

VETERINARY MEDICAL REVIEW

College Improves Relations with Livestock Industry



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

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Dr. Cynthia Trim (center) gives a laboratory demonstration to VMIV students, Pierre Tung (left) and Mike Thompson (right).

Anesthesiologist Recognized for Teaching Excellence

Dr. Cynthia M. Trim, Associate Professor of Veterinary Medicine and Surgery at the College, received the 1980 Alumnae Anniversary Award for Teaching Excellence and Outstanding Contributions to Education at UMC.

A public reception for Dr. Trim was held April 22 on the UMC campus.

Dr. Trim, one of 32 board certified veterinary anesthesiologists in the U.S., is president-elect of the American Society of Veterinary Anesthesiologists.

Dr. Trim, a native of England, received her Bachelor's degree in Veterinary Science from Liverpool University and then spent two years as a research assistant in anesthesiology at the University of Cambridge, where she was awarded the degree of Doctor of Veterinary Anesthesiology.

Following two years in general practice, Dr. Trim became an assistant professor of anesthesiology at the University of Guelph, Ontario, in 1974. In 1976 she was named assistant professor at the University of Illinois. She came to Missouri in 1977.

Teaching and research are among Dr. Trim's main concerns at UMC Missouri's Veterinary College. Whether in the classroom or laboratory, she is a "warm, enthusiastic and inspiring teacher," according to one of the many letters recommending her for the award.

Dr. Trim's research includes investigation of chemical and electrical methods of anesthetizing dogs as well as the study of the patho-physiology of malignant hyperthermia. In humans malignant hyperthermia can be triggered by certain anesthetics, which cause body temperature to rise dramatically. It often

results in death. This problem also affects certain kinds of pigs, which Dr. Trim uses as an animal model for her investigations.

Dr. Trim is director of the College's anesthesiology section, and she also serves on several committees.

As part of the Alumnae Anniversary Award, Dr. Trim receives a citation and \$1,000 from the UMC Alumnae Anniversary Fund Committee for the Recognition of Faculty Women. Alumnae contributed to a permanent fund from which the award is made each year.

Alumnae, faculty and women students of UMC selected by department chairmen were invited to nominate full-time faculty women for the award. Final selection was made by the Alumnae Committee.

Coming: Annual Conference

The 56th Annual Conference for Missouri Veterinarians will be held October 12 and 13, 1980, at the Ramada Inn in Columbia. For more information, please contact Dr. John Rhoades, W-234 Veterinary Medicine Bldg., College of Veterinary Medicine, University of Missouri-Columbia, Columbia, MO 65211.

On the evening of October 11, 1980, the Classes of 1955, 1965, and 1975 will hold reunions at Columbia's Ramada Inn. For more information on these reunions, please contact Dr. Kenneth Niemeyer, W-203 Veterinary Medicine Bldg., College of Veterinary Medicine.

Zambian University Official Examines College's Administration Procedures

Dr. Vukani Nyirenda visited the College on March 7 during his 30-day tour of American universities. Dr. Nyirenda is Secretary of the Central Administration, University of Zambia, and he is in the United States to study administration functions and systems of universities that have multi-campus organizations like the University of Missouri.



Missouri's Veterinary College was visited because it performs veterinary services and research for the benefit of the entire state as a single division within a four-campus university system. Furthermore, Missouri's Veterinary College cooperates in some teaching, research, and service ventures with other Columbia-campus divisions such as the College of Agriculture, the School of Medicine, and the College of Engineering.

Dr. Nyirenda stated he is making these studies to help prepare for the University of Zambia's expansion to a three-campus system. Each campus in his country will have responsibilities for interdisciplinary programs in particular areas of need as agriculture.

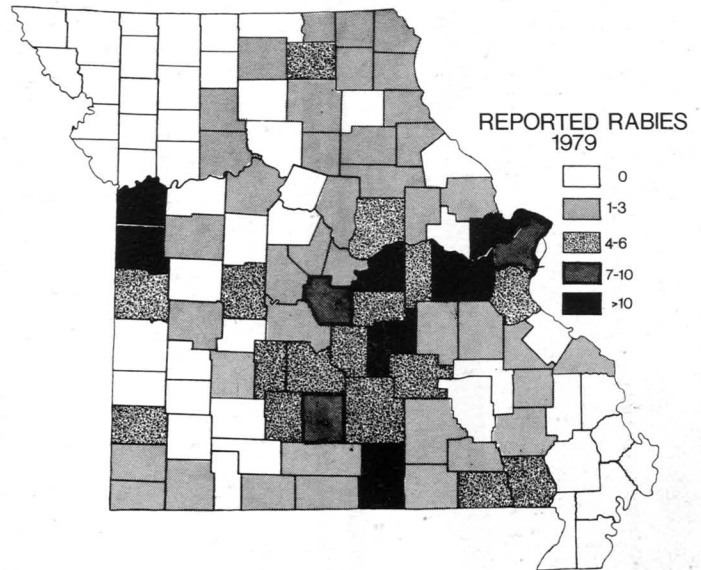
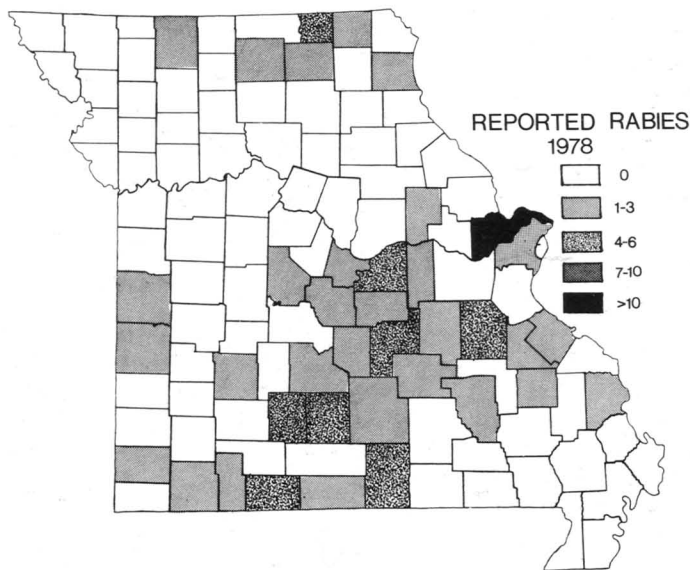
Dr. Nyirenda is a participant in the International Visitor Program, Institute of International Education. This agency provides a means by which the United States can seek solutions to international problems on a people-to-people basis. Mr. James Westmoreland, representative of the agency, accompanied Dr. Nyirenda on his U.S. tour.

Toxicologist Appointed

Dr. George E. Rottinghaus has been appointed Post-Doctoral Associate for the College's Veterinary Medical Diagnostic Laboratory.

Dr. Rottinghaus now works in the Toxicology section of the Veterinary Medical Diagnostic Laboratory. His professional interests include study of metabolites and toxic pollutants of water. He received his PhD degree in 1978 in biochemistry from Iowa State University; his dissertation was on studies of the blue-green alga, *Anabaena spiroides*. From 1978 until his appointment here, he worked at a Post-Doctoral Associate at Iowa State University.





Within a year, there has been a dramatic increase in reports of rabies in Missouri, as demonstrated in the above maps. Of particular concern are high numbers of reported rabies in densely populated counties. The risk of rabies to humans is growing each day in Missouri. All veterinarians are urged to take precautionary measures suggested in this paper.

The Continuing Rabies Problem In Missouri

Donald H. Mueller, DVM, and Donald C. Blenden, DVM, Dept. Veterinary Microbiology

Missouri veterinarians should not be surprised that we are in the midst of a tremendous increase in the occurrence of rabies. Except for forecasting the timing, this increase was predicted.

The increase is primarily concentrated in wildlife species, the skunk in particular. The skunk population has been building up for the last several years. However, the occurrence of rabies had been low for several years, and the skunk population has become "immunologically virgin" to rabies virus. Thus, as the virus enters this new population, there are no impediments to its progress.

With the mild winter we have just experienced, resulting in no natural depopulation of skunks from severe weather, we can expect a large population of skunks lacking resistance to rabies virus: hence, more rabies than before. Since rabies occurs in cycles or waves, and there have been few incidences of rabies in the last few years, we can expect the present wave to be large, and rabies may strike multiple locations before population immunity reaches levels enabling natural control to exert itself. The present wave could last several years and produce numerous rabies "hot spots" in the state.

Three "hot spots" of late 1978 and 1979 will likely fade away but others will pop up. These spots are in east central Missouri (St. Louis, St. Charles, Jefferson,

and Franklin counties), central Missouri just south of the Missouri River (Osage, Maries, and west central Missouri (Jackson, Cass, and Bates counties). At present, increased reports of rabies seems to be filling the gap between the east central and south central areas of 1979. The rest of the state is experiencing moderate increases in occurrence, but only in those areas of Missouri that traditionally report rabies. We can only speculate where the next epidemic areas will occur, but they are surely destined to occur. At this writing, more cases of rabies are being found in St. Charles county.

What do you do about it?

Recognize that the problem is primarily one in the skunk, and that other species in the Midwest are accidental hosts (dog, cat, horse, cow, others). Recognize the risks for what they are so you can educate yourself and your assistants about proper handling procedures of all animals and you can properly advise your clients about rabies risks. Vaccinate every dog and cat you can, and also vaccinate high risk herds of large animals. Use vaccines and vaccination procedures according to the recommendations of the vaccine manufacturers. Encourage your clients to confine and control their pets.

Do not vaccinate other species such as the skunk or the raccoon because no vaccine has been tested nor approved for use in them. We do not know if a vaccine actually stimulates protection in species other than those tested. Be aware and

advise your clients that any pet skunk, even one coming from a pet store, may have been exposed to rabies before purchase by a client. Onset of rabies in any skunk which has already been exposed to and is incubating rabies could be masked by vaccination so that the disease might not be recognized.

Over a decade of editorializing against vaccinating and descenting skunks (and acquiring wildlife species as pets) has gone on in our professional literature. By not accepting these animals as patients is the only way to rest easy.

Skunk rabies is a serious problem in Missouri. The current epidemic period will probably last two or three years, perhaps more. Rabies will continue to spill over from skunks to other species. Rabies surveillance data produced by the Missouri Division of Health and the records of this College gives us all the warning necessary; we only need to heed that warning.

Editor's Note: Drs. Donald Blenden and John Rkoades have completed the film "Think Rabies First". The 20 minute film is intended for an audience of veterinarians and veterinary students, and copies of it are being distributed to all veterinary colleges in the United States and Canada. The Schering Corporation funded production of the film. For information on viewing this film, please contact the Schering Corporation or Continuing Education in Veterinary Medicine, University of Missouri-Columbia.



Cattle industry representatives, along with College administrators, listen to Dean Weide talk about the College's budget.



Dr. Larry Morehouse demonstrates to Mr. Jim Halsey, MFA Cooperative Marketing Association, some findings in the bacteriology laboratory.

College Improves Relations with Livestock Industry

College Sponsors Series of Meetings with Representatives of Missouri's Livestock Industry: The Missouri Food Animal Production Conferences Program

"We hope these meetings will help build new bridges between the College of Veterinary Medicine and the livestock industry of Missouri," said Dr. Lloyd Faulkner to open the first of two series of meeting between members of the College and representatives of Missouri's food animal industry. After the last meeting had adjourned, everyone agreed that indeed new bridges had been built.

In intensive, two-way sessions held at the Memorial Student Union on the Columbia campus, College administrators and select faculty met first with representatives of the cattle industry, March 26 - 28, and then with representative of the swine industry, April 9 - 11.

The success of the meetings stems from groundwork laid months beforehand when the idea for the meetings was conceived in the Dean's Office. Dr. Lloyd Faulkner, Associate Dean for Research and Graduate Studies, took charge and developed the idea into a funding proposal. In September, Chancellor Uehling approved use of Unrestricted Development Funds from Alumni Development for a three-year series of meetings. A committee then selected members for two panels, one to represent the cattle industry, the other to represent the swine industry.

Each industry panel consisted of three producers, an area livestock specialist, and a rural veterinarian. In addition to these, a banker, a livestock marketing specialist and the state veterinarian served on both panels. In selecting the panelists, the College sought to achieve a cross-section of the cattle and swine industries.

Although an agenda was set, by intent the meetings were left flexible to encourage two-way communication.

On the evening of March 26, the meetings began.

Both the College and Industry Representatives Benefit From Meetings

The progress of the meetings exceeded the expectations of both College administrators and panelists. Industry representatives gained insight into facets of the College's operation and purpose, and those panelists did not hesitate to ask questions, make observations, and offer constructive criticism. From the willingness of the panelists to speak, College administrators and faculty improved their understanding of the needs and problems of Missouri livestock producers.

This last point had concerned College administrators. As Dr. Faulkner said: "We in the College may talk and talk among ourselves and do what we think is necessary, but in reality what we do may not be what the livestock industry

needs or wants. We may be drifting away from what should be done — and not realize that we are losing touch. That is why we are having this series of meetings: to keep in touch with the needs and problems of livestock production today in the state so that we can effectively contribute to Missouri's agriculture industry."

During the meetings, administrators and faculty reviewed functions of the College in relation to teaching, research, and service. They told the panelists of problems the College faces — some of the problems were shared with the livestock industry. Panelists also learned of the great strides the College has made, and how Missouri agriculture has benefitted from those accomplishments.

College Learns From the Panelists—Industry Needs Help: The College Can Provide That Help, But Not Before Changes Are Made

Panelists reacted to the presentations with comments, questions, and observations. Everyone soon became aware that all shared many of the same concerns, and that the College and the livestock industry worked from a common philosophical base. The panelists talked with College representatives on a number of areas.

Teaching — Was the College educating the sort of veterinarian the livestock industry needs? Yes, but. . .

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Many panelists remarked that many recent graduates of the College do not quickly and easily adapt to the rural environment in which they begin practice, and these graduates therefore do not live up to the producers' expectations. This situation is not so much a reflection of the quality of instruction received as it is the fact that few recent graduates grew up on farms. The declining rural population of Missouri means that there is a smaller pool than in years past of qualified applicants for the professional program who come from farm backgrounds.

Furthermore, fewer veterinarians than before are attracted to strictly rural practices. Long drives and odd working hours still exist for rural practitioners, but the demand for their services is declining. Financial rewards for these veterinarians have remained static for several years, and some practitioners have lost ground in the face of inflation. Coupled with the decreasing appeal for rural practice, many graduates are attracted to urban, companion-animal practices through their exposure to different teachers and veterinary practices while in College. Panelists expressed concern over what they perceived to be a growing emphasis of companion animal medicine in the College at the expense of food animal medicine.

On the other hand, both young and old rural veterinarians may not be providing the kind of veterinary service that producers need. Today, fewer producers raise more livestock than ten years ago. Many of these producers now do their own vaccinations, castrations, etc. The role of the veterinarian in their day-to-day operations is steadily declining. Part of the fault for that decline is due to the veterinarians themselves who do not keep pace with the changing face of Missouri agriculture. Nonetheless, producers still want veterinarians within reach to help them.

Panelists felt that the training of veterinarians to date has been too much oriented to treatment of disease rather than to disease prevention. Prevention should be of foremost concern. Panelists see the need for veterinarians who can help producers start and maintain good management programs for their herds. The orientation of rural veterinarians may have to change in other ways; they may have to promote their services more in the future. They must adapt their practices to make their services appealing and visible to producers — for example, offer for sale across-the-counter drugs. Above all, to enable the producers to make money, veterinarians should seek to improve communications between themselves and the producers they serve.

Research — These meetings reinforced the fact that the Missouri Livestock Industry needs and wants research. Panelists readily recognized the benefits they receive from research already performed at the College, but they agreed with College administrators and faculty that much more research remains to be done.

However, during the meetings, the panelists realized that the College has few funds to do the desired research, and that this funding will probably decrease in the future. Regarding poor funding for livestock research, panelists concurred with the observation made by College representatives that some federal and state agencies when setting research funding priorities appear to overlook the fundamental importance of livestock production in the nation's economy.

Panelists learned that not only do College researchers have to cope with inadequate funding, they must comply with what granting agencies decide are important problems for research work, not what researchers and producers may perceive as being the most pressing problems crying for research. Hand-in-hand with government agencies setting research priorities, these agencies set controls over many operations of both producers and the College. Panelists thought that people in the agencies who make rules and set priorities are sincere and intelligent, but they lack complete knowledge of the situation they try to control or fund. This lack of knowledge affects their decisions, which in turn impairs the effectiveness of producers and College researchers.

Panelists wanted research that would be of most benefit to them. They asked for help in controlling or overcoming problems such as reproductive failure, pinkeye in cattle, transmissible gastroenteritis, and arthritis, atrophic rhinitis and scours in pigs.

Throughout the meetings, though, panelists continued to express dismay over the poor support for research the College must contend with. When they asked how federal and state granting agencies may be influenced to increase research funding on livestock problems, College representatives replied that producer groups can exert pressure. One way of exerting pressure is by producer groups themselves through check-offs or other means directly contribute "seed money" for research they feel is necessary. Such "seed monies" serve to demonstrate where research is needed.

Service — For the most part, panelists praised the services performed by the College, especially the services provided by the College's Veterinary Medical Diagnostic Laboratory.



Dr. Loren Kintner summarizes his necropsy findings to some swine industry panelists.

CATTLE PANEL

*Dr. E. J. Powell (MVMA)
Maryville, MO*

*S. K. Turner (Banker)
Kirksville, MO
(both panels)*

*Jim Halsey (MFA)
MFA Cooperative Marketing Assoc.
Marshall, MO
(both panels)*

*Dr. Taylor Woods (State Vet. Office)
Walnut Shade, MO
(both panels)*

*Ed Schwitzky (area livestock spec.)
Higginsville, MO*

*Marshall McGregor (commercial cattle)
Richland, MO*

*David Smith (registered cattle)
Fulton, MO*

*Fred H. Meinershagen (dairy cattle)
Columbia, MO*

SWINE PANEL

*Dr. J. R. Randolph (MVMA)
Marshall, MO*

*S. K. Turner (Banker)
Kirksville, MO
(both panels)*

*Jim Halsey (MFA)
MFA Cooperative Marketing Assoc.
Marshall, MO
(both panels)*

*Dr. Taylor Woods (State Vet. Office)
Walnut Shade, MO
(both panels)*

*John Rea (area livestock spec.)
Animal Husbandry Extension
UMC*

*Bob Cochran (MPPA-commercial)
Cairo, MO*

*Jim Foster (seed stock)
Montgomery City, MO*

*Edward Brauer (feeder)
Cole Camp, MO*

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Livestock Industry, cont.

Members of the cattle industry panel discussed with College administrators at length the functions of the Veterinary Medical Diagnostic Laboratory in terms of it being a University unit and a state service. In the opinion of those panelists (and this opinion was echoed by members of the swine industry panel) the state's livestock producers and their veterinarians could not get by without the services of that laboratory. For these people, that laboratory is a central resource, staffed by trained and experienced personnel who use up-to-date techniques and equipment to perform services generally unavailable elsewhere in the state.

There being only one laboratory in Missouri to offer all this was the big problem the cattle industry panelists focused on. Several times during the March meeting, discussion returned to the concept of regional laboratories across Missouri working in concert with the central diagnostic laboratory at the College. Panelists were well aware that the Missouri Department of Agriculture has been developing regional laboratories. In that some of the cattle industry panelists had contact with the recently opened laboratory at Cameron, that laboratory was singled out as an example.

In the opinion of some panelists, the Cameron laboratory was 'oversold' to be a full-service laboratory. In their eyes, the facility is under-equipped and under-staffed. Alleviating those shortcomings to make it a true full-service laboratory would require a hefty investment by the state. Should the state government make that investment?



Mr. Ken Paulson, veterinary necropsy attendant, explains how the incinerator works to swine industry panelists during their tour of the Veterinary Medical Diagnostic Laboratory.

College administrators pointed out that maintaining several full-service diagnostic laboratories across Missouri would be very costly for the state in light of what may become duplication of services. On the other hand, administrators agreed with panel members that regional laboratories offer convenience to both producers and private veterinarians.

Discussion pointed to a compromise situation: regional laboratories would be available to help neighboring veterinarians and producers, and provide at the same time invaluable assistance to the College's Veterinary Medical Diagnostic Laboratory by performing post-mortem examinations. Regional laboratories

would send samples and cultures to the central College laboratory for further analyses, rather than try to do this work themselves.

Panelists also praised the continuing education and extension services performed by the College. As with diagnostic services, the main complaint of the panelists was that there are not enough of these good services.

Panelists appreciated the College reaching out to producers and private veterinarians. In particular, they liked the presentations made by faculty for producer groups throughout the state. Such programs gave producers just the information they needed to cope with particular problems and to stay in step with improvements in disease control. In addition, the presentations built up the image of the College among producers because those people could see and speak with the experts, faculty veterinarians who are just as concerned as producers about many of the problems facing the livestock industry.

Getting the Word Out

Everyone in the meetings agreed that if livestock producers — and all citizens of Missouri — could be aware of all that the College offers and does for the state's agriculture, the College would receive more support than now. With additional support, the College could then do a better job than now in teaching, research, and service.

Speaking of gaining support through improved communication, panelists cited these meetings. From what they learned about the College, they said it certainly deserved their support, and they will give their support.



Dr. William Fales points out to cattle industry representatives the diagnostic capabilities of his bacteriology laboratory.

Researchers Expand Work on Factor XII Deficient Cats

Animal Model Offers Potential Insight Into Complex Mechanisms of Blood Clotting

Serendipity occasionally plays a part in research. Finding the only known animal model for a study of a human blood disorder resulted from a fortuitous discovery during research with a feline blood parasite.

During routine hematology of many cats in the course of research on feline cytauxzoonosis, College researchers discovered a female cat which had a very prolonged *in vitro* clotting time. Further study by Drs. Ann Kier and Joseph Wagner of the College revealed the delayed clotting of the blood to be due to deficiency of factor XII, a plasma protein involved in activation of blood clotting, kinin generation, and fibrinolysis.

An inherited condition, deficiency of factor XII in man results in prolonged clotting of blood *in vitro*. However, persons without factor XII do not appear to be hemophiliacs — in fact, *in vivo*, their blood seems to clot normally. Study of factor XII deficiency in the cat offers possibilities for insight into the complex mechanisms of blood clotting and the reaction of the living body to infection and injury.

Working for three years primarily with Veterinary Medicine Research Council grants, Drs. Kier and Wagner developed a breeding program centered around the single factor XII deficient cat. From that cat, the two researchers have derived 15 offspring. By selective inbreeding, Drs. Kier and Wagner determined that factor XII deficiency in cats, like most affected people, is an autosomal recessive trait.

Based on these modest pilot studies, the U.S. Public Health Service this year awarded a five-year, \$91,655 grant to UMC's College of Veterinary Medicine for an expanded study of factor XII deficiency and to maintain the breeding program already established. Drs. Cynthia Besch and James Bresnahan have joined Drs. Kier and Wagner for the expanded research program.

The researchers are gradually building a colony of cats for future research at the University of Missouri-Columbia and eventually at research institutions elsewhere.

Dr. Bresnahan is particularly interested in studying inflammatory mechanisms of factor XII deficient cats and people — mechanisms that appear not to operate in the same manner as in normal



Dr. Kier



Dr. Wagner

cats and people, but mechanisms which to date had received very little study. Dr. Bresnahan, a post-doctoral trainee in laboratory animal medicine at the Veterinary College, received an NIH Research Fellowship for his work with the factor XII deficient cat model.



Ms. Julie Lawrence, work-study student, holds the cat that is the foundation of the College's research on factor XII deficiency.

Thus, chance discovery of a single cat with this inherited defect has opened doors for medical research of a blood disorder that could not be studied in man and could not be investigated *in vitro*.

UMC/Tuskegee To Work Together

Veterinary Colleges at the University of Missouri-Columbia and Tuskegee Institute to Develop Cooperative Programs.

Administrators of veterinary colleges at the University of Missouri-Columbia and Tuskegee Institute in Alabama have made an agreement to develop cooperative programs between the two colleges in teaching, research and service.

Agreement was reached during a visit to the Missouri campus on February 24 by three Tuskegee faculty.

Tuskegee's Associate Dean Gene Adams, and Drs. Ellis Hall and Raleigh Adams were invited here by Associate Dean Lloyd Faulkner to explore possibilities of a joint international program based on Tuskegee's expertise in community health and Missouri's work in blood-related diseases and diseases common to animals and humans. Both colleges will together propose an initial joint effort to outside funding sources to aid a single, less-developed country.

The Tuskegee delegation was also interested in enlarging a faculty exchange program in animal reproduction, zoo animal medicine, small animal surgery, and management information. The delegation noted Missouri's national reputation in these academic areas. In return,

Missouri's Veterinary College will expand its recruitment of minority veterinarians for graduate training, and residency and faculty positions.

In 1979, Associate Dean Faulkner proposed starting a cooperative program between the two veterinary colleges while he was lecturing at Tuskegee. To date, UMC Affirmative Action Funds support the project.

Award to Resident

Dr. Joanne Burns, Resident in the Department of Veterinary Medicine and Surgery, received a certificate and \$50 on April 9 for being selected an outstanding graduate student teacher at the University of Missouri-Columbia.

Dr. Burns received her DVM from Purdue.

Faculty Publish

Bojrab, J. J., and Dallman, M. J.: "Tracheal Resection and Anastomosis", *Canine Practice*, 7, 1:69-74.

Special People — Special Pets

Christine Crosley, VMIII

There are many Missourians with special needs for pet companionship, including the "homebound", the elderly, and the handicapped. United States Bureau of Statistics figures list more than 47,000 hearing impaired individuals in Missouri, along with 622,000 persons over 65, and an overall population of 480,000 disabled persons.

Boris M. Levinson, psychologist and originator of the "pet therapy" concept, writes: "A pet can provide a boundless measure of love, adoration and unqualified approval. Many elderly and lonely individuals have discovered that pets satisfy their needs and enable them to hold on to the world of reality, of care, of human sacrifice, and of intense emotional relationships. Their self-concept as worthwhile individuals is restored and even enhanced when they find that the pet they have been caring for loves them in return."¹

With tailored veterinary care and understanding these pets can improve the quality of their owner's lives. The *Baltimore Sun* magazine (November 4, 1979) describes one woman who benefitted from the love of a golden retriever. She was institutionalized, 77 years old, nearly blind and deaf.

"People come up behind her, push her here and push her there. She doesn't understand and so she withdraws. She tries to curl up into a ball, her face almost touching her knees. But this day was different. A golden retriever named Goldie, was visiting the patients. He ran

up to Mary and, nosing his way into the small space between her folded arms, he laid his head on her lap. Mary reached down and hugged him. For five minutes she held him. To the staff at the home, it was a breakthrough. For the first time they had seen Mary reach out to something. For a little while she understood what was happening to her and she wasn't afraid."

Special programs, such as the one quoted above, the Feeling Heart Foundation of Cambridge, Maryland, have begun to send volunteers and specially trained companion animals to visit caretaking and correctional institutions. The success of these programs indicate the great therapeutic value of pets for those removed from the mainstream of daily life. Companion animals have been shown to contribute greatly to the physical and mental health of those who don't talk or socialize, those who have withdrawn, and those who have no family or friends to relate to.

The veterinarian's role in such special programs is not to organize or direct, but rather to encourage and support, thereby lending impetus and vital credibility to these necessary projects. As Dr. Michael McCulloch, a psychiatrist in Portland, Oregon, writes: "Even though the veterinarian is not a mental health counselor by training, his professional obligations to his human clients do require him to respond The education of the veterinarian suggests that the primary obligation is to the pet. But I would argue that his obligation is to both

the pet and the special owner the veterinarian is ultimately involved in matters of human health and therefore, has an obligation to promote human health on a continuing basis."²

The older 25% of our population often find themselves physically limited, restricting their ability to take their pets to the veterinarian. Not only do those in wheelchairs have difficulty maneuvering within the confines of most clinics, but many cannot even attempt to transport themselves and their pet anywhere without special lifts and vans. The solution has been to rely on friends and relatives to transport the animal, usually unaccompanied by its owner, to the veterinarian. In many situations the animal, removed from its isolated environment and security of its owner, is upset and frantic, making diagnosis and treatment difficult.

This group's needs could be easily and inexpensively be served by a mobile unit and veterinarian committed to reducing the stresses on both the disabled owner and their pet. Such a unit could routinely provide general check-ups, vaccinations, and nonsurgical emergency care. A community service of this magnitude could be organized similarly to the current pooling of resources and staff for after-hours emergency care now prevalent in many Missouri localities.

Another special segment of our population very much aware of the usefulness of pets is the hearing impaired. Working with this group, the American Humane

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Association recently initiated a program whereby they train dogs to become the ears of the deaf. Dogs are trained to alert their owners to a baby's cries, to a knock at the door, and to a telephone or alarm clock ringing. Upon hearing these sounds, the dog runs to the owner, gets their attention, and runs back and forth from them to the source of the sound until the owner responds by following the dog. These dogs, after training, go nationwide to give demonstrations and to be placed in homes of the hearing impaired.

Every veterinarian in the state cannot be specially equipped with a telecommunicator to convert sound into written word. Every veterinarian cannot spend the long hours needed to learn American Sign Language, the language of the deaf. Yet, both social and professional responsibilities urge every veterinarian support the support the development of one specialized practice in each community whereby the hearing impaired can communicate effectively and quickly with their pet's doctor. Such a clinic would find that the \$600 investment in a telecommunicator and the six months training necessary to learn American Sign Language is a small cost compared to the benefits to both the practitioner and these special pet owners.

Many other innovative ideas working toward a community-based human and animal health care program could arise from the exchange of thoughts by an interdisciplinary board of physicians, veterinarians, and social workers. Dr. McCullough suggests that veterinarians and physicians abandon some of their notions of territoriality: "One concrete example of how the human and veterinary medical professions might cooperate to deliver better health care to the people of America is through exploring the benefits of prescription pets. In such a situation the physician would consult with a veterinarian and other appropriate professionals in public health, legal, medicine and government, so that arrangements could be made for pets to serve as companions to people. The potential benefit for prescription pets probably ranges across all ages of human development, from childhood to old adults. Through cooperation it could be made situation specific so that it fit into a wide variety of home and institutional settings."³

Ten years ago the Humane Society of Missouri based in St. Louis offered this "pets by prescription" program to the public through contact with psychiatrists and psychologists. Their lack of support at that time doomed the project. Positive feedback from the veterinary community is needed to work with and to convince a majority of physicians of the value of companion pet programs,

for the veterinarian can act as the unique liaison between the practitioner, the patient and the pet.

For any of the special programs mentioned above to be a success requires a sensitivity and awareness on the part of every Missouri veterinarian. Such endeavors also require the energy, money and support which is always lacking in innovative and newly initiated programs. Established veterinary practitioners may not see much profit potential in these situations. But as our society becomes increasingly sensitive to the needs of the elderly, the disabled, and the specially impaired, some veterinarians will need to acquaint themselves with the special services required by these people and their animals. To provide access to adequate veterinary care for ALL therefore looms as a challenge to the ever-growing veterinary profession in the 1980's.

Levinson, Boris M., *Pets and Human Development*, Thomas Publisher, 1972, p. III.

McCullough, M. J., "The Veterinary and Human Health-Care Systems: Issues and Boundaries," in *Implications of History and Ethics to Medicine, Veterinary and Human*, ed: L.B. McCullough, (College Station: CAA, Texas A&M Univ., 1978), p. 60-61.

Ibid, p. 62.



Visiting Lecturer Discusses Cattle Pneumonia

Dr. Robert Pierson, here talking with Dean Kenneth D. Weide, presented "Atypical Interstitial Pneumonia of Cattle" at the College, March 13.

The fifth Visiting Lecturer to appear this academic year at the College, Dr. Pierson is Head of the Ambulatory Section for the Department of Clinical Sciences, College of Veterinary Medicine at Colorado State University. Dr. Pierson's presentation was sponsored by the University Assembly Lectures Committee, the Student Chapter, AVMA, and the Visiting Lecturers Committee.



Upjohn Donates to Student Chapter

Mr. Mark Higgins (3rd from left), VMIV and President of the College's Student Chapter, AVMA, accepts a check for \$500 on behalf of the Student Chapter from the Upjohn Company. Ms. Denise Smith (2nd from left), Veterinary Sales Representative for Upjohn, made the presentation. Dean Kenneth Weide (left) and Dr. Robert Youngquist (right) look on. Higgins later stated that the Student Chapter hopes to use this contribution for improvements in the College's Student Lounge. Upjohn Company has made similar donations in the past to the College's Student Chapter.



Veterinary students visit display booths of exhibitors during the Second Annual Student Career Day.

"Qualities of a Successful Practice" Topic for College's Second Annual Student Career Day

In spite of the inconveniences posed by a late-winter snowstorm, nearly 150 students of the College attended the Second Annual Student Career Day, held March 1 at Columbia's Ramada Inn.

This program focused on those aspect of financial and personnel management which pertain to the veterinary practitioner. Mr. Owen McCafferty, Certified Public Accountant, spent the morning discussing such topics as accounting systems, budgetary forecasting, and inventory purchasing. In the afternoon, Ms. Jamie Fine, Assistant Administrator for the Animal Medical Center in New York, addressed personnel topics such as management and staff development.

Throughout the day, students had the opportunity to look at more than 20 exhibits which were hosted by private firms and government organizations.

The College of Veterinary Medicine, the UMC Extension Division and the College of Veterinary Medicine Alumni Association sponsored the day-long event.



Ms. Jamie Fine talks to students about developing good support staffs in veterinary clinics.



Dr. Ronnie Elmore was the guest lecturer for Research Day.

College Holds Student Research Day

The College held its Third Annual Research Day with the support of Beecham Laboratories on April 3, 1980. The featured guest speaker was Dr. Ronnie Elmore, theriogenologist with the College, who presented "Endotoxins in the Pathogenesis of Lactation Failure in Swine."

Five veterinary students, two residents and six graduate students presented results of their original research during the afternoon program.

The top award in the veterinary student division went to a second-year student, Annette Childs, for her paper, "Feline Urinary Lipids". In the graduate student division, Dr. Jarlath Umoh took top honors for his paper, "Immunofluorescent Staining of Rabies Antigen in Formalin Fixed Tissues."

State Announces Brucellosis Vaccination Program

All Cattle Producers to Benefit

Missouri livestock producers will now be able to obtain free brucellosis vaccination for their calves, according to an announcement by State Agriculture Director Jack Runyon.

The Missouri Department of Agriculture (MDA) is cooperating with USDA in making Strain 19 brucellosis vaccine available for use by Missouri veterinarians. The vaccine must be adminis-

tered by a veterinarian who will be paid a fee by the state and federal program.

"This is one more method to assure that Missouri lowers its brucellosis infection rate by 1982 when new federal regulations will be placed on livestock movements," said Runyon. In addition to the vaccination program for controlling the disease, MDA implemented a program for testing livestock at auction markets, made cattle abortions a

reportable disease and launched an intensive public education program.

Dr. Taylor Woods, state veterinarian for MDA, said the recommended age for vaccinating calves is two to six months; the preferred age is four months. He said: "We'd like to see a large percentage of this spring's calf crop vaccinated. We urge cattlemen to contact their local veterinarians before the animals get past vaccinating age."

New Intravenous Equine Anesthetic Techniques

Beverly Ann Gilroy, D.V.M.
Dept. Veterinary Medicine & Surgery

This article is a two part series describing new equine intravenous anesthetic techniques that utilize xylazine to permit use of anesthetic drugs that produce adverse effects when given alone.

Use of xylazine 1.1 mg/kg IV and ketamine 2.2 mg/kg IV to produce general anesthesia in the horse has several distinct advantages. The drug volumes used are relatively small (5-10 ml) and thus easily administered. Induction and recovery are usually very smooth^{2,5} which contributes to increased patient and personnel safety. Moreover, this drug combination results in reasonable cardiopulmonary stability.⁵

The xylazine is injected first and its sedative effects should be very obvious before the ketamine is injected. This usually requires waiting 3 to 5 minutes between injections. If for any reason the xylazine does not appear to be effective, the ketamine should NOT be given. After the ketamine is injected, the horse will usually "sit" and then go into lateral recumbency. General anesthesia with good analgesia and muscle relaxation lasts approximately 16 minutes,^{2,5} and time from induction to standing is usually 25 minutes.⁵ The horses tend to keep their eyes open; therefore, it is suggested the eyes be kept covered with a cloth or drape. Recovery is usually very smooth if the horse is not adversely stimulated.

The major disadvantage of the technique is that ketamine is not approved by the Federal Drug Administration for use in the horse. However, the efficacy and safety of the technique is now well documented^{2,5} and the pharmacodynamics of ketamine in the horse have recently been described.³ Xylazine-ketamine has been used clinically for castrations, radiology, cast applications and minor surgery. Use of this drug combination has been described as more expensive² than glycerol guaicolate and thiobarbiturates, but this may not be true depending on the specific products used. Moreover, the safety, convenience and quick recoveries produced may make this combination highly cost effective.

Different investigators^{1,6} have modified this technique by the addition of mephenesin-like drugs (diazepam or glycerol guaicolate) but the advantages of such adjunctive agents are not yet well proven.

The most common concern of veterinarians using this technique is whether they can repeat the injections to extend

the duration of anesthesia. Currently there is no evidence as to whether this can be done safely. A recent paper suggests that repeated injections of ketamine will result in increasingly prolonged effects of the drug. This would result in not only prolonged recoveries but potentially in "rough" recoveries and/or seizure activity if the ameliorative effect of the xylazine did not persist. Therefore, repeated injections cannot be recommended this time.

The second technique utilizing xylazine is less well known. Klein⁴ first used xylazine 1.2 mg/kg IV followed in 5-20 minutes with morphine .75 mg/kg IV in extremely fractious horses to allow examination and other minor procedures (cast removals, joint aspirations and injections, wound debridement and suturing). Lower dosages (xylazine .75-1.0 mg/kg IV followed in 5 minutes by morphine .25-.75 mg/kg IV) have been used at the University of California-Davis to produce profound sedation and analgesia. This combination supplemented with local anesthesia has been used on clinical cases involving examination and treatment of joints, facial and periorbital cryosurgeries, and flank laparotomies. The horses remain standing although they will usually attempt to lean against something.

Adverse reactions that have been observed are sweating, muscle twitches or tremors, "body jerking" and cutaneous wheals.^{4,7} The combination does produce cardiopulmonary stability.⁷ It seems especially useful in flank laparotomies for colic; a recent study⁸ documented the effectiveness of xylazine and fentanyl (another potent narcotic) in the relief of visceral pain. Although morphine was not tested in that study, it is more readily available and less expensive than fentanyl.

Klein⁴ administered narcotic antagonists (levallorphan 18.3-41.8 ug/kg, diprenorphine 4.5-9.0 ug/kg, or naloxone 9.9 ug/kg) following her procedures. When the lower levels of morphine are used, such antagonism is not usually necessary.

Advantages of the technique are the profound, dependable sedation and analgesia produced with good cardiopulmonary stability. A potential disadvantage is the requirement for registration with the Drug Enforcement Agency to use Class II narcotics. The technique is not expensive unless antagonism with naloxone is attempted.

Both of these techniques have great potential value in general equine prac-

tice and their use in appropriate cases should be considered.

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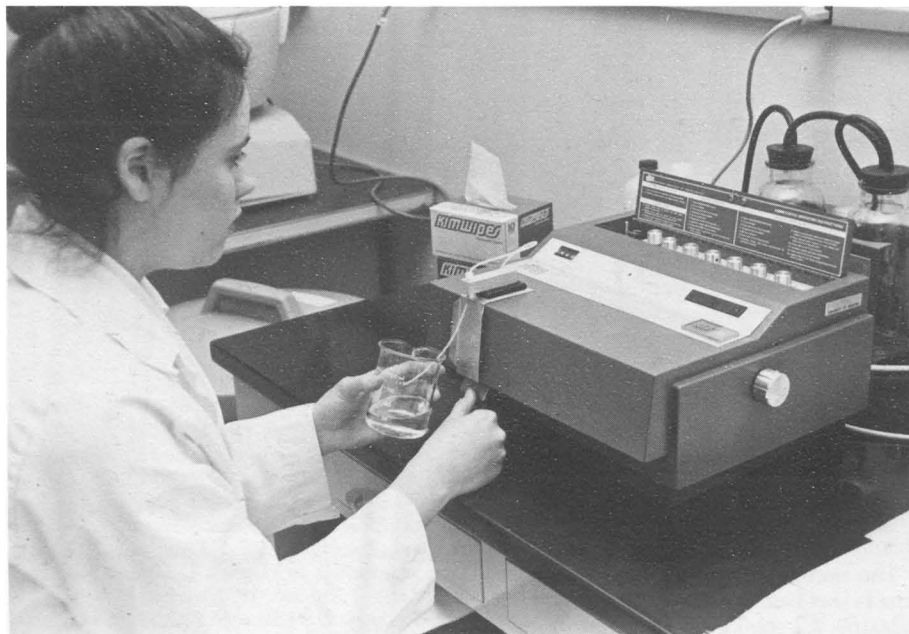
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Ms. Maxine Little, research assistant for Dr. Hewitt, working at the spectrophotometer, which will be used extensively in Dr. Hewitt's research.

Interaction of Organic Chemicals Under Study at College

Safe Working Conditions Sought For Industry Employees Handling Various Chemicals

Industry makes wide use of chlorinated hydrocarbons as solvents, degreasing agents, and intermediates in chemical syntheses. Although these organic chemicals are toxic, safe working conditions have been established for workers handling individual kinds of chlorinated hydrocarbons, which are forms of haloalkanes. Should any worker be exposed to toxic levels of certain chlorinated hydrocarbons, then kidney or liver damage may result.

However, in many industrial settings employees may be exposed to other organic chemicals in addition to haloalkanes. Present-day measures of the toxicity of single kinds of organic chemicals do not serve to determine the safety of workers exposed to combinations of

chemicals. 'Safe' levels of different types of organic chemicals may interact in the body to produce toxic situations.

Dr. William Hewitt, toxicologist at the College, is interested in what are the toxic results of two different types of organic chemicals interacting in the body. Dr. Hewitt received this past March a four-year, \$283,168 grant from the U.S. Department of Health, Education, and Welfare to study how ketones potentiate haloalkane-induced renal injury in an animal model. Dr. Esther Brown, histologist with the College, is co-investigator.

Referring to the significance of these studies, Dr. Hewitt explained: "in the industrial environment, workers are often exposed to ambient concentrations of various chemical solvents. Some of

these solvents are potentially toxic although methods permitting their safe utilization are usually known. However, when workers are exposed to a combination of substances, biological interactions may occur which enhance the susceptibility of the individual to the toxic properties of either or both solvents. Therefore, seemingly safe working conditions established for individual chemical agents may not be applicable in the presence of chemical combinations in a given occupational environment to which workers are exposed."

Based on his previous research in which he demonstrated that three ketonic solvents can interact with chloroform to produce a nephrotoxic condition in rats, Dr. Hewitt in his current project will determine if ketonic solvents as a class can potentiate haloalkane-induced nephrotoxicity and determine the mechanisms by which these solvents potentiate nephrotoxicity. Dr. Hewitt will use a battery of tests to ascertain the extent of kidney damage in laboratory animals. Such tests will include histological examination of kidney tissue, analyses of oxygen consumption and metabolism using C^{14} as a tracer, and determination of levels of urea in the blood. Dr. Hewitt plans to use different types of ketones such as acetone, and he will use chloroform as a model of a haloalkane.

Dr. Hewitt said that his research will require many experimental procedures that will tell him not only what happens in the ketone-haloalkane interaction but what quantities of ketones are necessary to induce haloalkane nephrotoxicity.

Dr. Hewitt hopes that this research will help to establish an animal model that may be used as a tool for future research and for establishing safe standards for chemical handling in industry.

This research may also have environmental implications. Some ketones and chloroform have been found in very low concentrations in drinking water of several American communities.

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Editor: Barry L. Siler,
W-205 Veterinary Medicine Bldg.,
College of Veterinary Medicine,
University of Missouri, Columbia, MO 65211

Return Requested

Wiley McVicker, D.V.M.
Hope Animal Hospital
Highway 87 E
Boonville, Mo 65233

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