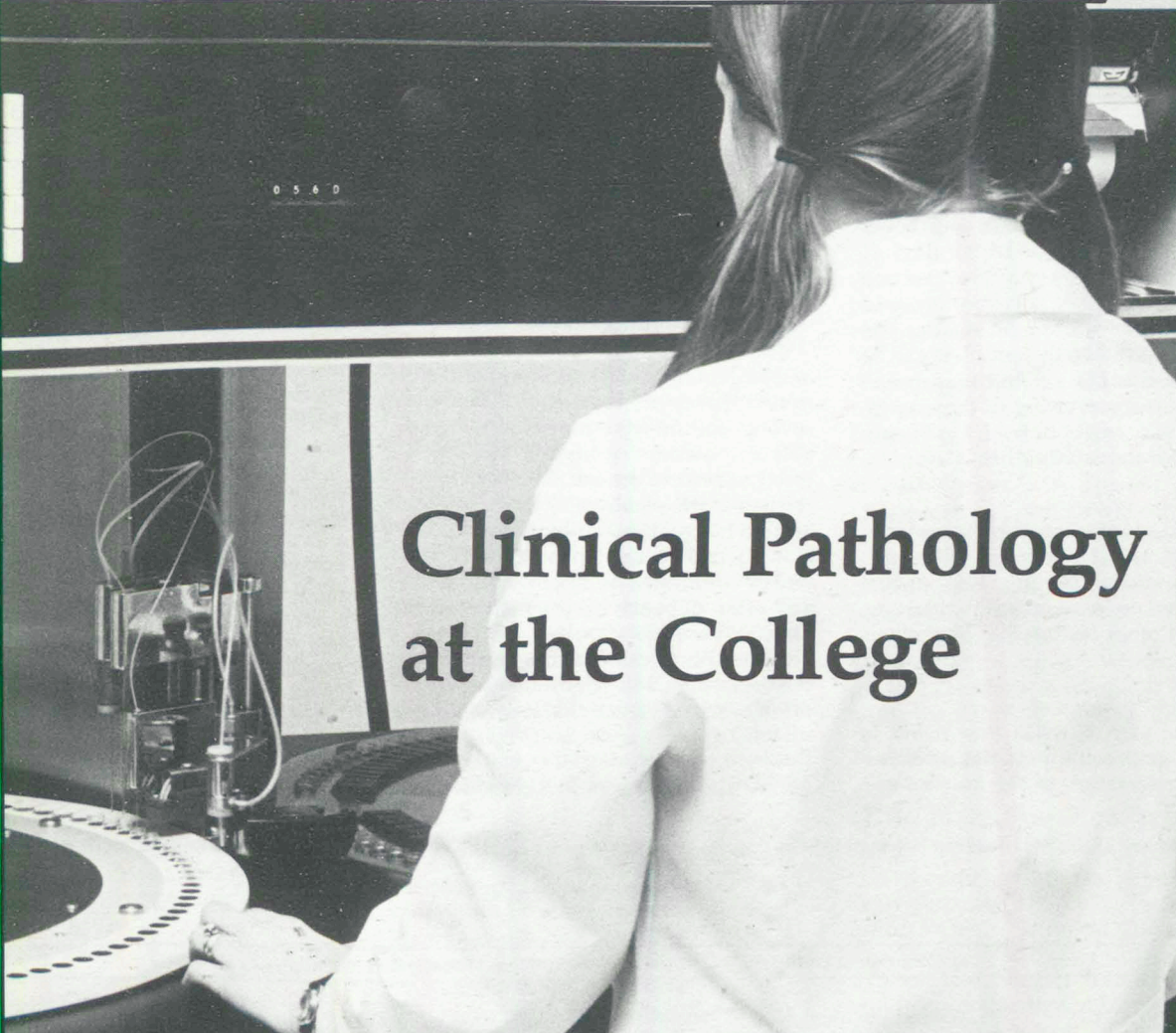


VETERINARY MEDICAL REVIEW



Clinical Pathology at the College

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

January/February, 1981, N.S., vol. 2, No. 1

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Neonatal Calf Diarrhea

When Presented with a Scouring Calf, Your First Concern Is to Decide Upon an Adequate Treatment Regime That Is Economically Feasible For the Owner

Sherrill Fleming, DVM
Resident
Dept. Veterinary Medicine & Surgery

Neonatal calf diarrhea is any acute diarrhea in calves less than ten days of age characterized by profuse, watery diarrhea, progressive dehydration, and acidosis, often resulting in death. The economic loss due to this problem can be great. Now that the calving season will soon be starting a review of the causes, pathogenesis, treatment, and management of neonatal calf diarrhea is in order.

Causes:

The chart adapted from *Veterinary Medicine* (Blood and Henderson—fifth edition) gives a list of the infectious agents encountered in neonatal calf diarrhea, along with other factors that may play a role.

Pathogenesis:

Neonatal calf diarrhea is a result of increased permeability of the intestinal wall, hypersecretion of the mucosa due

to the influence of toxins, impaired intestinal absorptive capacity or a combination of all three. The net effect is the loss of large amounts of electrolyte-rich fluid containing mainly sodium and bicarbonate ions. Dehydration and acidosis are the actual causes of death, although calves may also become septicemic.

Treatment:

When presented with a scouring calf, your first concern is to decide upon an adequate treatment regime that is economically feasible for the owner. A complete physical examination is in order, including temperature, pulse, respiration, and an estimation of the degree of dehydration of the calf.

If the calf is only mildly dehydrated and still interested in suckling, oral electrolyte therapy is very useful. There are several commercial preparations available as powders or liquids that are diluted and fed to the calf. Most calves will recover with electrolyte therapy alone and do not require antibiotics. The decision to treat a calf with scour boluses and/or antibiotics is an individual one and often depends on the history of the farm and the severity of the problem.

A moribund calf is a much more serious situation and vigorous therapy is often required. A calf that is unwilling or unable to suckle will require intravenous fluids to make sure that it will survive. For severe dehydration calves will re-

quire 100 ml/kg body weight (50 ml/kg for moderate) of a balanced electrolyte solution over 4-6 hours, followed by maintenance fluids at 140 ml/kg over the next 20 hours. Any commercially available fluid is acceptable including isotonic sodium chloride. Since these tend to be expensive you may wish to mix your own formulas from the following recipes.

Formula 1

Sodium chloride 30 g and potassium chloride 3 g in 3.8 liters or 1 gallon sterile distilled water will give 136 mEq/l Na; 147 mEq/l Cl; and 11 mEq/l K. To this can be added 30-50 ml of 50% dextrose solution. The sterile distilled water can be prepared by autoclaving distilled water in 1 gallon glass jars for 30 minutes with loosened lids. Cool, tighten lids and seal with autoclave tape. The sodium chloride and potassium chloride can be premeasured and taped to the jar in small plastic bags. Do not mix until ready to use. This can also be used for oral fluid therapy using tap water or distilled water.

Formula II

To make a 5% bicarbonate solution add 20 g sodium bicarbonate to 500 ml sterile distilled water (totals 240 mEq bicarbonate). Mix well and allow bubbles to settle out and give intravenously at the estimated dosage rate given in dehydration chart.

Formula III

Use a homemade substitute for oral electrolyte therapy for owners on an emergency basis. Mix 1 1/4 ounce (1 pkg) fruit pectin (Sure-Jel), 1 can beef consommé (10 1/2 ounce), 2 tsp. baking soda, 1 tsp. lite salt, and water to make 2 quarts. This can be divided into two to four feedings per day.

Summary of the Relationship between the Primary Aetiological Agents and the Epidemiology of Acute Undifferentiated Diarrhea of Newborn Calves (Blood and Henderson)

Primary Aetiological Agents	Epidemiological Factors	Possible Role of Epidemiological Factor
Common Enterotoxigenic <i>E. coli</i> Rotavirus Dietary abnormalities	Colostrum immunity of calf	Low levels of serum immunoglobulins render calves highly susceptible to death from diarrhea
	Overcrowding	Increased population density increases infection rate and high morbidity and mortality
Less Common <i>Salmonella</i> spp. <i>Chlamydia</i> sp. Adenovirus IBR BVD <i>Clostridium perfringens</i> Types B and C <i>Providentia stuarti</i> <i>Cryptosporidium</i>	Parity of dam	Calves born from heifers may not acquire sufficient level of colostrum immunoglobulins
	Meteorological	Changes in weather; wet, windy and cold weather commonly precedes outbreaks of diarrhea in beef calves (3). Higher mortality in dairy calves exposed to hot environmental temperatures (4). High environmental temperatures precipitate outbreaks
	Quality of diet	Heat denatured skim-milk used in milk replacers is less digestible than whole milk and precipitates diarrhea
	Calf rearer	The concern and care provided by the calf rearer will have a direct effect on morbidity and mortality associated with diarrhea

Visiting Lecturers

The first half of this year's Visiting Lecturers Program saw a number of outstanding speakers presenting a variety of topics.

As reported in the November/December, 1980, *V.M.R.*, Dr. Glen Severin began the season early with his talk on veterinary ophthalmology. Eight weeks later, on October 23, Dr. H. Graham Purchase from the U. S. Department of Agriculture spoke on avian tumor viruses.

Dr. Michael Shires came to the College on November 13 from Oregon State University to speak on bovine surgery. On December 11, Dr. Bradford Smith from the University of California-Davis presented "Equine Salmonellosis".

Spring, 1981, promises more quality presentations from outstanding lecturers. On March 12, 8:00 p.m., Dr. Michael McCulloch, psychiatrist from Portland, Oregon, will present "Role of Companion Animals in Human Mental Health". On March 19, 4:00 p.m., Dr. M. Stöber, Director of the Hannover (Germany) Clinic for Diseases of Cattle, will present "Clinical Picture of Bovine Leukosis in Europe". On April 1, 4:00 p.m., Dr. Lloyd Davis from the University of Illinois will present "Clinical Pharmacology", which will conclude the 1980-1981 Visiting Lecturers season.

Any reader of *V.M.R.* is encouraged to attend any or all of the presentations in the Visiting Lecturers Program. For additional information, contact: Dr. Larry Morehouse, Veterinary Medicine Diagnostic Laboratory, College of Veterinary Medicine, UMC, Columbia, MO 65211.

Ohio Firm Donates to College

A therapeutic aerosol generator has been donated to the College by the North West 16 Technical Consultants of Cincinnati, Ohio. The Intensive Care Unit of the College's Teaching Hospital will use the donated equipment, a TAG 15.3 aerosol generator valued at \$485.

This device was developed for the treatment of upper respiratory diseases of small animals. It works by creating a mist of therapeutic drugs, and this mist is inhaled by the animal in enclosed quarters.

This unit delivers an air flow of 15 liters per minute and has an aerosol generation of 0.3 cubic centimeters per minute. As much as 75% of the particles are smaller than three microns in diameter. Researchers have found that the smallness of particles is important for success in inhalation therapy.

Degree of Clinical Dehydration

Characteristic	Minimal (4%)	Moderate (6-8%)	Severe (10-12%)
Skin Resiliency	Pliable	Leathery	Absolutely no pliability
Skin Tenting (fold of skin of upper eyelid pinched to form a tent, twisted 90 degrees and released)	Twist disappears immediately. Tent persists up to two seconds.	Twist disappears immediately. Tent persists three sec. or more.	Twist as well as tent persists indefinitely.
Eye	Bright Slightly sunken	Duller than normal Obviously sunken	Cornea dry Deeply sunken, 2-4 mm. space between orbit and eyeball
Mouth	Moist, warm	Sticky to dry, warm	Dry, cyanotic Warm to cold
Estimated Bicarbonate requirement (mEq/l)	2	4	6

Example:

40 kg calf (83 pounds) 10% dehydrated.

Bicarbonate requirements are 6 mEq/kg.

Therefore it requires

6 mEq/kg x 40 kg = 240 mEq

Fluid requirements—

First 4 hours
(replacement) = 100 ml/kg or 100 x 40
4000 ml (4 l or approximately 1 gallon)

Next 20 hours
(maintenance) = 140 ml/kg or 140 x 40
= 5600 ml (5.6 l or approximately 1.5 gallon)

Clip and disinfect the jugular area and insert a 14 or 16 gauge 3 inch catheter. Start the intravenous drip with the first gallon of replacement fluids for 10-15 minutes. Disconnect and run in 5% bicarbonate solution to calculated dosage over 10-15 minutes. Reconnect fluid drip. Administer antibiotic of choice (dependent on sensitivities you have received in your area). Start second gallon of maintenance fluids in approximately 4 hours.

By the end of the 24 hour period the calf should be well enough to return to milk feeding with oral electrolyte supplementation and antibiotic therapy. Calves that do not respond do not rehydrate even with intravenous therapy, and to continue fluids longer than three days is futile. This is usually due to kidney shutdown or concurrent BVD or IBR infections. Overuse of antibiotics can result in a sterile gut syndrome and secondary yeast or fungus infections.

Management:

This is primarily dependent on the owner, the severity of the problem, and the value of the calves. A program aimed at prevention of calf scours is ideal. The first twenty four hours of a calf's life are instrumental in producing a vigorous,

healthy calf. Individual calving pens which are cleaned and disinfected between occupants are excellent. This allows both the cow and calf to get a good start while under close supervision. Adequate colostrum intake must occur before 12 hours of age while the calf is able to actively absorb immunoglobins. Dipping the naval in iodine solution as soon as the cord is broken will help to cut down on systemic infections. Clean calving areas, ensuring adequate colostrum intake, and avoidance of overcrowding cannot be stressed too much.

If a problem is evident an attempt to break the cycle can be made by:

1. A prompt post mortem examination of any dead calves and attempt to define exactly what the problem is.
2. Isolate affected animals from other susceptible calves.
3. Move cows which are due to calve to a new area which has not housed sick calves.
4. Specific vaccination programs for dams and calves may be of value.
5. Education of the owner to allow recognition of affected calves promptly so that effective treatment may be started as soon as possible.

As with any disease problem, cooperation between the owner and veterinarian is essential. Individual farms present individual problems and you must balance the management with the available facilities. Informed owners make better clients.

Note on Reduced Dose of Strain 19

The 2 cc. dose is the way to go when using the Strain 19 vaccine for brucellosis control. Although *V.M.R.* reported that the U.S. Animal Health Association had suggested that a 1 cc. dose of Strain 19 be considered for use, that organization did recommend that the 2 cc. dose be used.



Tom Eschenroeder checks work on the Gamma Counter, a scintillation counter for radioactive assays used in hormonal quantitation.



Christine Hotz, VMIV, fills out a form after completing a test. She, like all other upper-level veterinary students, spends several weeks in the Clinical Pathology Laboratory learning the principles and techniques of an important part of veterinary practice. Dr. Schmidt stated that teaching students such as Ms. Hotz is the main function of the laboratory.



Joanne Adams makes an adjustment on the Coulter Counter, an automatic cell counter used in hematology work.

Clinical Pathology Laboratory at the College

A Laboratory That Is More Than a Service

Superficially, the Clinical Pathology Laboratory appears to be a service arm of the Teaching Hospital. While much of the work performed by the Clinical Pathology Laboratory is for the Teaching Hospital, this laboratory is a multi-faceted unit performing a variety of functions for the entire College.

"Teaching is the main function of this laboratory," stated Dr. Donald Schmidt, Professor of Pathology who is the senior faculty member in clinical pathology. He went on: "All tests performed here are used to teach, even though the majority of those tests are made for diagnoses." All upper-level veterinary students must take the segmented curriculum block in pathology. Within that block, the students must spend at least two weeks working and learning in the Clinical Pathology Laboratory. Although complex instrumentation and expert technical help are available for performing very sophisticated tests, the students learn to do testing with techniques and materials that can be found in many private practices. Like the Teaching Hospital, the Clinical Pathology Laboratory intertwines the functions of service and teaching to make them as one.

"This is one system," remarked Dr. Schmidt, who was not only considering teaching and service but also the relationship of the Clinical Pathology Laboratory to the rest of the College. It is a unit that stands on its own, and one that

works in conjunction with the Teaching Hospital and the Veterinary Medical Diagnostic Laboratory, sharing their commitment to provide quality teaching, service and research.

Faculty and staff of the Clinical Pathology Laboratory hold appointments in the Department of Veterinary Pathology. However, it is not really correct to think of these people as working *in* that laboratory. In a large sense, they *are* the laboratory.

Dr. Schmidt came to the College in 1967 and began working in Clinical Pathology, then tucked away in a cramped space across the hall from the Teaching Hospital Auditorium. He joined Dr. Harry Berrier, entering into a spirit of teamwork. He said that then: "There were no signs on doors saying 'boss' and 'second boss'." Dr. Schmidt likes to work that way today.

Dr. Berrier has since directed his efforts to other research and teaching activities. Although other veterinary faculty had stepped in to help Dr. Schmidt over the years, Dr. Schmidt was the sole veterinarian in that laboratory during the past several months, a situation that demanded much of his time and effort. Fortunately, another clinical pathologist,

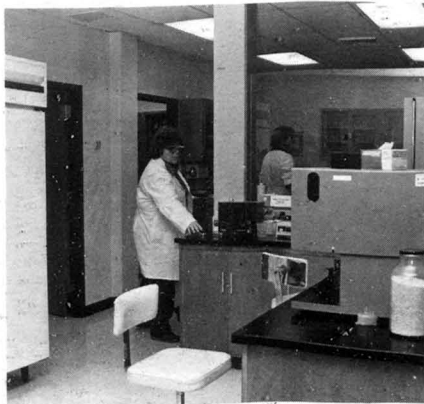
Dr. Steven Stockham, came to help Dr. Schmidt last December.

Taking care of much of the day-to-day management of the Clinical Pathology Laboratory is Ms. Nancy Olson, who joined the College's faculty last year as Instructor. She described her work as "making the laboratory run smoothly."

Both Dr. Schmidt and Ms. Olson spoke highly of the quality of staff of the laboratory. All are registered medical technologists who have received the same training as their counterparts in the Health Sciences Center on campus. Four registered medical technologists perform much of the laboratory's work along with three other staff persons. Dr. Schmidt felt that this number of staff was adequate to handle the work at present.

Although he is technically a student, the Clinical Pathology resident, Dr. Dean Basel, has been a great help since he started a year ago. Before Dr. Stockham and Ms. Olson had begun work, Dr. Basel shouldered some of Dr. Schmidt's responsibilities. The position of resident in Veterinary Pathology was formed shortly before Dr. Basel came to the College; he is the first person to fill that position.

cont., next page



Adequate space in the new Veterinary Medicine Building has improved working conditions in the Clinical Pathology Laboratory.



Martha Wade at the Programmachem 1040, a chemistry analysis machine.

Pathology, cont.

On hand for the faculty and staff to use in carrying out their work is an array of instrumentation. However, as Ms. Olson pointed out: "Some of this equipment is becoming outdated, and we're holding it together with service contracts and inspiration."

One significant factor in improving the operation of the Clinical Pathology Laboratory has been the move from its extremely cramped old quarters to a space about double the size in the Veterinary Medicine Building, completed early in 1977. Thinking back on the old space that laboratory occupied, an observer remarked: "I don't see how anything got done. People seemed to be working on top of each other." But a lot was done then, and a lot more is being done now.

Today, the Clinical Pathology Laboratory can perform a wide variety of tests in hematology, fecal examinations, urinalysis, cytology, and chemistry, for 79 different tests in all. The number of tests run in 1979 was greater than 21,000, a figure that does not include general profiles.

Most of the testing is for the College. Nonetheless, a small percentage is work for other University offices and for private practitioners. Dr. Schmidt stated that the Clinical Pathology Laboratory does not wish to widely advertise that it will do testing for people outside the College. He said while the laboratory does not

usually turn down any request, he does not want to see the laboratory swamped with more requests than it can possibly handle. Right now, the Clinical Pathology Laboratory is working almost to capacity.

Charges are made for most tests—the exception being those tests performed strictly for demonstration purposes. The charges were established to recover costs.

The Clinical Pathology Laboratory may be deemed a success for its record of making fast and accurate tests by the thousands each year. However, that laboratory can be judged successful for something else: the quality of students trained there.

Clinical Pathology Workshops Being Considered

Faculty and staff of the Clinical Pathology Laboratory are considering conducting workshops in the future on hematology and chemistry. In order to plan effectively and to gauge the degree of interest, Dr. Schmidt would like to receive letters of interest with regard to these proposed workshops. So, please drop Dr. Schmidt a note to let him know what you think. This may mean an opportunity for you, the practitioner, to improve your clinical pathology techniques.



L to R. Ms. Nancy Olson holds an MS degree in Pathology from UMC's School of Medicine, and she is currently working on her PhD at UMC. She is a registered medical technologist. Prior to joining the faculty of the College, Ms. Olson had been in charge of the Medical Laboratory Technology Program at Central Methodist College in Fayette.

Dr. Donald Schmidt, a native of Wisconsin, received his BS degree from the University of Wisconsin in 1944, his DVM degree from Michigan State University in 1947, and from the same school his PhD degree in 1961. Dr. Schmidt became board certified in morphological pathology in 1959 and in clinical pathology in 1972, both with the American College of Veterinary Pathologists. He has twice received the Norden Distinguished Teacher Award along with a number of other awards.

(An upper-level student enrolled in the pathology block.)

Dr. Steven Stockham received his DVM degree from Kansas State University in 1972 and his MS degree from Michigan State University in 1980, where he had also just completed a three-year residency program in clinical pathology. In September, 1980, Dr. Stockham was granted board certification in clinical pathology with the American College of Veterinary Pathologists.

Two Faculty Become Board Certified



Dr. James Lattimer



Dr. Cecil Moore

Two of the faculty in the College's Teaching Hospital have passed the certifying examinations of their respective specialty groups to qualify them for Diplomate status.

Dr. Jim Lattimer was one of four veterinary radiologists to pass the certifying examination of the American College of Veterinary Radiologists. Dr. Lattimer becomes one of the fewer than 90 Diplomates of that specialty group.

Dr. Lattimer was appointed Assistant Professor this past August. He received his DVM degree from Washington State University in 1975; he completed his residency program in radiology at Colorado State University in 1980.

Dr. Cecil Moore passed the certifying examinations to qualify him to become one of less than 70 Diplomates of the American College of Veterinary Ophthalmology. Dr. Moore had been appointed Assistant Professor after having completed a two-year residency program at the College.

Dr. Moore, who received his DVM degree from UMC in 1972, replaced Dr. Harlan Jensen who recently retired as ophthalmologist for the College.



Upjohn Donates to Student Chapter

Mr. Michael Pfander (right), VMIII and Vice President of the College's Student Chapter, AVMA, accepted a check on December 4, 1980, from the Upjohn Company on behalf of the Student Chapter. Mr. Dave Hornbacker (left), Veterinary Sales Representative for Upjohn, made the presentation. The Upjohn Company has made similar donations in the past to the College's Student Chapter.

College Expands Computer Use

New Position of Computer Programmer/Analyst Created



Mr. Jerry Davison began work at the College on December 1, 1980, as a computer programmer/analyst. His position is a new one at the College, and he will be responsible for automating much of the management information processing that is now being done manually.

Mr. Davison, who holds an MS degree in physics from UMC, will help expand the system in the Veterinary Medical Diagnostic Laboratory for case entry and reporting. He will also work with personnel in that laboratory and in the Teaching Hospital to upgrade the present billing system. To improve that billing system, Mr. Davison said, will require preliminary work.

According to Mr. Davison, the College's medical records need to be analyzed from the standpoint of how they are maintained and how best to incorporate them into a computerized data base.

The College may acquire its own computer, a distributed processing unit, but Mr. Davison said that such an acquisition lies sometime in the future. Until then, his work will be performed on terminals here in the College that are connected to central facilities on the Columbia campus.

Although there is initially some expense (and inconvenience) associated with automating College records into a computer system, all the effort is paid back through increased efficiency. Personnel can be freed to perform tasks other than tedious, time-consuming searching through records and preparing, by hand, statements and forms. An automated system will reduce errors and will achieve consistent billing and results.

In addition to improved record-keeping and billing system, Mr. Davison added that a computerized system means increased access to information. Associate Dean Lloyd Faulkner agreed with Mr. Davison, saying that information is always being accumulated in the College, but retrieval of information is often slow and difficult.

Information that can be conveniently retrieved may be used for purposes other than billing. Records may be analyzed in research projects or in treating patients. For example, Mr. Davison said that clinicians in the Teaching Hospital could make analyses of patient trends or pathologists could trace disease patterns in livestock populations.



Dr. Cecil Elder

Dr. Cecil Elder died January 9, 1981, at the age of 87. He joined the faculty of the University of Missouri-Columbia in 1931 of what was then the Department of Veterinary Science. He retired 32 years later from his position as Chairman of the Department of Veterinary Pathology of the College.

Cecil Elder was born at Aurora, Illinois, on June 23, 1893. He attended Kansas State University where he earned his DVM degree in 1916, and in 1924 he received his MS degree from Ohio State University.

Dr. Elder stayed on at Kansas State University as a faculty member for two years after he had received his DVM degree. In 1918 he enlisted in the Army Veterinary Corps.

In 1919 Dr. Elder went to the University of Wyoming where he became Professor and Chairman of the Department of Bacteriology and Veterinary Science. He left Wyoming in 1931 to assume a position at the University of Missouri.

Dr. Elder took a leave of absence in 1946 to work in Shanghai, China, as an advisor for the government. Upon his return to the University of Missouri, he organized the Department of Veterinary Pathology, of which he was Chairman until his retirement in 1963.

Dr. Elder was a charter member of the American College of Veterinary Pathologists, and he also took an active interest in the Conference of Research Workers in Animal Diseases (CRWAD). He was president of CRWAD in 1959-1960.

Kansas State University conferred upon Dr. Elder in 1957 its Distinguished Service Award in Veterinary Medicine. The Missouri Veterinary Medical Association presented him its Citation for Meritorious Service in 1964.

College Increases Aid to Students

The College is in the process of establishing four new scholarships and awards: the Frank E. and Ena Hickerson Rhoads Scholarship, the Lucy B. Davis Scholarship, the Clair M. Hibbs Diagnostic Laboratory Award, and the Adrian Durant Scholarship. These four join the more than 30 scholarships and awards now presented each year to needy or outstanding veterinary students.

The Frank E. and Ena Hickerson Rhoads Scholarship was named for its donors who contributed more than \$16,000 in their will to Missouri's Veterinary College. Of these four scholarships and awards, this is the only one to date for which the college has established criteria for recognizing a recipient. The recipient should be a third-year student, be in the upper ten percent of the class scholastically, have demonstrated leadership, and be of excellent moral character. The first of this scholarship's monies will be awarded this coming May.

In 1980, the estate of Lucy B. Davis bequeathed to the College more than \$10,000 to be used for scholarships to recognize proficiency and interest in small animal medicine and surgery.

Dr. Clair Hibbs, Director of New Mexico's Veterinary Diagnostic Services, recently established an award in his name to recognize interest and ability in veterinary diagnostic laboratory medicine.

A number of alumni and friends have been contributing to a fund established in memory of the late Dr. Adrian Durant who died June 15, 1980. These contributions will develop a perpetual scholarship program to be named for Dr. Durant. Dr. Durant had been in charge of the University of Missouri's Department of Veterinary Science in 1946 when the first students were admitted to the professional curriculum, and he was instrumental in transforming that department into a full-fledged veterinary school.

When You Suspect *Clostridia*

Presentation and Shipment of Samples to the Veterinary Medical Diagnostic Laboratory When Clostridial Cultures Are Indicated

William H. Fales, PhD
Loren D. Kintner, DVM
Stuart L. Nelson, DVM
Veterinary Medical Diagnostic Laboratory

Clostridium novyi, *clostridium septicum*, *Clostridium chauvoei*, *Clostridium perfringens*, and *Clostridium sordellii* are anaerobic organisms that cause significant diseases of livestock. These organisms replicate in dead tissue. *Clostridium chauvoei* is commonly associated with blackleg in cattle. However, based on data gathered at the College's Veterinary Medical Diagnostic Laboratory (VMDL), *Cl. septicum* and *Cl. novyi* are more frequently encountered. Following these in order of frequency are *Cl. chauvoei*, *Cl. sordellii*, and *Cl. perfringens*.

One should commonly expect to find *Clostridia* in the liver, spleen, and cervical tissues of well-nourished ruminants that die suddenly and bloat after death. One may also expect to find *Clostridia* in bloody loops of small intestines of cows that die of shock.

At the time of necropsy, the prosector has to decide whether the lesion is antemortem and therefore significant, or if it is a postmortem artifact. The prosector cannot delegate evaluation of the case or lesion to the bacteriologist or histopathologist who are not present at time of necropsy.

The prosector may send samples and history to VMDL to confirm the diagno-

sis and to ascertain what specie(s) of *Clostridia* are involved.

To make the best use of the services offered by VMDL, one should remove, if possible, a tissue sample from the periphery of the lesion. One should also make impression smears to accompany the specimen. Examination by VMDL personnel of smears made before and after shipment will indicate the degree of specimen preservation and thereby assist in interpretation of results. If one suspects enterotoxemia, one can send a sample of the contents of the small intestine. Tie off section of suspected intestine and place that in a sterile plastic bag (whirl pak).

Next, one should prepare a shipping container by cutting styrofoam or foam rubber to fit inside a small box. Pack the specimen and smears inside with sufficient amounts of "cold packs" to maintain the specimen (which should be chilled before packing). Before sealing the box, enclose appropriate history and state what disease is suspected.

Sample shipment should be by the fastest means possible, with as few delays as possible. Therefore, one should check route of shipment. The VMDL has a pick-up service from the Columbia bus depot. When possible, one should avoid sending samples that will arrive on weekends or holidays.

The Bacteriology laboratory of VMDL can identify *Cl. novyi*, *Cl. septicum*, *Cl. chauvoei*, and *Cl. sordellii* by culture and by fluorescent antibody conjugates. Confirmation of *Cl. perfringens* is made by culture.

For questions regarding *Clostridia*, call: 314/882-6695. Send samples to: Veterinary Medical Diagnostic Laboratory—Bacteriology Section, College of Veterinary Medicine, UMC, Columbia, MO 65211.

Endoscopy Film Being Made at College



Dr. B. D. Jones



Mr. J. A. Schemp

Production of a film on veterinary endoscopy has begun at the College, thanks to a \$7,000 grant provided by the American Optical Company. On December 9, 1980, Mr. J. A. Schemp, Senior Product Manager for American Optical's Scientific Instrument Division, handed the check to Dr. Brent Jones, who is now making the film.

Dr. Jones has achieved a national reputation for his work in veterinary endoscopy, a diagnostic tool that utilizes fiber optics. Because of his expertise in this field, American Optical Company asked him to make this film that will be distributed nationwide to various veterinary groups.

Veterinary Specialty Company Donates to College

The Tri-Plex Company donated \$6,500 to the College; Dr. George Knappenberger, representing that firm, handed the check to Dean Kenneth D. Weide last fall. Dean Weide said that this donation will be used to make improvements in the large animal area of the Teaching Hospital.

The Tri-Plex Company of Haven, Kansas, manufactures veterinary equipment, much of which is custom-built for special needs.

Dr. Knappenberger graduated from the College in 1950.

Veterinary Medical Review

College of Veterinary Medicine
and Cooperative Extension Service

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

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