, GEWEX will provide a model of the water cycle on an international scale.

The GEWEX Continental Scale International Project (GCIP), a component of the GEWEX program, has identified the Mississippi River Basin as their target in the United States. GCIP's goal is to obtain an understanding of the hydrology of the Mississippi River Basin, ultimately relating the findings on a larger scale. In order to effectively study the hydrology of the entire Mississippi River Basin, the basin was broken down into smaller study areas for more focused investigation, one being the Upper Missouri River Basin (UMRB) - a spatial region that feeds the Missouri River approximately 50% of its mean annual flow.

NASA awarded an $800,000 grant to Dr. Sherry Farwell, Dean of Graduate Education and Sponsored Programs, and Dr. Paul Smith, Professor Emeritus, Institute of Atmospheric Sciences, to support the UMRB Pilot Project. A group of more than 20 scientists and students from the School of Mines are focusing their efforts on a study area of the Black Hills region, hoping to create a complete model of the hydrological cycle that can eventually be employed on the larger Mississippi River Basin.

"It is hard to do a controlled scientific study of this kind on the entire Rocky Mountains of the western states, but what we have in our backyard in this portion of South Dakota is the Black Hills," said Farwell. "The Hills have the same kind of physical features that affect the water cycle in the larger Rocky Mountain area, so the Hills provide a good test bed or simulation of that larger area."

The first step towards constructing a reliable model to improve predictions of weather and precipitation in complex terrain was to develop a mathematical simulation that describes all four components of the water budget - something that has never been successfully done in the past. The four components, atmospheric, land surface, surface water, and sub-surface aquifer, must all interact in an accurate way within the model to represent what happens in the real water cycle.

"We also wanted to find out if we could successfully do a complete water budget on this small of an area as we have in the Hills," said Farwell. "A water budget is analogous to what people do when they balance a check book - that is, you have moisture (or dollars) coming in and leaving via different paths. In performing the budget analysis with a checkbook, you account for every amount that came in and where it was spent. In the case of a water budget, scientists do an analysis of how much water fell from the atmosphere as precipitation, and then attempt to account for what subsequently happened to it. A water budget would enable us to say this quantity goes down the streams, this much drains to subsurface locations, this quantity is stored in surface locations, this much evaporates, this is how much plants and trees put back into the atmosphere by transpiration, and so on."

File Photo

Rand Feind, research scientist for the Institute of Atmospheric Sciences, makes ground-based measurements with a microwave radiometer.

A designated area of the Black Hills approximately 120 miles by 60 miles was selected as the general location for the UMRB pilot investigation. During an intensive observational period (IOP), measurements were made at four central locations within the study area. These four measurement sites included the National Weather Service station in Rapid City, Custer Crossing near Lead/Deadwood, Custer Airport, and the Four-Corners area near the Wyoming-South Dakota border.

The IOP was conducted during a one month period from April to May, 1999. This intensive observational period was designed and performed as a three-phase program involving ground-based measurements of atmospheric water vapor flux and winds; wind and vapor measurements gathered by an instrumented aircraft; and surface and subsurface water measurements. A fourth component of the UMRB the scientists made use of was an ongoing ten-year study known as the Black Hills Hydrology Project (BHHP). This complementary project was being conducted by individuals from the Rapid City office of the United States Geological Survey. The

r or Not?

for flood and drought prediction

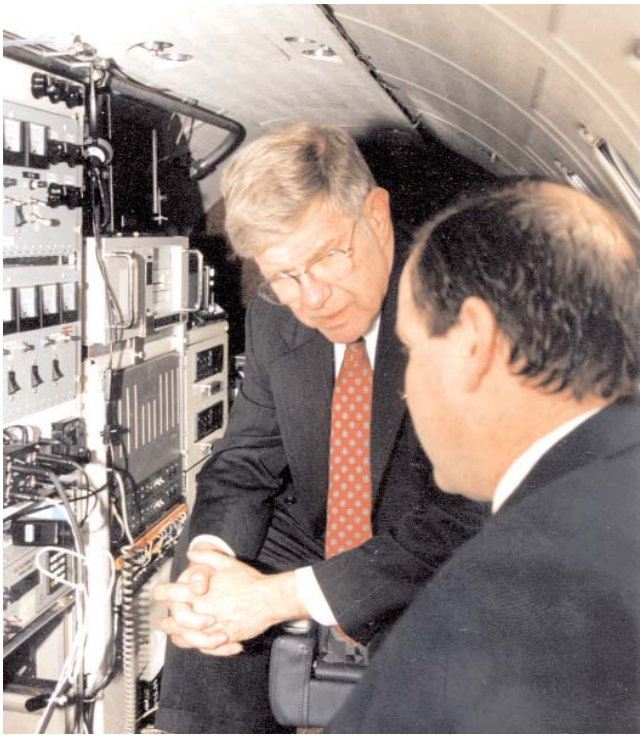
USGS study had established a number of sites in the Black Hills that were already equipped to measure stream flows and precipitation amounts. Specific measurement sites in the Box Elder Creek, Spring Creek, and Rapid Creek drainages were selected from the USGS BHHP to provide data in support of the objectives for the UMRB IOP.

With the assistance of over 20 faculty and students from Tech, aircraft crew and equipment contracted from the University of North Dakota, and individuals from the National Center of Atmospheric Research (NCAR), the IOP provided data that can be used to both develop and test models. Ground-based measurements were accomplished by launching balloons that measured water vapor, temperature, and air pressure from the surface up to 100,000 feet. A microwave radiometer was used at the Custer Airport site to give continual readings of water vapor in the atmosphere by measuring a profile straight up into the atmosphere; and a wind profiler measured wind speed and wind direction from the surface up to two to four kilometers in the atmosphere.

Dr. Smith directed the aircraft flights by radio communications from the Rapid City National Weather Service office on Signal Heights. "The objective," he said, "was to have the aircraft circumnavigate the Black Hills study area at various altitudes during active precipitation episodes, when the net moisture inflow to the Hills should be most easily measurable. The aircraft data tells us about the variations of the moisture fluxes in between the balloon-sounding sites."

"We are trying to integrate the basic physics and numerical analysis that have been done on a small scale with larger scale observations over a size that we can still measure," added Dr. Patrick Zimmerman, Director Institute of Atmospheric Sciences.

File Photo



Dr. Gowen and Dr. Patrick Zimmerman discuss the data to be collected on board the Cessna Citation II.

"For this research project we have accomplished this integration and all of our experiments worked. The components of our coupled model are linked and can now talk with each other. This is the first time a model of this scale has incorporated all the fundamental components in a fully coupled way."

The next step for the Tech scientists is to use this coupled model to simulate a whole water year. When the hydrological model is used to simulate a whole year, the results generated from the model output can be compared to the hydrological events that actually were observed for this same year in the Black Hills. Simultaneously, the School of Mines faculty are preparing for the next phase of the project because the Black Hills has been identified as an intensive study area for future GCIP studies. The project will focus on gaining a greater understanding of water cycles both to improve weather forecasts and to enhance our ability to manage watersheds. Therefore, proposals have been written and submitted by the UMRB team for follow-up on projects that focus on getting more information out of the current models, linking observations with actual precipitation amounts, and furthering our overall scientific understanding of this essential natural resource, water. Although we may never be able to change the weather, we may well be able to make long-term accurate predictions of future flood and drought occurrences in the Upper Missouri River Basin and worldwide. This knowledge would help us better manage our water and prepare for future weather-related emergencies.

The project will focus on gaining a greater understanding of water cycles both to improve weather forecasts and to enhance our ability to manage watersheds.

Industrial Partnerships Link Students to Business World

When the Department of Mathematics and Computer Science at the South Dakota School of Mines & Technology (SDSM&T) formed an Industrial Advisory Council they were not aware of the many great things that were to stem out of their first meeting. The Council was formed because the faculty was seeking industry input and hoped they might generate some industry involvement - but never dreamed it would turn out so well.

"We wanted to double-check ourselves and find out if the curriculum and programs we were providing for our students were preparing them for a career in the computer science and mathematics fields," said Dr. Toni Logar, Associate Professor of Mathematics and Computer Science.

"We wanted industry involvement and so began to talk about the possibility of having mentors in industry who would work with students while they are here in school. We discussed the possibility of classes working on specific projects for industry so that the students could get an idea of what sorts of things they would be working on when they graduate."

As it happened, the first meeting of the Industrial Advisory Council was received very well by all participants. Terri Engels (CSC '96) of Rockwell Collins attended the meeting and was one of the many present who jumped on the bandwagon and wanted to help nurture a positive relationship between her alma mater, the School of Mines, and her present employer.

Photo Courtesy of Rockwell Collins

AFD 3010 Adaptive Flight Display

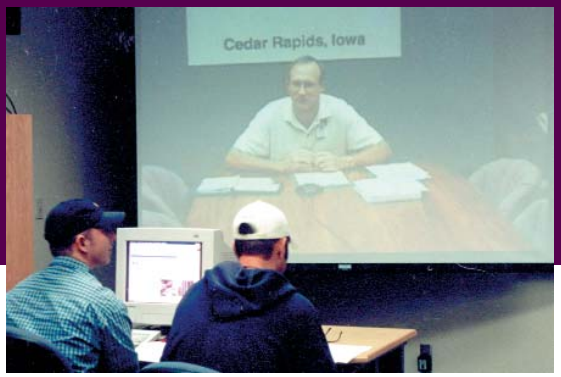
"As a student I worked on a project with Dr. Logar for Mt. Rushmore and found this experience extremely gratifying," said Engels. "In hopes that I could help provide the same opportunity for students today I approached Dr. Logar and my supervisor at Rockwell with my thoughts about trying to get a working relationship started between Rockwell and the school. Everyone was excited about the possibilities," she added.

At Rockwell Collins, Steve Dickes, Engineering Manager, wanted to develop a training program and was searching for the best way to distribute it to employees. Ideally, the program would utilize web-based knowledge and the latest technology, and would be easy to understand for employees in his department who did not have this type of experience. As a result Dickes and Engels turned to Logar and the School of Mines, hoping the students would be able to develop a web-based computer training program for the AFD 3010, or Adaptive Flight Display. Logar's Software Engineering class rose to the challenge.

The students in Computer Science (CSC) 477 were divided into five groups, each of which developed the software dependent upon their interpretation. Dickes served as their team leader, and together with Engels corresponded via e-mail, video teleconferences, and through occasional in-person visits with the five groups.

"Each group was treated as a contractor Rockwell would be dealing with on a normal basis," said Chris Ahlers (CENG, Pierre). "They gave us the outline, a 1,129 page spec, and we defined it as we saw fit - we went as far in our spec to say how much we are worth in an hour. They basically gave us a box and said, do what you want to do within these parameters, then through constant communication and feedback we adjusted what we designed to fit their needs."

"We basically went through the whole lifecycle process of a software project,"



Tom Padmore (CENG, Winner), and Brendan Getz (CENG, Rapid City) discuss their project with Steve Dickes at Rockwell Collins.

Story Photos by Kari Larese

said Corey Marthallar (CENG, Rapid City). "We learned that the trick is to do as much testing and communication with Rockwell in the first couple processes because once you get to the end and you have changes to your product, you have to jump three or four steps backwards. The more you think it out in the beginning, the less time it will take when you are coding at the end."

The computer-based training tutorial for the AFD 3010 was to be designed for any entry-level employee at Rockwell. Dickes wanted to take advantage of web-based technology so the tutorial would be easily accessible from any workstation. It was also a requirement for the software to be usable without the assistance of a co-worker or supervisor, and to be designed for the individual without an extensive knowledge of the AFD 3010 Display Unit.

The AFD 3010 Adaptive Flight Display helps tailor the flight deck in specific aircraft to the size and mission of the plane. All the information that is required to fly the plane, including airspeed, navigation maps, attitude, altitude, engine data, heading, annunciations, and radar, can be positioned on the AFD 3010 to reduce pilot scan while flying the plane. It was the students job in CSC 477 to teach this to employees at Rockwell in a computer-friendly, interactive tutorial that could be easily accessible as a reference tool.

"I had very high expectations for the students," said Engels. "SDSM&T has an excellent reputation so we knew going into this that we would get a quality product. The students have met our expectations and have come up with some innovative approaches to solving our problem."

"Instead of getting just one product, we will be getting five products and five different ways to design the tutorial," said Dickes. "We have assigned this project to some very capable students who have generated some very unique ideas. Some have gone beyond my own ideas. By utilizing the web-based technology, and designing the program so that it can be easily updated and modernized, we hope to be developing a training system for the future."

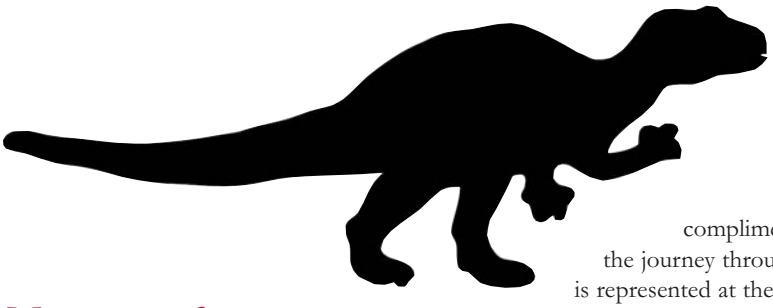
"SDSM&T has an excellent reputation so we knew going into this that we would get a quality product. The students have met our expectations and have come up with some innovative approaches to solving our problem."

-Terri Engels

The partnership between Rockwell Collins and the South Dakota School of Mines & Technology is a win-win situation for all parties involved. The students have obtained real-life experience by working with industry and reporting to a 'boss' other than their instructor at Tech. The students get a real sense of what is involved when developing software, and get an up-close introduction to Rockwell Collins opening up doors for possible co-op, internship, or future job opportunities. The partnership also sets the stage for future student projects directly linked to Rockwell Collins, as well as gives Rockwell a presence on campus when it comes to hiring Tech graduates.

When this Industrial Advisory Council was formed, no one could have foretold a better story. The efforts of an alum have directly produced a partnership with Rockwell Collins that will no doubt lead to even greater things for both the School of Mines and Rockwell in the future. The South Dakota School of Mines & Technology is preparing and producing future industry leaders. Now, thanks to the Industrial Advisory Council, businesses such as Rockwell, Sun Microsystems, and Heweltt Packard, L3 - Communications, Martin & Associates, Microsoft, and Raytheon are forming relationships with the school and are participating in educating our students, developing our curriculum, and providing research opportunities.

Eric Determan (CENG, Emery) provides student input during a videoconference with Rockwell Collins.



A Visitor Fro

Museum of Geology Places Allosaurus on Display at Journey Museum

As you enter Rapid City's Journey Museum an enormous, life-size cast of an Allosaurus engulfs you. All you can do is stand still in awe, shuddering from the second you instantaneously pictured the carnivorous dinosaur as it lived 150 million years ago. The dynamic pose of the "leaping reptile" is so striking that the minute you view the exhibit you are transfixed into a different time and place.

The pose of the Allosaurus exhibit at the Journey Museum is the work of a group of paleontology students from the South Dakota School of Mines & Technology (SDSM&T). The exhibit is on loan from the Museum of Geology located on the campus of SDSM&T. The Journey Museum asked Phil Bjork, former Director of the Museum of Geology, for a paleontology or geology exhibit to compliment the journey through time as it is represented at the museum.

Carrie Herbel, Collections Manager and Preparator at the Museum of Geology, served as a supervisor for four students at Tech. Dan Lien (Geol, Rapid City), Heather Finlayson (MS Paleo, '97), Darrin Pagnac (MS Paleo, '99), and Dave Cicimurri (MS Pale, Rapid City) were hired and tasked with cleaning the cast, selecting a pose, mounting, and placing the exhibit at the museum.

The Allosaurus on display is a composite of one of the largest Allosaurs found at the Cleveland Lloyd Quarry in Utah - one of the premier jurassic sites in the world. The cast was purchased from Dino Labs in Salt Lake City that sent the elements, or bones to the Museum of Geology to piece together.

The Allosaurus on display at the Journey Museum is the first ever and only of its kind to be exhibited in South Dakota. It lived during the Late Jurassic period, roaming parts of North America, including the Black Hills, and Africa in a climate that was warm and moist when an abundance of herbivorous or plant eating dinosaurs covered the landmass.

"It is a very dynamic specimen and has a lot of interesting features on it that people can look at for a long period of time," said Herbel. "It looks like there are some pathologies or bite marks on the shoulder blades, so it shows you this animal was a dynamic individual when it was on earth and had a life and lived a long time because it was so large."

The first instructions given to the group of students was to make the Allosaurus static and to design an armiture to support the animal. Bjork gave the students artistic license to make the exhibit as realistic as possible while maintaining the stability of the display. They wanted to choose a pose to show the animal in motion that would also capture the visitor's imagination.

"We were able to do a couple of things to make for a more dynamic display and make it appear as if the Allosaurus was going to reach out and grab you," said Dan Lien. "To give it an animated look the feet are spring loaded so it moves like the animal would if it were alive. It also makes the display not so rigid that if it were knocked it would not fall over."

Two other unique features of the exhibit are located in the arms and jaw of the animal. A rod or pipe stemming out of the scapula extending the length of the arm has a set screw placed so that you can change the position of the hands; and an aircraft cable was used in the jaw so that you can easily change the gape of the mouth to open bigger or smaller changing the ferocity of the animal.

"When we put the mount together for the animal we had to make sure it was going to be stable to support the pose we wanted and the weight of the cast," said Lien. "What we ended up doing was Darrin and I actually hung from the mount to make sure it would not fall. We also had to have a base built that is twice as big as what normally is used for an exhibit of the same size in order to support it."

The Allosaurus on display at the Journey Museum is the first ever and only of its kind to be exhibited in South Dakota. It lived during the Late Jurassic period, roaming parts of North America, including the Black Hills, and Africa in a climate that was warm and moist when an abundance of herbivorous or plant eating dinosaurs covered the landmass.

The skeleton of the animal includes 398 bones. If you were putting the pieces together you would find 1/3 of the bones in the skull and jaws. Its jaws were lined with about 70 slashing knife-like teeth which enabled it to be a fierce hunter. An adult could grow up to 39 feet in length and weigh as much as one to two tons.

"The exhibit gives children and adults

Heather F
Geology, d

m the Real Jurassic Park

Photo by Kari Larese

inlayson (MS Paleo, '97), Dan Lien, (Geol, Rapid City), and Mike Greenwald, Research Scientist, Museum of evote time and expertise to the installation of the Allosaurus exhibit.

alike a sense of what this animal was like during the Jurassic times," said Herbel. "The size and forcefulness of the pose encourage you to further explore the life of the Allosaurus as well as the field of paleontology."

"We chose this particular pose because it is fierce looking and very much life-like," said Finlayson. "It caters to the imagination. We hope kids come in, look at it, and imagine this animal as if it were alive."

In an effort to sponsor the new exhibit at The Journey Museum, the Museum of Geology is busy "Putting the Pieces Together" as they strive to reach out from campus into the community to provide interpretative and interactive experiences for the people of the region. One of the ways they do this is by bringing science into the lives of people and encouraging them to pursue and explore the world. In an effort to continue this thrust, the Museum of Geology is seeking sponsors for the Allosaurus. Sponsorship opportunities are available for the different bones of the animal varying from the skull priced at $8,000 to the individual toes priced at $25.

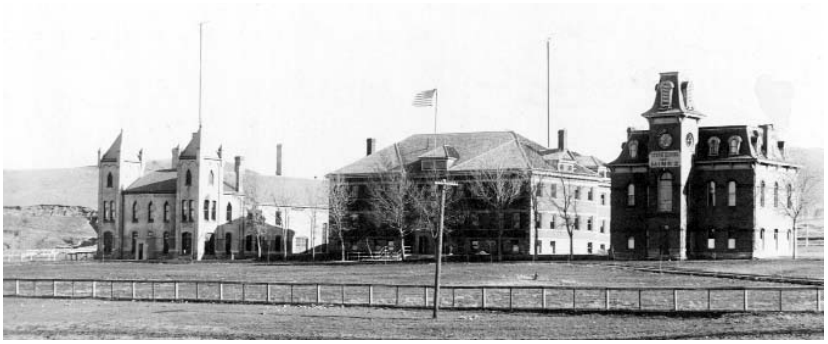
Individuals who are on the sponsorship list include: Eugene B. Bradshaw, Charles D. Dunmire, Owen D. Evans, Patricia Fallbeck, Douglas W. Fuerstenau, Gary D. Johnson, Marvin L. Messer, Virginia Simpson, Timothy L. Thomas, and Western Communications, Inc.

The Allosaurus was unveiled at The Journey Museum on May 18 in celebration of their 2nd anniversary. The Museum of Geology is one of four partners who display a facet of their collection at the Journey Museum in an effort to teach the history of the Black Hills region.

The Journey Museum
222 New York Street
Rapid City, SD 57701
(605) 394-6923

Hours of Operation:
Monday - Saturday
10:00 am - 4:00 pm
Sunday
11:00 am - 4:00 pm

Looking Back...



First three buildings on campus in 1908 - Prep Building (left), Main/Liberal Arts (center), and Metallurgy Building (right)

Photos Courtesy of SDSM&T Archives

File Photo

Dr. Richard Gowen

Photo Courtesy of SDSM&T Archives

In commemoration of the millennium you are invited to take a look back at the history of the South Dakota School of Mines and Technology (SDSM&T). In each of the four issues to be distributed in 2000 a look at Tech past and present will be portrayed in a re-photographing effort beginning with the inaugural year in 1887 spanning to the present day.

This first look focuses on the years 1887 - 1914 and will capture the first versus present day president; the establishment of the Hardrocker football team; a remembrance of the former Main (Liberal Arts) building; and the progression of M-Day activities.

Dr. Franklin Carpenter

Students during 1919 M-Hill celebration

PRESIDENTS

The first president of the Dakota School of Mines was Franklin Carpenter who in 1886 was named dean of the university. Carpenter took the position after a few others had turned it down. After all, who would want to take charge of a university that had no registered students, lacked funds, and was located in such a remote part of the country?

Dean Carpenter was expected to serve as both figurehead of the college and professor of geology and mining. Of utmost importance in his hiring, Carpenter had to be experienced in mining as well as frontier living, quite a difference from the president today, Dr. Richard Gowen.

In his role as president Gowen is addressing issues such as equipping the faculty and students to move forward with technological advances in the world; pushing the boundaries in the science and engineering fields; and developing internet software on the Tech campus for global applications.

M-WEEK

The M-Hill climb has evolved into an event that caps off an exciting week of festivities at the School of Mines. The tradition began in 1912 when a large 'M' measuring 112' x 67' was constructed with the intent to attract attention and excite people's interest in the university. More than 100 wagon loads of rock were

Photo by Kari Larese

Mixing the whitewash atop M-Hill during the 1999 M-Week festivities

Then and Now

Photo by Kari Larese

Slip-N-Sliding down the "M"

hauled up the hill to fill in the area that was then whitewashed by the students once it was completed.

Today the tradition spans the length of a week and closes out a month-long time frame when freshmen wear their green beanies, and seniors don their senior caps. This year's festivities included a Grubby Look-A-Like Contest, Quad Games & Ice Cream Social, Scavenger Hunt, Homecoming Coronation, athletic games, and of course the M-Hill climb. And although the methods have changed over the years, there will always be the whitewashing of the "M".

FOOTBALL

Football and Tech might not appear to be a natural fit, but the Hardrockers have been around almost as long as the the school itself. When the team first organized in 1895 the school was more

Photo Courtesy of SDSM&T Archives

1899 Hardrockers

concerned with finding players who had heard of the game before rather than selecting individuals who excelled at passing, punting, or blocking. That first season only one game was played against Black Hills College during which Tech won the inaugural game 18-0.

The Hardrockers have traveled a long road since 1895 when a uniform set of rules for the game did not exist, and an absence of helmets left players growing their hair long for protection.

The 1999-2000 season marks the 115th season of football at Tech and with it things continue to change. The South Dakota-Iowa Conference (SDIC), which Tech has been a member of for 83 years, will cease to exist as the Dakota Athletic Conference emerges.

File Photo

1999 Football Team

ARCH

The construction of the "Old Prep Building" in 1885 marked the beginning of the School of Mines and an intrusion of higher learning into a frontier town characterized by lynchings, violent murders, and 'women of the town.' It was a short three years later that the Metallurgy Building was built, and in 1901 the Main or Liberal Arts Building was constructed.

Over the ensuing decades the Liberal Arts building became the nucleus of campus life and was the last of the original three to remain standing, only to be demolished in 1994 due to structural problems.

In an effort to remember Tech's past, the blocks that made up the entry into the Liberal Arts building were carefully chiseled out, numbered, and reconstructed into what is today the Memorial Arch. The landmark, which is actually a three-arch structure, symbolizes the first three buildings on campus serving as a gateway between Tech's rich heritage and future success.

Arch commemorates the first three buildings on campus.

Photo by Darrell Sawyer

A Touch of Glass

Recycling provid

As the clock ticks, time passes, and we enter the new millennium, many issues face us today beyond the Y2K bug. In Rapid City the issue of recycling to help alleviate the filling of the landfill has come into the forefront during the past year. The city of Rapid City has initiated a "blue bag" recycling system that allows recyclable materials to be easily pulled from the waste stream and utilized in various ways. Of the aluminum, steel, glass, and plastic that come through the recycling system, glass is the only element that the city currently has no use for and is being stockpiled for future use.

For the past seven years Jerry Wright (CE, '71), Superintendent of Solid Waste Operations for the City, has been trying to come up with a viable use for the glass that comes to the Materials Recovery Facility. In most cities the glass is recycled for reuse as glass, but in Rapid City we do not have the facilities to do this. It is not economically feasible to send the glass to a recycling facility in Denver or Minneapolis, so Wright has been trying to devise a local solution.

"Recycled glass accounts for approximately 4% of what comes through the Materials Recovery Facility each year. There is the potential for approximately 3,000 tons a year," said Wright. "By finding a use for the glass which is an item that has normally gone in the landfill, we would save approximately $140,000 annually worth of storage for the City."

Two years ago the South Dakota School of Mines & Technology (SDSM&T) became involved. Wright and an old college friend who specialized in high performance concrete, M.R. Hansen (BS CE '69, MS CE '73), Associate Professor of Civil and Environmental Engineering at Tech, put their heads together and came up with a solution: utilize the glass as an aggregate in concrete.

Hansen with the help of Michelle Nielsen (BS CE '97, MS CE, '98), a graduate student at Tech, batched 33 different mixtures to test in order to obtain one that had the optimum glass to cement ratio. The one ultimately testing the best had a 20/20 ratio. Recycled glass was substituted for 20% of the sand and rock used, and fly ash, a waste product that results from burning coal, was substituted for 20% of the cement normally used in a concrete mixture. The result proved both economically advantageous and durable. The 20/20 mixture was be used for pavement patching on city streets and was tested at a location in Rapid City.

A second phase of the project brought in graduate student Terry Collins (MS CE, '99) who was responsible for developing a controlled low strength material that could be used for utility line backfilling such as when a water pipeline breaks in a street. His goal was to develop a mixture substituting recycled glass for all of the sand.

"The idea behind using the glass mixture for utility line back filling is that the back filling takes a large volume of material, and they had a very large volume of recycled glass that there was no use for," said Collins. "We wanted to use the mixture to refill holes such as utility lines, because it would be very easy to go back in and dig it up in the case of another water line break. It is also advantageous because the mixture would not settle once poured so it would not create potholes in the streets."

"We could potentially use all of the glass that comes through here for use in the controlled low strength concrete," said Wright. "In order to use the approximately 3,000 tons of glass that comes through each year, we would be able to fill a utility trench 2 feet wide, 5 feet deep, and one mile long."

The controlled low strength material utilizing recycled glass as an aggregate provides for good use all around. The Material Recovery Facility will save money in storage space at the landfill and the city will save money by using glass as an aggregate in concrete in both pavement patching and utility line backfill.

"There are many benefits to the use of glass in this way," said Collins. "The environmental benefit is that it is keeping the material out of the landfill. Other

les concrete additive

benefits are that it is much safer for the utility workers, it is faster, and it produces a higher strength backfill."

Utility backfill has traditionally taken place through repetition. Workers would place dirt into a hole, pack it down, and repeat this process until the dirt is level for a pavement patch. With the new mixture, there will be one pour that does not necessitate workers taking turns to pack it down. This leads to both a safer and faster process for the workers as they will no longer have to be down in a hole or ditch themselves. Another benefit is the increased strength of the material. Unlike traditional fill, the mixture substituting glass for sand does not shrink with use or age and will not develop into a pothole or utility trench settlement.

Wright feels this is a research project that other cities across the United States should also conduct. For cities with location problems such as Rapid City where it would cost quite a sum of money to send their glass out of town to recycle, they can also begin to reap the benefits by using their glass in the same manner. Countries on a worldwide scale can also take advantage of the controlled low strength material as well. In countries such as Singapore that have no natural sand, utilizing glass as a 100% substitute for sand in a concrete mixture would save them the money it would normally cost them to import the product.

The process to develop the concrete mixture not only brought together two college buddies who could use their expertise to combat a growing problem, but a group of SDSM&T alumni. In addition to Wright and Hansen, Pat Tlustos (CE '71) of Hills Ready Mix and Jerry Brown (MSCE, '70) of Birdsall Sand and Gravel have played instrumental roles in making this idea become patching a reality. Brown aided in the process of finding the right mixture for the pavement using a 20/20 mixture, and worked with Collins to create a workable mixture substituting sand for glass to use in utility line backfilling.

Four Tech alumni and two students came together to combat a problem to which the City of Rapid City has been seeking a solution for seven years. The "blue bag" recycling system that collects aluminum, steel, glass, and plastic can now be a complete recycling system as a viable use for glass has finally been discovered.

Photo Courtesy of the Department of Civilian Environment Engineering

City of Rapid City employee and Terry Collins (center) pour the glass and concrete mixture into its first pavement patch.

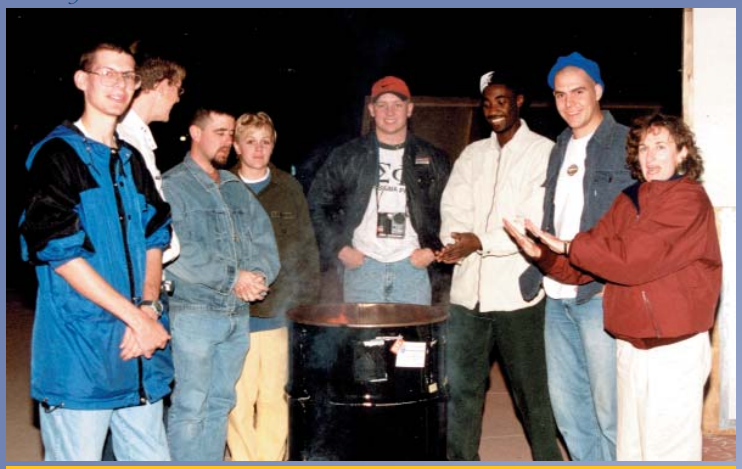
"There are many benefits to the use of glass in this way. The environmental benefit is that it is keeping the material out of the landfill. Other benefits are that it is much safer for the utility workers, it is faster, and it produces a higher strength backfill."

- Terry Collins

SDSM&T REACHING OUT

The South Dakota School of Mines and Technology provides ongoing outreach opportunities offered by our faculty, staff and students.

Photo by Kari Larese



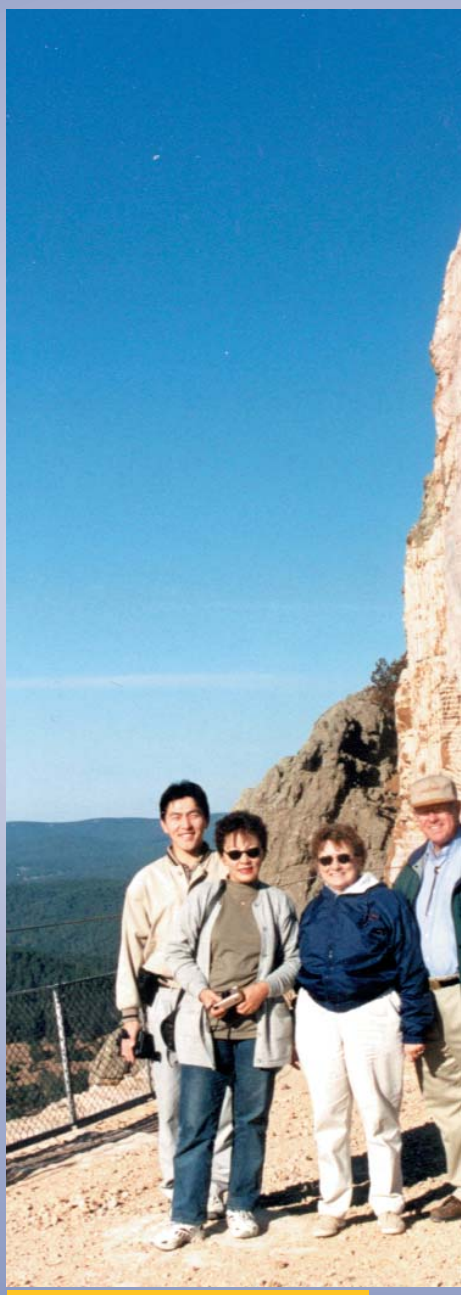
Members of Tech's Habitat for Humanity chapter help raise awareness of homelessness at a Shack-a-thon held on campus.

Photo by Kari Larese

Bird educators from the Alaskan Raptor Center and Volta the Bald Eagle talk to visitors at the Children's Science Center.

Photo by Kari Larese

New Computer Lab dedication. Dr. Gowen and John Fowler of Sun Microsystems cut the ribbon for the new industrial collaboration.



Batbayar Bayasgalan, Narantuya Shagdar, Mrs. Gowen, Dr. Gowen, Erdene Damdinsuren, and Janchiviin Budsuren

Photo by Kari Larese

Dr. Gowen shakes hands with Dr. Traverste, President of Si Tanka College.

Photo Courtesy of Robb DeWall

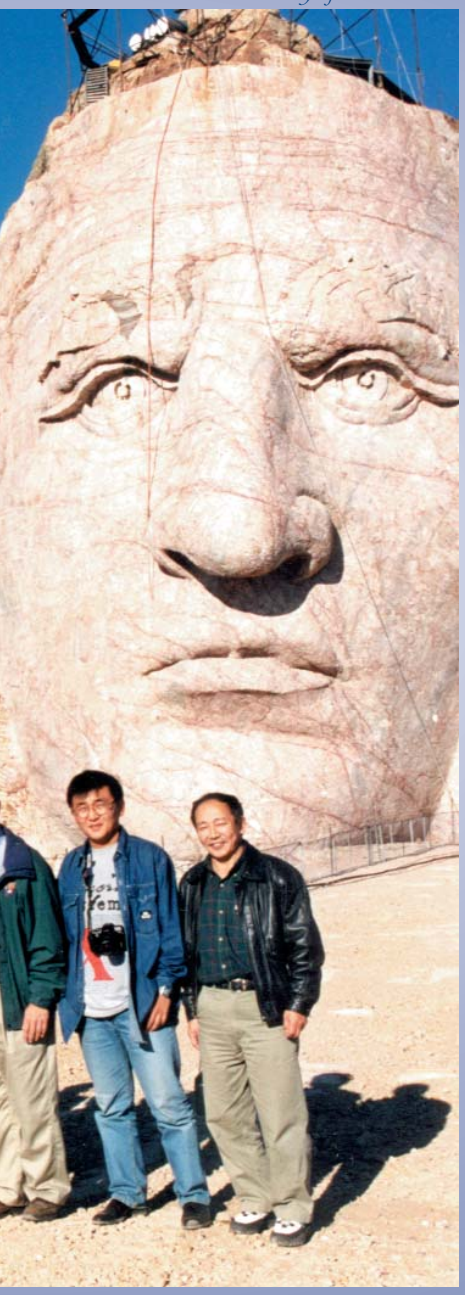


Photo by Julie Smoragiewicz

Dr. James Martin tells about his research expeditions to the Antarctic during a reception at the Museum of Geology.

Photo by Dr. James Martin

Mr. and Mrs. Bess and Wayne Harrold provide fossil donation to SDSM&T.

Animal Antics

Children's Science Center • 515 West Blvd
Rapid City, SD 57701 • (605) 394-6996

Hours: Wed & Fri - 9:30am-12:30pm; Sat - 10am-4pm
Animal Antics: Wed & Fri - 9:30am & 1pm; Sat - 10:30am
Storytime: Wed & Fri - 10:30am; Sat - 1pm

Children's Science Center enlists animals to teach math and science

Photo by Julie Smoragiewicz

Maureen Jenkins, CSC Administrative Assistant, enlists Little Huey - red tail boa - to educate recent visitors at the Science Center.

Imagine a place where children could go and work interactively with someone to learn about science and mathematics. By taking advantage of knowledgeable professionals, accessible exhibits, and a living collection, these hands-on lessons can open up the minds of our children and let imaginations run wild. Areas such as biology, geology, and the environment will be seen in a new light, and encourage further exploration.

The Children's Science Center and Animal Friends have joined forces to promote science and mathematics in the eyes of the younger generation. Elementary and middle-school age children have the opportunity to learn by doing at Rapid City's new Science Center. Three days a week educational programming is provided that focuses on exotic animal upkeep to learning about animals in their natural habitat. Kathy Parent of Animal Friends has been utilizing the Center's living collections to incorporate into her Animal Antics programming while also providing special animal guests and learning tools.

"As curators of the living collection at the Science Center we feel very fortunate to be able to provide interactive educational programming for visitors through which we teach fun ways to use science and math when taking care of animals," said Parent. "By using live animals we can show applicable uses for a variety of fields, and make it exciting for the kids."

The living collection at the Science Center has been made possible by donations from community organizations and individuals, and through loans from Animal Friends. The collection includes a variety of reptiles and amphibians including the Center's mascot, Sir Isaac Newton – a fire bellied newt. Visitors can encounter animals that vary from tree frogs to a South American lungfish. Yet, the most intimidating member of the living collection can be found in the critter wall - a Red Tail Columbia Boa Constrictor which will grow up to 12-feet in length.

The many animals in the Center's living collection, coupled with the educational programming provided by Animal Friends, has made Animal Antics a success since the Children's Science Center opened its doors. In addition to teaching the responsibilities that accompany pet ownership, Animal Antics incorporates lessons about mathematics, animal species native to South Dakota, and the circle of life and food web of the many different animals.

Parent also teaches about the biology of animals, and the importance of learning about the environmental conditions of their natural habitats. When children begin to question the life and death of a frog, tarantula, or bird, or when you try to create suitable living conditions for a fish or turtle, children must first learn about the biology of the species and environmental conditions

"By using live animals we can show applicable uses for a variety of fields, and make it exciting for the kids."
-Kathy Parent

Photo by Kari Larese

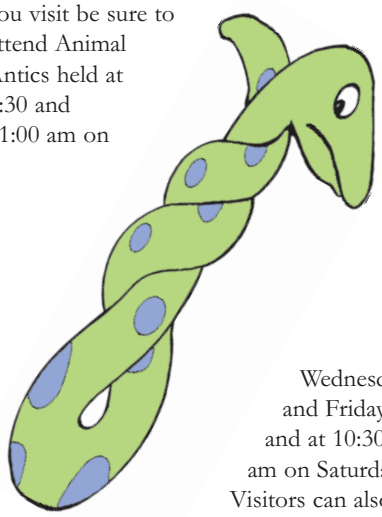
Children's Science Center located at 515 West Blvd, Rapid City.

of the animals natural habitat. This then leads to a lesson in another field, geography. After learning where the different animals live, children can they go over to a giant globe at the Center and locate the continent, country, or state where the animals can be found.

"By incorporating the exhibits and learning tools available at the Children's Science Center into the programming, children learn more than they would if they were just reading about it in a textbook," said Parent. "For example, they learn addition, subtraction, and multiplication while they study growth patterns, or dietary needs. They are shown how math is useful and applicable outside of the classroom," she added.

On December 4, 1999 the Children's Science Center joined forces with Animal Friends to host "Animal Friends Day." In addition to prizes and raffles, a variety of special events and guest speakers were on hand to share with the kids about champion cats, fish, parrots, and adoptable animals. The event gave visitors an opportunity to learn about the animals and visit with professionals about their care.

The Children's Science Center is an educational partnership between the South Dakota School of Mines & Technology, Rapid City, and area communities. The Science Center is located at 515 West Boulevard, and is open Wednesdays and Fridays from 9:30 am – 12:30 pm, and on Saturdays from 10:00 am – 4:00 pm. When you visit be sure to attend Animal Antics held at 9:30 and 11:00 am on Wednesdays and Fridays, and at 10:30 am on Saturdays. Visitors can also attend on Story Time for children ages 5 and under. Story Time is offered at 10:30 am on Wednesdays and Fridays, and at 1:00 pm on Saturdays.



The Children's Science Center is always looking for individuals interested in volunteering in the gift shop, with groups, or at special events. There are also opportunities to adopt or sponsor an animal exhibit by an individual, classroom, or group. To adopt an animal exhibit you would be responsible for financially providing food for one year. To sponsor an exhibit you or your group/organization would be responsible for the expense of the entire exhibit. For more information adopting or sponsoring an animal exhibit, volunteer opportunities, or general information about the Science Center, visit the website at http://www.hpcnet.org/sdsmt/childrens_science_center , or call (605) 394-6996.

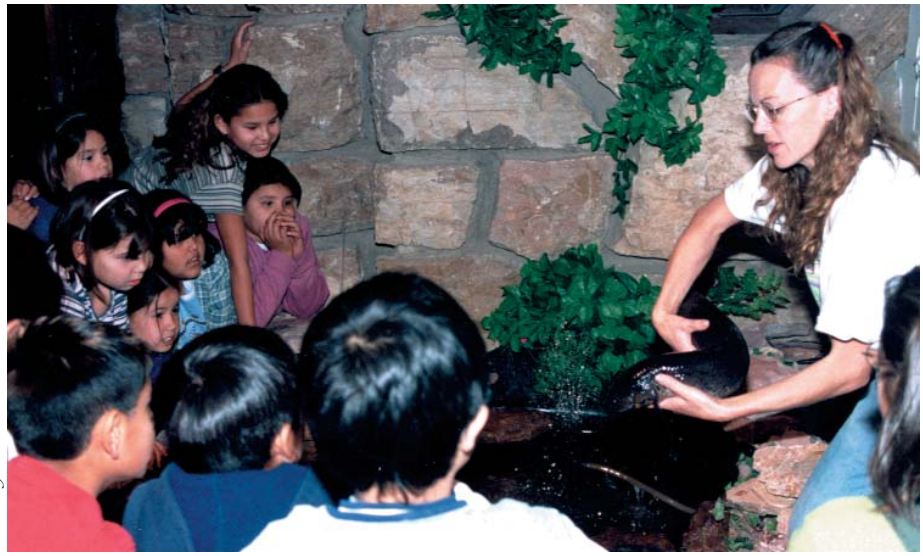
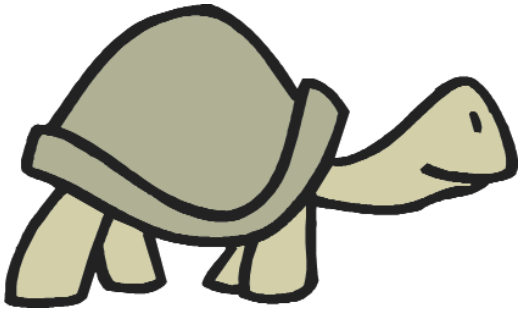


Photo by Kari Larese

Kathy Parent of Animal Friends introduces children of Porcupine School to the habits and unusual anatomy of a Lung Fish.



"For example, they learn addition, subtraction, and multiplication while they study growth patterns, or dietary needs. They are shown how math is useful and applicable outside of the classroom.
-Kathy Parent

Survey Says

Tech alums want to return to South Dakota

The South Dakota School of Mines & Technology (SDSM&T) has been and remains to be primarily a university for South Dakota students. Roughly 70% of the student body comes from South Dakota high schools, so it is no surprise that the majority would like to stay in South Dakota to work once they have graduated. Herein lies the challenge there are not sufficient job opportunities in the science and engineering fields in Rapid City and the state to keep them here. More job opportunities must be identified and developed to attract Tech graduates and encourage them to stay and work in the Black Hills region.

This past fall the university joined forces with the SDSM&T Alumni Association, the Rapid City Economic Development Partnership, the Governor's Office of Economic Development, and Black Hills Corporation to identify opportunities for Tech alumni to return to South Dakota. A survey was mailed to over 9,000 alumni, including 981 international alumni, seeking to identify individuals who are interested in returning to South Dakota for employment.

"We were hoping to accomplish two things with the survey," said Bob DeMersseman, President of the Rapid City Area Economic Development Partnership. "Provide a pool of people who are interested in relocating to the Black Hills if an opportunity became available; and to become aware of businesses who are interested in relocating or expanding into the area."

Drawing from surveys that were conducted in the past, SDSM&T, and the Economic Development Partnership (EDP) knew that there was a definite interest among Tech graduates to return to South Dakota for work. Previous survey results indicated that if there were viable opportunities in their specific career field with a comparable salary to what they were currently earning, they would return in an instant. What the past surveys lacked, was to ask those polled to identify businesses and sole proprietorships that are or might be interested in relocating to South Dakota. This one did.

Of the 9,356 surveys sent out in the initial mailing, early results indicate what we already knew – Tech alumni would love to move back to South Dakota, but the lack of viable job opportunities is keeping them from doing so. Over 1,500 surveys have been returned and of those, more than 500 indicated a desire to receive information about economic development programs assistance and incentives for business relocation or expansion to the area. Of those 500, 60 have provided direct leads to companies that may have an interest in expanding or relocating to South Dakota.

"It is exciting to see the enthusiasm surrounding this partnership between regional and statewide economic development efforts and our faculty, staff and alumni of SDSM&T," said Tim Vottero, Director SDSM&T Alumni Association. "We welcome the chance to help with this effort that is both important to the state's future and desirable to many of our graduates."

As alumni and South Dakota residents many are aware that Rapid City is the best kept secret in the mid-west, and actually know where Mount Rushmore is, but what other reasons are there for relocating to South Dakota? There is no corporate income tax, no personal income tax, no personal property tax, no inventory tax, utility costs are lower, the area is known for its unsurpassed natural beauty, outstanding quality of life and state-of-the art telecommunications. And it is listed as 47th in the nation in Total Crime Index.

The endless prairie and the 6,000 – 7,000 foot peaks of South Dakota have attracted large companies such as Gateway 2000, Conseco Financial, and Citibank that call the state home. In Rapid City new businesses are welcomed by a seven-mile park that runs along Rapid Creek, an unusually mild climate, and the region's major medical referral center in Rapid City Regional Hospital to meet all of your health needs.

At the South Dakota School of Mines & Technology, faculty and staff are combining their efforts to prepare the best science and engineering students for the job market. As a result of doing a good job, the majority of Tech graduates are enticed to top engineering firms, software companies, and Fortune 500 businesses in the United States.

The state of South Dakota is working hard to recruit more high-tech businesses that will compete with companies on a national scale, and employ Tech graduates in the state. The current Advisory Committee to the Economic Development Partnership board includes several alumni and current staff from SDSM&T, as does the EDP board itself who are working to increase business opportunities in the state, and for Tech graduates and alumni. This survey, distributed to over 9,000 alumni both nationally and internationally, is a giant step forward in working to retain Tech graduates and recruit new business to the region. The 60 direct leads produced so far are being contacted by the Rapid City Economic Development Partnership and may play a significant role in retaining our graduates.

File Photo

"We were hoping to accomplish two things with the survey...provide a pool of people who are interested in relocating to the Black Hills if an opportunity became available; and to become aware of businesses who are interested in relocating or expanding into the area."

-Bob DeMersseman, President of the
Rapid City Area Economic Development Partnership

Taking the Bite

New Dental Device Protects Environment

Wouldn't it be nice if you had an idea in your head for a fabulous new contraption that you knew would hit the market running. You just had to find the means to design, test, manufacture, and patent this stupendous idea of yours. Easy, right? It certainly was for Bob Meyer, President of RAMVAC Corporation of Spearfish.

RAMVAC markets and manufactures water-free dental vacuum systems that supply dental offices, military clinics, and dental schools. For quite some time Meyer had been seeking a resource to design a device to install into the vacuum system. He wanted to build something that would remove particles from the operating field and keep them from entering the creeks and streams in the environment. More specifically, Meyer was concerned with the amount of mercury that was getting into the environment; the amount that was becoming concentrated in fish; and toxic levels of mercury carried by fish that in turn would be eaten by humans.

"I have had other projects with state schools before and was looking to do the same with this one," said Meyer. "As it happened, I ran into Dr. Gowen (President of the South Dakota School of Mines & Technology) in the Minneapolis airport and struck up a conversation. I mentioned the project and Dr. Gowen told me to give him a call, said he might know a guy who would be interested. And that is how I got coupled with Dr. Dan Dolan (Professor of Mechanical Engineering) and the CAMP program at Tech."

The RAMVAC project became a senior design project for three students in Dr. Dolan's CAMP program (Center for Excellence in Advanced Manufacturing and Production), Chenoa Jensen (ME '99), Garland Krabbenhoft (ME '99), and Jim Tremel (ME '99). The three were presented with design objectives drafted by Meyer from which they came up with a proposal on how to best achieve the objectives, build a prototype, and test the prototype for efficiency.

"We set Dr. Meyer's objectives as our design constraints," said Jensen. "He told us how he wanted it to operate, and how big it should be, so from there we went on and did the research, manufacturing, and evaluation."

"This project was extremely valuable because it gave us a real world problem that has not been solved before, so we had nothing to draw on," she added. "It allowed us to go from the conceptual stage through all the necessary steps to develop a workable prototype – exactly what you would need to do when working in industry."

Over the 1998-1999 school year, Jensen, Krabbenhoft and Tremel worked closely with Meyer to develop the device to extract all particles five microns and larger, the thickness of a human hair, out of the operating field without interfering with the performance of the dental vacuum. The group worked with ProTech Engineering and Manufacturing, Inc. which took their design and developed a rapid prototype that was then put to the test.

A plastic model was tested at Southwest Research Institute in Texas, a national testing laboratory, and the rapid prototype developed by ProTech was tested at two dental offices in Rapid City for a two-week period of time. Both tests produced results that far exceeded their goals with a 98-99% efficiency rating.

Meyer has applied for a provisional patent for the device that would give him working time to finish up details but registers concepts that have already been developed. He characterizes the project as 70-80% done, with packaging to be the majority of work left to accomplish.

"Every member of the design team from the students to Meyer, all contributed significant ideas to reach the final product," said Dolan. "This project is an excellent example of what CAMP is doing and working towards, building connections with industry in a manner that everyone brings ideas to the table. We are truly working as partners, and that is what makes this work and has made this a successful partnership with RAMVAC."

> *"Every member of the design team from the students to Meyer, all contributed significant ideas to reach the final product. This project is an excellent example of what CAMP is doing and working towards, building connections with industry in a manner that everyone brings ideas to the table. We are truly working as partners, and that is what makes this work and has made this a successful partnership with RAMVAC."*
>
> - Dr. Dan Dolan, Mechanical Engineering professor

"This project has been a success thanks to the effort of the students," said Meyer. "I was very impressed at the organized approach they took to the development, and of the resources of the school that became available to them – especially the human resources. I will absolutely come back to Tech for future projects," he added.

A chance meeting in a Minneapolis airport with the President of the School of Mines has led to a partnership with industry which is likely to last far into the future. A new partnership with Tech has enabled Meyer to address environmental concerns with the dental vacuum system and curb the output of mercury into the water stream.

Yes, it is possible to find the means to design, test, manufacture, and patent a new contraption – especially when you have the resources available at the South Dakota School of Mines & Technology.

Story Photos Courtesy of Intercollegiate Athletics Department

Digging a New Foundation

We have all heard the saying 'If you're going to talk the talk, you've got to walk the walk.' South Dakota School of Mines and Technology's (SDSM&T) new volleyball coach, Connie Mettille, feels she is walking the walk.

Mettille comes to Tech at a time when the pace of the game of volleyball is getting quicker. She is challenged with a new team and is challenged with meeting the demands as a coach at the NAIA Division II level.

"At this level athletic programs are a little more autonomous and coaches wear many hats," said Mettille. "They certainly are not just responsible for coaching, but for scheduling, budget, travel, meals, and uniforms. You wear a tremendous amount of hats and get an appreciation for what you want to do the next year, how you want things set up, and what you will or will not do again."

Mettille was a cross-country and track athlete in college. Despite a tremendous love for the game of volleyball, she gave it up for cross-country because she lost a bet to her high school track coach. Mettille began coaching volleyball while attending Winona State University and has been coaching ever since with the exception of a brief hiatus while attending graduate school at the University of Wyoming. Her coaching experience has included high school and club teams in Minnesota and Wisconsin; and at the college level she coached the Winona State Men's team, and worked with the University of Wyoming women's team. A friendship with the former Tech volleyball coach Dana Pederson and a position as defensive coordinator on the Hardrocker football team for her husband Shane Stephen sealed Mettille's decision to come coach at Tech.

As a new face on the volleyball court at Tech, Mettille had to first earn the trust and respect of the women on the team. She did this by actively participating in spring practice, recruiting a strong freshman class, and sitting down individually to talk with each member of the volleyball team. She worked collaboratively with Pederson during spring ball to begin to implement her style of play to help develop a positive relationship with her new team..

"It was interesting because I was asking her (Pederson) to do some things with the team that she had never done before," said Mettille. "I think it was a big transition for these girls because I am very demanding and have high expectations. I think by being straight forward with them, and clearly defining their roles the girls began to trust and understand where I was coming from as a coach," she added.

"I came to Tech to play volleyball because of the coaches," said freshman hitter Jami Zilles. "Connie has earned the team's trust because she is very hardworking and wants the betterment of the team. She has brought a lot of enthusiasm to the court and really wanted the season to get started and for us to play well." The SD Tech volleyball team began the 1999-2000 season with one goal: to show well in the conference tournament. With a new coach, five new freshmen, and a new defensive and offensive scheme it was going to be a challenge, but the process remained in tact. A schedule that pitted Tech against teams ranked in the top 25 in the nation did not make the road easy to follow, yet left the conference competition wide-open. At the SDIC Tournament #1 seed Dordt College of Iowa took the championship, as Tech fell to Black Hills State University in first round play.

In the upcoming volleyball season SD Tech joins the Dakota Athletic Conference or DAC-10. The volleyball squad will see some of the best teams in the region and will need to continue to elevate their level of play. Their competition will include top ranked Dickinson State University, Jamestown College, and the University of Mary.

"We are moving out of the fire pit and into the oven," said Mettille. "We are not going to get a reprieve from quality teams. We have phenomenal athletes on the team right now and in order to continue to compete at this level we must increase our height."

The biggest asset the Tech team has is their quickness, a quality that Mettille will not sacrifice. She hopes that she will be able to increase the height of the team and bring athletes here that will be tall as well as have great footwork on the court.

Fans of SD Tech volleyball will have much to look forward to next season as Mettille leads the Hardrockers into the DAC-10 conference with as much enthusiasm as she displayed during her first season. An off-season that will build upon the team's new game plan and defensive focus coupled with new height gained from new recruits will prepare SD Tech for their new conference competition.

Team members are: Front Row: Sara Williamson, (EE Rapid City); Liz Harrison (IENG, Strasburg, CO). Middle Row: Holly Mulz (EE, Rapid City); Crystal Parsons (CEE, Spearfish); Hannah Gibson (IENG, Philip); Karen Balo (CEE, Gillette, WY); Lindsay Young (CEE, Spearfish). Back Row: Jami Zilles (IS, Logan, UT); Bobbi Jo Beyer (IS, Parkston); Molly Barnes (IS, Laramie, WY); Jennifer Korn (Che, Meridian,ID); Coach Connie Mettille; Cassie Keene (CEE, Cedar Hill, TX); and Brianna Davis (ENGR, Littleton, CO).

Research Notes

Dr. Sherry Farwell, Dean of Graduate Education and Sponsored Programs, was recently awarded $25,550 from the National Science Foundation for his project entitled "Graduate Research Fellowship Program." Dr. Farwell also recently received $3,600 in additional funds from NASA (prime-University of North Dakota) for his project entitled "Public Access Resource Center (PARC) Empowering the General Public to use EOSDIS-Implementation Phase III."

Dr. Maribeth Price, Assistant Professor, Department of Geology and Geological Engineering, was recently awarded $98,636 from the National Aeronautics and Space Administration (NASA) for her project entitled "Application of Remote Sensing to Forest Resource Inventory and Habitat Modeling."

Dr. Melvin Klasi, Associate Professor of Civil & Environmental Engineering, was recently awarded $18,003 by the Stress Steel Company, Inc. for his project entitled "To Provide Test Facilities and Personnel for GFRP Project."

Dr. Paul Smith, Professor Emeritus, Institute of Atmospheric Sciences, was recently awarded $105,446 in additional funds from the National Science Foundation for his project entitled "Turbulence Characterization and Detection."

Dr. William Roggenthen, Professor of Geology and Geological Engineering, was recently awarded $1,620 in additional funds 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. Chris Jenkins, Professor of Mechanical Engineering, was recently awarded $10,000 from The Boeing Company for his project entitled "Finite Element Modeling and Experimental Studies of Membrane Mirrors." Dr. Jenkins also recently received $15,000 from Triton Systems, Inc. (prime-DOD) for his project entitled "Material Development for Large Deployable Space Optics."

Dr. Jon Keller, Associate Professor of Metallurgical Engineering, and Dr. Lidvin Kjerengtroen, Professor of Mechanical Engineering, were recently awarded $70,000 from the National Science Foundation for their project entitled "A Multi-Scale Approach for Understanding the Role of the Interphase in Polymer Matrix Composites."

Dr. Sangchul Bang, Dean of the College of Earth Systems and Professor of Civil & Environmental Engineering, was recently awarded $2,135 from NAFSA: Association of International Educators for his project entitled "Korean Student Assistance Awards Program (KSAAP) Application.

Kata McCarville, Director, Instructional Technology Services, was recently awarded $54,000 from the National Science Foundation (prime-University of North Dakota) for her project entitled "High Performance Network Connection in Support of Meritorious Research DakotaLink."

Dr. Mike Langerman, Chair/Professor, Department of Mechanical Engineering, recently received $1,500 from SD TeAM and $10,000 from McTighe Industries for his project entitled "Fluid Dynamic Modeling of Oil/Water Mixtures in Corrugated Flow Channels."

Mike Greenwald, Research Scientist, Museum of Geology, recently received $15,000 in additional funds from the United States Department of Interior - Bureau of Reclamation for his project entitled "MNI-WICONI Water Project: Red Shirt Sector."

Dr. Karen Whitehead, Vice President for Academic Affairs, was recently awarded $300,000 from the BUSH Foundation for her project entitled BUSH Faculty Development Program.

Dr. Bruce Berdanier, Assistant Professor of Civil and Environmental Engineering, was recently awarded $359,056 from the United States Department of Interior - US Geological Survey for his project entitled "Provide Hydrologic Information and Research Results Related to State Water Resources Issues."

Dr. Neil Chamberlain, Associate Professor of Electrical and Computer Engineering, recently received $24,833 from Communiq, Inc. for his project entitled "USB Interfase for ISDN Modems."

Personnel *Changes*

WELCOME:

Craig DeTample, Exempt, Director, Children's Science Center (12/13/99)
Thomas Durkin, Exempt, Deputy Director and Coordinator, SD Space Grant Consortium, Graduate Education and Sponsored Programs (9/27/99)
Maureen Jenkins, CSA, Administrative Asst I, Children's Science Center, (10/1/99)
Julia Sankey, Faculty, Haslem Postdoctoral Fellow, Museum of Geology, (10/1/99)
Janet A. Larsen, CSA, Child Care Worker, Little Miner's Clubhouse (10/1/99)
Michelle L. Dean, CSA, Child Care Worker, Little Miner's Clubhouse (10/4/99)
Kristy J. Engle, CSA, Secretary, Business and Administration (11/1/99)
Tara A. Martin, CSA, Teacher Aide, Little Miner's Clubhouse (11/1/99)
Linda Moses, CSA, Child Care Worker, Little Miner's Clubhouse, started 10/12/99
Sharon L. Guilliat, Faculty, Humanities, Director of Drama, started 9/14/99

FAREWELL:

Robert Houdek, Exempt, Business and Administration (9/17/99)
Michael Mueller, Exempt, Physical Plant (10/31/99)
Margaret Sandine, Faculty, Associate Librarian, Devereaux Library (11/22/99**)**
Jean Verch, CSA, Secretary, Surbeck Student Center (11/23/99)

RECLASSIFIED:

Elizabeth Wild, CSA, Devereaux Library, has been reclassified to a Library Technician (8/7/99)

CHANGE IN POSITION:

Vickie Bender, Exempt, has accepted the Director of High Plains Center for Technology position (9/21/99)
David Turner has accepted the Software Development Manager position in High Plains Center for Technology (10/1/99)
Wendy Boomer, CSA, has accepted the Senior Claims Clerk position in Business and Administration-Debit Card/Cashier
Richard (Dick) Brich, CSA, Programmer/Analyst, Academic and Enrollment Services (12/1/99)

RETURNING:

Mitchell Stone, Faculty, Asst Prof, Social Science (9/1/99)
Nam-Soo Kim, temporary Exempt, Research Sci I (9/20/99)

Producing Leaders for the New Millennium

Students Encounter Opportunities Around Every Corner

Leadership is not something reserved for the president of an organization, the captain of an athletic team, or the head of the class. It takes on many different forms and can be seen in many different places across the campus of the South Dakota School of Mines & Technology (SDSM&T).

As students attend class, participate in academic clubs and organizations, or play an athletic sport either varsity, club, or intramural, they all have experienced leadership whether they were aware of it or not.

"There are all forms of leadership on this campus," said Chris Ahlers (CENG, Pierre). "It can be seen in the freshmen who wore their green beanies until M-Day, and when new organizations begin such as the soccer club. It is the person who stands up for their own rights, sets their own standards. The one who forges into the night," he added.

L to R: Jed Padilla, (CSC Gillette, WY); Cody Jackson (ME, Laramie, WY); Brent Peterson (CEE, Sioux Falls); Josh Sletten (CEE, Irene); Stephanie Hummel (ChE, Hurley); BJ Misterek (CSC, Sioux Falls); and Kyle Schofield (ME, Midland).

A leader has traditionally been associated with those that hold high-level positions such as a president, general manager, or supervisor, not those of the mid-level employee or member of a team. Trends are changing with time though. Today it is important for all members of a company or organization to be leaders - many of which have not been traditionally recognized as such. We are learning that it is developing and maintaining relationships that is the key.

It is for this reason that students, faculty, and staff at SDSM&T are working together to develop leadership skills in students while they are in college. It is important to acknowledge that those who organize a meeting time for a team project, gather a group to start an intramural basketball team, or make a suggestion during class or a club meeting are leaders.

"The way that businesses and corporations are moving toward in the future is team and group work," said Maureen Wilson, Assistant Director, Residence Life for Leadership Development/Residence Hall Director for Connolly. "It is not so much of having a leader anymore but having a group of people who can work together. At different times someone is going to be directing where that group is going, but at another time someone else may be saying well let's go this direction now. That is leadership."

There is a lot of positional leadership across the campus at Tech. These positions include resident assistants, peer advisors, orientation leaders, individuals involved with ROTC, and presidents, vice presidents, and treasurers of student organizations. It is looking beyond these positions where we can find the leadership of today and tomorrow. In every class project that involves a team of people there are leaders. Anytime a group of students gets together for a study group, or anytime people are just wanting to do something together, there is leadership taking place. There is a huge spectrum of leadership opportunities at Tech. It can be as simple as saying 'hey, what do you want to do Friday night?' to getting the Solar Car, Mini Baja, Mini Indy, and Concrete Canoe to their competitions.

"All of our students, faculty, and staff are involved in leadership, maybe not on a daily, but a weekly basis," said Michelle Howell, Director of the Surbeck Student Center and Student Activities. "They are exercising leadership but do not define it as such because they are not the president. They say, 'I just organized a study group because I needed help on my calculus,' without realizing their action was leadership."

Story Photos by Kari Larve

Amy Gab (IS, Rapid City) heads down the rapelling tower during cadet training.

Identifying and developing leadership in students today will help prepare them for life after college. Creating opportunities for students to experience leadership first hand equips them to begin their first job or continue their education. The vital ingredient is their interpersonal skills. In college and business organizations people need to rely on their ability to work well with others, confront difficult situations or negative people, and show initiative in various settings. The trend has moved from a steward shouting out directives, to a playing field where all students or employees participate in the leadership process.

At the School of Mines students, faculty, and staff are beginning to make a move toward meshing the many clubs, organizations, and academic curriculum to create a campus wide relationship. Developing cross-organizational friendships, working with campus staff, and sitting down with a faculty advisor to discuss something other than class notes or the upcoming test will help close the gap between positional leadership and leadership that focuses on interpersonal relationships. If you would like to learn more about cross-campus leadership at the School of Mines, contact Michelle Howell at (605) 394-2335.

Spotlight on Students

The North Central Region of the Association for Computing Machinery (ACM) Programming Contest was held in November. Three teams from SDSM&T competed. The final rankings of the Tech teams were 13, 14, and 29 out of 80 teams in the region. Students who participated included **Chris Ahlers** (CENG, Pierre), **David Burton** (CSC, Rapid City), **David Crandall** (CSC, Rapid City), **Joe Johnson** (CSC, Munich, ND), **Toran Kopren** (CSC, Meadow), **Preston Schneider** (CSC & MATH, Rapid City), **Rune Torgersen** (EE, Norway), **Reed Ulvestad** (CSC, Rapid City), and **T.J. Waitis** (CSC, Rapid City). **Drs. Ed Corwin and Toni Logar**, Department of Mathematics and Computer Science, were their coaches.

The SDSM&T chapter of Tau Beta Pi received two awards at the national convention held in Madison, Wisconsin. Officers accepting the awards were **Chris Ahlers** (CENG, Pierre), **Jason Thuringer** (ME, Parkston), **Amy Landreth** (CE, Chadron, NE), **Heidi Anderson** (CE, Rapid City), and **Alexa Maxwell** (EE, Rapid City).

Dr. M.R. Hansen, Associate Professor of Civil and Environmental Engineering, recently organized and chaired a National Student & Leadership Session at the American Society of Civil Engineers (ASCE) Annual Conference held in Charlotte, North Carolina. **Beau Obrigewitch** (CEE, Wiboux, MT) presented a paper at the session entitled "Concrete Canoe Design and Construction Developments at SDSM&T" in which he co-wrote with **Charles Baker** (CEE, Rapid City), **Terry Collins** (CEE, Rapid City), **Dr. M.R. Hansen,** and **Rhaub Walker** (CEE, Rapid City).

Dr. David Dixon, Associate Professor, Department of Chemistry and Chemical Engineering, accompanied 16 undergraduate students to the American Institute of Chemical Engineers National Conference in Dallas, TX. Part of the group represented the Rocky Mountain Region in the National Environmental Student Chapters Competition. **Brigitte McNames** (ChE, Custer) presented a research paper in the oral presentation competition; graduate students, **Xiaodong Zhang** (MES, China), and **Craig Steffan** (ChE, Hazen, ND) made formal research presentations; and three former students (BS ChE 1999), **Amy Kozel, Kirby Kozel,** and **Brandon Borge,** received recognition for their submission to the National Student Design Competition which received Honorable Mention. Other students who attended the conference included: **Chris Bulian** (ChE, Yankton), **Tara Boehmer** (EE, Mitchell), **Ryan Caldwell** (ChE, Sioux Falls), **Robert J. Cunningham** (ChE, Mitchell), **Erin E Ernst** (ChE, Aberdeen), **Katie Fuerst** (ChE, Mitchell), **Jeremy Ferebee** (ChE, Halliday, ND), **Tim Gramith** (ChE, Norwood, MN), **Jamie Gramm** (ChE, Gillette, WY), **Jason Herr** (ChE, Aberdeen), **Jason Heier** (ChE, Roscoe), **Colleen Manning** (ChE, Burbank), **Brooks Pettit** (ChE, Aberdeen), **Mike Stratton** (ChE, Brooklyn Park, MN), and **Eric Swanberg** (ChE, Bloomington, MN). Cunningham received the Donald F. Othmer Sophomore Academic Excellence Award. The award is given to the student in each student chapter who has attained the highest scholastic grade-point-average during his/her freshman and sophomore years.

The Black Hills Chapter of the South Dakota Engineering society presented a scholarship award of $750 to **Ken Harding** (ME, Rapid City). The scholarship is made to a returning SDSM&T engineering student that has been active in professional societies and activities.

Jennifer A. Waggoner (GEOL, Decatury TX) participated in the 1999 Lunar and Planetary Institute Summer Intern Program at the LPI and the NASA/Johnson Space Center in Houston, Texas.

Colleen Manning (CHE, Burbank) has been selected as the new chair for the Leadership Development Team.

Eleven students represented SDSM&T at the National Association for Campus Activities (NACA) Upper Midwest Regional Conference in St. Paul, Minnesota. Those who attended and their organization included: **Ben Simpson** (ME, Buffalo Gap), TONITE President**; Brianna Griffith** (GEOL, Escondido, CA), Coffeehouse/Recreation Chair; **Michael Dorman** (ME, Kennebec), TONITE member; **Chris Pellegrino** (IS, Evergreen, CO), M-Week member; **Pete Goede** (CEE, Burnsville, MN), M-Week member; **Chris Monson** (ChE, Pierre), TONITE member; **Jessica Kienow** (ChE, Aberdeen), TONITE member; **Charlie Knight** (ME, Ottumwa, IA), TONITE member; **Nick Bottelfsen,** TONITE member; **Matt Goeden** (CE, Yankton), TONITE member; and **Trinity Elverud** (IS, Rapid City), TONITE member.

PUBLICATIONS

Dr. Roger Dendinger, Assistant Professor of Social Sciences, wrote a chapter for a book recently published entitled "Casino Gambling in America: Origins, Trends, and Impacts." Dendinger's chapter was entitled "To the Supreme Court: Indian Gaming in the Southeastern United States."

Campus Briefings

Neal Hodges, Yvonne Paulson, Karen Henrichsen, and **Debbie Zeidler** were the September, October, November, and December Traditions of Excellence Award (TEA) winners respectively. Neal is a Senior Systems Programmer for Instructional Technology Service; Yvonne is a Teacher's Aide at Little Miner's Clubhouse; Karen is a Bookstore Buyer at the Tech Bookstore; and Debbie is a secretary in the Interdisciplinary Sciences office.

SDSM&T alum **Dr. James R. Swartz** (ChemE, '71), professor at Stanford University, was recently inducted into the National Academy of Engineering (NAE). NAE noted Swartz's contributions to the design, scale-up, and yield improvement of recombinant protein production systems as a reason for his induction.

Condolences to the family and friends of **Onesmus Matebele** (GEOE '97). Matebele recently was a victim of a car accident in his home country of Zambia.

Brian Steinberg, Assistant Director of Residence Life for Programs/Residence Hall Director for March/Dake, presented a program at the 1999 UMR-ACUHO (Upper Midwest Region of the Association of College and University Housing Officers) annual conference in Sioux Falls, SD. The program was called "Residence Hall Recognition for the Next Millennium".

Dr. Kerri Vierling, Assistant Professor, Biology Program, gave two invited talks on October 2nd and 4th. On October 2nd Dr. Vierling gave a talk to the South Dakota Ornithological Union entitled "Causes of population declines of Lewis's Woodpeckers in the West: implications for conservation"; and on the 4th she gave a talk to the University of South Dakota Biology Department entitled "Source and sink habitats of a generalist species in a suburban/rural landscape: a case study of Red-winged blackbirds."

Congratulations to **Sandy Carlson**, SDSM&T Foundation and her husband, Scott, on their new arrival, Sarah Ann Carson. Sarah was born on October 15, 1999, and weighed 6 lbs. 6 oz.

Dr. Robb Winter, Professor of Chemistry and Chemical Engineering, attended the 36th Annual Technical Meeting of the Society of Engineering Science at the University of Texas at Austin October 25-27, 1999. At the conference Dr. Winter presented a paper entitled "Interphase Nanomechanical Properties in a Polymer Matrix Composite" which he co-wrote with Dr. J.E. Houston of Sandia National Laboratories. He also attended the 46th International Symposium of the American Vacuum Society in Seattle, Washington October 25-29, 1999. Dr. Winter presented a paper entitled "Interphase Nanomechanical Properties in a Model Epoxy-Silane-Glass Composite as Revealed by Interfacial Force Microscopy" he co-wrote with H. Cabibil and J.M. White of the University of Texas at Austin, and J.E. Houston.

Former Tech President Brigadier General **Harvey R. Fraser** was selected as the recipient of the 1999 General Patton Award. This award is given annually to a person recognized for significant contributions to world peace. Fraser was selected to receive the award for his leadership and bravery with the 51st Engineer Combat Battalion, United States Army, during critical battles to halt the German offensive in the Ardennes, during December 1944; and for his dedication to delivering high quality educational opportunities to students.

At the American Institute of Chemical Engineers' Annual Meeting in November in Dallas, TX, **Dr. David J. Dixon,** Associate Professor of Chemistry and Chemical Engineering, was the vice chair on a session entitled: Free Forum on Engineering Education. Dr. Dixon was the presenter on a paper titled: Use of Simulation Software Packages as a Teaching Tool in the 4-year Chemical Engineering Integrated Design Project, written by **Dr. Larry Bauer,** Professor of Chemical Engineering, Dr. Dixon, **Dr. James Munro,** Interim Dean, College of Materials Science and Engineering, and Professor of Chemistry and Chemical Engineering, and **Dr. Jan Puszynski,** Professor of Chemistry and Chemical Engineering. Dr. Puszynski presented two (one invited) papers at the 1999-Fall TMS Meeting in Cincinnati, OH. During that meeting he co-chaired one technical session. Dr. Puszynski also presented the invited seminar at the Capitol Section of American Institute of Chemical Engineers in Washington, DC.

At the Geological Society of America Annual Meeting held in Denver, **Kata McCarville,** Director, Instructional Technology Services, presented a poster session entitled "Walk This Way: Spreadsheet Modeling of Trackways." The poster covered an integrated math-field exercise she conducted with the SKILL students this past summer.

The Leadership Rapid City Class of 1999 graduated four individuals from SDSM&T. They are: **Michelle Howell,** Director of Surbeck Student Center; **Donna Hughes Hargraves,** United Campus Ministry; **John Lofberg,** Administrative Assistant, Office of the Vice President; and **Vojislav Kalanovic,** Associate Professor of Mechanical Engineering.

Rick MacDonald, Computer Support Supervisor, Instructional Technology Services, was selected as the new Career Service Council Member. Also announced at the meeting was a new plan to ensure equitable representation across the campus.

Dr. Roger Dendinger, Assistant Professor of Geology, has been asked to serve on the advisory board of the Professor of Geography, has been asked to serve on the advisory board of the Professor of Geology, has been asked to serve on the advisory board of the South Dakota Geographic Alliance by the Alliance coordinator, Prof. Charles Gritzner of South Dakota State University. The Geographic Alliance program is funded by the National Geographic Society's Geography Education Foundation. Geography alliances are operational in all 50 states. The South Dakota Alliance involves educators at all levels of instruction and administration and provides inservice teacher training conducted through institutes, seminars, short courses, and workshops.

MIT Professor Emeritus **Walter A. Rosenblith,** a former faculty member at Tech, was recently awarded the Okawa Prize. The award is presented annually to persons who have made outstanding

contributions to research, technological development and business management in the information and telecommunications fields. Rosenblith also received an honorary degree from SDSM&T in 1980.

Dr. M.R. Hansen, Associate Professor, Civil & Environmental Engineering, was elected as a Fellow of American Concrete Institute (ACI) International in recognition of his contributions to the work of ACI.

Dr. V. Ramakrishnan, Distinguished Professor of Civil Engineering, has published two co-authored papers, presented a seminar at the University of Illinois, Chicago, and presented six papers at three different conferences. One paper, co-authored by former graduate student Sivakumar Chokalingam entitled "Statistical Model for Prediction of Fatigue Life of High-Performance Lightweight Concrete," was published in the Journal of Structural Engineering; and a second paper co-authored by **Dr. Sookie Bang,** Associate Professor of Biology, **Dr. E. F. Duke,** Professor of Geology and Geological Engineering, and **K.S. Deo,** entitled "SEM Investigation of Microbial Calcite Precipitation in Cement," was published in the proceedings of the 21st International Conference on Cement Microscopy. Dr. Ramakrishnan also presented a seminar at the University of Illinois, Chicago, entitled "Recent Developments in Concrete Fiber Composites." Two of the six papers Dr. Ramakrishnan presented were at international conferences. The first was entitled "Performance of Polyolefin Fiber Reinforced Concrete under Cyclic Loading," and the second was entitled "Prediction of Flexural and Fatigue Life for High Performance Lightweight Concrete." The second was co-authored by former graduate student C. Siva Kumar. At a third conference, a specialty Third International RILEM Workshop, Dr. Ramakrishnan's theme paper was entitled "Constitutive Model for Prediction of Flexural Fatigue Life and Performance Characteristics of Polyolefin Fiber Reinforced Concrete." This was also co-authored by Kumar. The final three papers were presented at the American Concrete Institute's Fall Convention. "Novel Technique for Repairing Cracks in Concrete Using Bacteria," was co-authored by Dr. Sookie Bang; "Performance Evaluation of 3-D Basalt Fiber Reinforced Concrete and Basalt Rod Reinforced Concrete," was co-authored by Neeraj S. Tolmare, Engineer, Gilbane Building Co., and Dr. Vladimir B. Brick, President, Research and Technology Inc.; and "An In-situ Method for Measuring Tensile Bond Strength of Concrete Overlays and Whitetoppings," was co-authored by Mr. Leif W. Wathne, Concrete Materials Engineer, H. Gene Clark, Concrete Quality Engineer, and **Ramachandran Santhosh** (MS CE, India).

You Are Invited . . . Calendar of Events

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

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 - Saturday, January 14 & 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 University, Home

Sunday, January 23
6:00 pm Nostalgia Night Film Series
Dial M For Murder, Elks Theatre

Thursday, January 27
Men's Basketball vs. Black Hills State University, Home
Women's Basketball vs. Black Hills State University, Home

Saturday, January 29
9:00 am Cracker Barrel, CB 204

Sunday, January 30
6:00 pm Nostalgia Night Film Series
Adam's Rib, Elks Theatre

February

Friday, February 4
6:00 pm Women's Basketball at Dordt College
8:00 pm Men's Basketball at Dordt College

Saturday, February 5
9:00 am Cracker Barrel, CB 204
6:00 pm Women's Basketball at University of Sioux Falls
8:00 pm Men's Basketball at University of Sioux Falls

Sunday, February 6
6:00 pm Nostalgia Night Film Series
Ben-Hur, Elks Theatre

Friday, February 11
6:00 pm Women's Basketball vs Dakota State University, Home
8:00 pm Men's Basketball vs Dakota State University, Home

Saturday, February 12
9:00 am Cracker Barrel, CB 204
6:00 pm Women's Basketball vs Huron University, Home
8:00 pm Men's Basketball vs Huron University, Home

Sunday, February 13
6:00 pm Nostalgia Night Film Series
Stalag 17, Elks Theatre

Friday, February 18
6:00 pm Women's Basketball at Dakota Wesleyan University
8:00 pm Men's Basketball at Dakota Wesleyan University

Saturday, February 19
9:00 am Cracker Barrel, CB 204
6:00 pm Women's Basketball at Mount Marty
8:00 pm Men's Basketball at Mount Marty

Sunday, February 20
6:00 pm Nostalgia Night Film Series
Singin' In The Rain, Elks Theatre

Sunday - Saturday, February 20 – 26
Engineer's Week 2000

Monday, February 21
HOLIDAY – Presidents' Day

Wednesday, February 23
6:00 pm Women's Basketball vs Black Hills State University, Home
8:00 pm Men's Basketball vs Black Hills State University, Home

Friday, February 25
10:00 am Engineers Week
Experiments/Displays in participating departments
1:00 pm "Grubby" Contest
6:00 pm SDES Annual Engineers Week Banquet

Saturday, February 26
9:30 am Computer Programming Contest
1:00 pm Mathcounts
Women's Basketball at SDIC Playoffs
Men's Basketball at SDIC Playoffs

Sunday, February 27
6:00 pm Nostalgia Night Film Series
The Grapes of Wrath, Elks Theatre

Tuesday, February 29
Women's Basketball at SDIC Playoffs

March

Friday, March 3
Concrete Conference, Civil & Environmental Engineering Department

Saturday - Sunday, March 4 – 12
SPRING BREAK – No Classes

Sunday, March 5
6:00 pm Nostalgia Night Film Series
Dirty Harry, Elks Theatre

Wednesday, March 8
Ash Wednesday

Saturday, March 11
Destination Imagination
Citywide Spelling Bee Finals

Sunday, March 12
6:00 pm Nostalgia Night Film Series
Sorry, Wrong Number, Elks Theatre

Friday, March 17
St. Patrick's Day

Friday, March 24
High Plains Regional Science Fair

April

Friday - Saturday, April 7 – 8
Regional Math Association of America Conference

Friday - Saturday, April 14 – 15
Multicultural Exposition

Friday, April 21
Good Friday

Friday - Monday, April 21 – 24
Easter Break

Sunday, April 23
Easter Sunday

Friday, April 28
South Dakota Space Day

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Tech Trivia

Did you know…

- The campus sundial stands as a monument to the English groundskeeper George Thomson.
- What now stands as the Old Gym Building was constructed in 1928. It was built to house the gymnasium and auditorium, and was financed through a cigarette tax.

- First Lady Pat Nixon paid homage to those who died in the infamous Rapid City flood that hit on June 9, 1972.
- In 1919 World War I detachments were trained at SDSM&T in either radio or mining. The men in the detachments were inducted into the service as vocational students.

- This campus landmark commemorates the 100th year of SDSM&T and marks the spot where a time capsule was deposited.

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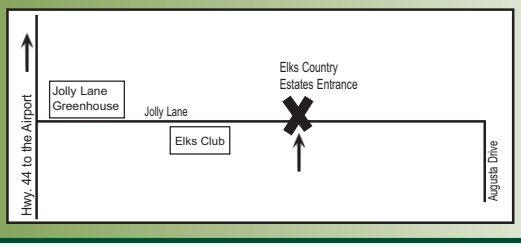

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