

VETERINARY MEDICAL REVIEW

FOUR OAKS DAIRY COLUMBIA, MISSOURI 314-474-5862 5 / 28 / 81

C3	PREGNANCY EXAM < 75 DAYS >	*	*	*	*
C5	PREGNANCY EXAM < 98 DAYS >	*	*	*	*
C6	POSTPARTUM < 145 DAYS >	*	*	*	*
C11	PREGNANCY EXAM < 74 DAYS >	*	*	*	*
C17	POSTPARTUM < 104 DAYS >	*	*	*	*

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Veterinary medicine enters the computer age

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

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and Missouri Veterinarian, Vol. 31, No. 2

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Computers and veterinary medicine

Machines no bigger than TV sets are changing animal health practices.

The request is a common one:

Farmer Jones calls Dr. Smith because he isn't sure his particular feed combination is the best one for his dairy herd. Should he mix it differently, or perhaps buy something else? Is a change worth the cost and trouble?

Time was when a call like that might have meant two or three hours work for a veterinarian, calculating different feed formulas and costs. But if Dr. Smith is one of the growing number of veterinarians with office computers, Jones probably will have his answer before he hangs up the telephone.

Microcomputers—self-contained computers based on the microprocessor chip—offer the practical route to the computer age. With units ranging from \$1,500 to \$10,000, microcomputers could become as common in the office as telephones—and just as useful.

The options are endless: streamlined business procedures, inventory control, word processing, medical records and case summaries, herd health management, ration balancing, laboratory management, differential diagnosis, research and continuing education.

At the College, microcomputers are used in the food animal clinic to help manage client dairy herds. Faculty members also are exploring the microcomputer's potential in education by creating autotutorial programs for students and practitioners.

First, a few basics:

There are three general types of digital computers—microcomputers, minicomputers and mainframe computers. The major differences lie in storage capability, sophistication, speed and cost.

A microcomputer usually can run only one program at a time and has a memory of 64K bytes (64,000 characters) or less. This is adequate for most practices, farms and small businesses.

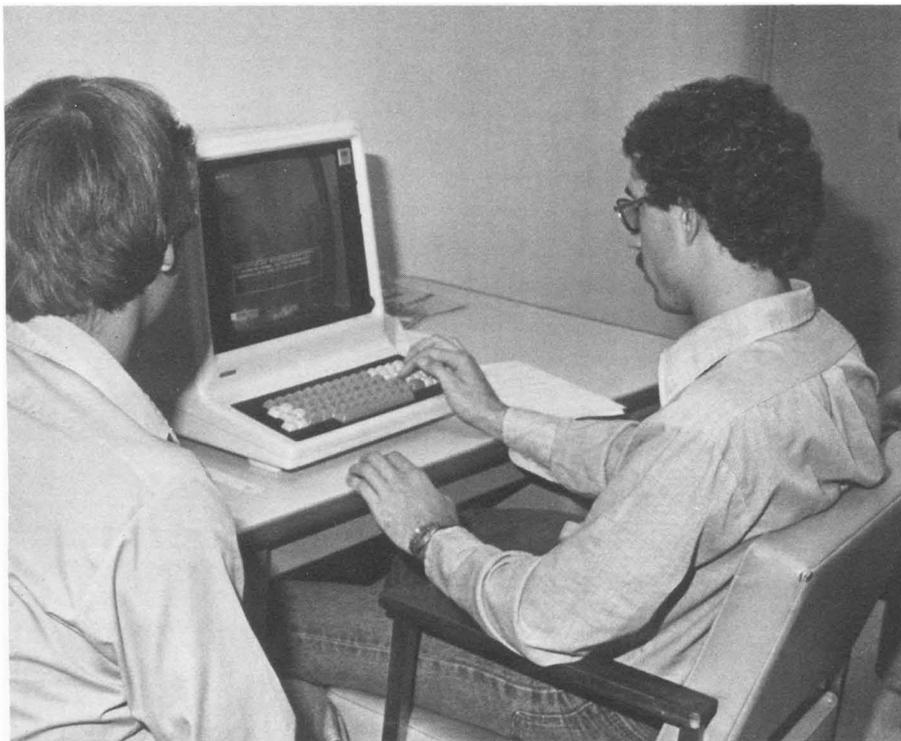
A minicomputer is capable of running more than one program simultaneously and can run programs of more than 64K bytes.

A mainframe computer has a 4M byte (4 million characters) memory or larger.

Computer hardware is the machine and its various parts, and the equipment used to run it.

Software is the computer program.

Programs usually are written in high-



Don Conner photos

Students experimented with games and autotutorial lessons on a Plato microcomputer during the terminal's one-week stay at the College in June.

level computer languages, which are translated into computer commands. Computer languages include Common Business-Oriented Language (COBOL), Formula Translator (FORTRAN), A Programming Language (APL), RPG, Ada, Pascal, Beginners Allpurpose Symbolic Instruction Code (BASIC) and PILOT. Most veterinary computer programs are written in some form of BASIC.

Standard hardware for a microcomputer includes a cathode-ray tube display that resembles a television set, keyboard, disc drive and printer. Some companies manufacture television adaptors that convert a regular TV set to a display tube, saving the purchase price of the video screen.

Disc drives store programs and record data on either floppy discs or hard discs. Floppy discs come in two sizes; 5 1/4-inch discs can store from 100,000 to 250,000 characters or more while the 8-inch discs have a 600,000-character or more capacity. The more expensive hard discs have a greater storage capability and are quite a bit more durable than floppy discs.

Early microcomputer models used cassette tapes rather than disc drives for programming and memory functions. Cassette models still are offered with the least expensive computers. Their speed and storage capacity are severely limited, however, and cassettes do not provide random access. Veterinary programs currently

being written usually are designed for floppy disc systems.

Initial start-up costs for microcomputers average between \$1,500 and \$7,500, depending on the equipment used. Basic equipment is priced at the lower end of the spectrum.

"A veterinarian can set himself up in the computer business for \$2,000 to \$3,000," says Dr. Ron Elmore of the College's food animal clinic. Dr. Elmore uses a Radio Shack Model I with four disc drives for his herd health management and theriogenology work at the College.

There are almost 50 companies involved in the manufacture of microcomputers and their accessories. Among the better-known firms are Radio Shack, Apple, Cromemco and North Star.

Although there's no shortage of companies, there may be a lack of dealers and service centers in certain areas, particularly rural and small towns.

"That's primarily why we went with Radio Shack," Dr. Elmore says. "Most towns have a Radio Shack store. Practitioners, especially those in rural areas, have to take availability and service into account before they buy."

Elmore's program is one for dairy herd health management. It was designed, he says, so that the user need not know programming. It is written simply, with instructions on how to proceed.

The program is in medical record form, arranged sequentially by each cow in the herd. Data is entered and updated after each visit, much like hard-copy records. Computer printouts can give the practitioner paper copies of medical charts.

The computer's efficiency becomes apparent when it is called upon to make calculations and information searches. Dr. Elmore can ask the computer to conduct a search, and 20 to 30 minutes later he will have a printout (cover photo) of which cows should be seen during the next day's visit to that client. With built-in parameters of heat, calving and breeding dates, the computer has selected electronically the cows to be palpated and stated the reason for the examination.

Other features Dr. Elmore intends to add to the dairy health program include:

- calving interval calculations;
- drug evaluations to check efficiency of certain drug treatments (such as calculating days from treatment to conception);
- printout lists of cows to "dry off" 60 days before calving;
- expected calving dates.

"This computer will be doing things the farmer or veterinarian wouldn't, or couldn't, calculate themselves," Dr. Elmore says. "The veterinarian is actually helping to manage the herd. With a computer, he has more information for management than the farmer does."

Dr. James Thorne, another food animal clinician, agrees. "A business program may streamline office procedures and save some money, but a herd health program will make money for a veterinarian."

The food animal clinic stepped into the computer age with two goals: to put the clinic's client records on the computer and manipulate them for veterinary use, and to produce software for the practitioner. So far, records for one client herd have been entered into the computer and they are being tested against hand-written records for accuracy. If it works for the clinic, this program and others can be offered to practitioners.

Drs. Elmore and Thorne are working with Dr. Robert Miller to create a beef cattle management program. Other health programs available elsewhere deal with nutrition and swine.

Small animal practitioners can modify herd health programs to fit their needs if they have several kennels or breeders for clients—simply consider them as herds.

Other types of microcomputer programs can be utilized by any practitioner. The business programs are the most popular.

Accounting, billing, mailing lists and inventory control all fall under business programs. Word processing can be added for correspondence and client reminders for such things as check-ups and vaccinations.

As with business records, medical records can be stored in a microcomputer, although a good program for that has not yet been perfected.

Ration-balancing brings us back to Farmer Jones' problem. A nutrition program can calculate correct feed mixes and portions for just about any breed of animal, providing an invaluable service to clients. Ration-balancing also can be included in herd health management programs.

Differential diagnosis is a controversial computer offering. Students and young practitioners usually want it while professors and more experienced veterinarians shake their heads. A medical diagnosis program is currently in use at Stanford University Medical Center, where its merits have been hotly debated. Most practitioners are afraid to give a computer sole responsibility for diagnosis. Programs soon may be available, however, that offer several diagnostic possibilities when given a set of symptoms. The purpose is to offer a range of possibilities and maybe jog the doctor's memory concerning potential diagnoses. It also could become an effective teaching tool for students.

Computers themselves are teaching tools and several College faculty members are taking advantage of the educational potential. Dr. Steve Simpson is working on an autotutorial program in neurology. The program runs on an Apple II microcomputer, providing lectures with color diagrams. After the lesson, there is a quiz. Dr. Elmore has a clinical competency quiz for theriogenology students on the Radio Shack model and Dr. Thorne has devised a multiple-choice test for food animal students.

Veterinary schools at the University of Illinois and Purdue University use Plato microcomputers for autotutorial education. (Plato is based on a massive mainframe computer system by Honeywell with 15 years experience behind it.)

"You have to consider the cost effectiveness of using computers on a large scale in education," Dr. Simpson says. "But the potential for continuing education is very good."

Conceivably, the day may come when veterinarians who can't make it to a short course or conference could order the computer program for the course. A floppy disc could be mailed to the practitioner to play on his computer. The computer hardware also could be leased.

The future holds other promises for microcomputer users. Universal software may be created for use on any brand computer. Also on the drawing board are methods that would allow interfacing with other brands. Networking—linking several microcomputers together—soon will be available at a reasonable cost. Portable microcomputers the size of a

small typewriter will allow practitioners to take them along on calls. Videodiscs and voice-activated computers are other new concepts that may find their way into microcomputer technology.

But the first step is programming. There are few veterinary programmers. In that area, the human medical field is somewhat ahead of veterinary medicine. MDs have formed the Society for Computer Medicine, which publishes a magazine, *Physicians Microcomputer Report*. Milliken Communications Corp. of St. Louis produces continuing education programs on Apple discs. Many hospitals reportedly put microcomputers to use on blood gas analysis and other services in emergency rooms and intensive care units.

Some programming companies are starting to specialize in veterinary medicine, while others have been established strictly for veterinary use.

Veterinary Computeristics is a programming company in northern California created by a diagnostician. It produces diagnostic and medical records programs.

Lame Horse Enterprises of Burleson, Texas, is a programming company that wants to get into veterinary programs, particularly herd health management.

The Clinical Epidemiology Branch of the National Cancer Institute has created a Veterinary Medical Data Program on a mainframe computer for case summaries. It now is stored and operated by Cornell University.

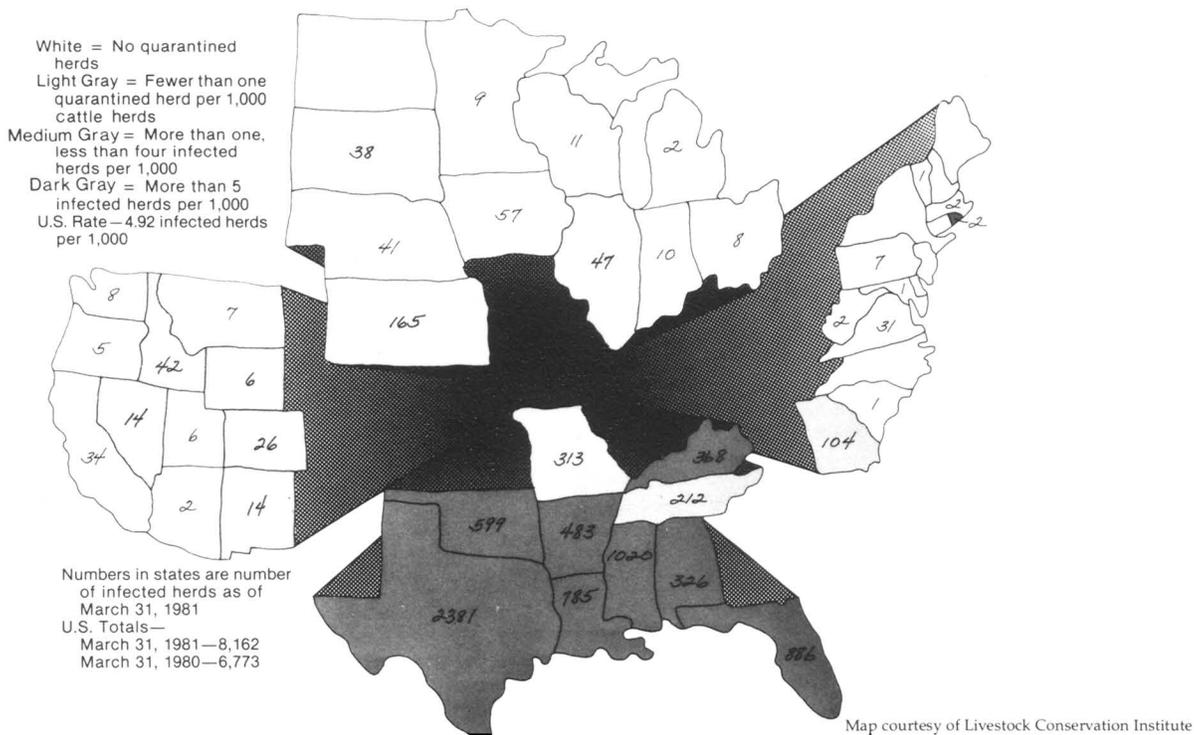
Bovocon is a California company that produces a commercial dairy management program. Company officials claim a heat detection rate of 95 to 100 percent. The computer monitors cows through a receiver and prints out lists of cows to watch. Identicow and Surge are commercial ration-balancing programs now on the market.

Very few beef cow-calf programs are available. Agmanco is an agricultural manufacturing company in Idaho that has made a cassette beef program with a large memory capacity. MCS of Alabama hopes to begin producing several beef programs, including ones for artificial insemination and cow-calf management. The College's Dr. Miller plans to create a herd health computer system for Midwestern veterinarians.

Other veterinary schools involved in programming include Michigan State University and the University of California-Davis extension service. UCD researchers currently are working on programs for dairy health, feedlot necropsy and death loss, and swine health.

Additional programs of interest are Dialog, a literature search program created by Lockheed in Palo Alto, Calif., and PEARL, a program from Computer Pathways Un-

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In March, Missouri's brucellosis-quarantined herds stood at 313, ranking the state as a high-incidence area.

BRUCELLOSIS UPDATE

By January, Missouri should be well on its way to eradication.

Tighter control over imports may be Missouri's ticket to Class B status next year when new brucellosis categories are determined.

"We definitely will make it," says Dr. Robert Moody of the U.S. Department of Agriculture's Missouri office. "It will be a struggle, but we can do it."

On Jan. 1, 1982, the USDA will classify states as either A, B or C for brucellosis infection. Class A states will be considered brucellosis-free and producers there generally may move cattle freely across state lines. Class B states will be those with a brucellosis infection rate of up to 1 percent of its cattle herds. Breeding cattle shipped from a "B" state to another state will be tested within 30 days prior to movement and be quarantined for 45 to 120 days upon arrival at their destination. Class C states will be those with more than a 1 percent infection rate. Breeding cattle moving interstate from "C" areas will have to have two negative brucellosis tests at least 60 days apart, with the second test within 30 days prior to movement. Class C cattle also will be quarantined 45 to 120 days upon arrival at their destination. Certified-free herds will be exempt from pre-movement tests.

Missouri reported 298 infected herds in May, down from April's 308 and March's 313. With about 94,000 cattle herds in the

state, the infection rate is 0.3 percent, well under the 1 percent maximum for Class B status.

"Our main concern right now is control and quarantine of imports from other states," Dr. Moody says.

Regulations that went into effect July 11 require anyone involved in cattle sales or purchases to register with the Missouri Department of Agriculture. Each registered person must keep certain records on each test-eligible animal for at least two years to enable a trace back to the original herd or forward to their point of resale.

The new rules, Dr. Moody says, will work with the herd certification program in the country's eradication efforts. The program currently requires three negative brucellosis tests before a herd can be certified brucellosis-free. All cows and heifers retained on the farm must be certified as official calfhood vaccinates. Producers and dealers must document legal movements of animals and record all tests and quarantine requirements of animals added to the herd. To maintain herd certification, at least five negative tests must be documented in ensuing years, with no positive or suspect tests in that time.

Brucellosis losses to the U.S. cattle and dairy industry were \$30 million in 1976. USDA officials estimate losses at \$850

million a year if brucellosis is left uncontrolled. Most of the nation is considered infection-free or low-incidence. Ten southern states are considered high-incidence brucellosis areas: Missouri, Oklahoma, Arkansas, Tennessee, Kentucky, Texas, Louisiana, Mississippi, Alabama and Florida.

Federal and state officials stepped up efforts to eradicate brucellosis in the spring of 1979. Missouri's infection rate stood at 0.5 percent, but Dr. Taylor Woods, director of the state veterinarian's office, feared that number would increase to 2 percent or 3 percent by 1981 if no control efforts were made.

For more than 30 years, Missouri's brucellosis control was voluntary among herd owners. The state's infection rate dropped from more than 10 percent in 1947 to 0.153 percent in 1977. Dr. Woods attributed the increasing cases in 1979 to a herd buildup among owners who inadvertently were purchasing infected cattle and introducing them into existing herds.

A national information campaign began in the spring of 1979, when new regulations came out requiring improved surveillance of all U.S. cattle, particularly those shipped to other areas. That winter, the Missouri Department of Agriculture declared cattle abortions a reportable dis-

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The care and feeding of psittacine birds

Birds are misunderstood pets, a mystique that can lead to improper care. Many dealers and pet shop owners often are ignorant of bird needs, says Dr. John Lenz, leaving the animal's new owner to learn whatever he can about his new pet from other sources. The first stop on that road to knowledge is usually the veterinarian's office.

Dr. Lenz, of the College's small animal clinic, has prepared an information sheet for his clients to familiarize them with pet psittacine birds. He offers it here for use by other practitioners who may have birds among their patients.

More than 400,000 pet birds are imported legally into this country each year. Many thousands more are smuggled in to evade the expense of the U.S. Department of Agriculture's stringent quarantine regulations. These regulations are designed to prevent the entrance of exotic diseases, particularly Exotic Newcastle Disease and psittacosis.

Exotic Newcastle Disease—a virus causing pneumonia and encephalitis—represents a serious threat to the American poultry industry. In 1971, the disease was introduced by way of imported pet birds in California. It spread to broiler and layer chicken farms, hatcheries, and turkey producers, with a loss of millions of birds and millions of dollars. In 1980, more than 35,700 pet birds had to be destroyed after exposure to this disease.

Psittacosis is a disease causing enteritis in many types of birds, and it is transmissible to humans. The human form causes fever, loss of appetite, constipation, tiredness and pneumonia. It is rarely fatal.

Both Newcastle and psittacosis can be difficult to diagnose in birds. In general, any bird obtained should be observed closely for signs of disease for at least 60 days. Any indication of loss of coordination, muscular weakness or paralysis, loss of balance, or diarrhea lasting more than 48 hours should be reported to a veterinarian. Since smuggled birds ordinarily are introduced into legitimate wholesale/retail trade channels, the buyer cannot be certain of the history of the new pet.

Behavior

Most species of psittacine (parrot

family) birds are relatively less active than other kinds of birds and therefore, are well-suited to captivity. As in other confined animals, abnormal behavior patterns can and do develop. Some of these are relatively harmless, such as stereotyped "pacing" or repetitious vocalizing.

A serious behavioral vice, occurring nearly always in isolated birds not well-socialized to humans, is feather plucking. This is often a very difficult habit to break. A veterinarian can give advice on behavior modification.

Nutrition

One of the most frequent causes of poor health in pet birds is malnutrition. This often is revealed by poor feather growth, weight loss and inactivity.

Commercial seed mixtures and parrot diets are *not* adequate to meet the nutritional needs of psittacine birds! In the wild, these birds eat fruits, flowers, leaves, grasses, nuts and even some insects, as well as seeds. The captive bird's diet should include a wide variety of foods. Pet birds safely can eat anything people do, but it probably is wise to avoid stringy items.

Birds should eat foods divided among the following groups:

Fruits (peeled)

apple
grapes
orange
lemon
banana
lime
grapefruit
peach
plum
berries
pear
tomato
cherry

Cereals

bread
seeds
rice
crackers
breakfast cereals
fresh corn on cob
rolled oats (oatmeal)

Vegetables

broccoli
cabbage
spinach
brussel sprouts
kale
parsley
chard
dandelion
lettuce*

Others

crushed oyster shell
dry dog food
slices of carrot
hard-boiled egg
sprouted seeds
potato
cheeses
turnip
nuts

*lettuce is not nutritious enough to substitute for others in this group



Certain foods should not be fed, or fed only as a special treat in limited amounts. These are foods birds become addicted to and then refuse to eat anything else. Any food has this potential, but sunflower seeds and peanuts are the most common culprits.

Vitamin and mineral supplements probably are not necessary for birds eating a well-balanced diet, although supplements are relatively inexpensive insurance that birds will not develop nutritional deficiencies. There are many brand names and types of vitamin-mineral preparations. Ask a veterinarian or someone knowledgeable which formulas are best.

Clean, fresh drinking water should be supplied daily.

Housing

Tamed birds can be allowed indoor freedom, but care must be exercised to prevent escape. Wing feathers can be clipped to prevent flight by clipping the feather shaft about halfway to the tip. Clipping every other feather on one wing usually will prevent flying without disfiguring the outline of the wing. Be careful not to clip the feather shaft too short, or it will bleed.

For their safety, birds should be caged at night and when left alone. Untamed birds must be caged continuously. Cages must be large enough to allow perch placement so that the tail feathers do not rub across the cage bars and break the feather tips. A bird should have enough room to spread its

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Psittacine birds

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wings and to perch with its head up. A cage is never too big for the bird.

Some common foot problems can be prevented by replacing the uniformly sized dowel perches with perches of assorted sizes. This allows the feet to be in different positions when perching, providing needed foot exercise as well as allowing the bird to select the most comfortable perch.

Psittacines enjoy looking out of windows, but a free-flying bird can panic and fly into the glass. If a free-flying bird is loose in a room, pull the blinds or curtains.

Environment

Most parrots, loris, parakeets, lori-keets, macaws, etc., come from tropical jungle habitats. Exceptions are the budgerigar—a very common Australian shell parakeet—and the cockatiel—a small parrot; both live in the Australian desert. Budgies and cockatiels tolerate somewhat greater temperature change and lower humidity than other psittacines.

For most psittacine birds, the optimum temperature range is 75 to 80 degrees Fahrenheit. It is important to house the bird away from drafts. The location should be checked for drafts with a thin strip of facial tissue. It is essential to avoid chilling these birds. Ruffled feathers and huddled posture may indicate the bird is cold (or has a fever). Positioning a light bulb near the bird helps raise the temperature of the area.

Humidity should be kept around 50 percent. Few home heating systems can keep the relative humidity this high; house plants, trays of water, or a mechanical humidifier may be needed.

Some individual birds will bathe frequently, others less often, but warm bath water should be offered 1-3 times a week, in a shallow container large enough to hold the bird. It is particularly important to shield the wet bird

from drafts until it has dried completely.

Birds enjoy sunshine and like to sun themselves, but they can become overheated and suffer from heat prostration. Birds placed in direct sunlight should be able to move into a shaded area, and should have plenty of fresh cool drinking water. Parrots enjoy being outdoors in warm weather, but incur risks of escape, free-roaming dogs and cats, children, and disease.

A change in surroundings has bad effects on many birds. This is most frequently seen as short-term diarrhea (48 hours) and mild depression. This is one reason why many veterinarians prefer not to hospitalize bird patients. If the diarrhea persists, a veterinarian should look at the bird.

Proper sanitation is the most important prevention for infectious disease. Cage bottoms should be changed as often as needed to keep them clean, dry and sanitary. Newspaper should not be used to line cage bottoms. Some inks are toxic and newsprint tends to rub off on feathers, discoloring them.

Bird skin is very sensitive to coal tar, pine oil and petroleum-based products. Disinfectants such as Lysol and Pine-Sol should not be used around birds. Cages, feeders, perches and waterers can be disinfected safely and inexpensively by washing, then soaking or wiping with a solution of one ounce laundry bleach in one quart of water. Be sure to rinse thoroughly to eliminate traces of detergents or disinfectant. Some types of metals will be corroded by the bleach solution. If this occurs, a veterinarian can supply a suitable non-corrosive disinfectant.

Socialization

Young, immature birds are easiest to tame for handling. Older birds can be tamed, but patience is required and behavioral problems, such as feather-plucking, may be more likely. Single birds are more likely to develop strong human-oriented bonds than birds kept in groups. Even birds housed alone in their cages will orient themselves to

other birds if they can see or hear them. The tamest and gentlest birds to handle nearly always are those that are handled and given much human companionship when very young.

Some species, most notably macaws, form strong pair attachments. When these birds are kept alone, they become very attached to one or two humans. It is not unusual for the owners to go on a two-week vacation and come home to find their pet has developed neurotic behavior patterns.

Breeding

Most people with a few pet birds should not attempt to breed them. Owners fortunate enough to have compatible pairs that try to mate need to read and study about the species, or better yet, contact an experienced breeder.

Diseases

Signs of disease in birds are similar to those of other animals. They include bleeding, lameness, vomiting, diarrhea, loss of appetite, sneezing, droopy attitude, lack of normal activity and ruffled feathers.

Diseases often progress rapidly in birds. Many birds die from treatable diseases because treatment was started too late. As soon as disease signs are noted, veterinary medical advice should be obtained. If the local veterinarian is not equipped to treat birds, he or she may refer the bird to a specialist. Some owners try to treat diseases with products obtained at pet shops, grocery stores, etc. When this is unsuccessful, the veterinarian's job is much more difficult.

When transporting a bird to the doctor, protect it from chilling and drafts. Bring it in its regular cage, and do not clean the cage before the visit. If any medications or vitamin-mineral supplements are used, bring the bottle with its label. A sample of the regular diet is helpful. Before moving the cage, empty the water dish and replace it in the cage.

Datebook

August 21-30. Missouri State Fair in Sedalia. The College will have a booth in the Agriculture Building.

September 10-11. Continuing Education course: Small Animal Technician Workshop. For further information on courses, contact the College's Continuing Education Office, or call (314) 882-7848.

September 13. Continuing Education

course: Care of the Cardiac Patient.

September 16-17. Continuing Education course: Necropsy Techniques.

September 24. Visiting lecturer: Dr. Horst Leipold on "Nature, Cause and Effect of Congenital Defects in Cattle," 4 p.m. at the College.

September 24-25. Continuing Education course: Surgery Update.

October 10. Annual Conference re-

unions for 1956, 1966 and 1976 graduates, at Columbia's Ramada Inn.

October 11-12. Annual Conference for Missouri Veterinarians, at the College and Columbia's Ramada Inn.

October 21. Continuing Education course: Swine Health Day.

October 28. The 31st Gaines Veterinary Symposium at Louisiana State University in Baton Rouge.

Microcomputers

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limited that allows the computer to program itself.

Veterinarians interested in programming have formed the Veterinary Computer Society. For further information, contact Dr. Adam Magby, 879 Kemp-ton St., New Bedford, MA 02740.

The American Association of Bovine Practitioners also has a computer committee. It will present a microcomputer seminar at the organization's November meeting in Spokane, Wash.

The College's continuing education of-fice has a microcomputer seminar planned for April 18 in Columbia. Swine, beef lot, dairy and small animal medicine will be covered in discussions, with half the day devoted to hands-on experience with the computers.

Additional reading

Books

1. *So You Are Thinking About A Small Business Computer*, by Richard Canning, Canning Publications Inc., 925 Anza Ave., Vista, CA 92083. 1980. (\$14)
2. *Computers in the Practice of Medicine*, Vols. I & II, by H.D. Covvey and N.H. McAlister, Addison-Wesley Publishing Co., Reading, MA 01867. 1981.

Magazines

1. *Byte*, Byte Publications Inc., 70 Main St., Peterborough, N.H. 03458. (\$19 for 12 issues)
2. *Output*, Technical Publishing Co., 666 Fifth Ave., New York City, N.Y. 10102. (\$9.97 for 12 issues)
3. *Interface Age*, 16704 Marquardt Ave., Cerritos, CA 90701. (\$18 for 12 issues)
4. *Info World*, 530 Litton Ave., Palo Alto, CA 94301. (\$18 for 26 issues).

Recent articles

1. "Computers: Have They a Place in Practice?" *Veterinary Record*, Jan. 10, 1981, Vol. 108, No. 2, p. 25.
2. "Cash Register—Computer—Practice Analyzer" by Janet Bates, *Veterinary Economics*, March 1981, Vol. 22, No. 3, pp. 22-26.
3. "Components of Software" by Ivan Fillmore, D.V.M., *Veterinary Economics*, February 1980, Vol. 21, No. 2, pp. 39-40.
4. "Getting the Most From Your Computer System" by Ivan Fillmore, D.V.M., *Veterinary Economics*, April 1980, Vol. 21, No. 4, pp. 44.
5. "Using a Minicomputer for Income Analysis" *Veterinary Economics*, December 1980, Vol. 21, No. 12, pp. 30-34.
6. "Beware of Business Computer Sys-

tems That Do Not Fit Your Needs" by F.G. Smith, *Journal of the American Animal Hospital Association*, 1979, Vol. 15, No. 5, pp. 651-653.

7. "A Computerized Dairy Herd Health Program (abstract)" by R.W. Erickson, C. Gibson and D. Gayk, *Journal of Dairy Science*, 1980, Vol. 63, Supplement 1, p. 116.
8. "Microcomputers in Dairy Practice," by K.E. Sterner, *Bovine Practitioner*, 1979, No. 14, pp. 54-55.
9. "Computer-Assisted Practice Management" by C.V. Trayser, *California Veterinarian*, 1979, Vol. 33, No. 7, pp. 32-34.

Software Sources

1. *Survey of Availability of Micro and Mini Computer Software*, by J. Robert Strain, Institute of Food and Agriculture Sciences, University of Florida, Gainesville, FL 32611.
2. *Radio Shack's Software Sourcebook*, available at any local Radio Shack.
3. *CP/M Users Group—Over 4,000 Free Programs*, by the CP/M (command processor for microcomputers) Users Group, 1651 Third Ave., New York, N.Y. 10028. (\$6 for the catalog)
4. *Microcomputer Resource Guide for Agriculture*, by Russ Wilkens of the Agriculture Education Department at University of California, Davis, CA 95616.

New faculty

Dr. James Tomlinson

Dr. James L. Tomlinson has joined the Department of Veterinary Medicine and Surgery as an assistant professor of surgery. He replaces Dr. W. G. Whittick, who left the College last December.

Dr. Tomlinson, 34, received his D.V.M. and B.S. degrees from the University of Minnesota, and an M.A. in veterinary clinical science from the University of Saskatchewan where he recently completed a small animal residency.

He has practiced in several small animal clinics and was in charge of small animal surgery at Wolff Animal Hospital in Bloomington, Minn. Dr. Tomlinson also has served a small-animal internship at the University of Georgia and was a virus research technician for the University of Minnesota's Department of Microbiology.

Dr. Jennifer Balke

Dr. Jennifer Balke has begun a graduate program in theriogenology as a research assistant.

Dr. Balke completed a residency in theriogenology at the College June 30.

Dr. Terry Blanchard

Dr. Terry L. Blanchard, a theriogenologist, is the College's newest assistant professor in the Department of Veterinary Medicine and Surgery.

Dr. Blanchard, 31, recently completed a residency in reproductive studies at the University of Pennsylvania's New Bolton Center. He holds a D.V.M. degree from Kansas State University and a B.S. in biology from the University of Kansas.

He served in the Peace Corps for two years as a research study leader for the Philippine Council for Agricultural Resources and Research. Dr. Blanchard also taught anatomy, physiology and farm animal health at the University of the Philippines at Los Banos and Central Luzon State University. Before his overseas work, he spent a year in a mixed-animal practice in Crown Point, Indiana.

Dr. Blanchard is a member of the Soci-

ety for Theriogenology.

Dr. Ronald McKnight

Dr. Ronald McKnight has joined the Department of Veterinary Medicine and Surgery as a resident in radiology. He replaces Dr. Joanne Burns, who completed her residency June 30.

Dr. McKnight, 33, comes to the College from Tuskegee Institute in Alabama, where he served a one-year internship. He holds a D.V.M. and B.S. in animal science from Tuskegee, as well as a B.S. in chemistry, math and biology from Coppin State College in Baltimore. He also has completed two years of graduate study in math at Coppin.

He is a member of the American Chemical Society.

Dr. Margaret Dillender

Dr. Margaret J. Dillender joined the Department of Veterinary Microbiology this summer as a research associate.

Dr. Dillender, 28, received her D.V.M. degree from the College in May.



Missouri Veterinarian

Dean's Corner



We graduated the 31st class from the College of Veterinary Medicine in May.

You might be interested in some of the job activities involving the Class of 1981. From very early survey returns, we have learned the following:

There were 6.1 job opportunities per student which resulted in 3.7 job interviews and 2.3 job offers for each student.

The salary ranged from \$11,000 to \$30,000 with the average salary being \$18,634.

At this time, it appears that our students do not have difficulty finding jobs. We hope to have a more complete survey about August 1.

Our entering class has the following statistics. Cumulative G.P.A. - 3.5. Physical Science G.P.A. - 3.3. Biological G.P.A. - 3.58. The average age is 22.

Of a total of 76 students, there will be 32 females and 44 males.

We have 68 Missouri residents and 8 non-residents.

It appears that we will have an excellent student body.

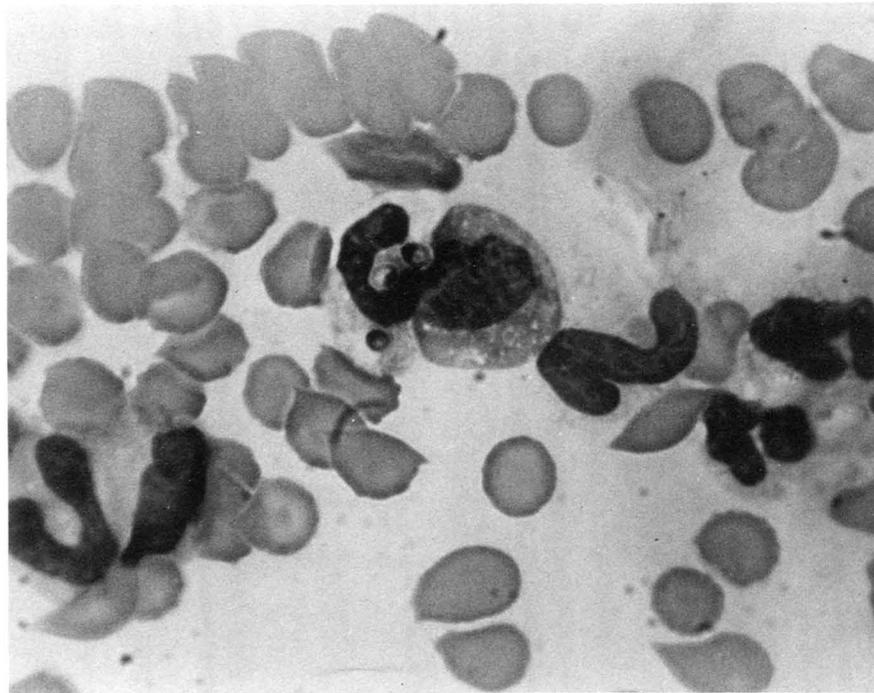
If you have any young men or women interested in veterinary medicine as a career, please have them contact me.

I would like to invite each of you to visit the College. We will have our Veterinary Alumni Day October 24. This is the day of the Nebraska game. It's a fun day for you and your family. Motel rooms and 100 tickets have been reserved. Keep checking for more information about the middle of August from the Alumni Center.

Come join us for a good time.

Sincerely,

Kenneth H. Niemeyer, D.V.M.
Assistant Dean for Student and Alumni Affairs



What's your diagnosis?

An 8-year-old Schnauzer was admitted to the clinic with a history of vomiting and diarrhea of five days duration. There was also a history of weakness and weight loss for the past several weeks.

Hemogram on admission showed: Hb 11.1 gm/dl(12-18)*; PCV 29%(37-55); WBC 19,200/cumm(6-17); Neutrophils, 19,200/cumm(3-11.4); Neutrophil bands, 14,000/cumm(0-0.3); Lymphocytes, 2,580/cumm(1-4.8); Monocytes, 1,110/cumm(0.15-1.35); Plasma protein 6.7 gm/dl(6-7.5) (T/S meter); Platelets, 101,000/cumm (2-9).

Biochemical Profile: Albumin, 1.0 gm/dl(2.3-4.3); Alkaline phosphatase 300 IU/L (0-88); Phosphorus, 5.6 mg/dl

(2.5-5.0); Calcium, 7.9 mg/dl(9.8-12); BUN, 32 mg/dl(5-28); Glucose, 73 mg/dl (71-115); Glutamic-pyruvic transaminase, 44 IU/L, (4-66); Bilirubin, total, 4.1 mg/dl (0.1-0.6); Bilirubin, direct, 3.0 mg/dl; Osmolality, 304 mOsm/kg (280-305).

Radiographs reveal hepatomegaly and splenomegaly.

*Reference values are included in parentheses

Picture is from the peripheral blood smear, in the feather-edge area of the smear.

What's your diagnosis?

Answer on Page 12

Missouri Veterinarian
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Editor Sue Graves
Managing Editor Kathy Casteel
Faculty Drs. E. Brown & R. Miller

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Spring in the bluegrass



Khristina Kirkland, VMIV

Kentucky in the spring, bluegrass, and some of the world's finest thoroughbred horses turned my March-April free block into an unforgettable experience. Since my primary interest in the veterinary profession is equine medicine, I wanted to gain some exposure to the racing industry and large-scale breeding farm operations. Spendthrift Farm in Lexington, Ky., was my first choice of prospective farms, and to my delight, Dr. Don Witherspoon, director of veterinary services there, told me I was welcome to work with him.

My two-month stay was a priceless educational opportunity. Spendthrift is a sophisticated, highly efficient breeding establishment operated by qualified horsemen and horsewomen. Dr. Witherspoon provided me with this opportunity, and I am extremely grateful to him for allowing me to share his genius and the pleasure of his company. He is an outstanding veterinarian and a fine instructor.



The horseshoe-shaped barn is the "high rent" district at Spendthrift. It houses such great stallions as Affirmed, Seattle Slew, Nashua and Raise a Native.



Dr. Don Witherspoon, director of veterinary services at Spendthrift, goes about his morning rounds at one of the more than 50 broodmare barns. Spendthrift employs three fulltime resident veterinarians.



One of the farm's breeding sheds. In 1980, Spendthrift bred 1,583 mares with 3,195 covers for a phenomenal average of 2.01 covers/mare.



The world-renowned stallion, Affirmed, winner of the 1978 Triple Crown. One of the best race horses in thoroughbred history, he was the first thoroughbred to earn \$1 million in a single season. He has been syndicated for \$14 million. Spendthrift has the distinction of standing two of the three living Triple Crown winners at stud.



Grazing peacefully at mother's side is perhaps the next Kentucky Derby or Triple Crown winner. The parklike farm has more than 4,000 acres of carpeted pasture. Spendthrift is a commercial breeding farm consistently ranking among America's leading consignors at the three major select summer yearling sales.

Thanks to Dr. Witherspoon's continuing interest in my career, I will be attending the 1981 Select Summer Yearling Sales in Lexington. I am looking forward to returning to Spendthrift and seeing "old friends." The thoroughbred industry is a world in itself and I encourage anyone with an interest in horses and equine medicine to experience the bluegrass.

Diagnosis

From Page 9

Histoplasmosis. Numerous *Histoplasma capsulatum* organisms could be found in the neutrophils and monocytes in the blood smear, particularly those found in the feather-edge of the smear. Necropsy of this animal revealed disseminated histoplasmosis with granulomas being found in the liver, spleen, lung, and kidney.

D.A. Schmidt, D.V.M., Ph.D., Dipl. ACVP

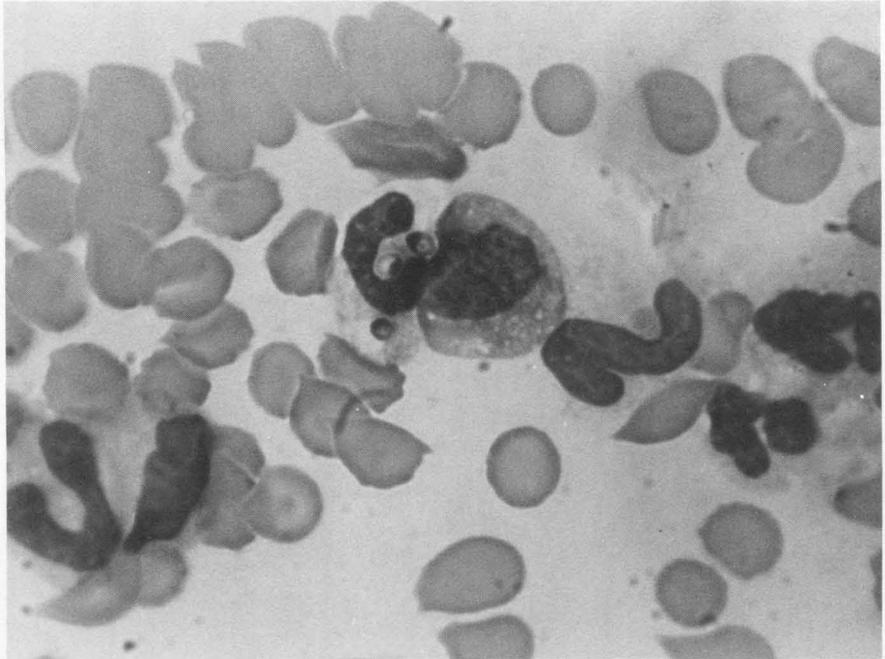
Department of Veterinary Pathology

S.L. Stockham, D.V.M., M.S., Dipl. ACVP

Department of Veterinary Pathology

P. Roudebush, D.V.M.

Department of Veterinary Medicine & Surgery



Pitman-Moore donates \$500 to SCAVMA

Chip Whitlow (right) of Pitman-Moore pharmaceutical company presents a \$500 check to David Graeff of the student chapter of the AVMA. The money was earmarked for SCAVMA's speakers program and was used to bring Bob Harman from the University of California-Davis to the College June 4-5 to speak on microcomputers in veterinary medicine.

Don Connor photo

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College of Veterinary Medicine
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