

Arkeology

SPRING-SUMMER 2004 News and trends on veterinary medicine and the human-animal bond.



Missy's pacemaker is about the size of a silver dollar. The pulse generator part of the pacemaker is implanted in her neck. Wire leads wind to two parts of her heart. Below, Robert Teak and Missy.

P R E V I E W S

Our Mission

Because animals are more important today than ever before in our history, the MU College of Veterinary Medicine is dedicated to preserving, protecting, and strengthening the human-animal bond. *Arkeology*, as its name implies, is a medium for bridging between the role of the College as a protector of the animal kingdom (a kind of modern ark) and as a place where science, medicine, learning, and teaching can flourish (*logia* is the old Latin and Greek word for study or discipline). Continuously embarking on voyages of teaching, healing, and discovery, the College invites you on board this vessel to journey with us.

Creating a Legacy

Charles McKee was a proud Arizona cowboy and horse breeder. That put him in contact with the MU Veterinary Medical Teaching Hospital, and he liked what he saw. He wanted to be remembered for helping animals, so he endowed a professorship in Microbial Pathogenesis—the study of how infections harm livestock.

Helping A Hero

Rusty is a horse of uncommon abilities. The kids who ride him consider him their favorite hero. When Rusty's cancer reoccurred, he needed a hero's treatment that he got at the MU College of Veterinary Medicine.

Stubborn Love

It took a veterinary medical student years to overcome obstacles to save a mule from physical abuse. With a last bit of help from her class, she finally saved the animal. Now, both will celebrate their individual graduations.

A Big Job

Recent state budget cuts have pinched the college. Helping coordinate private giving is an important, and big, job.

Not Skipping A Beat

Modern Veterinary Pacemaker Implantation Is Minimally Invasive,
Even When Utilizing the Latest Advances in Technology



Missy doesn't miss a beat. If there is a family activity, she is there, taking full advantage of the chance to run with the neighborhood kids, watch TV, or be the center of attention at a party.

Since Missy entered the Teak family's lives as a pup on Valentine's Day 1991, the English Springer Spaniel has also been the most communicative of dogs. "Like Cheetah in the Tarzan movies, Missy has nine distinctive sounds that she uses to communicate," Robert Teak of Webster Groves, Mo. says.

Missy is smart, too. When retrieving the morning newspaper, she brings the St. Louis Post-Dispatch in first, preferring the regional newspaper to the New York Times that she leaves on the doorstep.

When Missy developed a cough, Mr. Teak initially attributed it to the allergies that Missy has always had. When the cough lingered, he consulted his veterinarian at the Webster Groves Animal Hospital. The cough was related to bronchitis, but other tests indicated a more serious problem. Missy's heart was beating only 40 beats per minute instead of a normal 120.

Missy had a problem called bradycardia, a blockage in the electrical conduction system of her heart.

Referred to the Cardiology Unit at the Veterinary Medical Teaching Hospital (VMTH) at the University of Missouri-Columbia College of Veterinary Medicine, Missy was a textbook case for something

that is becoming common in veterinary cardiology, the implantation of a pacemaker. But Missy had arrived at a teaching hospital with a strong connection to MU's human research hospital and long history with cardiovascular research. After a mere three-day stay, Missy would go home not with a typical veterinary pacemaker, but the latest in technology. In fact, she would be the first dog in Missouri to receive a dual-chamber pacemaker.

Veterinary Pacemakers— From Pioneer to Commonplace

Pacemakers in dogs correct the same abnormalities as they do in people. They are often the medical method of choice used to correct bradycardia.

"Bradycardia can occur as a result of a number of different problems," says Dr. Deborah Fine, a MU veterinary cardiologist who assisted in Missy's case. "The sinus node is the heart's own pacemaker. If it fails to generate adequate electrical charges then the heart rate will slow down. After these electrical impulses leave the sinus node they spread through the top chambers of the heart causing them to contract and pump blood into the lower chambers of the heart."

"In Missy's case, her slow heart rate was a result of an interruption of the normal flow of electrical current through the heart," added Dr. Alan Spier, assistant professor of veterinary cardiology and Missy's

primary care giver. "Normally, the heart's own pacemaker initiates an impulse that traverses the cardiac chambers, first the atria then the ventricles. The only electrical connection between the atria and ventricles is the AV node. Electrical impulses can fail to conduct through this region, as in Missy. If severe enough, this block prevents any signals from reaching the ventricles. Under these circumstances the ventricle must discharge on its own (rescue beats). The rate of spontaneous discharge from the ventricle is much slower—about 40 beats per minute."

Dogs with these problems are typically weak and can exhibit fainting spells—often as many as ten a day. A pacemaker is required to directly stimulate the ventricle to 'pace' at a higher rate.

Like their human counterparts, dogs needing pacemakers are typically older. The average age is nine years. The best candidates have hearts in reasonably good shape and have no other illnesses, such as cancer, that would otherwise shorten their life span.

There are no pacemakers specific to veterinary use.

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COMMENTARY: DR. JOE N. KORNEGAY



The Power of Giving

As usual, our parents were right.

Our parents taught us that it is better to give than receive. Fortunately, many people in today's society learned this lesson well. I'm constantly amazed at the generosity of people – call them what you may, philanthropists, good Samaritans, or just plain good folks – who give so freely of their time and resources. • Speaking as a veterinarian and life-long animal lover, it's gratifying to see that this generosity is often directed at animals. Think about it. For many of us, animals, in particular, pull at our heart strings. How many of you have cried at a movie when an animal was mistreated, lost, or died. I sure have. This issue of Arkeology includes several stories in which a love of animals led to acts of kindness by some very special people. • In donating pacemakers, families have given the gift of life to countless animals that otherwise would have passed from this earth all too early. Needless to say, the lives of their owners were also enriched. • I imagine all of us can readily identify with the story of Christina Truesdale and her beloved mule, Cadillac Jack. The commitment of our students is a constant source of pride. And, here, Christina's commitment extended to her new-found classmates, who shared their own resources to make her dream a reality. • The endowment in microbial pathogenesis created by Colonel Charles and Charlene McKee will touch the lives of humans and animals for generations to come. Talk about relevant. It's hard to imagine an area of science that offers greater promise for meaningful discovery, as both we and our livestock increasingly face dangers due to either intentional or natural infections. • Lest we

forget, when it comes to animals and humans, giving is a two-way street. Rusty, the therapeutic riding horse, has given so much to the children of the Vail Meadows Riding Center. Yes, he truly is a hero. In return, those who have come to love

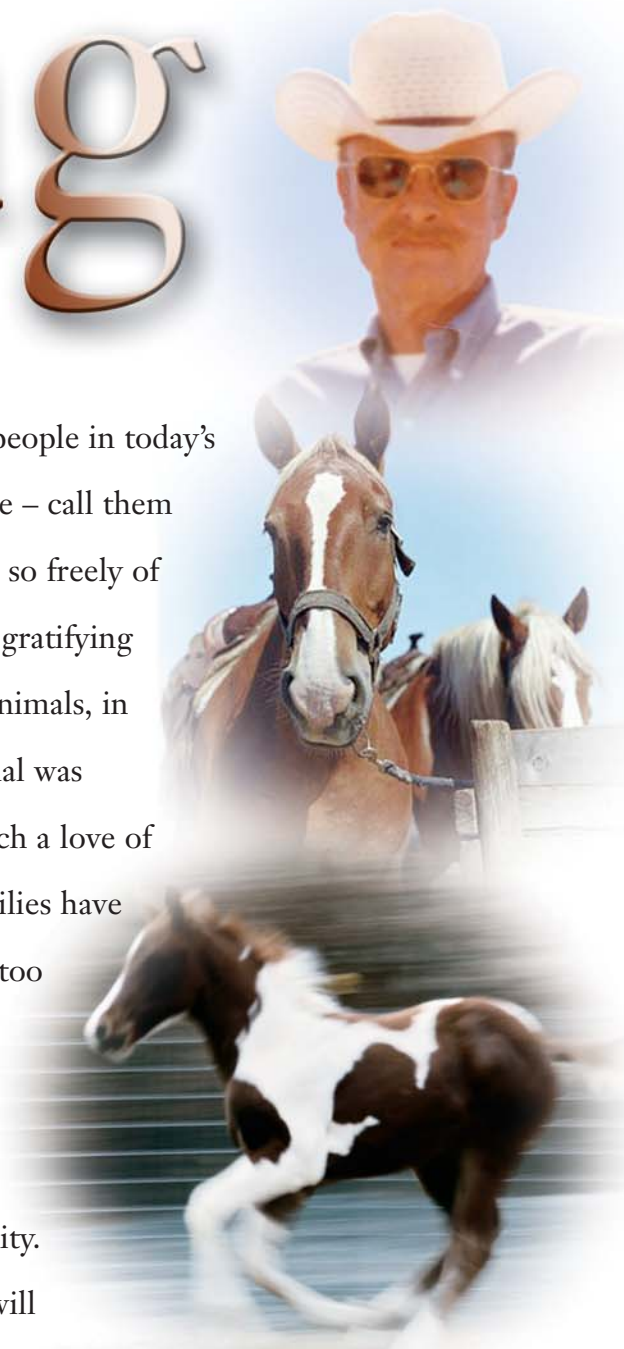
Rusty have given of themselves, as well, raising over \$7,000 for his radiation treatment. • The final story on Greg Jones and our development effort reminds me of how much people have given to the College of Veterinary Medicine over the years. Again, just plain folks who share our commitment to animals. Thank you so much.

• As usual our parents were right. It is better to give than to receive.



Dr. Joe N. Kornegay,
Dean, College of Veterinary Medicine

College of Veterinary Medicine, University of Missouri-Columbia • Spring-Summer 2004





The Legacy of Charles McKee

A Lifelong Love of Animals Lead an Arizona Rancher To Endow a Professorship to Study Microbial Diseases



Col. Charles McKee in front of his Arizona ranch home.

If Hollywood's Central Casting needed a western cowboy, they could have gone right to Charles McKee. Tall, tanned, skinny as a fence post, and capped with a curved-brim Stetson, he could have starred in any story about an Arizona rancher.

And the portrayal would have been spot on. From the late-sixties until his death, he owned a horse ranch near Sierra Vista, Cochise County. He loved the desert and the quarter horses that he raised there. He was particularly proud of his abilities as a breeder of superior horses.

That put him in touch with the University of Missouri College of Veterinary Medicine's Teaching Hospital. There, he must have liked something that he saw. He decided to leave his estate to the college. With it, the college endowed a professorship in Microbial Pathogenesis. This professorship will establish a research program to study how infectious diseases affect large animals, and build on the MU-wide strengths in animal agriculture and infectious diseases.

A legacy that you would not expect from a typical Arizona rancher? But, Charles McKee was hardly typical.

Missouri Roots and a Life at War

Mr. McKee was not an Arizona native. He was born on a farm in Clay County, Missouri—Jesse and Frank James' homestead was just eight miles away.

"In my youth," he told the Huachuca Scout newspaper in 1984, "farmers didn't have cars. They rode horses and buggies to town on Saturday. We farmed with horses right up until World War II."

It was that experience that developed a life-long love for horses and large animals.

"When I was four years old, I got my first saddle for Christmas. When I was

five, I was riding my own horse."

In 1941, Mr. McKee was enrolled at MU studying journalism. He joined the university's ROTC program so he could ride Army cavalry horses and play polo. His timing was terrible as the Japanese attacked Pearl Harbor shortly after his enlistment.

He fought with the famed 101st Airborne Division through Europe as a forward artillery observer. When Germany surrendered, his unit had fought its way into Austria, home of famed equine exhibition teams. Mr. McKee finally got to get into the saddle—with some of these famous horses.

Mr. McKee stayed in the Army. In 1967, he was stationed in Ft. Leavenworth, studying equine bloodlines and animal husbandry in his spare time. He began his own herd in 1968 when he purchased his Arizona ranch. Soon, he had 15 quarter horses, five of whom were in foal.

"I started with one mare, then began buying the best studs," he told the newspaper. "Now, I'm into the breeding business and run a mare/foal operation. And we raise good ones, too."

His relationship with horses was interrupted several times by the call of duty. He served in the Philippines as an intelligence officer during the Korean War and was recalled again for duty in Vietnam as a military advisor. He also served as chief of staff of III Corps Advisory Group and in Washington DC was attached to Army Intelligence. He retired a full colonel with two Bronze Stars, Master Parachutist Medal, Gallantry Cross, and the Vietnamese Cross of Gallantry, among others.

He died in 1999 on the ranch that he loved.

A Search For a New Professor

His gift to the college established the Col. Charles and Charlene McKee Professorship in Microbial Pathogenesis.

A nationwide search is underway for the new professor, who will join MU's infectious disease group, a collaboration between the MU School of Medicine and Veterinary Pathobiology in the College of Veterinary Medicine. This position will complement other scientists who are investigating molecular determinants contributing to the virulence of pathogens. This research is critical to development of effective vaccines, as well as greater knowledge in food safety, antibiotic resistance, and bio-terrorism threats.

"Such a position is important because of the difficult times facing livestock producers," says Dr. Joe Kornegay, dean of the MU College of Veterinary Medicine. "Profit margins have been slim to non-existent," he continues.

"Preventing these diseases may make the difference between turning a profit or not. MU researchers must help producers and veterinarians develop effective strategies to treat and prevent these diseases. I am particularly intrigued by integrated approaches that extend from the research laboratory to the farm. One idea under consideration is to house researchers, such as the McKee Professor, in close proximity to faculty from extension, the diagnostic laboratory, and our teaching hospital. This will ensure an exchange of ideas, progressing from identification of problems to potential solutions." **Ark**



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HELPING A HERO

A Therapeutic Riding Horse's Treatment for Advanced Cancer Not Only Helps the Horse, But Helps the Kids Who Love Him



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Rusty, back in action. From left to right: Cirilos Guardiola, Tim Sutphin, Bryce Davenport, and Vail Meadows Therapeutic Riding Center Equine Director Jennifer Rivera. Behind them are Michael Standiford, on Rusty, and volunteer Chris Hipsher, behind Rusty. The mission of the Vail Meadows Therapeutic Riding Center is to enhance the quality of life of each individual who comes to ride, regardless of their financial status. It is donation funded, and run by volunteers who serve as riding instructors, therapists, educators, and allied health professionals. You may contact the Vail riding center at: Vail Meadows Therapeutic Riding Center, 6118 Cedar Point Rd., Oregon, OH 43618. (Photo courtesy Ken Grosjean, Suburban Metro Press, Oregon, Ohio.)

To the kids who ride him, Rusty is a hero. Not only does the spotted Tennessee Walking Horse have special talents for the riders at the Vail Meadows Therapeutic Riding Center in Oregon, Ohio, he is, like them, “not perfect.” Rusty lost his right eye to squamous cell carcinoma cancer in 1999. To the kids battling their own physical and mental handicaps, Rusty was an inspiring example of hope against injury and disease.

When the cancer reoccurred in mid-2003, Rusty's future looked grim. A fast-growing tumor the size of a baseball had grown in his vacant right eye socket, causing him immense pain and endangering his life.

To the kids, Rusty's plight seemed a gloomy reflection of their own lives.

Rusty's many friends, however, vowed not to give up on the nine-year-old horse. They started a statewide fundraising campaign to send him to the Veterinary Medical Teaching Hospital at the University of Missouri-Columbia for a dramatic course of radiation treatments. The effort was for the kids as much as the horse—an example of never giving up even when things look bleak.

Not Any Therapeutic Riding Horse

Horseback riding for the disabled is a form of physical, psychological, and emotional therapy, helping people with disabilities such as cerebral palsy, Multiple Sclerosis, Autism, spinal injuries, and mental retardation. The animal's warmth and gentle rocking motion create a therapeutic massage. Controlling a horse inspires self-confidence, responsibility, and teamwork. Best of all, it is a thoroughly enjoyable experience for kids who often have few outlets to expand their boundaries.

In terms of physical benefits, riding strengthens weak, atrophied, or unused muscles. It also relaxes

tight, spastic, and rigid muscles. Riding helps normalize muscle tone, increases flexibility, assists in acquiring balance, and moves pelvis, hips, and torso in a “normal” walking pattern. This improves the rider's posture, and increases blood and oxygen flow to the body including the heart and brain. The motion also increases lung capacity, improving speech. Riding increases endorphin and serotonin levels in the brain, improving self worth and esteem, relationships, independence, and social awareness.

Of Vail's dozen horses, Rusty's skills go beyond the norm—no other Vail horse is as versatile. For example, Vail's Shetland ponies can only accommodate riders who can sit straight up. Rusty has the unique tolerance, temperament, gentleness, and maturity to allow riders with little or no spinal support to lie on Rusty's back as he ambles along. These riders would not be able, otherwise, to participate in therapy.

Rusty also chooses to bond with people who cannot leave their wheelchairs—he has been known to kneel down to them and place his head in their laps so they can pet him.

“We can do just about anything with him,” says Wendy Vail, equine health manager at Vail Meadows Therapeutic Riding Center. “From children painting him with their hands to disabled people riding him while lying down, Rusty stays calm and welcomes it all.”

In addition, Rusty doesn't exhibit the quirky fears of some of Vail's other horses, says Robyn Shinaver, manager of the center. Rusty is unafraid of the therapeutic aids such as hoops, balls, and other devices used to help riders exercise certain muscles and improve dexterity. He doesn't flinch when a rider involuntarily bumps him, either.

Rusty is the horse of choice, too, with helping the mentally challenged. His cooperative nature allows

each person enough saddle time to undergo a lengthy treatment designed to help the rider increase attention span. Rusty also hangs in the arena long enough for the rider to perform a series of coordinated, confidence building, movements. More than 600 such therapeutic riding centers exist today. Vail Meadows opened in 1998 and serves about 45 special riders a week.

Rusty's successes are many. Lauren, suffering from a brain disorder that kept her from eating or talking on her own, faced orthopedic problems because of a lack of spinal support. Her condition wouldn't allow her to ride a horse conventionally. Riding on her back and backwards on Rusty massaged Lauren's spine, helping her achieve the first goal of her therapy, lifting her head on her own—something she did on Christmas eve.

Mira, suffering from neurological problems, disliked other therapeutic horses because the regular bumpy, walk-trot cantor aggravated her chronic pain. Rusty's smooth gait was ideal for her and other patients with spinal or neck injuries. Michael, who suffers from very rigid muscle contractions after a near drowning, also could only find relief and therapy on the gentle Rusty.

Rusty is a trooper who works four days a week—about two thirds of the classes offered. That makes him Vail's most valuable horse. It filled the staff with dread last summer when someone noticed a lump on Rusty's eye socket. Rusty's cancer had come back. Many of the children cried, believing that they would lose their special horse.

Rusty's special abilities had made him known regionally. Communities around northern Ohio decided that he would have the best care possible. A fund-raising campaign, designed around homemade, red paper hearts that could be bought for \$1, was begun. A Toledo police riding festival brought in \$850. An Ohio real estate agent wrote 200 colleagues, seeking donations. Even a funeral home became involved. In six weeks, \$7,250 was raised, more than enough to pay for Rusty's treatments.

Rusty Comes to the University of Missouri

The Ohio State University College of Veterinary Medicine, who had initially treated the cancer, now referred Rusty to the University of Missouri Veterinary Medical Teaching Hospital. Rusty came to MU for two reasons: its reputation in successfully treating a variety of oncology cases, and its availability of both a horse-size CT scanner and linear accelerator.

The MU Veterinary Medical Teaching Hospital is one of only seven facilities in North America that can provide CT scanning (to access the location of the cancer) and radiation treatment (to kill the cancer cells) in animals as large as a horse. Missouri is the third largest state in horse ownership, following only California and Texas, according to a recent survey.

It's CT scanner is a complex x-ray machine that can take pictures from a variety of directions, yielding a three-dimensional computer image of Rusty's head—showing precisely the location of sensitive organs like the eyes as well as the spread of the cancer. With this data, a plan for a series of radiation treatments was created—each treatment designed to maximize cancer-killing radiation on the tumor, but minimize exposure to adjacent healthy tissue.

Here, Rusty was in good hands with Dr. Jim

Lattimer, who heads the hospital's imaging and radiation treatment efforts. Dr. Lattimer is often the go-to veterinarian in the most challenging cases. He's been tapped to help image an endangered Snow Leopard with hip problems, and ancient Egyptian animal mummies to see what was under the wrapping.

Dr. Lattimer is one of handful of board-certified radiation oncologists in the world. He not only provided this special expertise, but he often helped wheel an oversized cart with the 900-lb. Rusty into the linear accelerator.

"The most challenging part of this case was treating the tumor to the highest dose possible without damaging his other normal eye," said Dr. Terriann Tucker-Warhover, a veterinarian who has come back to MU for advanced experience in radiation therapy. "The treatment process itself was daunting in moving a huge animal like Rusty to position him accurately to within millimeters of the prescribed treatment parameters on a daily basis. The daily anesthesia was also very tough and without the excellent staff here it would have been hard to do."

Dr. Lattimer and Dr. Tucker-Warhover planned Rusty's treatments, taking raw data from the CT scanner and x-rays, they created 3D images in the teaching hospital's rendering software program. This program is used to better aid human cancer victims at such advanced hospitals as Washington University in St. Louis. The software would be critical in administering precise computer-guided beams of radiation to the tumor during multiple treatments over a three-week period.

A Team Effort to Save Rusty

Rusty's treatment also teamed some of MU's best veterinary medical clinicians and professors. Dr. David Wilson, head of the equine clinic and associate director of the teaching hospital, served as Rusty's primary clinician. Dr. John Dodam, associate professor of veterinary medicine and expert in anesthesiology, watched over the critical job of sedating Rusty. Horses don't breathe well while on their sides—the position that Rusty needed to be in to receive the radiation. It was critical to minimize the duration of the procedure to allow Rusty to get back on his feet—and breathing normally—at the earliest opportunity.

In all, Rusty underwent 15 radiation treatments—his head carefully placed under a custom-made, rotating head of the linear accelerator for each individual radiation dose prescribed by the computerized treatment plan.

True to form, Rusty maintained his easygoing and cooperative attitude in what must have been a trying ordeal for him. Veterinary medical students who cared for him and helped in his treatments pulled for him, offering words of encouragement.

"Everyone here was really pulling for Rusty," Dr. Tucker-Warhover said. "All of our patients are part of someone's family, and Rusty is part of a lot of people's families."

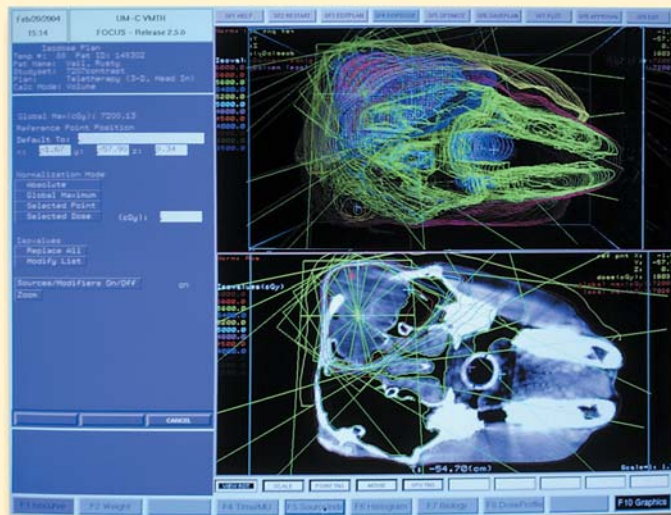
Treatments completed, he was back in his trailer for the trip back to Oregon, Ohio and a late-night arrival that nonetheless saw dozens of well-wishers on hand to greet him. It would be weeks before a new CT scan would reveal if the MU treatments had any effect on the advanced tumor.

A month and a half later, a CT scan at The Ohio State University told the story. It showed the tumor had shrunk to one-fourth of its original size—well beyond the expectations of the treatment team. Since the lingering effects of radiation will continue to kill the tumor, the prognosis looks promising. Rusty may have several more good years.

With the news, Rusty returned to service, inspiring the kids who now had even more reason to consider him a hero. **Ark**



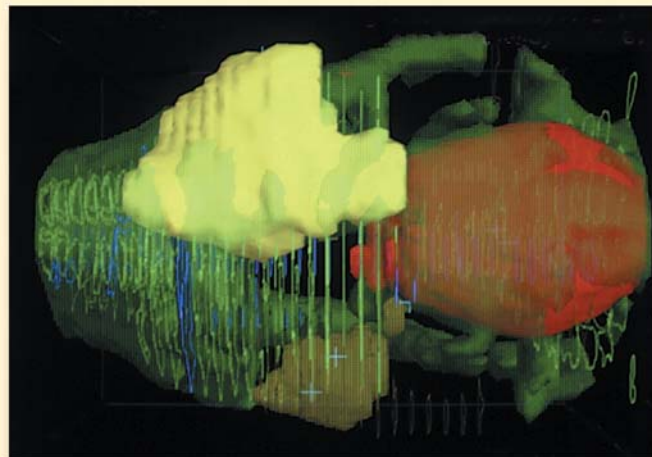
Dr. Terriann Tucker-Warhover used a combination of x-rays, CT scans, and other data to plan Rusty's radiation treatments. The complex computer plan, consisting of dozens of individual treatments involving varying doses and directions of the radiation beam, was downloaded directly into the linear accelerator's computer.



The computerized plan to treat Rusty consisted of dozens of individual doses of radiation that target the tumor, but minimize damage to adjoining healthy tissue. Rusty's tumor can be located at the upper left part of each of these CT-scan images.



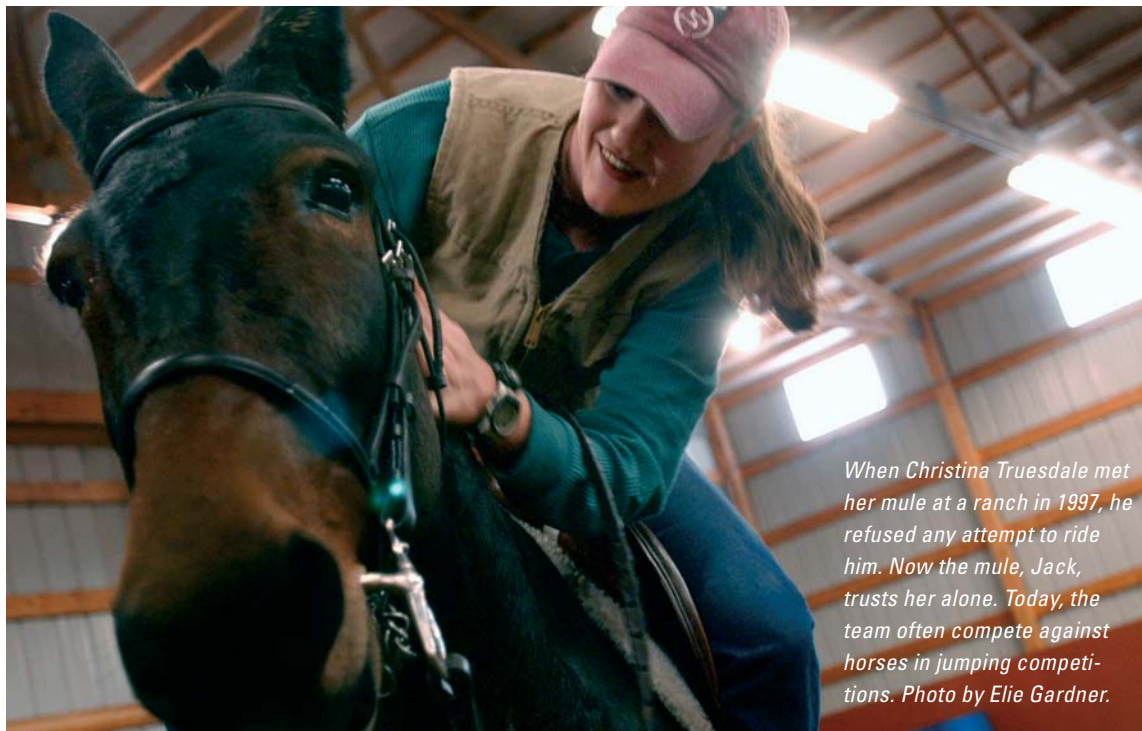
Not many veterinary radiation specialists choose to handle the most challenging cases or large animals such as Rusty. Dr. Jim Lattimer, who heads the veterinary medical teaching hospital's imaging and radiation treatment efforts, often takes on these cases. He led the team who diagnosed and treated Rusty. He stands with the hospital's new Spiral CT scanner. The previous scanner was one of the first used in veterinary medicine—Dr. Lattimer helped pioneer its use in the veterinary arena. The new device is faster and renders more precise images than the previous unit.



A 3D CT-scan image of Rusty's head, as seen as if looking straight down on it, revealed the size of his tumor (shaded in yellow). The overall green image is Rusty's skull, and the orange-red mass is his brain. The brownish-green image at the lower center of this scan is Rusty's left eye.

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When Christina Truesdale met her mule at a ranch in 1997, he refused any attempt to ride him. Now the mule, Jack, trusts her alone. Today, the team often compete against horses in jumping competitions. Photo by Elie Gardner.

Stubborn Love

A Veterinary Medical Student Refuses to Give Up On An Abused Mule

Last summer, the Boone County Fairgrounds was a graduation ceremony, of sorts, for a special mule and rider. For six years, the rider had used her meager savings and boundless stubborn determination to save the frightened, abused, starved, and neglected animal. This show would help determine if the mule had overcome his emotional scars as he had his physical ones.

Under the arena's floodlights at the All Star Mule and Donkey Futurity, Christina Truesdale, University of Missouri College of Veterinary Medicine Class of 2004, and Cadillac Jack, were up to the English Riding competition. Jack, who once quaked at the sight of anyone, went through his routine with skill and precision, ignoring the people who once terrified him. With discreet dabs of makeup concealing his scars, he performed his routine of trotting, cantering, backing up, jumping, and changing direction.

Winning or losing wasn't important. Overcoming Jack's fear of people was the goal. And showing the world what friendship and patience can accomplish.

Meeting Cadillac Jack

Christina, then 19, met Cadillac Jack on a hot summer 1997 day at a southern Missouri horse ranch where she had taken a summer job. It was a horse lover's dream, she says, primitive conditions and pay, but more than eight hours a day of saddle time.

But Christina didn't get a horse. When assigning her steed, the ranch's owner pointed to a "little brown thing, with long ears pinned back, all huddled up in a corner." It wasn't even a horse, but a seven-year-old bay gelding mule.

That angered Christina. "That's what I'm going to ride?" she said as she approached the beast.

Closer, she saw something else. The mule was weak and unsteady. His eyes widened in fear as she approached. He tried to back up and flee, held fast by a rope. He was terrified.

She also noticed whip scars on his head, neck, and shoulders. One particular mark on his forehead looked as if a ferrier's tool delivered a blow right between the eyes. (Christina would learn later that the mule had been beaten with boards and ropes, and left neglected and hungry in a pasture for two years.)

She edged closer to him, speaking softly. To her surprise, the mule calmed. She stroked his cheek,

then eased a bridle over his head, avoiding his ears.

Christina forgot about her anger. Not only would she ride him, she resolved to rehabilitate and save him—even if it meant buying him on her meager undergraduate student finances.

"Something happened that day," she knows now. "We established an immediate bond."

For the rest of the summer, Christina taught herself the skills of animal rehabilitation, riding the rocky trails with tenderfoot city folk getting a week-end taste of the Old West. Relying on patience and consistency, she acclimated the mule to what scared him. "We worked through it slowly, deliberately," she remembers. "I established a routine. If he became frightened of something, we would work through it. There's no common technique in these cases, just immense patience.

"Abused animals have real trust issues," she says. "I'm not a magical mule whisperer or anything, but I'm the only person that he trusted for a long time."

That strengthened her resolve to save him—even if it meant showing up for her important veterinary medical school interviews with the big brown beast in tow.

Because of his smooth gait and sure-footed ways over the rocky trails, Christina gave the mule a special name: Cadillac Jack.

At the end of the summer, she showed up at the

ranch owner's office with her life savings in hand, asking to buy Jack. Jack still wouldn't let anyone else ride him—and at an equine facility with 110 head of riding stock, that exception was a big problem. This could be his last chance before being shipped to the slaughterhouse. The owner refused.

A Fight for Cadillac Jack

For two years Christina kept asking. "I made a real pest of myself," she says. "I wanted him. I told them if you ever want to sell him, call me first."

In 1999, she graduated from Truman State University in Kirksville, Mo. and was accepted into the MU veterinary school, winning a competitive Army scholarship. Meanwhile, Jack was living semi-wild at the ranch. Guests and wranglers alike were afraid to ride him.

The ranch owner finally gave up. Jack had to go.

But it wasn't Christina who got the phone call. Cadillac Jack was sold to a Missouri horse trader. Truesdale learned about the sale weeks later.

"I hung up the phone and just cried, so angry that he wouldn't sell Jack to me," she recalls. "I felt like I had lost Jack forever."

Christina didn't give up. She tracked Jack to a woman in Wentzville who owned dozens of horses and mules. Jack had not changed his ways. "Such a beautiful animal," his new owner said. "But I can't ride him. He just runs off."

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Graduation day for Cadillac Jack. At the Boone County Fairgrounds last summer, Jack placed above average. More importantly, he had overcome his fear of people and crowds. Christina Truesdale's graduation from the MU Veterinary Medical will occur in May 2004—with Jack accompanying her to her first job. Photo by L.G. Patterson / Special to The Kansas City Star



Christina Truesdale brushes Cadillac Jack outside of his stall at a farm south of Columbia. Photo by Elie Gardner.



Veterinary Medicine is a full partner in MU's Life Sciences efforts.

Christina offered to help, telling the owner that she had a special bond with him. But secretly, she was hoping to buy Jack.

Even after their years apart, Jack recognized Christina immediately, running to her like a happy dog. "Jack just came alive," she remembers.

Jack responded immediately to Christina's training commands, too, going through his riding paces with precision. That was a bad move. Seeing his potential, the woman decided not to sell him.

Christina drove to Columbia, Mo. for her new veterinary medicine studies with a heavy heart. Her MU classmates tried to console her, offering tips on other animals. Christina was still determined.

Weeks later, the Wentzville horse trader called back. She did not want Jack after all. She wanted money, \$1,300 in cash—fast.

When the Class of 2004 heard that Jack was within Christina's reach, they pulled together. One classmate loaned her a saddle, and another a barn

where Jack could board. Still another gave Christina an interest-free loan.

Their generosity shocked Christina. "I basically had only known these people for four weeks," she says. "They didn't have to help at all."

Days later, a borrowed trailer pulled up to the Wentzville barn, money swapped hands, and out walked one happy mule. **Ark**

Not Skipping A Beat

■ continued from page 1

The devices are units intended for human use, with good battery life left, that have been replaced in their original owners or removed from a person after death. Frequently, new pacemakers that have exceeded their shelf expiration date, or have become obsolete, are donated by pacemaker manufacturing companies to be used in animals.

Missy's pacemaker was an "explant," one used previously in a human. Using explants is an excellent way for companion animals to take advantage of top-of-the-line, new technology.

"We receive many phone calls from people with pacemakers, or their family members, expressing desire to donate the pacemaker after the individual's death," Dr. Spier says. "Many people feel strongly that this is an important gesture, particularly to people for whom animals have played an important role in their life. This is an excellent example of how technology can be used to foster and reinforce the human animal bond."

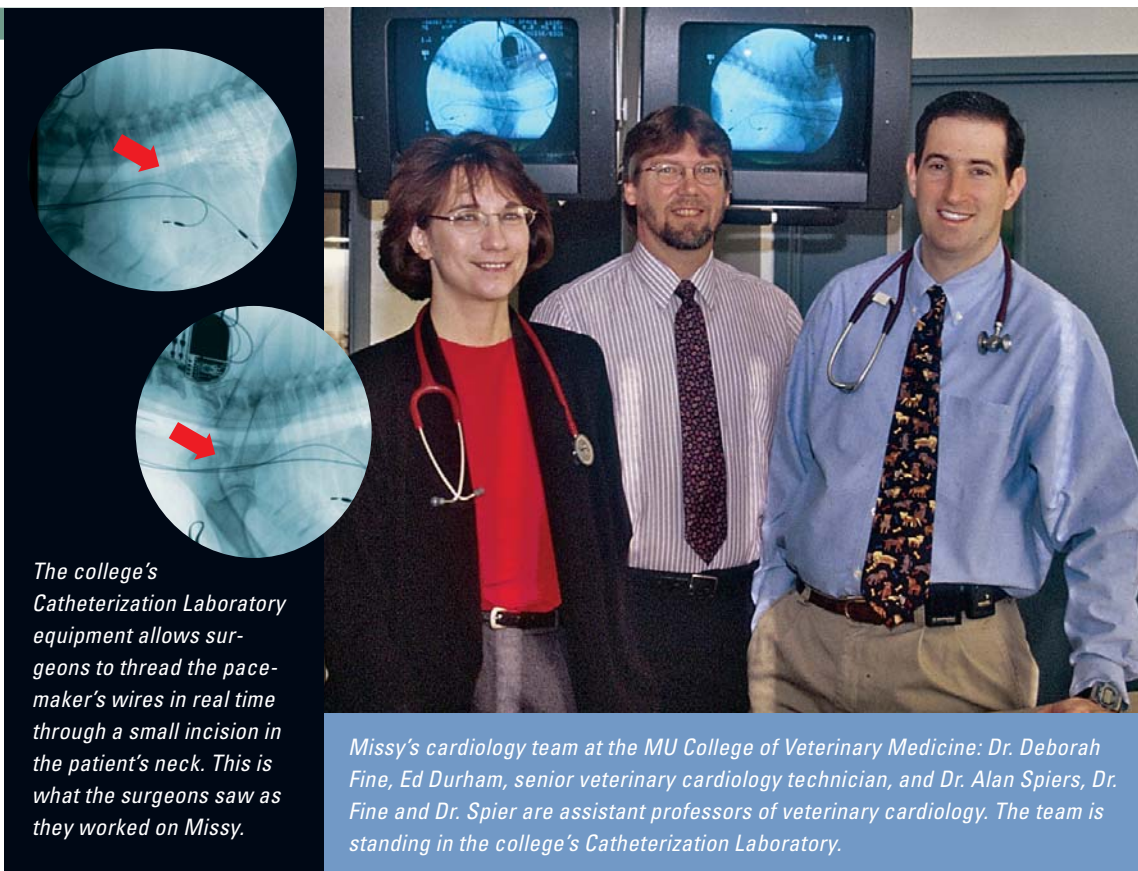
Modern pacemakers are dramatically better than the pioneering 1950's devices that were as big as a lunch box. These first pacemakers did nothing but send a steady stream of electrical pulses.

The largest component of a modern pacemaker, the pulse generator, is about the size of a silver dollar and weighs an ounce. This part contains the battery and a tiny computer that monitors and controls the rhythm of the heart. Teflon coated wires, called leads, transmit the electrical impulses.

Usually, animals receiving pacemakers get a single-chamber device—the simplest and least expensive unit. This machine delivers an electrical stimulus directly to the ventricles—the lower chambers. While very good, they are not the best possible medical solution.

Missy got a dual-chamber pacemaker—the first one implanted in a dog in Missouri. These devices are state-of-the-art for human implantation and usually have two leads, one attached to the right atrium and the other in the right ventricle (the top and bottom chambers of the right heart). This pacemaker can monitor and deliver impulses to one or both heart chambers, providing a more precise heart rhythm and blood flow. Dual chamber pacing allows not only for restoration of heart rate, but also for synchronization between atria and ventricles—something that single chamber pacing does not provide.

These units feature microprocessor-based circuitry and newer pacing routines allowing rate-responsive adaptations to exercise or at-rest conditions. They can be programmed to do nothing if



The college's Catheterization Laboratory equipment allows surgeons to thread the pacemaker's wires in real time through a small incision in the patient's neck. This is what the surgeons saw as they worked on Missy.

Missy's cardiology team at the MU College of Veterinary Medicine: Dr. Deborah Fine, Ed Durham, senior veterinary cardiology technician, and Dr. Alan Spiers. Dr. Fine and Dr. Spier are assistant professors of veterinary cardiology. The team is standing in the college's Catheterization Laboratory.

the heart is pacing normally on its own, but spring into action with the appropriate stimulus if the heart's proper electrical activity has failed. Newer pacemakers also feature computer memory and telemetric monitoring—they can be interrogated by external monitors to keep cardiologists apprised of the heart's activities.

Newer batteries can provide up to 12 years of continuous function. Well over two million human pacemakers have been implanted worldwide.

One of the best advances involves how the pacemaker is implanted. Twenty years ago, pacemakers required extensive surgery. Surgeons had to cut through the chest wall and spread the rib cage to attach the leads to the heart. Patients faced lengthy recuperation just from the surgery.

A New Tool, Catheterization

A less invasive approach was developed in the early 1980's. Here, surgery consists of a small incision in the neck. The lead is threaded through the jugular vein until it reaches the heart. A tiny Batman-type grappling hook built into the end of the lead attaches it firmly to the heart muscle and keeps

it in place until scarring anchors it there. The pulse generator is inserted under the skin at the back of the dog's neck.

There are only about 110 board-certified veterinary cardiologists worldwide—80 are in the US. Two of them, Drs. Spier and Fine, work at MU.

Threading the lead through the vein and positioning it prop-

erly in the heart requires some sophisticated technology, however. Here, the MU Veterinary Medical Teaching Hospital's Catheterization Laboratory comes into play. Essentially a room-sized x-ray fluoroscope, it allows surgeons to see their progress of threading the lead through the vein and into the heart in real time. This procedure is minimally invasive (it is done under local anesthesia with humans).

The prognosis for dogs with pacemakers is usually very good. A pacemaker typically extends the life of the dog three to five years.

And these treatments are often not onerous to owners. Dogs walk out of the hospital essentially cured with just a small incision. Unless other problems are present, there are generally no pills or injections to take. A checkup once or twice a year is needed to make sure the pacemaker is functioning correctly.

Mr. Teak remembers a particular post-operative instruction—to alert Missy's groomer of the location of the pacemaker.

While not inexpensive at about \$2,000, pacemaker implantation is not incredibly costly either. In fact, the cost is not too different than a surgical repair of a fractured leg in a dog. The cost of a new dual-chamber device for human use can top \$10,000.

Missy Hardly Skips a Beat

Missy's surgery was done on a Wednesday, she spent Thursday in the ICU, and went home, wagging her tail, on Friday.

While no surgery is routine, her small incision needed to insert the pacemaker's lead healed quickly. With improved cardiovascular efficiency, she felt better and became more active.

Appropriate for a family pet who hates missing a beat. **Ark**

Pacemaker Research at the Beginning

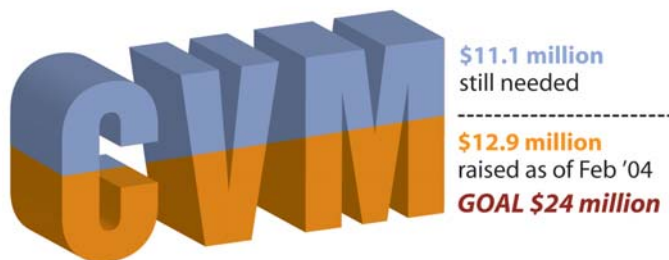
Pioneering work with pacemakers isn't new to the MU College of Veterinary Medicine. Retired Professor Dr. Alan Hahn in 1969 helped develop an experimental pacemaker powered by the wearer's own body electricity. This was in the days when batteries were too big to implant. While modern lithium batteries negated the need for such a power source, the research taught the MU surgical team a lot about pacemaker use in animals. In the 1980's, Dr. Hahn and surgeon Dr. Eric Pope, associate professor of veterinary medicine and surgery, implanted some of the first pacemakers in dogs.

Returning to Mizzou and a Big Job



Greg Jones' First Assignment— Raise \$24 Million

For All We Call Mizzou Gifts and Pledges Secured



8

Everyone who has ever accepted a new job knows what it is like to walk into an ongoing operation with established projects fully underway. That's what Greg Jones experienced this past fall when he joined the University of Missouri College of Veterinary Medicine as development director.

Greg faced, perhaps, an additional daunting challenge—joining MU right in the middle of its biggest fundraising campaign ever—the *For All We Call Mizzou* campaign. His job description, no less, is to help the college raise \$24 million in private giving before the campaign ends in December 2005.

Talk about job pressure.

Luckily, Greg's predecessors left him with a head start—over half has already been raised. The effort seeks to increase funding for student scholarships, establish endowed professorships and programs, and refurbish college facilities and equipment.

Back to Missouri

Greg was born and raised in Springfield, Mo. He graduated from the MU Business School in 1992, followed by the Washington University Law School in 2000. Between the two degrees he worked for Andersen Consulting in St. Louis and for his father's company.

It was his work as an estate-planning attorney in downtown St. Louis where he came to appreciate how important leaving an educational legacy was to many of his clients.

"I began thinking," he said. "I saw the appeal of a career path where my love for higher education would be combined with my professional education and experience. The field of development at a college is what I found."

His first opportunity at this new career path was at Clarke College in Dubuque, Iowa, a small private college with 1,200 students.

However, when the opportunity to return to his alma mater became available, Greg returned to MU

to join the College of Veterinary Medicine. "It was a great opportunity because of my respect for the profession and my love of animals," he said.

"I was pleasantly surprised at the brilliant minds working at the veterinary medical college," Greg continued. "I had no idea of the achievements in such areas as oncology, neurology, and orthopedics. I was impressed by the comparative medicine programs and the collaboration our faculty has with human medicine, nursing, and other MU divisions."

Greg was also impressed by the level of health care that patients in the Veterinary Medical Teaching Hospital receive. "Two to three times a week, I receive a call from a Teaching Hospital client who wants to express their appreciation for the outstanding service they have been provided."

Achieving the For All We Call Mizzou Goals

It's critical that the college achieve its campaign goals, Greg said. While the college has made impressive gains in creating student scholarships, it is still fighting increasing costs and declining state funding. New facilities will be needed to help future students flourish, and upgrading the hospital's modern imaging equipment is essential.

New programs will promote higher levels of discovery and service in such areas as animal agriculture and companion animal medicine—affording even better service to Missourians and making students more capable in their professional careers.

"Private funding has never been more important to the college," Greg declared. "State appropriations provide only about one-fifth of MU's total budget. Student fees contribute about 45 percent. Additional revenue must come from research funds, donations, investments, and endowments. Such an approach will ease additional pressure on students and their families, as such a move could jeopardize students' access to MU."

Traveling the state and country for the college,

Greg has found its alumni to be a devoted and caring group who want to see their veterinary college succeed. "These are caring people who are passionate about the success of the school," Greg said.

"This college has a rich history of private support from alumni, friends, businesses, foundations, and other organizations," Greg said. "Endowments have established critical student scholarships and provided funding for important research programs here. They have helped to establish many outstanding programs. There's no reason why it can't continue to progress to be one of the top three."

Goals of the MU College of Veterinary Medicine's Campaign

There are three specific goals in the college's \$24 million *For All We Call Mizzou* campaign—student scholarships, facility improvement, and program development.

The \$4.2 million goal for student scholarships is designed almost exclusively to provide grants and awards to DVM and post-graduate students.

Facility improvements would solve some nagging problems as well as provide new opportunities. The CVM Library, for example, would shed its 1970's décor in favor of a new, computer-based, learning concept, providing knowledge resources to students that reflect the tremendous informational possibilities of the 21st Century. Likewise, the imaging suite of the teaching hospital will be improved with much of the latest technology that has revolutionized this area of medicine in the past decade. A new Equine Lameness Center would also be built, capitalizing on recent research discoveries made in the Equine Clinic. Another campaign goal is to upgrade the diagnostic capabilities of the Veterinary Medical Diagnostic Laboratory—a critical resource to Missouri's \$2.5 billion animal agriculture industry. An additional goal of the campaign is the construction of Barkley House, akin to a Ronald McDonald House, where animal owners can stay during lengthy visits to the teaching hospital.

The biggest part of the campaign, at \$12.6 million, is to enhance the college's service and research capabilities—thus giving students the educational benefit of the latest discoveries and providing citizens with the most up-to-date diagnostic and clinical techniques. Specifically, the college hopes to establish a Center for the Study of Livestock Infectious Diseases, the Center for Study of Equine Locomotion, and the Center for the Study of Animal Wellness—programs that will improve the productivity of Missouri farms and enhance the emotional and physical benefits of human and companion animal relationships. Investments in this area will also strengthen the college's already impressive programs in comparative and laboratory medicine. **Ark**

Arkeology



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