



VETERINARY MEDICAL REVIEW

Summer 1987
University of Missouri-Columbia
College of Veterinary Medicine
and Cooperative Extension Service



**EXTERNSHIPS:
THE KNOWLEDGE
THIRST-QUENCHER**



DEAN'S COLUMN

Kahrs details highlights of college activities

Students, faculty, staff and alumni were saddened by the death of Dr. Arthur Case, 76. He was a beloved teacher at the college from 1947 to 1981 and an honored professor emeritus since then.

Two eminent faculty, Dr. Joseph Bojrab and Dr. Larry Morehouse, had coronary artery bypass surgery. Both recovered successfully. Effective this summer, Morehouse retires and Bojrab is going to Las Vegas, Nev., to open a referral practice.

College gifts increase

Gifts to the college from alumni and friends increased from \$228,332 in 1985 to \$251,050 in 1986. This encouraging trends permits the purchase of needed equipment, support for the Raptor Rehabilitation Program, support of this publication and many other projects that help bring PRIDE to the college. PRIDE is the acronym for a current college push: Public Relations through Individual Dedication to Excellence.

Long-range plan

Alumni, faculty, students and University officials are currently reviewing the third draft of the college's long-range plan, "Planning for Change in Veterinary Medicine." It will require continued modification to adjust to changing needs of our society, but it will serve as a general guideline as the college moves into the future. Call us if you would like a copy of the latest draft.

North Farm closes

The Veterinary Research (North) Farm was closed Jan. 1 in an effort to meet University and federal animal care and use guidelines, and to conserve resources. This action ends a 71-year chapter in the fight against animal disease and leaves the college without facilities for study of infectious diseases in food producing animals.

MVMA poll

The Missouri Veterinary Medical Association queried its members about their views on college programs and we have learned a lot from the constructive comments submitted. The respondents overwhelmingly endorsed the MVMA effort to gain support for the college's efforts to upgrade to contemporary educational, research and public service programs.

Please plan now for Alumni Day, Oct. 31, which will feature reunions for the classes of 1957, 1967 and 1977. The Annual Conference will be held Oct. 4 and 5 with reunions on Oct. 3 for the classes of 1952, 1962, 1972 and 1982. We would love to have you come and see us any time.

Best regards,

Robert F. Kahrs

ROBERT F. KAHRS, Dean

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ON THE COVER: Kitty Gepford, VM4, spent 12 hours a day, six days a week on her free block working for a veterinarian. She made less than she would have if she had worked at a fast-food restaurant. Why did she do it? Experience, she says. Gepford and five other students explain why they went on externships, beginning on Page 12. Photo by Patrick Nichols.



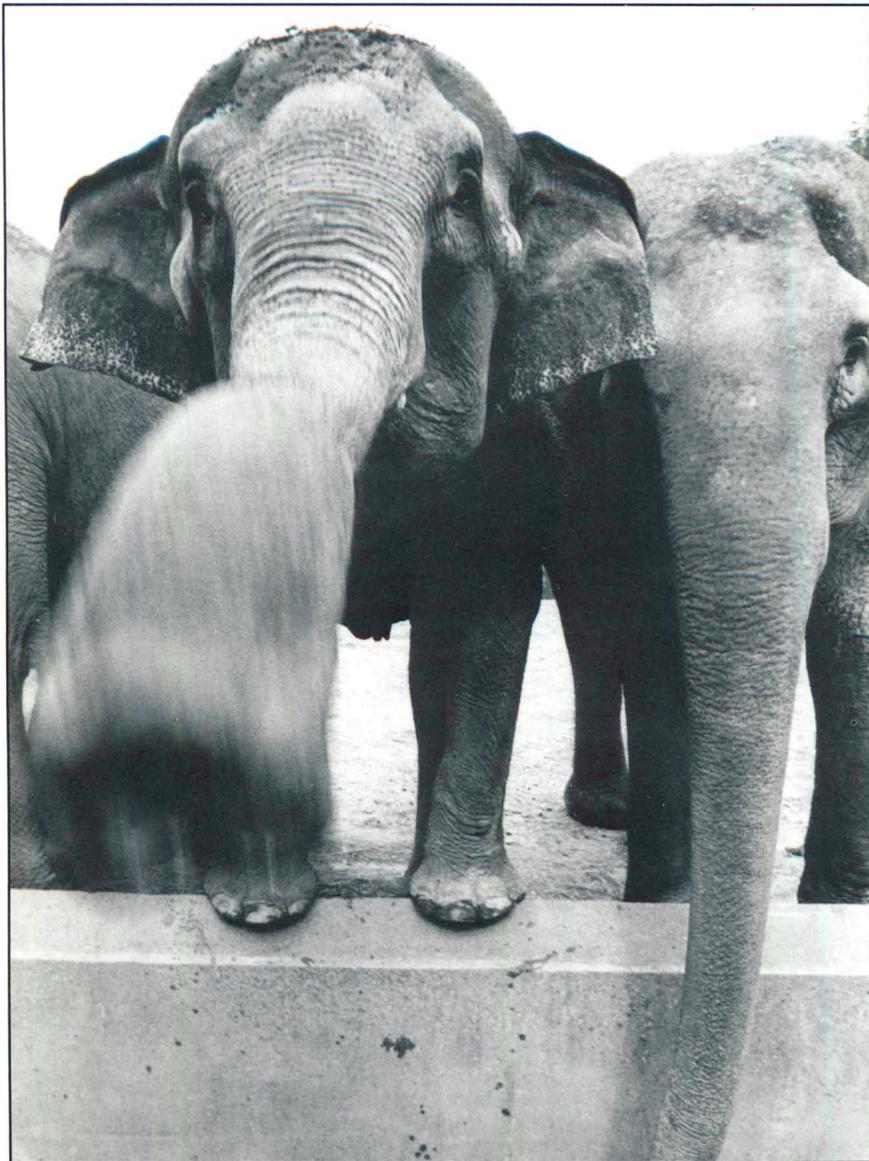
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Radiographing a giraffe, setting a bear's leg or performing a root canal on a gorilla are all in a day's work for these

Mizzoo Veterinarians



Performers from the St. Louis Zoo Elephant Show play around between shows.

SIMPLE procedures have a way of becoming not quite so simple at the St. Louis Zoological Park.

When a black bear fractured its leg, veterinarians set it with a heavy plaster cast. It took the animal two hours to chew its way out.

A fiberglass and steel cast took the bear two days to remove. Finally, the veterinarians were forced to place a steel plate in the animal's leg.

"It is challenging just to solve simple problems," says William J. Boever, BS Agr '66, DVM '70, the head veterinarian at the zoo. "There is always something unusual you have to cope with. It is difficult to make a diagnosis and then carry out a treatment regime."

Boever has been dealing with stubborn elephants, obstinate apes and 654 other sometimes uncooperative species of animals at the St. Louis Zoo for 17 years. He and his staff of one full-time veterinarian, one part-time veterinarian and one resident are responsible for maintaining the health of 2,700 animals in the 66-acre park.

The zoo veterinarians are part of an adjunct program at the college. They occasionally visit campus to lecture, give case studies or use the college's facilities. The two-year residency program, funded by the National Museum Act, is in cooperation with the college's department of medicine and surgery.

"The most challenging thing is the problem of variability," says Dr. Eric Miller, the other full-time veterinarian. "You don't have the repertory of things to fall back on.

"You haven't seen three of these and 10 of those," he says. "And often the animal's behavior prevents you from doing conventional treatments. Sometimes you have to ask yourself,



Above, Dr. William Boever, adjunct assistant professor, checks the appetite of a rare black rhinoceros. At left, Dr. Eric Miller, adjunct assistant professor, makes his rounds at the zoo in a fully equipped clinic truck. Resident Randall Junge, right, takes a blood sample from an animal born prematurely.



'Is the treatment of an animal worse than the disease?'"

The St. Louis Zoo veterinarians are part of a small fraternity. Only 70 to 90 full-time zoo veterinarians exist in the United States. Most zoos didn't even have a veterinarian on their staffs until 15 years ago.

"When I first joined the zoo, zoo medicine was not as advanced as it is today," Boever says. "It was a lot of trial and error. You just didn't have any places to go for the answers."

And often zoo medicine is still trial and error. "A lot of times when you are working on the animal it is the first time it's ever been done," says Randy Junge, the zoo's resident.

Boever, who worked summers at the zoo while he was in school, joined the St. Louis Zoo after graduation because of the variety of animals with which he was able to work. The majority of cases at the zoo, however, are routine respiratory problems, skin problems or viral diseases.

"Sometimes we do have some animals that develop some problems from captivity, but mostly they have the same problems which exist in domestic animals," says Boever, an adjunct assistant professor.

The veterinarians go to great lengths to ensure that the animals do not get sick in the first place. The big cats at the zoo all receive the same vaccinations as house cats. Every animal in the park has feces checked twice a year for parasites, and many species receive tetanus shots.

The zoo also has a complete diagnostic laboratory and all animals who die are necropsied. "That's the ultimate diagnosis," Miller says.

Surgery is difficult because all animals must be anesthetized, and many cannot be brought to the zoo's hospital. The radiograph equipment, for instance, is on wheels so it can be moved out of the hospital. The veterinarians spend most of their time working out of a large white clinic truck.

"Obviously, if we get a sick giraffe, we don't bring it to the hospital to treat it," Boever says.

"Surgery in the zoo is rather limited compared with domestic-animal practice," he says. "There are no animals that are hit by cars, and they don't usually get lacerated by fences. There are no declaws, no castrations."

Miller, who has worked 5½ years at the zoo, two of them as a resident,

says he rarely encounters any unique problems, only unique situations.

"Much of our work is preventive medicine," he says. "Sometimes you can't believe that most people don't realize you can do normal everyday medicine on exotic animals."

One of Miller's more bizarre cases was a fruit bat. It had a rare heart condition that made its head swell up like a melon.

But Miller's continual problems are with primates. They make even the smallest medical procedure into a major production.

"Apes are difficult to treat because they are thinkers," says Miller, looking through the glass at the animals in the zoo's new Ape House. "They can take out things you give them. They know when you have slipped medicine into their food."

Miller calls the animals by name and identifies their character traits.

"That's Mera," he says, pointing out a large Sumatran Orangutan. "I think she's going to run for office some day. She comes down and works the crowd."

"The apes all have such personalities. They are individuals and they are easy to tell apart."

Roscoe, an ugly, large male ape, approaches the window, brandishing its teeth and gums at Miller.

"They often don't associate the veterinarian with the benefits of medical care," Miller says.

A primate provided Junge's most interesting operation. The first-year resident did a root canal on a gorilla.

"It was fascinating. I did X-rays, blood samples and EKGs," he says. "I've never worked on an animal like that before."

Junge, who beat out 24 other applicants for the prestigious zoo residency, practiced a year at a

small-animal clinic in South Bend, Ind. He also worked part time as the staff veterinarian for the small South Bend Zoo. But nothing fully prepared him for the St. Louis Zoo.

"You have a lot more contact with different types of animals here," he says. "There are so many animals. Often you treat whole herds, rather than the animals on an individual basis."

"You work on something new every day. There are some animals in this zoo I have never even heard of. You learn to be creative."

The large number of animals also has its down side: It's impossible for the veterinarians to keep track of the health of every animal. So the zoo veterinarian's first line of defense is the animal keeper. Since many species are adept at hiding their symptoms, often it is only the keeper who can recognize a problem.

"The keepers are like the owner of a dog," Miller says. "The dog may look fine in the operating room, but it is the owners who are going to tell you they do this and this and this, and yet they stopped doing that in the operating room."

"How well the keepers and veterinarians work together is important," he says. "Keepers are our eyes and our ears when we aren't there."

The population of the St. Louis Zoo, thanks to a number of very successful breeding programs, is almost self-sustaining. Eighty percent of the animals currently in the zoo are captive-born.

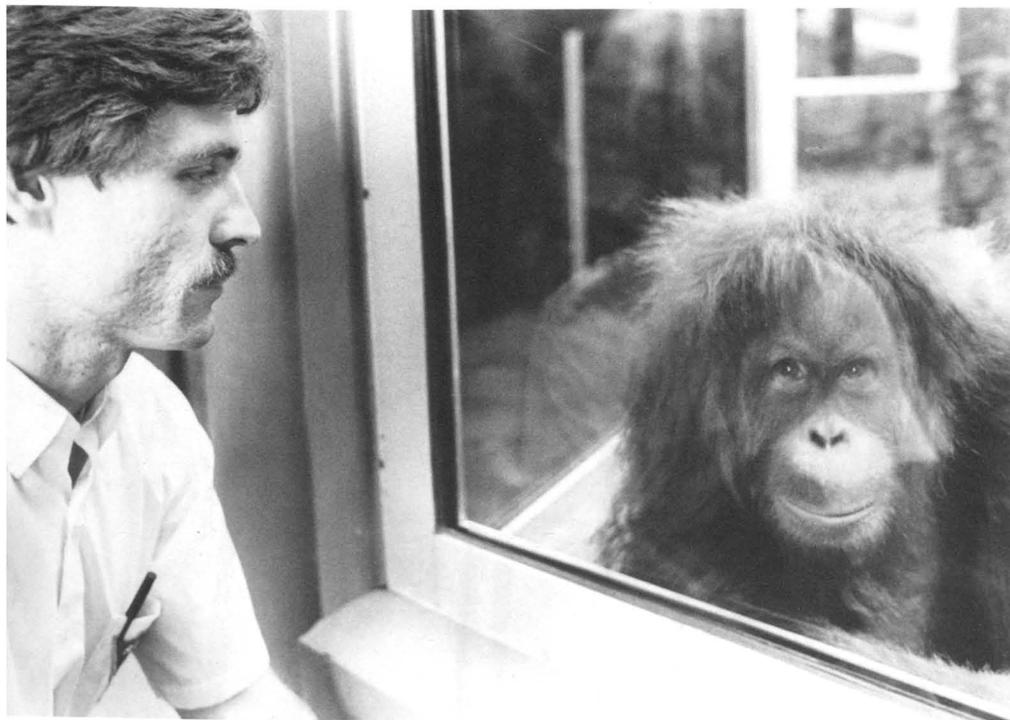
The veterinarians play a key role in the breeding process. Boever and Miller are conducting research on the reproductive cycle and artificial insemination of both elephants and cheetahs.

"Zoo populations should be, and must become, self-sustaining," Miller says. "The place to save wild animals is in the wild, but the wild is rapidly disappearing."

Miller is also one of the nation's foremost experts on the black rhino, which has become extinct in the wild. There are only 377 black rhinos left in 30 zoos around the world.

Miller keeps a special eye on the black rhinos in the park. One female recently gave birth, but the infant died after six months. Another female is now pregnant.

"I am very interested in conservation," Miller says. "I am hoping our reproductive research will offer the same benefits to zoo species as we have to cattle."



Dr. Randall Junge, resident, has a staring match with Mera the Sumatran Orangutan in the zoo's new Ape House.

By Drs. Manuel J. Torres-Anjel, Donald C. Blenden and Kuraru Loretu

The peculiar effect of rabies virus on pituitary cell tissue cultures

AIDS-like wasting syndrome with marked growth impairment elicited by rabies virus has been characterized by our work on four animal models (mouse, rat, rabbit and bovine).¹ In all of the studied species, hypophysary infection by RV has been an outstanding discovery. Since we consistently find RV infecting the anterior (adeno-) hypophysis and the infection is concomitant with the growth disruption, it was important to try to characterize anterior pituitary cells RV-infectivity patterns *in vitro*.

Materials and methods

Cell line: A pituitary rat tumor (GH-producing) cell line (GH3) was obtained from the American Type Culture Collection² where it is catalogued as ATCC CCL.82.1. The cell line GH3 is a collection transplantable pituitary tumor obtained by cloning a MtT/W5. The culture is biphasic with cells both attaching to culture bottle bottoms ("monolayer") and remaining in suspension while growing ("floating" microcolonies) (Fig. 1).

Virus: Infection of GH3 cells was studied with a vaccine (*Neurogen R*) strain³ and with a wild bovine paralytic rabies variant of RV. The BPRV was utilized both in a brain-to-brain as well as cell-adapted (BHK-21) versions of the virus ATCC VR.985⁴ isolated and monoclonal antibody characterized by ourselves.⁵

Monitoring of infection and GH production: Studies were based on histological and immuno-staining techniques (Figs. 2 and 6). RV-infection was monitored by immuno-fluorescence (FITC) and PAP-immunoperoxidase (IPP). The anti-RV immunostaining utilized monoclonal antibody reagents produced against nucleocapsid determinant sites 103.7 and 502.2 non-commercially conjugated with FITC or kindly custom conjugated for us

with horseradish peroxidase (HRP) by the same commercial concern.⁶ Modifications of both the immuno-staining techniques were also utilized for GH determinations *in situ*.

To study membrane optical density in infected cells, a gradient visible light transmission illumination was used concomitantly with fluorescent incident illumination on anti-RV fluorescent (FITC) antibody stained cells.

Results

The infection of GH3 cells with RV was rapid (24 hours on), efficient (more than 50 percent obtained from the first passage) but never complete (no 100 percent infection ever reached) after several passages and asymptotical. No obvious cytolytic effect was encountered as monitored by comparative turbidimetry (visible extinction at 450 nm) of paired infected vs. non-infected replicate cultures (Fig. 1). Growth hormone

production of uninfected GH3 cells was monitored using anti-GH antibodies (FITC) (Fig. 2). A tendency was observed for RV + cultures ("floaters") to spontaneously agglutinate (Fig. 3) corresponding to traditional hem agglutination (goose erythrocytes) by RV.

Infected cells tended to be larger and monolayers showed RV + s tendency to multiply without completing the mitosis process giving rise to syncytia (Fig. 4). The RV + carrying syncytia in the floating phase showed a remarkable diminution of cell membrane's optical density (Fig. 5) which suggested that syncytia were also formed by cell-to-cell fusion between GH3 cells, another excellent mechanism to assist in cell-to-cell RV-transmission.

The "luxury" function (production of GH) of RV + vs. number of RV GH3 cells was found to be markedly diminished in the RV + infected vs.

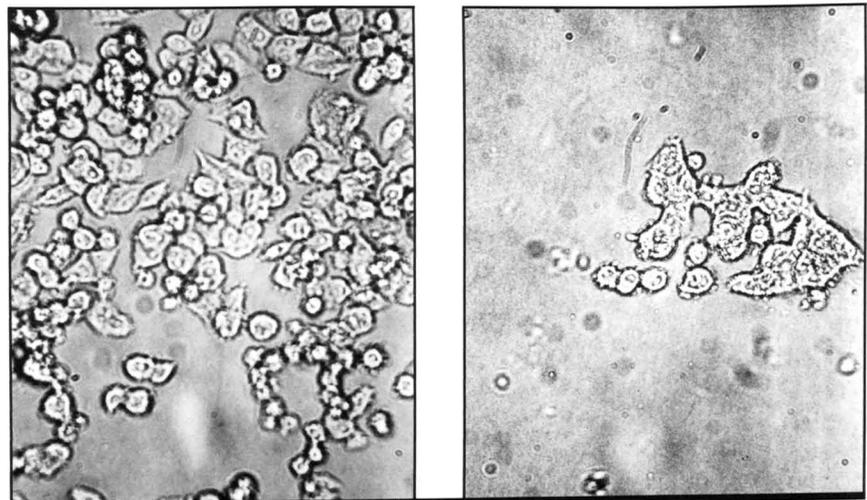


FIG. 1 Comparison between healthy No RV (left) vs RV+, right, culture of GH3 cells. the individual structure of healthy cells (A) and the tendency by a few to establish a fibroblast-like monolayer (fusiform cells). Note also the tendency for the infected cells (B) to divide without full separation and/or to fuse either way leading to syncytium formation.

the No RV uninfected cells (Fig. 6). Also RV+ cells produced neuron-like dendrites (Fig. 6c).

Discussion

Syncytial formation is a characteristic of some pathogenic viruses, some (sendai) applied to hybridoma production. Syncytium formation is also reported between lymphocytes and among lymphocytes and other cells in retro-HTLV III⁷ and other retro-lymphocyte leukemia viruses (Fig. 7). RV transfer from cell-to-cell, including non-neurological cells, is still an unknown mechanism. Dietzchold et al.⁸ showed marked differences between fully (FPV) and cell-to-medium-to-cell (LPV) vs. less (LPV) pathogenic fixed virus variants in cell-to-cell (FPV) and cell-to-medium-to-cell (LPV) viral transfer.

Classical hemagglutination (Goose) had been reported in rabies many years ago. Our studies have brought together all these concepts as to better understand RV behavior and pathogenicity. The RV agglutinated the "floating" cells in an adenopituitary biphasic tissue culture and brought them together structurally by damaging their membranes to become syncytial. The possible formation of actual hybridomas by RV serving as a virus "bridge" is being studied.

The syncytial phenomenon also occurred in attached microcolonies ("stickers") suggesting incomplete mitosis. The syncytium/hybridoma mechanism could take place *in vivo* and be an excellent mechanism for virus dissemination. Also if shown

to produce hybridomas as *in vivo* or *in vitro* it could bring about further mechanisms of a useful research tool.

RV-infected cells also produced neuronal-like dendrites. Coming from cells of endodermic (adenohypophyseal) vs. diencephalic (neurohypophyseal), this is a remarkable behavior and a superb mechanism to facilitate cell-to-cell infectivity from the distance.

The *in vitro* deformation of RV-infected cells coincided with stoppage of their "luxury" functions, the production of GH also with adenohypophysis infection, growth impairment, wasting syndrome and immunosuppression reported by us *in vivo*. Only the FPV, and not the LPV variants, have been found to infect the hypophysis *in vivo* and produce the wasting effect in animals.⁹

The infection and affection of luxury production of growth hormones by specifically equipped cells of the pituitary is shown to be a critical pathogenesis mechanism in other important (arena) viruses: The lymphocytic choriomeningitis (LCM) virus shows a behavior with respect to GH-producing cells, almost identical to what we have found for RV.¹⁰

Studies on the outstanding similarities between rabies virus and retroviruses in as far as production of syncytia (and possible hybridoma formation) are continuing, looking also at the possible blockage of hormone production and hormone-related immunosuppression. We would like to suggest looking at retroviruses from the point of view of possible hormone-related immunosuppression and through a similar mechanism as RVs.

Footnotes:

- ¹Torres-Anjel et al., 1984, 1985, Conf. Res. Work. An. Dis., Chicago, 65, No. 387:66, No. 298:54.
- ²ATCC, 1985.
- ³Philips-Roxane Inc., St. Joseph, Mo. 64502.
- ⁴ATCC, 1985.
- ⁵Torres-Anjel et al., 1986; Vet. Med. Rev., 7:3-5.
- ⁶CENTOCOR R, Malvern, Pa.
- ⁷Lawrence, J., 1985; Scientific American 253(6):84.
- ⁸Journal of Virology, 56:12, 1985.
- ⁹Torres-Anjel et al., 1984; American Association of Veterinary Laboratory Diagnosticians Annual Proceedings, 27:1-26.
- ¹⁰Oldstone et al., 1982/84; Nature 300:360 and 307:278.

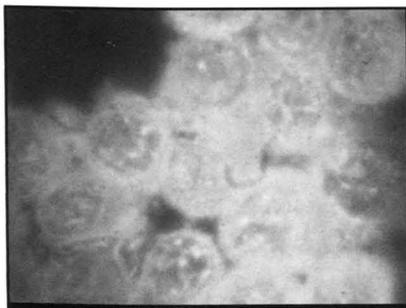


FIG. 2. Anti-GH immunofluorescent staining of healthy uninfected No RV GH3 cells. Note the well defined round shape of the cells, the clearly defined cell "limits" (membranes) and the abundant fluorescent stained GH granulation.

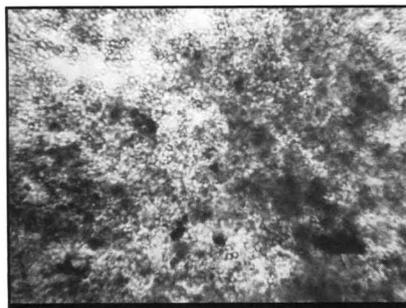


FIG. 3. GH3 cell agglutination. This is a mechanism that brings cells together facilitating cell fusion, syncytium formation and RV cell to cell transmission. The same effect is obtained with either anti-GH antibodies as with RV. (The former is shown here).

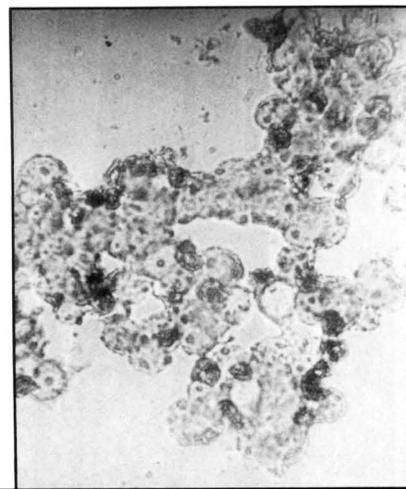
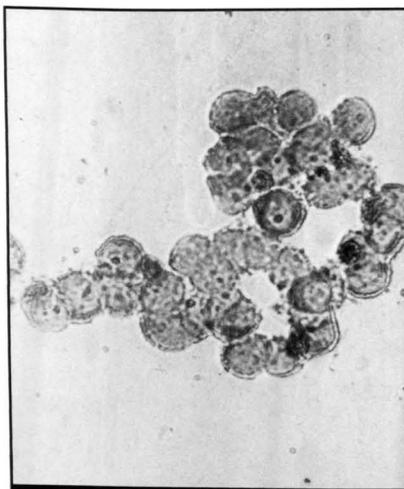


FIG. 4. Vital staining comparing No RV, left, vs RV+, right, infected GH3 cells. Note the individual well-defined single cell identity in the healthy cells (A) vs the more diffuse, syncytial, multinucleated cell formation of the infected cells (B). Note that the infected cells, in spite of the deformation, still do not take the vital stain (they remain viability positive). The tricellular syncytia in the extreme right of the 4B is to be compared with the T-lymphocyte syncytia (HTLV-III+) shown in figure 7A.

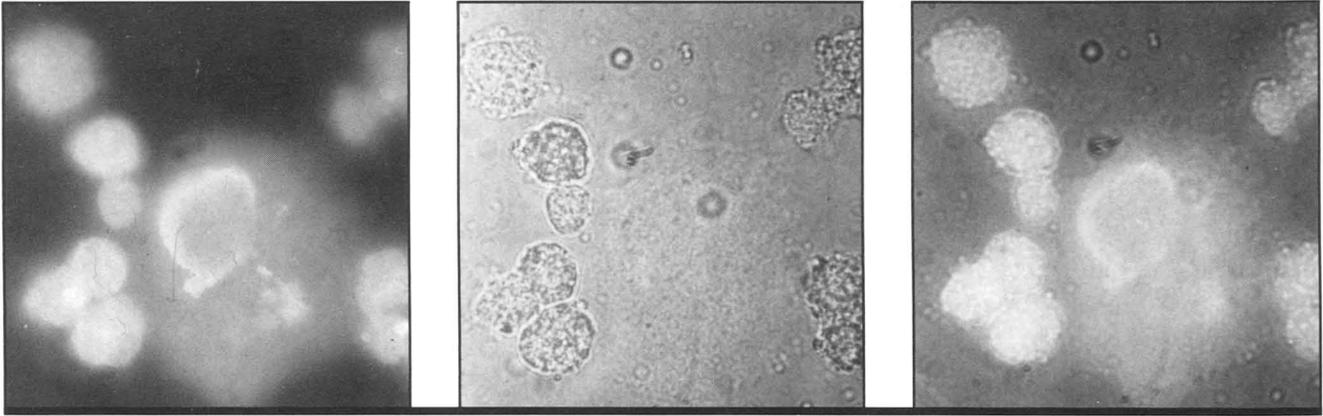


FIG. 5. Gradient fluorescent (F) visible (V) of RV+ infected GH3 cells stained with FITC anti-Rv nucleocapsid monoclonal antibodies. Left, 100 percent F; right, 50 percent F/V; center, 100 percent V. Note the uninfected cells on the extreme left, the early infection in the cells surrounding the syncytium and the advanced infection in the central syncytium which becomes a "ghost" in B

and "disappears" in C indicating loss of optical density (i.e., suggesting membrane damage). A similar mechanism taking place between cells of different origin (i.e., GH3+ compatible lymphocytes, studies are in progress) would give rise to hybridomas.

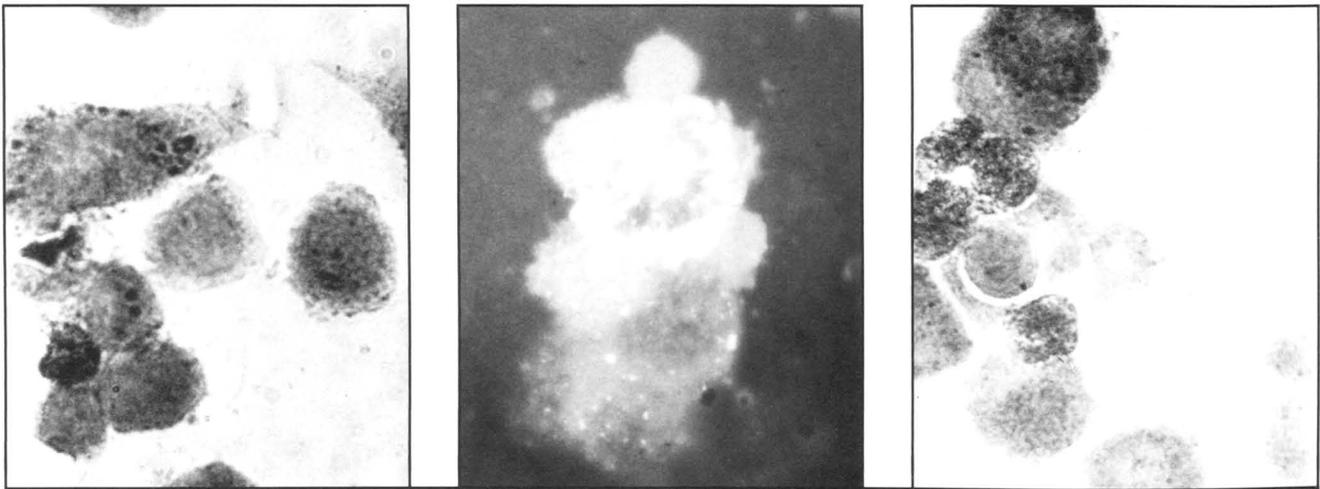


FIG. 6. Immunostaining of No RV (uninfected) vs RV+ (infected) GH3 cells. Center, anti-RV fluorescent antibody staining of infected RV+ (syncytial) and uninfected (No RV) GH3 cells. Note the two uninfected or slightly infected round, high density, "compact" cells at 12 and 3, clockwise, vs the large infected syncytia. The solid compact cells and the large diffuse one are to be compared (for GH content) with those in Fig. 6B and 6C. Left and right, anti-Gh IPP staining of RV+ vs No RV

GH3 cells. Note the small high density "compact" cells showing very strong GH staining vs the infected, larger, more diffuse cells showing little or no anti-GH stained granulation. The small No RV high GH cells and the large RV+ low- or no-GH staining are to be compared to those in Fig. 6A for absence or presence of RV. Also note the neuron-like dendritic bridges (C) that extend from RV+ infected to RV- infected cell facilitating RV transmission.

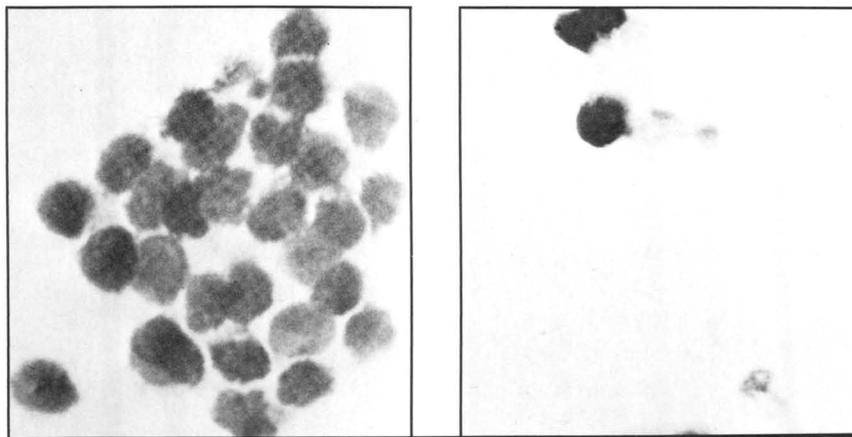
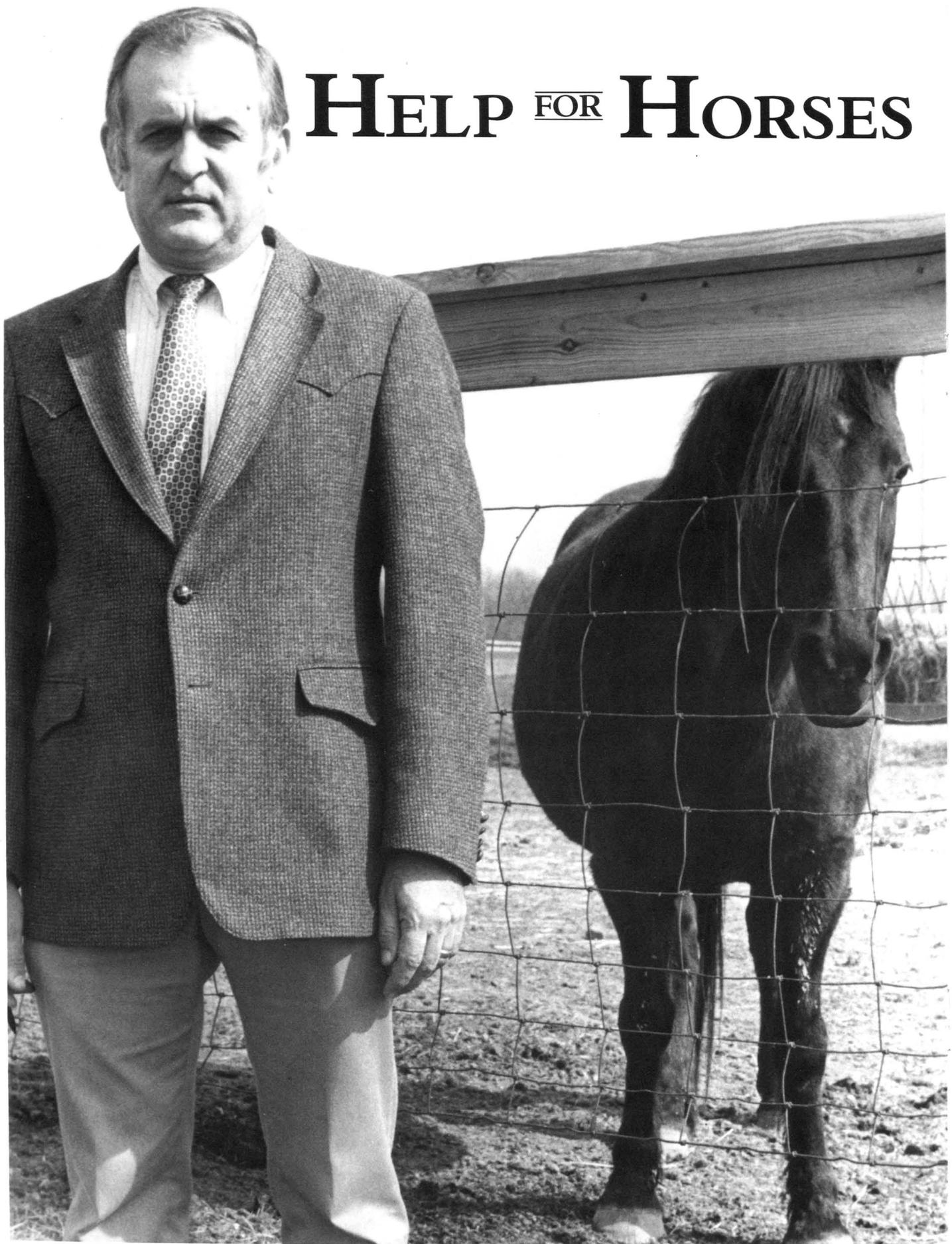


FIG. 7. Photographs and text borrowed from Lawrence, J. 1985. Scientific American 253(6):84. Normal T cells (left) contrast with infected T cells (right) because the AIDS virus causes the membranes of infected cells to fuse, yielding multinucleated complexes known as syncytia. The virus primarily infects T-4 cells, which look like other T cells but differ from them in function and biochemical makers. Fusion of infected cells with normal ones might spread virus to other tissues.

HELP FOR HORSES



TWO University researchers have found what is, if not technically a vaccine for colic, founder or diarrheal diseases in horses, a vaccine that will prevent one of the most common complications of those maladies.

Dr. Harold Garner, professor of veterinary medicine and surgery, and Dr. Ronald Sprouse, a former college microbiologist who now works in the University's School of Medicine, have developed a vaccine named Endobactoid. It has the potential of saving hundreds of horses and millions of dollars for horse breeders each year.

The vaccine, which Garner and Sprouse developed after 14 years of research, was approved by the U.S. Department of Agriculture last year. The Schering-Plough Corp. has agreed to distribute the vaccine and to pay the University royalties. A portion of that money will go directly to the College of Veterinary Medicine and the School of Medicine.

The key to the pair's vaccine is endotoxins. These are released when gram-negative bacteria, which normally help break down food during digestion, die off. When the horse's digestive system is upset, from overeating for example, large numbers of gram-negative bacteria die and release the endotoxins into the system. The endotoxins can seriously complicate colic, founder and diarrheal diseases.

The vaccine enhances the ability of the horse's immune system to produce anti-endotoxin antibodies. The vaccine has little to no effect, however, on horses that are already living with long-term endotoxin damage, such as the chronic laminitis.

"The antibodies resulting from vaccination may prevent an endotoxin challenge or simply buy time until a horse can be properly treated," Garner says. "It does not prevent colic nor diarrhea, it just increases an animal's chances with endotoxins, which complicate all those diseases."

Garner recommends that the vaccine be given to horses six months or older as part of a normal vaccination routine.

"The vaccine we have genetically engineered causes the horse to build up an immunity against these endotoxins," Sprouse says. "And the beauty of the vaccine is it has broad cross-protective elements. The antibodies that the horse builds will

have success against many gram-negative bacteria, not just one."

Eventually, the vaccine may be applied to other animals, such as cattle and hogs. The research also may be used to develop a control for some of the gram-negative bacteria-based disorders that affect infants, especially in Third World countries.

Garner and Sprouse teamed up on this project in 1974 because Garner, who teaches at the Equine Center, needed a method to prevent either laminitis or endotoxemia.

"Both are clinical problems of the horse that I was dealing with virtually every day," he says. "But we didn't know how the problems were complicated by endotoxemia. And if you don't know the mechanisms of something, you don't know how to fix it."

The pair spent seven years characterizing the diseases in horses and looking for the causes. They were fairly sure nine years ago that endotoxins were involved, but it was only four years ago, when they switched bacteria strains, that the work neared the stage of developing the vaccine.

"We switched to another mutant strain of bacteria," Garner says. "Sprouse's background and laboratory experience pointed him toward that. That kind of thing only dawns on you after you've been in the trenches fighting for a while.

"There are a couple of unique

things about the vaccine: It is cross-protective against several varieties of gram-negative bacteria, and the toxoid portion of the vaccine stimulate the animal's immune system," he says. "It is this combination of these two ideas that was the breakthrough."

Garner and Sprouse are currently working on an anti-endotoxin hyperimmune serum, an antidote for colic, carbohydrate-induced laminitis, foal septicemia, gram-negative diarrhea and gram-negative metritis. It is hoped the USDA will approve the serum for use by the end of the summer.

"It will be directed at the actually ill animal," Garner says. "It will provide an immediate source of antibodies. This passive immunity (immediate, short term) provided by the hyperimmune serum is in contrast to active immunity (long term) provided by the vaccine. It requires a month for a horse to develop its own antibodies after vaccination.

"It is recommended that an individual horse be vaccinated initially, followed in two weeks by a booster and a yearly booster thereafter."

The pair was funded in their research by a \$170,000 grant from the American Quarter Horse Association, a \$100,000 grant from the USDA and a \$150,000 grant from Schering-Plough.

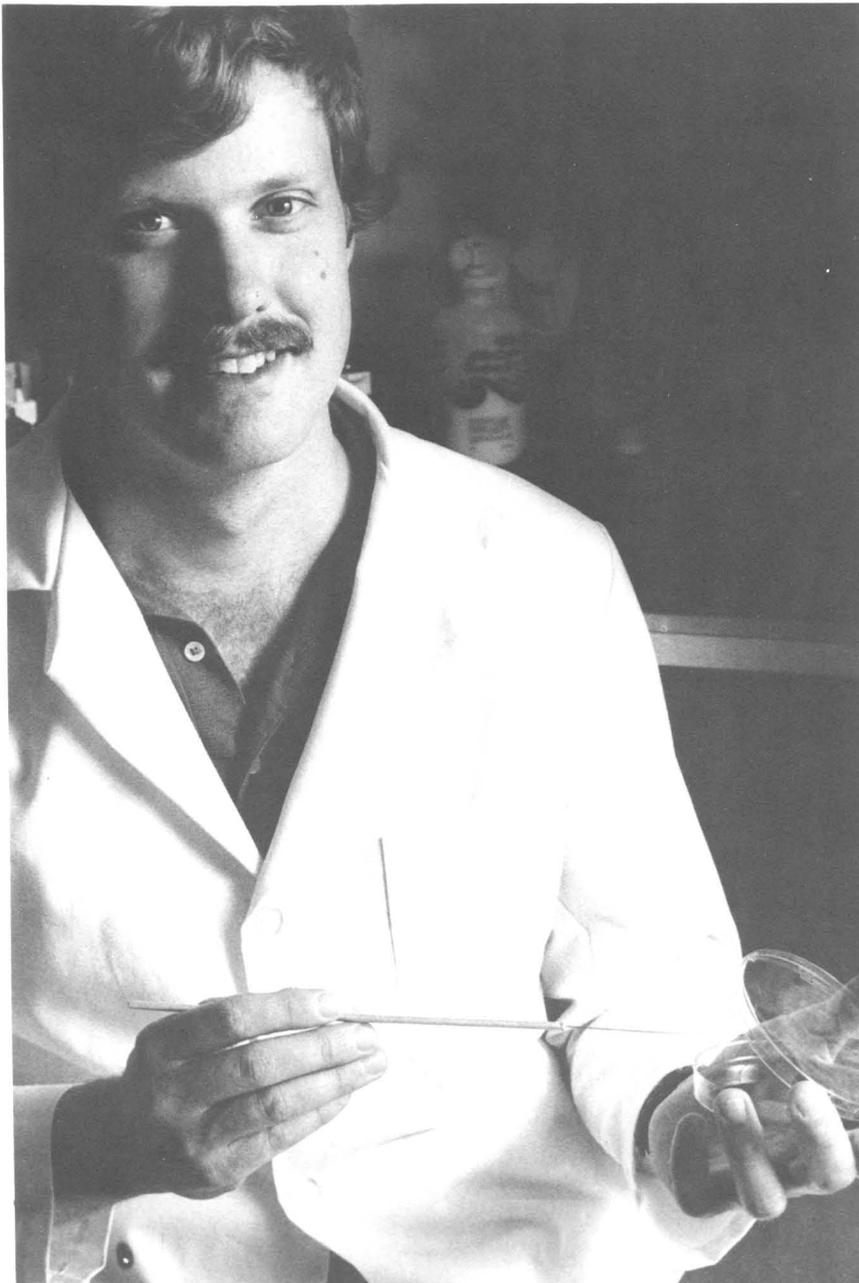


Dr. Harold Garner, professor of medicine and surgery, left, was instrumental in developing a revolutionary vaccine for horses. The work was conducted at the college's equine facility at Middlebush Farm, above.

LONG HOURS, LOW PAY AND A THIRST FOR KNOWLEDGE

STORY BY ROBERT KOHLMAN

PHOTOS BY PATRICK NICHOLS



Kevin Kohne

KEVIN Kohne, 25, is a city boy raised in South St. Louis. He chose two of his three externships—at the Ramsey (Ill.) Veterinary Clinic and the Howard County Veterinary Service in Fayette, Mo.—because they were rural practices and provided work with large animals.

“I grew up in the city, and I was always more comfortable with smaller animals,” he says. “I took two free blocks with mixed-animal practices because I was weak in that area and I wanted to make myself more marketable. But I don’t know if anything can replace growing up on a farm and being with large animals day in and day out.”

He did work at one small-animal practice—the Oakville Veterinary Clinic in St. Louis. After he graduates, Kohne plans to work at a mixed-animal practice, although he wants to end up in small-animal medicine eventually.

“I’m just a lot more comfortable with small animals,” he says. “It’s what I grew up with. When I was on my externships, I did a lot more hands-on work at the small-animal clinic because I was more confident doing that.”

DAN Peter, 30, found the client and marketing aspects of running a practice the most valuable part of his externships.

“I think client contact and management is something that is going to make you or break you,” he says. “It doesn’t matter how good a veterinarian you are; if you can’t keep your clients you are not going to survive.”

“The client contact is much different from what we get at the (college’s) clinic, especially in rural areas,” he says. “Farmers are a different breed than the people who

WHAT Kitty Gepford, 28, learned in her three externships was how much she had left to learn.

In school, "We get a lot of what we call zebras. There are a lot of unusual cases," says Gepford, who is pictured on the magazine cover. "But you go out on externships and you get to see a bit of everyday things."

Externships, taken by third- or fourth-year veterinary students during one of their four one-month free blocks, is a chance for on-the-job training to supplement college training. The pay is low; \$150 a

week is considered good money. And the hours are long; 12- to 15-hour days, six days a week, are not uncommon. But students agree the experience is worth it.

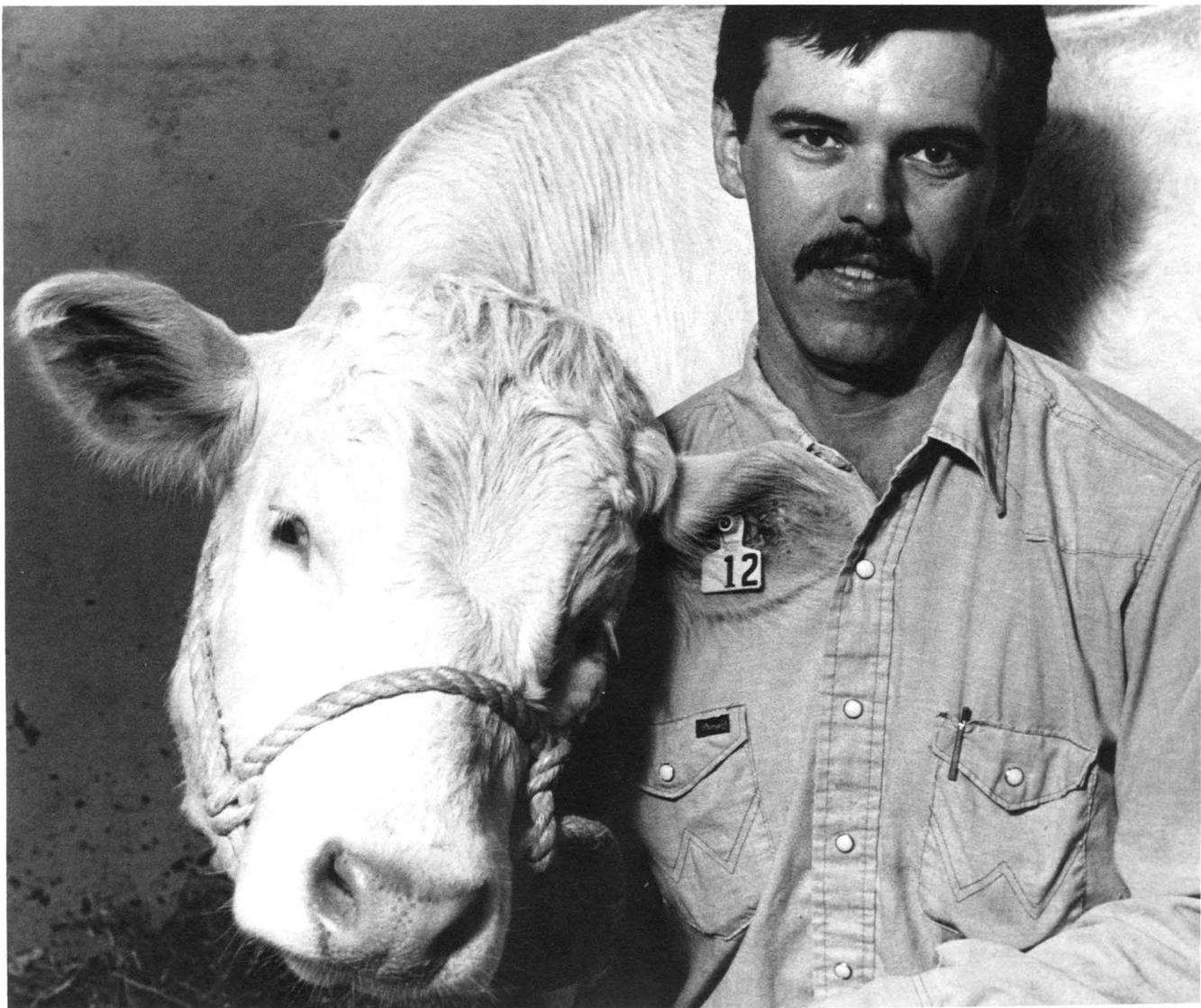
Gepford worked at the Alamo Rintado Equine Clinic in Santa Ynez Valley, Calif.; the Santa Barbara (Calif.) Equine Practice; and at the Callaway County Veterinary Clinic in Fulton, Mo. She also spent one free block studying neonatal foal care at the University of Florida in Gainesville.

At the Callaway mixed-animal practice, Gepford performed routine

surgery in the clinic and also accompanied a veterinarian on his rounds. Long days turned into long weeks; often she worked on Sundays. But the time and effort paid off.

"At most of the places where I have been looking for jobs, the comment has been that they like Missouri students because they always come out ready to practice," Gepford says.

Here, five fourth-year students share the lessons they learned at small-animal to exotic-animal externships in locations from New York to California.



Dan Peter

bring their poodles into the clinic."

Peter, who plans to enter a mixed-animal practice when he graduates, worked at the Brookfield (Mo.) Veterinary Clinic and the Callaway County Veterinary Clinic

in Fulton, Mo. Eventually he plans to set up a mixed-animal practice of his own.

"I paid a lot of attention to the way they handled things in the office and the way they handled

clients," he says. "We don't have a business management course at the college, and it's something I think is very important. You can pick it up on your own, but experience is the best teacher."

WHILE he was an undergraduate student in field biology at Washington University in St. Louis, Marty Greenwell, 27, decided he wanted to help preserve rare and endangered animals. He thought the best way he could contribute was as

a veterinarian in a zoological park. Greenwell's externships have all been geared to provide him with exposure to exotic animals. He has worked at the St. Louis Zoo; the National Zoo in Washington, D.C.; and at the Black Mountain Veteri-

nary Clinic in Henderson, Nev. Black Mountain owner Gary Weddle, BSF '72, DVM '78, specializes in exotic animal medicine.

"I was interested in studying animals in the field, their preservation, and gathering and disseminating information," says Greenwell, a Florissant, Mo., native.

"I am all for preservation in the wild, but the way Third World and African countries are going, there is not going to be much land left for the animals," he says. "The modern zoo is the safety valve. The breeding of captured animals is going to be very important for the preservation of many animals."

During his zoo externships, he was allowed to draw blood and radiograph, but neither zoo let him take on a case by himself.

"Zoo animal medicine is probably the youngest specialty in veterinary medicine. It's a lot of trial and error. It's a real challenge, but that's what attracts me, also. I can be a pioneer, an explorer. I can open up new avenues of knowledge."



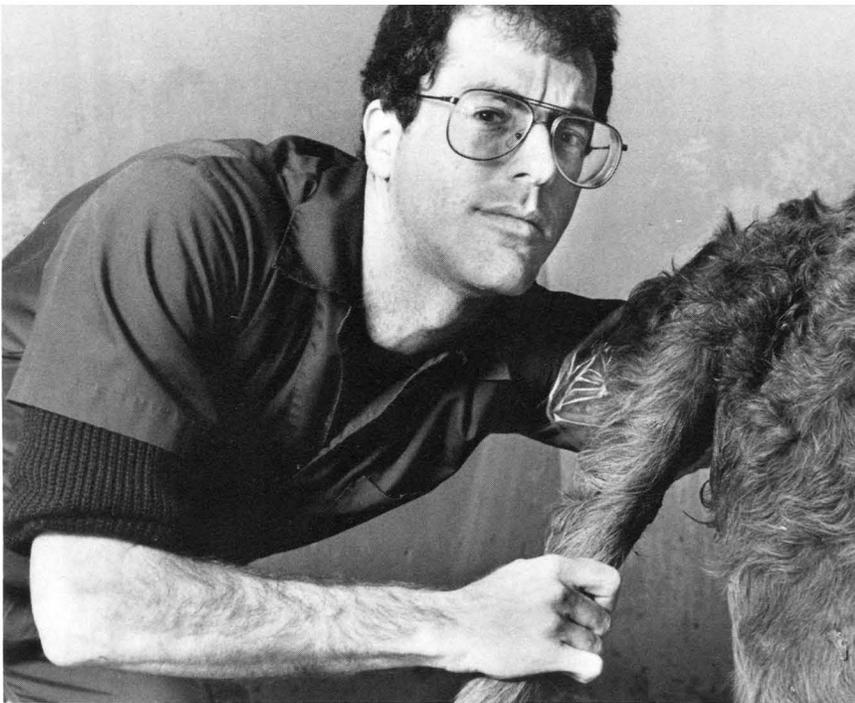
Marty Greenwell

BARRY Kipperman, 28, landed a position after his externship experience at three small-animal clinics in New York City.

Kipperman, who was an extern at the Manhattan Veterinary Group, the Westside Veterinary Center and the Animal Medical Center, begins a one-year internship at the AMC after graduation.

"I wanted to get back to New York and develop contacts there," says the Manhattan native. "Had I not made those contacts and gone to those places, I would not have gotten the internship."

Primarily interested in small-animal medicine, Kipperman says he spent most of his time watching other veterinarians work.



Barry Kipperman



"If you know you want to work in a certain area, it's nice to have gotten your feet wet in that area," Kipperman says. "That's why I went to Manhattan."

His internship at the AMC could lead into a residency and a specialty in internal medicine, or it could lead him straight into a private small-animal clinic.

"One of the reasons I'm pleased about acquiring the internship is that it will give me greater professional freedom.

"It will allow me to work in a high-quality practice when I finish, and it will allow me to demand a higher salary."

NATALIE Rabiner's most vivid memory from her three externships was the time she saved Freckles. The dog had protracted pravo virus enteritis, its pupils were dilated and it was gasping for breath. Rabiner did not give it much hope.

"Usually when a dog's pupils are dilated and fixed, you know it's on its way to doggie heaven," says Rabiner, 29. "But I initiated emergency treatment and we kept it in the clinic for a week. It lost about half its body weight, but it came out of it. I was really amazed. I saved that dog from death."

Rabiner also performed surgery at her three externships at the Mohave Valley (Ariz.) Animal Hospital; the Highland Park Animal Hospital in Los Angeles; and the Tropicana Veterinary Clinic in Las Vegas.

Most of the surgeries were elective and routine, such as spays, neuters and lump removals. She also did several exploratory procedures as well as foreign-body removals.

"At a couple of the clinics, I was in charge of the hospitalized patients," she says. "At one (in Arizona) I was able to see clients as well."

Natalie Rabiner

AROUND THE COLLEGE

The college's SCAVMA auxiliary chapter hosted the first SCAVMA regional meeting Oct. 25 in Columbia.

Twenty-one delegates, from Texas, Illinois, Iowa, Ohio and Missouri, participated in workshops on leadership duties, membership drives, programming and special projects.

Biomedical Sciences

Dr. H. Richard Adams, professor and chairman, presented "Intrinsic cardiodynamic response to shock and trauma" at the Louisiana State University Medical Center Dec. 16 in New Orleans.

Dr. Esther M. Brown, professor, published "Textbook of Veterinary Histology," third edition, with H.D. Dellman in January. The book is now translated into five languages.

Dr. V.K. Ganjam, professor, and C.B. Chastain wrote the book, "Clinical Endocrinology of Companion Animals," published by Lea & Febiger.

Dr. Calvin Hale, assistant professor, presented "Adenosine transport in SL vesicles" and "Effects of endotoxin in shock in Na-Ca exchange" at the American Physiological Society meeting Oct. 6 to 9 in New Orleans.

Dr. Ronald Korthuis, assistant professor, presented "Role of humoral factors and reduced vascular sensitivity to norepinephrine in the intestinal hyperemia associated with experimental diabetes mellitus" and "Neurohumoral effects on fluid exchange in the skeletal muscle microcirculation" Oct. 5 to 10.

Dr. M. Harold Laughlin, associate professor, J.F. Amann and J.

Robertson received a \$57,544 grant from the National Institutes of Health for the study called "Training: Muscle blood flow and capillary dynamics." He presented "Acute and chronic effect of exercise on muscle blood flow" Jan. 28 at the University of Mississippi-Jackson.

Dr. Mark Novotny, research assistant, and H.R. Adams published "New perspectives in cardiology: recent advances in antiarrhythmic drug therapy" in the Journal of the American Veterinary Medical Association, Vol. 189, No. 5, 535-539, 1986.

Dr. Vincent St. Omer, professor, published "Behavioral and developmental effects in rats following in utero exposure to 2,4-D/2,4,5-T mixture" with F.K. Mohammad in Neurobehavioral Toxicology and Teratology, 8:551-560, 1986. He presented "Clinical use of antibiotics in equine practice" to the Trinidadian Veterinary Fraternity Dec. 16 in Port-of-Spain, Trinidad and Tobago. St. Omer presented "Postnatal developmental neurotoxicity of secalonic acid in suckling mice following exposure via Dam's milk" at the 16th annual meeting of the Society for Neuroscience Nov. 8 to 16 in Washington, D.C.

Diagnostic Laboratory

Dr. Cynthia Besch-Williford, assistant professor, presented "Diagnosis and treatment of rabbit enteritis complex" at the MAKO Commercial Rabbit Meat Producers Conference Sept. 6 in Bolivar, Mo.

Dr. William H. Fales, professor, presented "In vitro indications of antimicrobial resistance with bovine

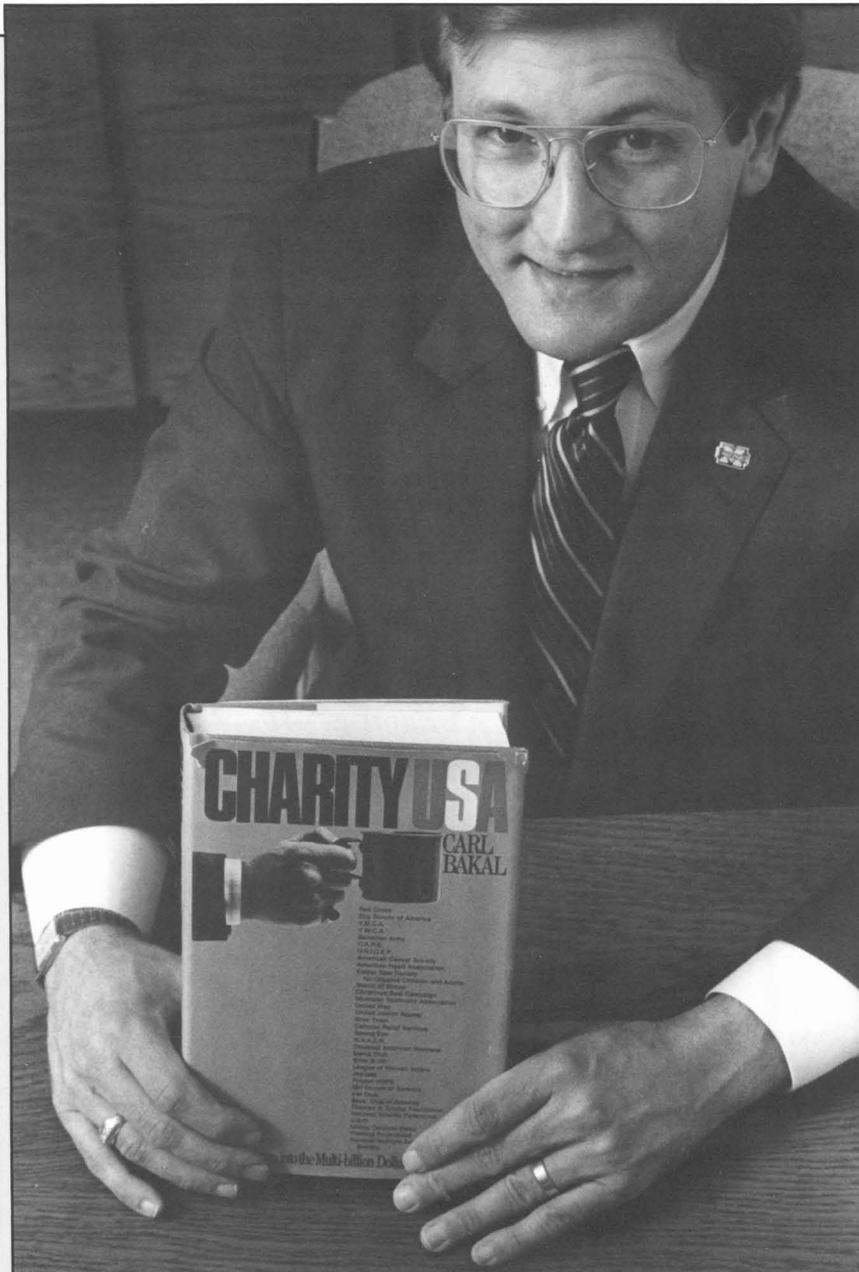
and porcine isolants of pasteurilla using a beta lactamase test" at the Conference of Research Workers in Animal Disease Nov. 17 and 18 in Chicago. He presented "Use and comparison of minimal inhibitory concentration and disk diffusion antimicrobial susceptibility testing with bovine isolants of *P. hemolytica* type and pasteurilla multocida recovered from Missouri cattle with BRDC," which he wrote with J.N. Berg and L.G. Morehouse, at the meeting of the American Association of Veterinary Laboratory Diagnosticians Oct. 19 to 21 in Louisville, Ky.

Dr. Ann Kier, associate professor, presented "Hageman trait studies: an animal model" Oct. 17 at the University of Cincinnati Medical School. She published "Regulation of transbilayer distribution of a fluorescent sterol in tumor cell plasma membranes," with W.E. Cowlen and F. Schroeder, in Biochemical Biophys Acta, 861:287-301, 1986.

Dr. Emmet L. McCune, professor, presented "Current trends in turkey disease in Missouri" at the Missouri Turkey and Egg Convention Oct. 7 and 8 in Springfield.

Ted McSheehy, supervisor, was awarded the mid-Missouri branch AALAS Technician of the Year Award for 1986. This annual award is given to a technician, employed in a laboratory animal facility, who is an outstanding employee and shows dedication to common goals in laboratory animal science.

Dr. L.G. Morehouse, professor and director, served on the Missouri Department of Agriculture Advisory Committee to State Diagnostic Laboratories Oct. 30 in Jefferson City. He served as a consultant to the Commission of Agriculture of



Michael C. Tarry, the college's new development officer, is raising money for college improvements, including expanding facilities, increasing research and continuing renovations.

Raising funds for the college

When the lights go out at the College of Veterinary Medicine, they take everything down with them—including laboratory and clinical equipment. Unlike most medical facilities, the college is without an auxiliary power source.

The college needs to raise about \$5.6 million from private sources to expand its inadequate facilities, increase research and continue renovations, says **Michael C. Tarry**, the college's new development officer.

Specifically, the college wants to move the Equine Center to campus and acquire an alternative power supply, as well as purchase major equipment, such as a gas chromatograph/mass spectrophotometer, a photomicroscopy unit and automated antimicrobial sensitivity testing equipment.

"There are big challenges ahead of the college," Tarry says. "It's a big job." The University also has asked the state for \$15.75 million to expand the college's facilities, but the legislature will not provide the expansion funds unless the college also raises money on its own, he says.

Tarry, who began working full time for the college in February, is contacting alumni, friends, veterinary supply houses and major corporations for donations.

"We are going to contact the people who brought pets into the clinic, the people who have a warm place in their hearts for veterinary medicine," Tarry says. "We hope, because of the treatment of their pets, they will stand with us in our time of challenge."

the Commonwealth of Pennsylvania on diagnostic laboratory facilities and functions Nov. 24 to 26 in Harrisburg, Pa. He also served as a consultant to the American Institute of Biological Sciences-National Academy of Science Dec. 1 to 3 in Washington, D.C. He served as secretary-treasurer to the board of governors, as treasurer and member of laboratory accreditation, and as a member of the executive board of the U.S. Animal Health Association

at the American Association of Veterinary Laboratory Diagnosticians meeting Oct. 17 to 24 in Louisville, Ky.

Morehouse and R. Solorzano presented "Annual report of the Missouri enteric diseases of swine" at the NC-62 meeting on the Enteric Diseases of Swine project at Tuskegee Institute, Sept. 30 to Oct. 1 in Tuskegee, Ala. He served as a site visit team member for diagnostic laboratory accreditation at

Louisiana State University Sept. 9 to 11 in Baton Rouge, La.

Dr. Merl Raisbeck, assistant professor, presented "Heptachlor contamination of dairy, beef and swine: the experience in Missouri" at the American Association of Veterinary Laboratory Diagnosticians Oct. 19 to 21 in Louisville, Ky. Raisbeck and G.E. Rottinghaus received a \$52,500 U.S. Department of Agriculture contract to investigate heptachlor contamination and



Inadequate funding forced college officials to allow North Farm buildings to deteriorate.

End of an era: North Farm closes after 71 productive years

The College ended a 71-year chapter in the fight against animal disease Jan. 1 when it closed the University's only veterinary research farm, North Farm.

The farm, a 90-acre plot three miles north of Columbia, has hosted research in such diverse areas as hog cholera, rabies, Texas cattle fever and fowl typhoid in turkeys. The first discovery of cytauxzoonosis, an infection of cats and bobcats, came from research done there.

"It's with serious misgivings that I close this chapter in the history of veterinary medicine in Missouri," says Dean Robert F. Kahrs.

The college was forced to close

the facility after years of under funding. In 1975, inadequate resources forced the college to stop maintaining the farm, and many of the buildings on the property have collapsed or are beyond repair.

The farm also has lost 19 acres of land to a highway and a railroad which cut across the corner of the property. The main farm is now 66 acres, and there is an additional 10 acres separated from the farm by the highway.

Kahrs has requested University approval and funding for a Center for Applied Research in Animal Health and Welfare Technology. The center may be placed at the

University's Sinclair Farm, which already contains other research facilities.

The North Farm, which has been valued between \$350,000 and \$400,000, will probably be sold by the University. It has been zoned for commercial use.

The money from the sale of the farm could be divided among the 19 schools and colleges at Mizzou, although Kahrs said the money may be returned to the college.

"I hope the money can be dedicated toward animal research facilities," he says. "That would be a good faith gesture and I think there's a lot of good faith."

develop a strategy to decontaminate cattle.

Dr. George Rottinghaus, assistant professor, presented the posters "Sodium hypochlorite degradation of zearalenone," which he co-wrote with B. Olesen and R. Pankayatselvan, and "Economical method for vomitoxin removal from scab infected wheat," which he co-wrote with S. Searles and E.J. Searles, at the 21st Midwest Regional American Chemical Society meeting Nov. 5 to 8 in Kansas City. He published "Comparison of serological tests for detection of antibodies to sendai virus in rats," which he wrote with S.V. Gibson and J.E. Wagner, in *Laboratory Animal Science*, Vol. 36, No. 5, October 1986, 496-498. He

published "Novel trichothexenes from *Fusarium sporotrichoioides*," with D.G. Corley and M.S. Tempesta, in *Tetrahedron Letters*, 27:427-430, 1986. He published "CD additivity in trichothecene benzoates: application as a microanalytical method for trichothecene characterization," with E.M. Oltz, K. Nakanishi, B. Yagen, D.G. Corley and M.S. Tempesta, in *Tetrahedron*, 42:2615-2624, 1986.

Rottinghaus published "New trichothecene mycotoxins of *Fusarium sporotrichoioides* (MC-72083)," with D.G. Corley, J.K. Tracey and M.S. Tempesta, in *Tetrahedron Letters*, 27:4133-4136, 1986. He wrote the chapter, "A review of TLC and HPLC methods for analysis of

aflatoxins in commodities," which appeared in "Diagnosis of Mycotoxicosis," J.L. Richard and J.R. Thurston, editors, Martinus Nijhoff Publishers, Dordrecht, The Netherlands, pp. 239-255, 1986. He served on the American Association of Veterinary Laboratory Diagnosticians Toxicology Advisory Committee and the Committee on Mycotoxins Oct. 19 to 21 in Louisville, Ky. **Dr. Robert Solorzano**, professor, served on the bluetongue virus committee at the American Association of Veterinary Laboratory Diagnosticians meeting Oct. 19 to 21 in Louisville, Ky., and United States Animal Health Association Oct. 19 to 24 in Louisville. He represented Missouri and presented "Pseudorab-

ies research at UMC" at the annual NCR-115 meeting in Ames, Iowa.

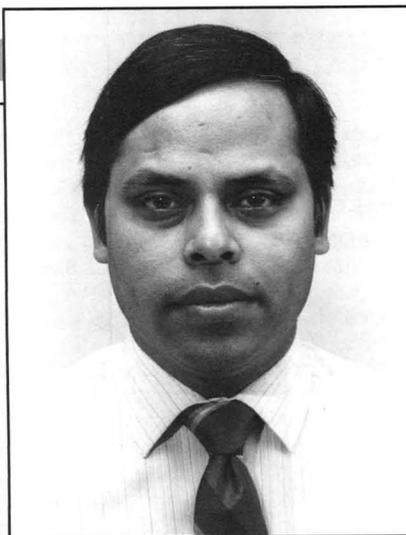
Dr. James Turk, associate professor, presented "Prevalence of swine disease" at the Missouri Veterinary Medical Diagnostic Laboratory and at the American Association of Veterinary Laboratory Diagnosticians meeting Oct. 19 to 21 in Louisville, Ky., and at the 62nd annual Conference for Veterinarians Nov. 9 in Columbia. He presented "Lectin peroxidase staining of canine round cell tumors" at the American College of Veterinary Pathologists annual meeting (Surgical Pathology Specialty Group) Dec. 3 in New Orleans.

Dr. Margaret Turk, associate professor, published "Chemical modulation of three-methylindole toxicosis in mice: effect on bronchiolar and olfactory mucosal injury," with W. Flory and W.G. Henk, in *Veterinary Pathology*, 23:563-570, 1986. She presented "Pathologic changes in the progression and resolution of equine pharyngitis" at the American Association of Veterinary Laboratory Diagnosticians meeting Oct. 19 to 21 in Louisville, Ky. She presented "Diagnostic features of common canine skin tumors" at the fourth Congress of Veterinary Pathologists Sept. 17 to 20 in Cordoba, Spain. Turk presented "Diagnosis of abortion in food animals" at the 62nd Annual Conference for Veterinarians Nov. 10 in Columbia. She presented "Scanning electron microscopy of 3-methylindole-induced bronchiolar epithelial damage in mice" at the American College of Veterinary Pathologists annual meeting (Pulmonary Pathology Specialty Group) Dec. 2 in New Orleans.

Dr. Catherine Vogelweid, senior research lab technician, presented "The determination of common antigen between serotypes of *H. pleuropneumoniae* in immunized rabbits and swine" and led the anatomy and pathology section of a meeting at the Conference of Research Workers in Animal Diseases Nov. 17 to 18 in Chicago.

Medicine and Surgery

Dr. M. Joseph Bojrab, professor, presented "Physical exam and AHT in surgery of respiratory system" at the Surgical Forum Oct. 27 to 29 in Chicago. He presented "Superficial cosmetic surgery and surgery of head and neck" at the American



Dr. Bimal Kumar Ray

New faculty

Dr. Bimal Kumar Ray joined the college in September as an assistant professor in microbiology.

Ray, who received his bachelor's degree in chemistry and his master's degree and PhD in biochemistry from Calcutta (India) University, was a researcher at Washington University in St. Louis from 1977 to 1986. His research interests are molecular genetics of eucaryotic and molecular parasitology.

Animal Hospital Association regional meeting Oct. 23 to 24 in Charleston, N.C.

Dr. William Braun, associate professor, presented "Diagnosis and control of abortion in goats" at the annual conference of the American Dairy Goat Association Oct. 12 to 18 in Minneapolis. He presented "Selected topics in caprine reproduction" at the fall conference of the Society for Theriogenology Sept. 18 to 19 in Rochester, N.Y.

Dr. Bruce Clark, assistant professor, presented "Rapid Progesterone assay, a new and important tool for reproductive management" at the 12th annual Food Animal Medicine Conference Oct. 13 and 14 in Columbus, Ohio.

Dr. E. Allen Corley, professor, presented "Hip dysplasia and the orthopedic foundation for animals" at the Welsh Corgi National meeting Sept. 11 and 12 in Dallas.

Dr. Louis A. Corwin Jr., professor, presented "Radioisotope radiotherapy of canine primary bone tumors with samarium-153 EDTMP" at the American Society for Therapeutic Radiology and Oncology meeting Nov. 2 to 7 in Los Angeles.

Dr. Ross P. Cowart, associate

professor, attended the Foreign Animal Disease Diagnostic Laboratory training course Nov. 16 to 22 in Greenport, N.Y.

Dr. James Creed, professor and chairman, presented "Selected soft tissue surgery techniques" and "Stabilization of long bone fractures with pins and wires" to the New Mexico Veterinary Medical Association Oct. 31 in Las Cruces, N.M. Creed presented "Principles of intramedullary pinning," "Thoracolumbar disk syndrome" and "Principles of rigid internal fixation" Oct. 5 to 19 to veterinarians in Tokyo, Osaka and Fukuoka, Japan.

Dr. Eleanor Green, assistant professor, presented "Recurrent esophageal obstruction in the horse: neurologic considerations," at the American Association of Equine Practitioners meeting Nov. 30 to Dec. 3 in Nashville, Tenn. She presented "Equine laminitis/endothemia: pathophysiology and therapeutics" and "Laboratory findings in equine diseases" at the Indiana Veterinary Medical Association meeting Feb. 1 to 3 in Indianapolis.

Dr. W. Grant Guliford, resident, presented "Canine bladder stones" to a breeder's society Dec. 3 in St. Louis.

Dr. Brent Jones, associate professor, presented a series of lectures Oct. 9 to 12 at the Swedish University of Agricultural Sciences in Uppsala. The lectures were: "The medical problem of vomiting," "The medical problem of regurgitation," "Diseases of the stomach," "The pathophysiology and therapy for acute diarrhea," "The medical problem of chronic diarrhea," "Functional bowel diseases," "Biochemical evaluation of liver diseases," "Liver biopsy techniques," "Diseases of the liver," "Diseases of the pancreas," "Introduction to veterinary endoscopy," "Upper gastrointestinal endoscopy" and "Lower gastrointestinal endoscopy."

Jones presented "The use of liver function tests: a clinician's perspective," "Pathophysiology, diagnosis and therapy of hepatic disorders," "The malassimilation syndromes I and II," "Pathophysiology and treatment of acute diarrhea," "GI function tests (AHT)" and "Obtaining and care of pathology specimens (AHT)" to the Society of Ontario Veterinarians Jan. 29 to Feb. 1 in Toronto.

Dr. Richard Linhart, resident, presented "Use of a rapid progesterone enzyme immunoassay as an aid

in estrus detection in physiologically anestrus dairy cows treated with prostaglandin" at the annual meeting of the Society for Theriogenology Sept. 18 and 19 in Rochester, N.Y.

Dr. Terri McCalla, resident, presented "Multilobular chondroma in a dog: a case report" at the Comparative Ocular Pathology Conference Nov. 19 in Urbana, Ill.

Dr. Cecil P. Moore, associate professor, presented "Selection of biopsy site for quantification of conjunctival goblet cells," "Microbial isolates from two groups of Southern Wisconsin horses" and "Intraocular lens implantation in laboratory beagles" at the American College of Veterinary Ophthalmologists and International Society of Veterinary Ophthalmology meetings Nov. 6 to 9 in New Orleans. He presented "External and internal ocular diseases of small animals" to the Nebraska Academy of Veterinary Practice Sept. 18 in Omaha, Neb.

Dr. Craig Smith, resident, presented "Use of a rapid milk progesterone assay to aid in monitoring and treating cystic ovarian disease" at the annual meeting of the Society for Theriogenology Sept. 18 and 19 in Rochester, N.Y.

Dr. James Tomlinson, assistant professor, presented "Wobbler Disease" at the Las Vegas Veterinary Medical Association meeting Jan. 22 in Las Vegas, Nev. He presented "Orthopedic surgery" to the North Carolina Veterinary Medical Association meeting Jan. 16 in Raleigh, N.C., and to the Dayton Veterinary Medical Association meeting Jan. 31 in Dayton, Ohio.

Dr. A. David Weaver, professor, presented "Tibial neurectomy for the correction of spastic paresis in calves" at the American Association of Bovine Practitioners meeting Nov. 18 to 21 in Louisville, Ky. He was the chairman of a session at the 14th International Meeting on Diseases of Cattle, World Association for Buiatrics Aug. 26 to 29 in Dublin, Ireland.

Microbiology

Dr. Hans Adldinger, professor, presented "Epstein-Barr virus DNA contains insertional element downstream of EBNA-2 exon" at the annual meeting of the German Association for Hygiene and Microbiology Oct. 1 to 4 in Freiburg,

Germany. He published "Geographical prevalence of two types of Epstein-Barr virus," written with U. Zimmer, G.M. Lenoir, M. Vuillaume, M.V. Knebel-Doeberitz, G. Laux, C. Desgranges, P. Wittmann, U.K. Freese, U. Schneider and G.W. Bornkamm in *Virology*, 154, 56-66, 1986.

Dr. John Berg, professor, and W.H. Fales conducted a workshop called "Veterinary bacteriology in the clinical laboratory" at the American Society for Microbiology regional meeting Oct. 12 to 21 in Louisville, Ky. He received a \$33,077 National Food Training Grant in Biotechnology, as related to food animal health and protection, from the U.S. Department of Agriculture.

Dr. Donald Blenden, professor, presented "Principles of postdisaster behavior" at the Mass Casualty Management seminar Oct. 16 in Columbia.

Dr. Gerald Buening, professor, presented "Immunology of anaplasmosis" at the seventh National Congress of Parasitology Oct. 16 to 18 in Pueblo, Mexico. He also participated in round table discussions at the congress with Mexican scientists concerning immunoprophylaxis against bovine hemotropic diseases. Buening presented "Development, specificity and sensitivity of a DNA probe to detect babesia bigemina infected erythrocytes," written with P. Myler, A. Barbet and T.C. McGuire, at the annual Anaplasmosis Research Workers meeting in Baton Rouge, La. Buening and D.G. Thawley received a \$96,147 grant from the U.S. Department of Agriculture for the "Detection of anaplasma marginale in bovine tissue by in situ hybridization." Buening visited the Department of Infectious Diseases at the University of Florida in Gainesville from Jan. 18 to Feb. 1 as part of a collaborative research project.

Dr. Julio Figueroa, research associate, presented "Production of monoclonal antibodies against babesia bigemina," written with G.M. Buening and T.J. Green, at the seventh National Congress of Parasitology Oct. 16 to 18 in Pueblo, Mexico. He also participated in round table discussions at the congress with Mexican scientists concerning immunoprophylaxis against bovine hemotropic diseases. He presented "Antigen characterization and in vitro growth inhibition

of babesia bigemina by monoclonal antibodies," written with G.M. Buening and T.J. Green, at the annual Anaplasmosis Research Workers meeting in Baton Rouge, La.

Sara Green, senior research lab technician, and Robert Corwin, presented "Evaluation of two serodiagnostic tests for *Dirofilaria immitis* antigens" at the Conference of Research Workers in Animal Disease Nov. 15 to 18 in Chicago.

Dr. Eric Miller, adjunct assistant professor, presented "Cardiomyopathy in a greater Indian fruit bat" and "Hemolytic anemia in the black rhinoceros—an update" at the American Association of Zoo Veterinarians convention Nov. 2 to 6 in Chicago. He led a session on "Hemolytic anemia in the black rhinoceros" at the Management of African Rhinoceroses conference held Oct. 26 to 28 in Cincinnati.

Dr. Manuel Torres-Anjel, associate professor, presented "The microepidemiology of a hypothalamic/hypophysary/thymic effect of rabies virus" at the Research Toward Rabies Prevention meeting of the National Institutes of Health Fogarty Foundation Nov. 5 in Washington, D.C. He published "Hypophysary involvement and immuno/growth depression in rabies I. Bovine Paralytic Rabies," with W. Wolff, T.A. Mollet, F.A. Martz, L. Kintner, D.C. Blenden, M. Turk, D. Volz, M. Riordan, M. Wilson and M. Stafford, in *The Bovine Practitioner*, 21(1):52-58, 1986. Torres-Anjel published "The kinetics of growth in feline infants in the study of FAIDS" in the Proceedings of the 67th annual meeting of the Conference of Research Workers in Animal Disease held Nov. 17 and 18 in Chicago.

Pathology

Dr. David E. Bean-Knudsen, research associate, published "Effect of shipping stress on clinicopathologic indicators in F344/N rats," with J.E. Wagner, in *American Journal of Veterinary Research*, Vol. 48, February 1987.

Dr. Susan Gibson, research associate, presented "The research animal diagnostic and investigative laboratory: how it works and how to use it" at the annual meeting of the Kansas Branch of the American Association of Laboratory Animal Sciences Nov. 14 in Kansas City,

Kan. She presented "A retrospective study of cryptosporidiosis in guinea pigs" at the American Association for Laboratory Animal Science Oct. 4 to 10 in Chicago. She published "Comparison of serological tests for detection of antibodies to sendai virus in rats," with A.A. Rottinghaus and J.E. Wagner, in *Laboratory Animal Science*, 36(5):504-506, 1986.

Dr. Curt Matherne, research associate and National Institutes of Health postdoctoral fellow, presented "Myeloproliferative syndrome in two owl monkeys" at the American Association for Laboratory Animal Science Oct. 4 to 10 in Chicago.

Dr. Bonnard Moseley, associate professor, presented a talk on calving to a cattlemen's meeting Jan. 13 in Farmington, Mo.

Dr. John E.K. Mrema, research assistant professor, published "Erythrocytes and erythrocyte morphologies of colony-born and healthy owl monkeys (*Aotus lemurinus griseimembra*)," with C.W. Caldwell, P.L. Stogsdill, S.T. Kelly and T.J. Green, in the *Journal of Medical Primatology*, 16(2), April 1987.

Dr. LeRoy Olson, professor, pre-

sented "Detecting carriers of swine dysentery in swine" and "Comparison TGE vaccines for immunizing sows" at the fifth Congress of Federation of Asian Veterinary Association Oct. 18 to 21 in Kuala Lumpur, Malaysia. He presented "Genitourinary pathology" at the Armed Forces Institute of Pathology Jan. 23 in Washington, D.C. He published "Presencia de una treponema sp. en cerdo con un proceso diarreico muchohemorragico en Panama," with N. Obaldia and F.M. Contreras, in *Revista Acovez*, 10(1986):4-6.

Dr. Larry P. Thornburg, associate professor, presented a short course on liver disease in dogs and cats Dec. 12 and 13 to the Wichita Veterinary Medical Association in Wichita, Kan. He published "Experimentally induced Tysser's Disease in the African white-tailed rat (*Mystromys albicaudatus*)," with K.S. Waggies and J.E. Wagner, in *Laboratory Animal Science*, Vol. 36, No. 5, October 1986, 492-495. He presented "Effect of formalin ph on histochemical demonstration of copper in canin liver" at the annual meeting of the American College of

Veterinary Pathologists Dec. 1 to 5 in New Orleans.

Dr. Joseph Wagner, professor and chairman, published "Naturally occurring *Bacillus piliformis* infection (Tysser's Disease) in guinea pigs," with K.S. Waggie and S.T. Kelley, in *Laboratory Animal Science*, Vol. 36, No. 5, October 1986, 504-506. He published "Survey of genetic authenticity of commercially produced inbred rats," with C. Kendall and D. Geiger, in *Laboratory Animal Science*, 36(6): 655-658, 1986. He published "Experimentally induced tyzzer's disease in the African white-tailed rat (*Mystromys albicaudatus*)," with L. Thornburg and K.S. Waggie, in *Laboratory Animal Science*, 36(5): 492-495, 1986. Wagner was awarded a \$100,000 contract from the National Cancer Institute for operation of an Animal Disease Diagnostic Laboratory. He also was given a \$120,000 grant for March 1987 to February 1988 for the operation of a Research Animal Diagnostic and Investigative Laboratory from the National Institutes of Health.



ALUMNI

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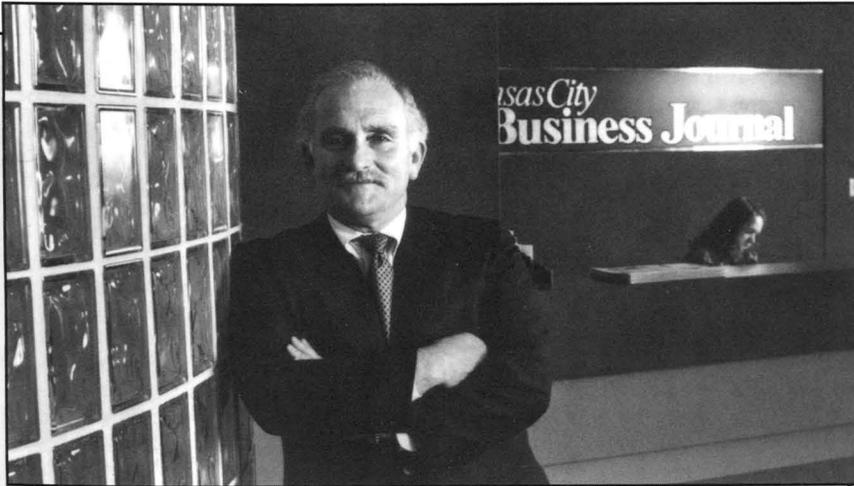
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PEOPLE



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Veterinarian switches careers

For **Bill Worley**, BS Agr '64, DVM '66, no career change seems too big. He has gone from being the owner of a small-animal clinic to vice president of a 36-paper chain of business weeklies in just five years.

As *Forbes* magazine puts it, he is the "veterinarian turned mini-media mogul."

Worley entered the College of Veterinary Medicine because of his suburban-rural background and his love for animals. But soon after graduation he found his interests sidetracked. He dabbled in business—mini-storage warehouses, a Wendy's franchise, coal mining and a beer distributorship. Even when he was practicing veterinary medicine he spent more time buying and selling clinics than he did in surgery.

"I have the attention span of a 4-year-old," says the Kansas City resident. "I never stick to anything for long."

In 1982, he and partner Michael Russell started the *Kansas City Business Journal*, a weekly paper for small- and medium-sized business.

Worley thought the daily newspapers were ignoring the interests of the local businessman. The fact that he knew nothing about journalism didn't faze him at all.

"I had done everything else," he says. "Running a newspaper didn't seem that much harder."

Apparently not. The partners' formula for local coverage is: "If Lee Iacocca runs over Malcolm Forbes, we wouldn't write about it unless it happened in one of our markets." That, combined with in-depth coverage and high ad rates made the *Kansas City Business Journal* so successful that they knew they could expand within six months.

They began by starting another business weekly in San Jose, Calif. Four months later, they bought another, and now Worley and Russell are buying papers 10 at a time.

The job has gotten so demanding that Worley was forced to give up veterinary medicine. He doubts if he will ever go back.

"I'm too much of an entrepreneur."

'53

Kyle C. Kent, BS Agr '49, DVM, was chosen the 1987 Veterinarian of the Year by the Missouri Veterinary Medical Association. Kent is a past board chairman, president and vice president of the MVMA. In 1953, he established the mixed-animal *Kent Veterinary Clinic* in Green City, Mo., which he now runs with his son **Richard Kent**, DVM '74.

'68

Van B. Ricketts, BS Agr '65, DVM, is president-elect of the Missouri Veterinary Medical Association. He started work in December as the director for technical veterinarian service at Pfizer Inc.

'70

Raymond C. Ebert, BS Agr '68, DVM, is vice president of the Missouri Veterinary Medical Association. He owns the *Pleasant Hill (Mo.) Animal Clinic*, a general practice.

'74

James O. Britt Jr., DVM, and his wife, Sally, announce the birth of a son, Adam Todd, Dec. 23. Both parents are employed by the Los Angeles County Health Department, where he is a veterinary pathologist and she is a registered sanitarian.

'75

Lonny W. Dixon, BS Agr '72, DVM, MS '81, left the University of Texas Health Science Center in San Antonio, to become director of animal resources at the Sterling Winthrop Research Institute in Rensselaer, N.Y.

Royal W. Ranney, BS Agr '50, MS '60, DVM, is president of the 850-member Missouri Veterinary Medical Association. He has a mixed-animal practice with two partners in Rolla, Mo.

Tom Lenz, DVM, has received specialty certification in theriogenology from the American College of Theriogenology. Lenz, a resident at a broodmare farm in Fullsheare,



New Jefferson Club member

The donation of Virginia Busch of St. Peters, Mo., will help renovate the

intensive care unit of the small-animal hospital, says Dean Robert Kahrs.

Texas, was one of 16 veterinarians from the United States, Canada, Australia, South America and West Germany to pass the exam.

'80

Larry Coleman, DVM, has started a residency in swine medicine at North Carolina State University in Raleigh after working six years in a practice in Broken Bow, Neb.

Ray Geisman, BS Agr '76, DVM, and his wife, Sherri, announce the birth of a 9-pound, 4-ounce daughter, Sarah Marie, June 13.

Alan Hunnicutt, DVM, and **Tina Cone, DVM '81**, were married in April 1986.

Jim Peddicord, BS Agr '76, DVM, and his wife, **Renee Peddicord, AB '74, MA '75**, announce the birth of a 10-pound, 4-ounce son, Jimmy, Nov. 12.

Cathy Vogelweid, DVM, MS '82, and her husband, **Gary Vogelweid, BS BA '75**, announce the birth of a son, Eric, April 3, 1986.

Kurt Weingand, DVM, is an assistant professor of laboratory medicine at the Kansas State University College of Veterinary Medicine in Manhattan. He previously taught at the Wake Forest University Medical Center in Winston-Salem, N.C.

'83

Jim Travers, BS Agr '77, DVM, was selected as the Jaycee Outstand-

ing Citizen in Blanco, Texas. Travers performs embryo transfers at the Ford Arabians ranch in Texas.

'85

Randy Huenefeld, BS Agr '81, DVM, and his wife, **Kathy Law Huenefeld, BS Agr '82, DVM**, announce the birth of their first child, Jennifer Leigh, Jan. 3. The Huenefelds own and operate the Rolling Meadows Animal Hospital, a mixed-animal practice, in Adrian, Mo.

Richard Markell, BS Agr '81, DVM, has been elected to the board of directors of Reigns, Riding for the Handicapped. He has an equine practice in Fallbrook, Calif.

'86

Ed Migenco, AB '81, DVM, is engaged to Mary Lueckenhoff of St. Elizabeth, Mo. The couple plan an August wedding. Migenco bought the City Animal Hospital in St. Louis in July.

Robin M. Smith, AB '81, DVM, opened the Buttonwood Animal Hospital in Columbia in November with classmate **Richard Rowland, BS Agr '82, DVM**.

Obituaries

Victor Pumarejo-Garcia, VMIII, was killed New Year's Eve in the

DuPont Plaza Hotel fire in San Juan, Puerto Rico. The fire also claimed the lives of his mother and grandmother.

Pumarejo-Garcia was spending his free block as an extern for a Puerto Rican veterinarian.

The Class of 1988 and Omega Tau Sigma plan to purchase a painting in Pumarejo-Garcia's memory for the college.



Dr. Arthur Case, a professor emeritus who joined the college in 1947 as acting chairman of veterinary medicine and surgery, died Jan. 25. He was 76.

Case, who was granted emeritus status by the Board of Curators in 1981, was one of the first faculty to join the college after it was created in 1946.

"Trying to establish the college felt like swimming up a rapid river doing the backstroke," Case said last year, "slow but steady progress."

He was honored in 1977 with a Faculty-Alumni Award from the Mizzou Alumni Association and in 1980 with a Distinguished Service Award from the college.

Case received his bachelor's degree and doctoral degree in veterinary medicine from Kansas State University. He served from 1942 to 1947 on the faculty of the School of Veterinary Medicine at The Ohio State University.

Case is survived by his wife, Annette, two daughters, two sons, two brothers, a sister and two granddaughters.

Memorials may be sent to the College of Veterinary Medicine Library. Make checks payable to the University of Missouri and send to: Dr. K.H. Niemeyer, associate dean, 203 Veterinary Medicine, Columbia, Mo. 65211.



May 1987 graduate displays Mizzou pride on car's license plate

When Joanne Klingele drives down the road, there is no doubt as to where she received her degree. Her personalized Missouri license plate, DVM 87, says it all. Klingele was one of 30 women and 33 men who graduated in college ceremonies May 15. The commencement speaker was Dr. William W. Armistead, vice president for agriculture at the University of Tennessee.

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