MVMA HONORS CVM’S VOGELWEID

MU College of Veterinary Medicine Clinical Professor Catherine Vogelweid, DVM, PhD, was honored during the 2017 Missouri Veterinary Medical Association Convention with the Dr. William A. Wolff Volunteerism Award.

Vogelweid, who has been with the Department of Veterinary Pathobiology since 2004, is a member of the Missouri Volunteer Veterinary Corps. As a member of the Corps, she was deployed to Joplin following the 2011 tornado, where she provided veterinary care for dogs and cats in the mass care shelter. In 2014, she was instrumental in organizing the Technical Large Animal Emergency Rescue Program in partnership with Boone County Fire and Rescue. The program allows firefighters and CVM veterinarians to train together in technical large animal emergency rescue techniques and deploy as a team.

Vogelweid’s efforts in the field of emergency rescue extend to her teaching. She initiated emergency and disaster response training for CVM students and graduate students pursuing degrees in public health. She is the instructor and course director for Animals in Emergencies and Basic Emergency Response Training for Veterinary Students.

Vogelweid earned a DVM, master’s degree in veterinary medicine and surgery and PhD in pathology at the University of Missouri. She also completed a postdoctoral fellowship and residency in laboratory animal medicine at MU. Her knowledge and interests in animal disaster and emergency response were first developed during her work as director of the Laboratory Animal Resource Center at the Indiana University School of Medicine, where she worked with the state veterinarians to develop an exemplary statewide response plan for research animals. Her planning expertise was recognized with an award from the Indiana Board of Animal Health and Indiana State Government. The Volunteerism Award is named for William A. Wolff, DVM, MS, of Columbia, Missouri, a retired CVM faculty member. Wolff’s volunteer service included serving as the director of the Missouri Volunteer Veterinary Corps and chairman of the MVMA Emergency Management and Public Health Committee. The award was renamed to honor him in 2015.

The MVMA Convention took place Jan. 19-22 at the Holiday Inn Executive Center in Columbia. Vogelweid received her award during the Awards Banquet held Jan. 21. CVM Dean Neil C. Olson, DVM, PhD, also was recognized during the Awards Banquet when he was named a New Lifetime Member of MVMA. Earlier in the convention, the Missouri Academy of Veterinary Practice recognized Craig Payne, DVM, MS, associate extension professor and director of Veterinary Extension and Continuing Education, for his contributions to continuing education.
The Mizzou Alumni Association (MAA) announced the recipients of the Henry S. Geyer Award on Tuesday, Jan. 17, at a reception in Jefferson City. The recipients were Curator Emeritus Sean McGinnis, State Representative Donna Lichtenegger and Missouri State Senator Dan Brown.

The Mizzou Legislative Network Committee (MLN) annually presents the awards to at least one state-elected official and one citizen who exemplify the dedication and spirit of Henry S. Geyer. As a former state representative, Geyer believed education was the key to progress and prosperity in Missouri and introduced a bill to establish the University of Missouri in 1839.

“This year’s recipients are great examples of what it means to advocate for higher education in our state,” said Lesa McCartney, chair of the MAA’s Legislative Network Committee.

Brown represents the 16th Senatorial District in the Missouri State Senate, which includes Camden, Crawford, Dent, Phelps, and Pulaski counties. He was elected to the Senate in 2010 and reelected in 2014. In addition to his legislative duties, Brown has practiced veterinary medicine for more than 30 years. He earned both his bachelor of science degree in agriculture and his doctor of veterinary medicine from the University of Missouri. As a member of the Senate Appropriations Committee, Brown has been a consistent and strong supporter of his alma mater and the rest of the UM System campuses. He resides in Rolla with his wife, Kathy.

Lichtenegger represents the 146th House District, which includes a portion of Cape Girardeau County. She was elected to her first two-year term in 2010. Lichtenegger has been a consistent proponent of higher education in the state legislature, first serving on the House Higher Education Committee in 2011. She serves as chairwoman of the committee. Born in St. Louis, Lichtenegger graduated from Normandy High School, attended the University of Missouri and has a degree from St. Louis Community College – Forest Park. She has 37 years of experience in the dental field and resides in Jackson with her husband, John.

McGinnis is an attorney engaged in civil trial practice, with primary emphasis in personal injury, governmental entity and constitutional law litigation. McGinnis is Curator Emeritus of the University of Missouri, serving on the Board of Curators from 1999 to 2005. He was a founding board member of the Mizzou Legislative Network, serving as chairman from 1997 to 1998. McGinnis was also a founding board member of the MU Political Action Committee and the University of Missouri Flagship Council.
MU College of Veterinary Medicine Professor John R. Middleton, DVM, PhD, DACVIM, has been appointed as a veterinary medical research representative on the American Veterinary Medical Association (AVMA) Council on Research. The committee advises the AVMA Board of Directors on scientific research and discovery that impacts the veterinary profession in order to sustain and advance the scientific basis of veterinary medicine. Middleton said he was interested in the position because it fits with his professional goals.

“I enjoy applying my knowledge and skills to help the profession constantly evolve to meet the needs of society. Applying my knowledge of agricultural animal research and innovation on this council allows me to give back to the profession,” he said.

Middleton is a professor of food animal medicine and surgery and assistant director of the MU Agricultural Experiment Station. He earned his doctor of veterinary medicine and PhD from Washington State University. He went on to earn board certification in large animal internal medicine, and he is an associate member of the European College of Bovine Health Management.

He has more than 23 years of experience in clinical practice and more than 20 years in veterinary research with a focus on mastitis and milk quality in dairy cattle and goats. He serves as the chair of the USDA NCAC-02 Animal Health Advisory Committee for the North Central Region and is a past president of both the National Mastitis Council and National Mastitis Research Foundation. He has also represented MU at Association of American Veterinary Medical Colleges Research Committee meetings for the past five years.

He has published more than 75 peer-reviewed manuscripts primarily on food animal species, more than 170 abstracts/proceedings and several book chapters.

It was his work with the USDA NCAC-02 and attendance of the AAVMC research committee that prompted Erle Douglas “Ed” Murphey III, DVM, AVMA assistant director in the Education and Research Division, to ask Middleton to serve on the Council on Research. Richard Antweiler, executive director of the Missouri Veterinary Medical Association, nominated him to the post.

His first meeting with the Council on Research took place in October. Middleton said, “There are a number of activities relevant to the AVMA membership and veterinary research community that the council is engaged in, including developing internal policies, providing liaisons to other professional organizations with similar objectives, and working with government regulatory and funding agencies to improve policy, regulation and opportunities for veterinarians and veterinary researchers.”
Recognitions and Honors

Genome Society Honors Mizzou Grad Student

A doctoral student at the University of Missouri College of Veterinary Medicine received two prestigious awards from the International Mammalian Genome Society (IMGS). The IMGS is a professional scientific organization that promotes and coordinates the genetic and genomic study of mammals.

Jake Moskowitz, DVM, and graduate student in the Comparative Medicine Program, won the Lorraine Flaherty Award in recognition of his outstanding student presentation. Flaherty was a geneticist and professor of biomedical sciences who focused her career on the mouse as a model system for human disease. Moskowitz, whose faculty mentor is James Amos-Landgraf, PhD, also received the Verne Chapman Young Scientist award, the highest honor given to a trainee or post-doctoral student by the IMGS. The award makes him a member of the society’s governing secretariat for two years, and includes two international trips to those meetings, along with a cash award.

Researcher Earns Fellowship to Study Cancer in Small Animals

Lauren Young, DVM, who recently completed a clinical nutrition residency, received a fellowship to study cancer in small animals.
evant to their field. It’s asynchronous, 100 percent online, so they can continue to work full time and do the coursework during their discretionary time. They can fit it in as best suits their schedule.

“We also have students who are veterinarians. They are primarily interested in working toward board certification,” Chastain continued. “Our program can help guide some of their study, that would otherwise be self-study. They’ll have support while they’re working toward certification. Plus, they end up with a master’s degree, so they get more reward for their efforts and more bang for their buck.”

“We have a student who is a DVM practicing in the Nashville area,” Wallace said. “She is a board-certified specialist in canine and feline practice. She also has an MBA. And now, she’s about two-thirds of the way through our master’s program. She’s doing a really good job.”

Students enrolled in online graduate training tend to be more mature and experienced, and frequently more motivated too. Many have already established a career and some, a family. Relocation is usually not an option, so they value the lack of geographic constraints that distance learning offers.

The CVM’s online master’s program has a long reach. Chastain has had students from nearly every mainland state, Hawaii, and Guam in the Marianna Islands. Wallace has had a student who was deployed to Afghanistan.

David Liss is currently earning his online master’s degree from MU while working in California.

Liss, BA, RVT, VTS, CVPM, is board-certified in both emergency/critical care and small animal internal medicine. He has worked as a technician manager and emergency room/intensive care unit manager. He is a technician educator who lectures internationally and the author of numerous articles and book chapters. Liss has received some notable awards, including Veterinary Technician Educator of the Year from the Western Veterinary Conference and Southern California Technician of the Year. For nearly six years, he has served as director of a veterinary technology associate’s degree program in Los Angeles.

“With our program, you don’t have to stop everything you’re doing, or take time out of the middle of the day. If you are that motivated to advance your career, you can continue your full-time job and still get a master’s degree. You can maintain the critical parts of your family life. You can do this after you put the kids to bed.”

— C.B. Chastain

Continued on page 6
Online Masters, continued

“I stay clinically relevant by working relief as an ICU technician, but I work primarily as program director for the veterinary technology program at the Platt College School of Medical Sciences,” Liss said. “To advance to a dean position, or secure a better position in the private or public sector, I knew I would need a graduate degree. I also wanted to have formal academic training in research and publication.

“A very small number of schools offer a master’s degree in the realm of veterinary medicine. Several of those programs admit only veterinarians,” Liss continued. “The online program at the Missouri CVM bridged both of those issues for me. And, I could continue my employment while I worked toward my degree.”

Stephanie Gilliam works at MU’s Veterinary Health Center (VHC) as a senior veterinary technician in neurology/neurosurgery and small animal physical rehabilitation. She also serves as an adjunct clinical instructor in the Department of Veterinary Medicine and Surgery.

Gilliam, RVT, BS, CCRP, VTS (neurology), was instrumental in developing the VHC’s Physical Rehabilitation Service. She has presented at national meetings for veterinary practitioners and technicians, receiving first-place honors in case presentations at the 2009 American College of Veterinary Internal Medicine forum. She was named a Service Champion by the MU Staff Advisory Council in 2014.

Now, she is pursuing an online master’s degree with an emphasis in veterinary medicine and surgery at the CVM.

“I love to teach,” Gilliam says. “I feel that a master’s degree will make me a better instructor and give me more opportunities for teaching veterinary students and technicians alike.

“And, I want to provide the best care possible to my patients. They deserve it,” Gilliam said. “In our profession you have to be continually learning in order to stay up to date with current medicine.”

Already working on the MU campus, location was not a deterrent for Gilliam. But, competing demands for her time presented an obstacle. For her, the online master’s degree program became the door upon which opportunity could knock.

“I am a full-time veterinary technician, an adjunct clinical instructor and a mom of two,” Gilliam said. “I am only able to pursue this dream because it is online.”

It’s a point that Chastain highlights.

“With our program, you don’t have to stop everything you’re doing, or take time out of the middle of the day. If you are that motivated to advance your career, you can continue your full-time job and still get a master’s degree. You can maintain the critical parts of your family life. You can do this after you put the kids to bed,” he said.

“But, Mizzou is the only place you can do it and earn a degree that’s relevant to veterinary medicine,” Chastain emphasized.

Pursuing a graduate degree requires desire, determination, discipline, persistence and intellectual prowess. Even those traits may not be enough for an aspiring student with a profession, a family, or both. For them, the CVM’s online master’s degree program can open the door to a world of opportunities.
CVM Community Comes Together to Help Colleague

After spending nearly two months recovering from a viral illness, a debilitating infection in his leg and a bleeding ulcer, Chris Shaw, the College of Veterinary Medicine Information Technology Help Desk coordinator, faced one more challenge before he could return to his Columbia home: The medical staff at the Bluffs, a skilled nursing and rehabilitation facility, required that Shaw’s home be equipped with a wheelchair ramp before they would release him.

Shaw has a prosthetic leg, but cannot use the device to get around until the injury to his leg completely heals, making the use of a wheelchair necessary for at least several months. He said the Bluffs staff made the ramp requirement out of concern for his safety.

When Shaw’s colleagues at the CVM learned of his situation, they came up with a plan to assist him.

Cynthia Richards, a systems administrator who works with Shaw in IT, began a fundraising effort to purchase materials needed for the ramp. A collection can was placed in the Zou Cafeteria, a get well card was circulated, and word spread quickly about the endeavor.

“We raised over $600 in two days,” Richards said. “I was amazed by the overwhelming support from the CVM community.” A donor from outside of the CVM also contributed to the effort. Shaw, who has worked at the CVM for nearly 27 years, said he was deeply moved by the support he received. “It made me cry when I heard about it,” he said.

While Richards spearheaded the fundraising, Matthew Keeler, associate director of IT, took charge of plans to build the ramp. He visited Shaw’s home to measure the space available for the structure, drafted a plan and obtained approval from the city for the construction.

The weekend before Thanksgiving, Keeler and Richards were joined by Lisa Freesemann of the CVM IT program, Marie Schlup from the Department of Veterinary Pathobiology, and her husband, Bobby, and Art Smith, a former CVM employee who is now with the University of Missouri Division of Information Technology, and his wife, Amanda, to build the wheelchair ramp. They accomplished most of the construction in one day, returning later to add a rail.

Richards provided Shaw with photographs of the ramp, and he was able to leave the rehabilitation facility and return home the following weekend.

Richards added that the money raised by Shaw’s colleagues was more than enough to pay for the ramp so she used the surplus to help pay his medical bills.
Veterinary Products Night: A 20-Year Tradition

Twenty-one companies and agencies participated in the 20th annual MU College of Veterinary Medicine Veterinary Products Day held Oct. 18 in the Adams Conference Center. The networking event brings together veterinary students with representatives from animal care and nutrition companies, veterinary interest businesses and the government. The forum allows students to learn about animal nutrition and care products, careers opportunities and professional services.


The evening included a food buffet featuring a variety of appetizers, as well as drawings for prizes and scholarships.

Common Probiotics Can Reduce Stress Levels, Lessen Anxiety

Probiotics, or beneficial live bacteria that are introduced into the body, have become increasingly popular as a way to improve health and well-being. Previous studies have shown a direct correlation between gut microbes and the central nervous system. Now, researchers at the University of Missouri, using a zebrafish model, determined that a common probiotic sold in supplements and yogurt can decrease stress-related behavior and anxiety. Studying how gut bacteria affect behavior in zebrafish could lead to a better understanding of how probiotics may affect the central nervous system in humans. Their results recently were published in Scientific Reports a journal of Nature.

“Zebrafish are an emerging model species for neurobehavioral studies and their use is well-established in drug-screening,” said Aaron Ericsson, director of the MU Metagenomics Center and a research assistant professor in the Department of Veterinary Pathobiology. “Our study has shown that simple probiotics that we normally use to keep our digestive tract in sync, could be beneficial to reducing our stress levels as well.”

In a series of studies, researchers tested how zebrafish behaved after doses of Lactobacillus plantarum, a common bacteria found in yogurt and probiotic supplements. In the first study, scientists added the bacteria to certain tanks housing zebrafish; other tanks of zebrafish received no probiotics. Then, the researchers introduced environmental stressors to both groups, such as draining small amounts of water from the tank and overcrowding.

“Each day we introduced a different stressor — tests that are validated by other researchers and cause higher anxiety among zebrafish,” said Elizabeth Bryda, professor of veterinary pathobiology in the MU College of Veterinary Medicine. “These are common environmental stress patterns, such as isolation stress and temperature change, so it made the tests relevant to humans as well.”

By analyzing the gene pathways of both groups of fish, the research team found that zebrafish that were given the supplements showed a reduction in the metabolic pathways associated with stress.

“By measuring the genes associated with stress and anxiety, our tests were able to predict how this common probiotic is able to benefit behavioral responses in these fish,” said Daniel Davis, assistant director of the MU Animal Modeling Core. “Essentially,
bacteria in the gut altered the gene expression associated with stress- and anxiety-related pathways in the fish allowing for increased signaling of particular neurotransmitters.”

To test their theory further, the researchers measured the movements of fish in their tanks using sophisticated computer measuring and imaging tools. Previous studies of fish behavior have found that fish that are stressed tend to spend more time at the bottom of their tanks. Once the fish were administered probiotics, they tended to spend more time toward the top of the tanks — the change in behavior indicating they were less stressed or less anxious.

“Using zebrafish, we’ve developed a relatively inexpensive platform for testing of other species of bacteria and probiotics and their potential benefit on different systems of the body,” Ericsson said.

The study, “Lactobacillus plantarum attenuates anxiety-related behavior and protects against stress-induced dysbiosis in adult zebrafish,” was published in Scientific Reports. The work was funded by a faculty research grant from the College of Veterinary Medicine. The content is solely the responsibility of the authors and does not necessarily represent the official views of the funding agencies.

COLLABORATION RESULTS IN TREATMENT FOR CANINE MEGAESOPHAGUS

The Veterinary Health Center (VHC) at the University of Missouri’s College of Veterinary Medicine is pioneering a new approach to treat one type of canine megaesophagus, a devastating disease of dogs.

A partnership between the VHC’s Small Animal Internal Medicine, Radiology, Surgery and Nutrition services and an investigator in the Otolaryngology-Head and Neck Surgery department at the university’s School of Medicine has resulted in the discovery of a breakthrough treatment for a subpopulation of dogs with megaesophagus. The Mizzou team has identified a defect of the lower esophageal sphincter (LES) as a potential treatable cause of megaesophagus.

Megaesophagus (ME) refers to a large, dilated esophagus with poor or no motility preventing normal passage of food and liquid into the stomach. With ingesta not reaching the stomach to produce the sensation of being full, the dog will continue to eat. As a result, the esophagus enlarges greatly. Dogs end up not getting enough calories so they waste away. Dogs with ME also regurgitate large amounts of undigested food and some of that material can be inhaled into the lungs. This inhalation can result in aspiration pneumonia, a dangerous additional symptom that kills many affected animals.

“In general, dogs with megaesophagus typically die of malnutrition, aspiration pneumonia, or are euthanized because the owners are told they have a
terrible prognosis,” according to Associate Professor Carol Reinero, DVM, PhD, an internal medicine specialist helping coordinate the efforts of the multidisciplinary team. “We’re taking a closer look at a subpopulation of dogs with idiopathic megaesophagus, which means we don’t know what causes it. We run all of our traditional tests, but we’ve never been able to find an underlying cause. Now with our video fluoroscopic swallow studies, we have identified an abnormality that we believe is driving the problem: an LES-achalasia-like syndrome.”

The LES acts as a valve between the esophagus and the stomach, opening when food and water are swallowed, then clamping tight so food doesn’t come back from the stomach into the esophagus. In dogs afflicted with megaesophagus caused by an achalasia-like syndrome, the LES remains closed.

“Video fluoroscopic swallow studies have been around a long time,” Reinero said. “The problem with prior protocols is they did not represent normal eating and drinking behaviors. Those tests had very little to do with reality. A dog had to be restrained, lying on its side, and syringe-fed barium, which was not palatable even when mixed with food. If dogs don’t eat during the swallow study you’re not going to get a diagnostic study.”

In order to receive a better diagnostic result, the Mizzou collaborative research team blended innovation with adaptation, developing new techniques and tools while borrowing procedures from human medical practices to diagnose and treat this type of canine ME. Assistant Professor Teresa Lever, MS, PhD, from the Otolaryngology-Head and Neck Surgery department, spearheaded the development of trapezoidal holding chambers or kennels — which are now patented — where dogs walk in and are funneled to the narrow end of the enclosure. The animals are more naturally restrained and are given food that they consume while standing upright. Lever’s lab, in cooperation with an independent company that conducts feeding trials in dogs, also developed a number of different recipes and consistencies of food and liquid to optimize how well the dogs could take it down and discover which contrast agent was more palatable and effective.

“So, now we have these chambers, we have optimized palatable recipes, and we have experience in normal, healthy dogs without swallowing disorders, as well as lots and lots of patients coming in with other swallowing disorders,” Reinero said. “It was in the process of developing this protocol and having clinical patients come in when we recognized that LES-achalasia-like syndrome was the underlying cause of megaesophagus in some dogs. That’s when we began to adapt what they do with humans, a therapy where we’re opening or dilating the LES with Botox and/or balloon dilation.

“We perform an endoscopy to first dilate the LES and then administer Botox, which paralyzes the sphincter muscles that formerly wanted to remain closed. While we are still evaluating this procedure, we’ve had dogs with remarkable clinical improvement. Additionally, when we repeat the fluoroscopic studies, we can document an open LES. The patients that show improvement can be candidates for surgery, and that surgery is potentially curative,” Reinero said.

During a patient’s recovery, residents in the Nutrition Service monitor the dog’s weight and food intake. The amount of food an owner may give a pet might need to be altered every couple of days.

James Schachtel, Bvet Med, MRCVS, is a radiology resident and collaborator. “This approach gives these dogs a chance, whereas a lot of them didn’t have much of one,” Schachtel said. “At this time, it is early in the evaluation process, but it’s a novel approach that shows promise.

“This subpopulation can receive a really significant benefit from our direct ability to detect their malady. It can give them a really good quality of life. This is a revolutionary diagnostic technique for a disorder identified with a pathological outcome. It offers us the opportunity to use therapies that have been successful in people, so we’re optimistic we can experience similar success with canines,” Schachtel said.
Military service can change people. Service members may be away from family, friends and home for long periods of time. They may be at risk of injury or death. They may see comrades killed or wounded. They may have killed or wounded others, or been wounded themselves. Stress can become distress.

Bandit understands. He endured a lot before he became a therapy dog and a comforting companion to thousands of troops at Fort Leonard Wood, Missouri. Bandit was a rescue, a puppy-mill puppy no one wanted. He was malnourished, had a misshapen front leg, mange, and what was believed to be a large tumor on his neck that turned out to be an abscess. At 16 weeks old, he was facing imminent euthanasia.

Kelly Brownfield and David Gist of Waynesville, Missouri, had recently adopted Bandit’s brother, Duke. When Brownfield looked into the doomed dog’s eyes, she refused to let him be put down and adopted him too.

For Brownfield, the director of the Fort Leonard Wood USO center, nearly every day became take-your-dog-to-work day. “I found myself with two rambunctious Great Danes while I was working long hours at the USO,” Brownfield said. “Our incredible executive director, Kathy O’Connor, suggested I bring them to the USO on longer days. The troops enjoyed having puppies running around, but something funny started happening — Bandit kept disappearing. I would always find him rolled up in the lap of a soldier, a soldier who was crying, or a soldier who had lost a loved one. After several such encounters, I realized Bandit had something bigger to give to others.”

He became a certified therapy dog in 2012. Brownfield estimates Bandit cheers about 1,500 troops every week at the USO center. He’s a regular at the base hospital as well. On Wednesdays, Brownfield and Bandit visit the St. James Veterans Home. He’s an official USO Comfort Dog.

In 2014, the University of Missouri College of Veterinary Medicine had the opportunity to return the care and comfort Bandit offers to so many. Bandit had developed a cranial cruciate ligament tear in a back leg. His veterinarian referred him to MU’s Veterinary Health Center for surgery. VHC veterinarians performed a tibial plateau leveling osteotomy. Due to the steep slope dogs have on the tops of their knees, the surgery involved making a circular cut in the top of the shin bone — the tibial plateau. Then, the contact surface of the bone was rotated until its orientation was relatively level. The surgeons then stabilized Bandit’s shin bone with an eight-screw plate and a 10-screw plate.

In November 2015, the cranial cruciate ligament in his other back leg ruptured. Brownfield again rushed the hero dog to MU’s VHC. Bandit battled several complications and barely survived. During the months of recovery, the dog’s Facebook page was flooded with posts from people around the world.

The elite 3rd U.S. Infantry Regiment — The Old Guard — performs a special mission. The unit provides military funeral escorts about 20 times a day at Arlington National Cemetery and guards the Tomb of the Unknown Soldier, 24 hours a day, 365 days a year. These superlative soldiers make up the Arlington Honor Guard. They were so impressed by Bandit’s service, they invited him to oversee a wreath-laying ceremony at the Tomb of the Unknown Soldier. He is the first dog ever granted this honor.
CVM Dean Neil C. Olson was named a Lifetime Member of MVMA during the organization’s annual convention.

Bryan Torres, DVM, offered a presentation on Non-surgical Management of Osteoarthritis.

Speed Networking gave veterinary students the opportunity to meet with prospective employers.

Kirk Thompson and Fred Williams, DVM, shared information about services at the Veterinary Medical Diagnostic Laboratory.

A lab held at the CVM led by Britt Conklin, DVM, focused on Therapeutic Shoeing.