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CPM-Dairy *Software That Brings a New Approach to Dairy Nutrition*

Feed continues to be the major input cost to dairy operations, often approaching 50-60% of the value of milk sold. Indirectly, nutrition influences profits by affecting milk production levels of lactating cows, growth rates of heifers and repro-



ductive efficiency. The Center for Animal Health and Productivity at New Bolton Center has been actively involved in the development of computer software that will control feed cost, promote animal health and production, and help minimize environmental pollutants. The Center for Animal Health and Productivity, in conjunction with Cornell University and the Miner Agricultural Research Institute, Chazy, NY, will be releasing a new dairy ration evaluation and formulation computer program. The new program is called CPM-Dairy in recognition of the collaborative efforts of faculties at the three institutions. At Penn, the development of this program was coordinated by Dr. William Chalupa and Dr. Ray Boston and evolved from concepts

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From The Dean



The other day I was intrigued to learn that the number of applications for next year's class, the Class of '02, is up by 10% to a total of 1360 for 109 places. This trend has been growing


for the past seven years and reflects increased interest in veterinary medicine as a career. This increased interest is not restricted to young people for applications now cover a wide age spectrum. In recent years our youngest applicant was 18 and our oldest 59.

Undoubtedly, provision of student scholarships to offset the high cost of tuition at Penn has played an important role in amplifying the number of applications we receive and we are tremendously grateful to the Governor and Pennsylvania legislature, the alumni, and the School's many friends and benefactors for their support and generosity. But I believe there are additional factors at work, more and more young people recognize the expanding opportunities and riveting challenges for veterinary medicine in the next century. These prospects radiate well beyond the traditional but increasingly sophisticated role veterinarians play in providing care for domestic

animals. Examples of these opportunities include:

- Development and application of biotechnology in animal agriculture,
- Increasing the health and productivity of animal agriculture in the U.S. to sustain the industry and meet growing world markets for our goods. By 2050 it is projected that world food production must expand threefold to meet the needs of a burgeoning global population; this will include a population in developing nations that is moving up-scale and demanding more and more animal products in their diet.
- Investigating environmental issues both in the U.S. and abroad. This work will include the inter-related problems of nutrition, odor and waste management that accompany intensive animal agriculture,
- Wildlife preservation,
- Protection of the oceans and developing aquaculture in the U.S. as an environmentally sensitive industry. After oil, importation of seafood products is presently the largest contributor to the balance of payments deficit in the U.S. Control of infectious disease is one of the greatest challenges facing this fledgling industry. We know virtually nothing about the incidence and impact of infectious disease among economically important vertebrate and invertebrate species in the oceans.

- Controlling new and emerging infectious diseases affecting both animals and man. All of the dangerous new infectious diseases that have recently been reported to afflict humans originated in animals.
- Controlling the safety of the Nation's food supply in a global marketplace,
- Interpreting the ethical use of animals in society,
- Expanding the care of companion animals for an aging, urbanized society in which demographers now predict more and more people will be living alone.

Veterinary medicine has expanded remarkably during the past 30 years. In my view this growth is far from over and the profession will continue to address an ever more complex and important range of societal concerns well into the next century. Moreover, these new challenges offer the profession a more dazzling and inviting palate than the medical profession which is more and more enveloped and constrained by cost containment and HMOs. So I am not surprised that we are attracting growing numbers of the brightest and most able students and I believe this pattern will continue for years to come. 

Alan M. Kelly,
B.V.Sc., M.R.C.V.S., Ph.D.

The Gilbert S. Kahn Dean of Veterinary Medicine

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Class of 2001

The 74 women and 33 men who comprise the Class of 2001 attended 78 different undergraduate schools and come from 17 states and four foreign countries. Pennsylvania is the home state of the majority of students, 59, followed by New York with 12, New Jersey with seven and California with six. The other 13 states are represented by one or two students each. The four foreign students come from Canada, Germany, Morocco, and the United Kingdom. Advanced degrees held by the students include M.A. (3), M.S. (6), M.B.A. (1), Ph.D.(5).

A Lion's Tail Saved

On Sunday, May 25, 1997 an unusual emergency case came to New Bolton Center's Widener Hospital. Leeds, an eight-year-old, 900 pound male lion was brought in with a severely lacerated tail by his owner, Ms. Kay Rosaire Mowery of Clementon, NJ. The lion, a performer with his owner and her fourteen other tigers and lions, was in danger of losing his tail as it had lost both its bony integrity and the major blood vessel carrying blood to the tip. The laceration cut the

tail bone in half and all that remained was skin and a small amount of muscle on the upper side of the tail. Dr. William Donawick, Mark Whittier and Lila Griswold Allam Professor of Surgery, was called to the hospital by Dr. Eric Parente, assistant professor of sports medicine, "...because of his expertise in vascular surgery." Dr. Lin Klein, Professor Emeritus in Anesthesia, was asked to participate in the surgery because of her experience and interest in anesthesia of

exotic animals.

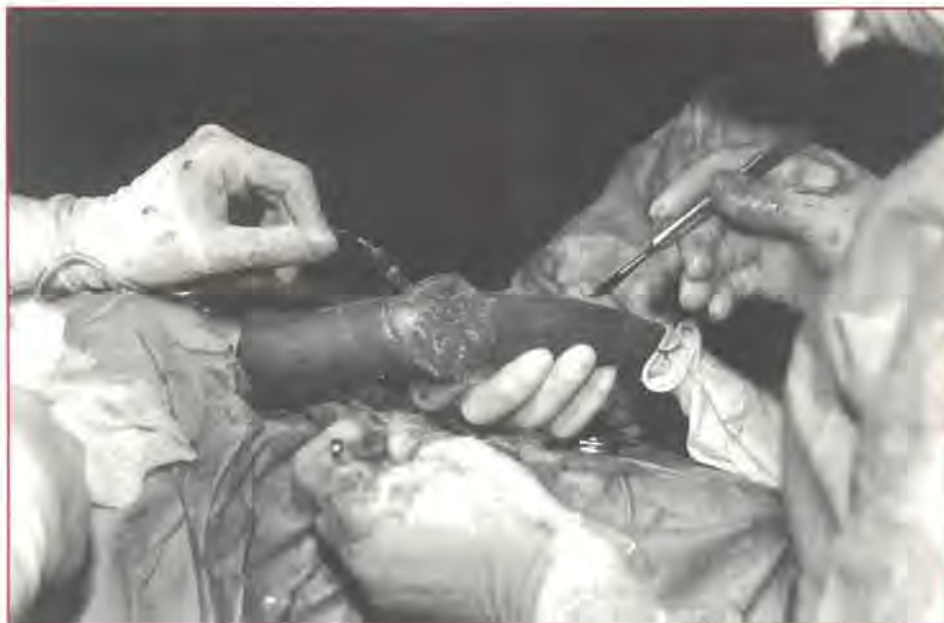
Dr. Donawick felt there were two options: 1) remove the tail beyond the site of injury or 2) attempt repair of the damaged tail. The owner was adamant about saving the tail as she felt strongly that loss of it would hamper the lion's ability to continue performing in her show. Dr. Donawick, assisted by Drs. Barbara Dallop and Dana King, residents in surgery, took on the challenge. Mary Crotau, OR nurse, Diane Hurly, anesthesiology technician, and several fourth year veterinarian students were present to assist.

After the laceration was thoroughly cleaned, Dr. Donawick removed the damaged muscle tissue, damaged vertebra and part of each of the adjacent vertebrae. Once this was accomplished the tail was shorter and two healthy bones were in contact. Holes were drilled in the remaining adjacent bones and wires were placed to approximate bone and provide bony stability. Shortening the tail brought the cut ends of the coccygeal artery close enough together to repair it by arterial anastomosis. The skin and muscle tissues that remained were closed over the artery. The tail was bandaged lightly and the lion discharged. Two off site visits were made after the surgery.

Leeds' tail healed and he has gone back to performing. The lion and his other large cat friends are wintering in Sarasota, Florida and will return to their New Jersey home next spring. 🏠



Dr. Donawick and his sedated patient after successful surgery.



The wound.

Scholarships

Pandora Davis, V'99, has been awarded a scholarship by the Barnstable County Agricultural Society, Inc. of East Falmouth, MA.

Lisa Barnett, V'98, is the recipient of the Dr. Ginnie Lieblein Memorial Scholarship. The Class of 1947 Scholarships were presented to **Benjamin Spitz, V'99, John Eccher, V'99, Kathryn McPherson, V'99, and Heather Galano, V'99.**

CPM-Dairy: Software That Brings a New Approach to Dairy Nutrition

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learned in various spreadsheet versions that have been used in the field over the last several years.

CPM-Dairy uses two approaches to evaluate and formulate rations: a modification of the classical National Research Council (NRC) system and the Cornell Net Carbohydrate and Protein system (CNCPS). CNCPS in CPM-Dairy differs from traditional programs by accounting for dynamic attributes of feed ingredients such as passage and digestive rates. Passage rate is the speed at which a feed ingredient leaves the rumen and determines how long it is exposed to the resident microbial population. Digestive rates determine how quickly nutrients are assimilated from feed ingredients. By using these attributes of feed ingredients, rumen function is modeled in a manner that allows for a better estimation of ruminal microbial yields from various feed combinations. The microbial population produced in the rumen is digested further down the GI system and is a vital source of protein, often forming 50% of the cow's total protein requirement. Through this process and along with other metabolic and anatomical adaptations, the cow's digestive system plays a vital role in the conversion of feed ingredients unusable to man into useful products. To feed the cow, the rumen must be fed in a symbiotic fashion so that maximal efficiency can be achieved. CPM-dairy models this process.

To evaluate or formulate a ration, a nutritional consultant will first visibly inspect the feeds to examine their quality and physical characteristics (fiber length). Samples of the feed ingredients are then sent to a forage testing laboratory for analysis of nutrient content. The laboratory results are faxed to the nutritional consultant and are entered into the computer program. The program allows dairy rations to be formulated or evaluated for heifers, dry cows as well as lactating cows. Nutrient requirements are determined by the physiological state of the animal (body weight, milk production level, milk composition,

growth rate) as well as environmental factors (temperature, wind chill, coat matting, etc.). Linear and nonlinear programming are mathematical techniques used in the program to formulate least-cost-rations and ensure that the nutrient requirements of the rumen microbes and cow are met. Thus these methods will identify which ingredients should be fed as well as how much should be feed for each ration.

The program is expected to gain rapid utilization and replace many traditional software programs in the field. The program will continue to capture the economic benefits associated with least cost formulations, but, by modeling the underlying biological process, will allow further economic efficiencies to be gained. The CAHP's Field Investigation Unit is currently using the program to evaluate production and health problems on dairy herds in the Commonwealth. The Production Medicine Program at the 1998 Penn Annual Conference will feature the CPM-Dairy program and provide a hands on training opportunity for practitioners.

CPM-Dairy will be an integral component of other software under development at the CAHP. Ration and manure data from CPM-Dairy can be used in the Dairy Nitrogen Planner, a spreadsheet program developed by Dr. Zhengxia

Dou, Dr. James Ferguson and Dr. Richard Kohn, to help understand the environmental consequence of ration and cropping decisions on nitrogen flows in dairy operations. This Dairy Nitrogen Planner program will help dairy producers develop efficient nutrient management plans to minimize the environmental impact of their production systems. The CPM-Dairy program will also provide the basis for development of dynamic programming approaches to ration formulation. This new approach to ration formulation investigates the economic effects of feeding specific sequences of rations to cows and can be used to capture further economic benefits in terms of seasonal feed prices and feed availability. These methodologies have been used to formulate optimal sequences of rations for dairy heifers and will be applied to investigate feeding strategies in lactating cows.

The CPM-Dairy program is a representative product of the research themes of the Center of Animal Health and Productivity, that is to develop tools and techniques that improve the economic health and viability of animal production systems. ■

By David Galligan, V.M.D., M.B.A., associate professor of nutrition and animal health economics

Dr. Brinster honored by City

The American Philosophical Society in Philadelphia was the site of a special ceremony in November. Here Dr. Ralph Brinster was honored by the City of Philadelphia as the recipient of the John Scott Prize. The award, established in the early 19th century by John Scott, a druggist from Edinburgh who provided funds to the City of Philadelphia to present awards to people who had made useful inventions. The first award was presented in 1834. Dr. Brinster was honored "for his pioneering research in transgenesis. The transgenic animals

pioneered by Professor Brinster produce insight into such human genetic disorders as birth defects, cancer and heart disease."

The other honoree was Dr. Frank A. Cotton, a chemistry professor at the University of Texas. Past recipients of the prize have included innovators and scientists such as Mme. Currie, Thomas Edison, the Wright brothers, Edwin Land, Jonas Salk, Guglielmo Marconi and many others selected to follow John Scott's wish of honoring "ingenious men or women who make useful inventions."

Marshak Dairy Facility Update

The Marshak Dairy Facility has been in operation for over a year and the greenhouse-style barn is working well. Leroy Bruce, New Bolton Center's Farm Manager for fifty years, retired in June of 1996. His place has been taken by Jim Wolfer who manages the farm and is involved with running the Marshak Dairy under the direction of Dr. William Chalupa, professor of nutrition.

The original herd of forty Holsteins was transferred from the tie stalls of the old bank barn to the new dairy on November 11, 1996. The cows adjusted very quickly to the free stalls with mattresses and sawdust beds. All animals used the stalls within a few hours after arrival.

Production remained constant throughout the transition. At present between 150 and 160 cows are milked with an average daily production of between 65 lbs. and 75 lbs. of milk per cow per

day. One person milks 150-160 cows in approximately 2.5 hours twice a day. The milk tank is emptied on alternate days and the milk is sold to Land-O-Lakes Dairy Cooperative. The dairy houses 165 milking cows, 25 heifers and 50 calves, bringing the total number of animals at the dairy to 240.

Winter brought one ice storm that did damage the plastic roof which was immediately repaired. During the summer, Dr. Chalupa reports, very little effect from heat on the cows was noticed. During the hot months, shade cloths are placed over the plastic roofs to cut down on solar warming, side wall curtains are opened to allow air movement and fans enhance the air circulation throughout the barn for the cows' comfort. The fly population was minimal.

A greenhouse-style heifer barn was completed in July and houses calves, heifers, and dry cows. It has box stalls for maternity cases.

Pasture has been created all around the Marshak Dairy for heifers and dry cows.

Mr. Wolfer reports that the dairy's automatic flushing system has enabled New Bolton to use the wastes as fertilizer. The solid effluent that is separated from the flushing water has been used to fertilize NBC crops four times since the cows moved in. Waste water from the flush manure removal system has been irrigated on to cropland four times since the opening of the dairy and slurry waste which settles in the ponds has been removed and distributed to cropland two times.

Jim Wolfer was born and raised on a dairy farm in the Western part of New York State and received his BS degree in general agriculture and agriculture education from Cornell University. Mr. Wolfer served as farm superintendent for ten years at the University of Delaware, prior to that he managed the dairy there.

The School recently hired a dairy manager, Mr. Tim Terry, who holds an Associate degree in animal husbandry from SUNY Cobleskill, BS in animal science and dairy management from Cornell, and a MS in animal science and ruminant nutrition and biochemistry from Michigan State University.

M.B.

Leptospirosis on the Increase

The annual vaccinations for dogs include an inoculation to protect the pet from leptospirosis. Unfortunately, the vaccine currently available against this disease does not protect against all of the leptospiral serovars and a dog can contract the disease even though it has been vaccinated.

The various serovars are in the wildlife population and are shed in their urine. Dogs in suburban and rural areas then can get infected as they come in contact with contaminated water in puddles and streams. Urban dogs can become infected through exposure to rat urine.

Leptospirosis is a zoonotic, a disease that is communicable from animals to people. It can cause acute or chronic illness, often involving the liver, kidney and/or eye. The symptoms may suggest a gastrointestinal ailment. If leptospirosis is suspected, a blood test can be performed. However, it needs to be interpreted carefully because previous vaccination against the disease may cause some changes in the test results. Treatment is with antibiotics, often rather aggressively as the disease damages the liver and kidneys. If these organs have been damaged severely, the dog may have chronic liver and/or kidney failure.

Because the organism is shed in the urine of the ill animal it is extremely important that dogs be treated promptly and properly so that they are not a source of infection for people, other pets or livestock.

VHUP has seen an increase in leptospirosis cases during the last two years. Owners of dogs that run in areas with a lot of wildlife should be on the look-out for symptoms and take the animal promptly to the veterinarian if illness is suspected. It needs to be treated quickly to limit the damage to the liver and kidneys and to prevent infection of people, other pets and livestock. 🐾

M.B.

Increased Patient Load at George D. Widener Hospital

Bruce Rappoport, associate dean for New Bolton Center and director of the George D. Widener Hospital at New Bolton Center, reports that the hospital had a record year in FY 96/97 with over 6100 admissions (not including Field Service). In 95/96 the Widener Hospital had 5700 admissions.

Mr. Rappoport attributes the larger case load to 1) an increase in the client base; 2) a growth in performance horse clients (dressage, hunter/jumper, and driving horses); 3) an overall healthier economy. Also, the hospital is seeing people who are willing to make the investment in their "increased value" horses whereas in the past many would not have spent the money. The Emergency Service at New Bolton saw an increase in caseload for colics and orthopedics (sports medicine injuries).

Mr. Rappoport comments, "Our success in achieving this new milestone is due, in no small part, to the clinicians and staff who have provided top quality service to the horse-owning and agricultural community."



The 20th Annual Feline Symposium was March 22, 1997 at VHUP. It again included the "Parade of Breeds," narrated by Mr. Richard Gebhardt and a wine and cheese reception hosted by Mrs. R.V. Clark, Jr. and Mrs. Edith Young. The 1998 Annual Feline Symposium will be held on Saturday, April 4, 1998. Following are the summaries of the talks at the 20th symposium.



Feline Wellness and Geriatric Therapeutics

The concept of feline wellness hinges on the fact that cats are prone to different health problems at specific stages of their life cycle. Dr. Diane R. Eigner, whose Philadelphia-based veterinary practice, The Cat Doctor, treats cats exclusively, discussed preventive care and geriatric therapeutics in cats.

Dr. Eigner often tells her clients their cats can perhaps subsist for a total of some 20 years with reasonable quality of life. If a cat is to thrive this long, she explained, it must receive adequate health care starting early in life.

When she sees a kitten for its first veterinary visit, Dr. Eigner performs a thorough physical exam and feline leukemia virus (FeLV) test, which she sometimes waives if the owner provides proof that both parents are negative for FeLV. She vaccinates for feline viral rhinotracheitis, calicivirus and feline panleukopenia (FVRCP) using an *intranasal* vaccine (to remove the risk of vaccination-site fibrosarcoma), and for

rabies if the kitten is three months of age or older.

The kitten's stool is examined for evidence of parasites, including such protozoa as coccidia. She prescribes worming medication to all young kittens and strays regardless of fecal evaluations, following the CDC's recommendations. The ears are checked for mites, and a MacKenzie toothbrush fungal culture is performed to detect dermatophytes in the skin if she feels it is warranted (she estimates that 80 percent of her purebred patients carry ringworm spores). Dr. Eigner also broaches general health care maintenance issues with the owner at this time. "I like to introduce the wellness concept early on," she said.

This involves discussion of factors like pet health care insurance, dental care, diet and behavior. Dr. Eigner advocates feeding a special kitten diet for the first year of the cat's life. For adults, she recommends the premium brands of cat food, such as Iams, Waltham, Science Diet and Select Care, all of which she credits with reducing the frequency of urinary crystal formation. For females she recommends both the commercially available diets and the premium ones.

Dr. Eigner advises her clients to begin brushing their cats' teeth early on so the cats don't object to the practice later in life. She said brushing twice weekly reduces plaque by about 70 percent. As such, it minimizes the need for dental procedures under general anesthesia later on, and lessens the likelihood that potentially insidious oral and subsequent systemic disease will develop.

"Dental disease is one of the most significant things that often goes undetected in cats," she said.

At the first and second appointment, Dr. Eigner examines kittens for the evidence of congenital defects, such as skeletal or soft tissue abnormalities and cardiac murmurs. In the follow-up visit, which is about three weeks after the initial appointment, she administers the

initial FVRCP vaccine and the first FeLV vaccine if they are at risk for exposure to feline leukemia, she deworms again (three weeks later, she examines a stool sample to ensure the kitten is free of parasites). The FVRCP vaccine is repeated and the FeLV vaccine is given if the kitten has significant FeLV exposure risk. For a kitten aged three months or older, the rabies vaccine is given if it has not yet been administered.

At six months, Dr. Eigner rescreens for FeLV (17 percent of FeLV+ cats are asymptomatic) and tests for feline immunodeficiency virus (FIV). She advises waiting until the cat is six months old to screen for FIV because earlier tests can yield false positives due to maternal antibodies. At this time, Dr. Eigner spays/neuters the kitten if it is still intact (she has performed these procedures on kittens as young as eight weeks of age without any negative consequences). Her presurgical database includes PCV/TS/BUN, as well as a thorough physical to rule out heart murmurs or other conditions that may have developed. Insertion of a microchip, which aids in identification of the cat if it gets lost, might also be done.

When a client brings in a recently-acquired adult cat, Dr. Eigner performs a physical, screens for FeLV, FIV and parasites, and updates the cat's vaccines if they are not current.

Annual visits for Dr. Eigner's <ten-year-old patients include a physical exam, fecal, dietary review and yearly FVRCP vaccine. The cats are vaccinated for rabies every three years (with the exception of the second booster, which is given one year after the initial vaccine). The FeLV vaccine is given to high-risk cats.

When her patients attain ten years of age, Dr. Eigner obtains baseline values by running a CBC/chemistry profile/a thyroid profile and urinalysis. She repeats these tests annually to monitor the function of the major organ systems, such as the kidneys.



At Dr. Eigner's clinic, geriatric exams are conducted for cats over 13 years old. These cats have their CBC, special serum values (creatinine, BUN, ALT and SAP), urinalysis and blood pressure (via ultrasonic Doppler flow detector) evaluated on a semi-annual basis. A thorough oral examination is also done, as dental disease is common in geriatric cats. If dental procedures, such as teeth cleaning and extractions, are indicated, she takes special measures for these older cats. They are given antibiotics before and after the procedure and, in order to keep the kidneys well perfused, they are started on fluids the morning of their procedure.

Although many owners are wary of having their elderly cats anesthetized, Dr. Eigner strongly recommends dental care where indicated, regardless of age. "These are not cats that shouldn't be treated," she said. "Afterwards, they are happy again, pain free, and go back to normal eating and grooming."

Geriatric cats are prone to renal failure, and Dr. Eigner treats them accordingly. Diseased kidneys tend to produce inadequate amounts of erythropoietin, a hormone that stimulates the bone marrow to produce red blood cells. She medicates anemic cats whose PCVs are <20% with iron and Epopo® (Epopo), a synthetic erythropoietin formulation. Most of these cats are sent home with subcutaneous fluids and KCl (they are often hypokalemic). Their PCVs are monitored to ensure that polycythemia has not developed secondary to treatment with Epopo®.

Other therapeutics Dr. Eigner evokes for geriatric cats are cimetidine and famotidine (anti-ulcer medications); phosphorus binders (antacids; treat vomiting/nausea); cisapride (increases gastric motility); lactulose (laxative; binds ammonia); amlodipine (treats hypertension); Cosequin® (enhances cartilage integrity); and fentanyl patches (provide analgesia).



Feline Cardiomyopathies: Diagnosis, Prognosis, and Treatment

Feline heart disease can cause — or result from — insults to other body systems. Dr. Nancy A. Sanders, lecturer in small animal critical care at the School, presented the clinical signs of, and diagnostic tests and treatment options for, several types of cardiomyopathies that occur in cats.

Nonspecific signs of heart disease include dyspnea, coughing, lethargy, exercise intolerance, inappetence, weight loss, visual impairment and hindlimb paralysis/paresis. Diagnosis and characterization of heart disease can be made by integrating the results of electrocardiography (ECG), echocardiography and radiography with pertinent blood values and history and physical exam findings.

The feline heart can be affected by congenital anomalies, arrhythmias, heartworm infection, valvular and pericardial lesions, and, of greatest significance, primary cardiomyopathies.

The most common myocardial disease is hypertrophic cardiomyopathy (HCM), which is characterized by ventricular hypertrophy and its consequences. "The muscle gets thickened at the expense of the internal diameter of the heart, so there is very little space for blood to collect," Dr. Sanders explained.

These changes trigger a destructive chain of events. The atria enlarge as they pump against the stiffened ventricles. As blood stagnates in the atria, thrombi can form. These clots can enter the circulation and settle in organs and blood vessels such as the descending aorta, where "saddle thrombi" can impair the circulation to the hindlimbs, possibly resulting in paralysis. Blood also backs up into the pulmonary vasculature, leading to pulmonary edema

and respiratory distress. Hypertension and associated retinal detachment are other unfortunate consequences.

Physical exam findings include tachycardia, hypertension, gallop rhythm, heart murmurs, abnormal lung sounds, deficient pulses, cold extremities and retinal changes +/- blindness. On radiograph, the lungs typically are radiopaque and left atrial enlargement may be apparent; the heart generally does not appear enlarged because the muscle thickens toward the internal rather than external cardiac diameter. The thickness of the myocardium and consequent diminution of the chamber are evident on echocardiogram.

HCM is best treated with diuretics, vasodilators, beta-blockers and calcium-channel blockers. Other therapeutic options include chest tap to remove free fluid from the thoracic cavity, and anticoagulants to prevent clot formation. The treatment regimen should also incorporate management of underlying causes of HCM, which include hyperthyroidism, hypertension, chronic lung disease and congenital anomalies. (Breed predispositions and idiopathic mechanisms may also be responsible.) HCM carries a guarded prognosis, which varies depending upon the severity.

Restrictive/intermediate cardiomyopathy (RCM) has a similar mechanism to HCM. RCM results from myocardial fibrosis; although the heart muscle is not as corpulent as in HCM, its compliance is reduced. The ensuing pathogenesis and complications are akin to those seen in HCM, but the respiratory signs are typically more pronounced. RCM is an idiopathic disease, although suspected causes include endocarditis and viral infections. The treatment protocol for RCM is the same as for HCM, but the prognosis is slightly better because cardiac function is usually not as compromised.

Dilated cardiomyopathy (DCM) involves a different type of mechanism. Here, the myocardium is atrophied and flaccid. As a result of this weakened contractility, the chambers become engorged

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with blood. Consequently, the atria expand because they cannot pump blood into the dilated ventricles. This leads to circulatory backflow into the pulmonary vasculature, resulting in pulmonary edema and pleural effusion. Radiography reveals an enlarged cardiac silhouette (lateral view), and the lungs appear radiopaque.

The leading etiology of DCM is dietary deficiency of taurine, an essential amino acid in cats. Retinal degeneration may also be present secondary to taurine deficiency. Because commercial cat foods are nutritionally balanced, DCM is rarely seen in cats today. Most cases of DCM are idiopathic; rarely, it has been seen associated with hyperthyroidism (hypothyroidism is also a suspected cause).

DCM is treated with taurine supplementation, diuretics, vasodilators and positive inotropes (i.e. digoxin). The prognosis is guarded initially, but improves if the causative factors are identified and treated quickly.

A newly described entity, endomyocarditis is a rare condition involving inflammation of the myocardium and the internal linings of the heart. It typically affects young male cats with recent histories of stressful events, such as surgery or grooming; other underlying causes include viral infections and systemic inflammatory conditions, such as pancreatitis.

On echocardiogram, the affected heart appears thickened, as in HCM, but lung pathology and dyspnea are more severe. Endomyocarditis should be treated as a medical emergency with oxygen, diuretics, vasodilators and intensive care. If the patient survives the initial crisis, the disease may progress to HCM or RCM. The prognosis for survival is grave.

Treating heart disease is a careful balancing act. Congestive heart failure and kidney failure, for example, are treated in opposite manners. A cat in HCM likely needs diuretics to decrease associated pulmonary congestion. But diuretics can cause dehydration, leading to hypotension and renal failure.

"Everything has its drawbacks," Dr.

Sanders said, "and we have to be very careful when we put a cat on medications for heart disease."



Cat Houses I Have Known

Ideal animal husbandry systems incorporate the principles of sound health care, nutrition, safety and environmental stimulation. Geoff Loveridge, a spokesperson for the Waltham Centre for Pet Nutrition, discussed kennel, cattery and operation, as well as group animal care for cats.

Waltham's animal facility, located in Melton-Mowbray, England, serves as the nutrition and palatability testing center for the pet foods the company manufactures. The campus, which is open for public visitation, houses cats and dogs in several "homey" buildings, said Mr. Loveridge. Sixteen breeds of dogs reside at the center. The dogs have indoor/outdoor runs, play paddocks and toys.

Like its canine constituency, Waltham's cats have their needs met on many levels. The cats are housed according to sex, age and life stage. The breeding building adheres to strict hygiene; shower stalls help to ensure that entrants don't bring in pathogens from the environment. The floors are cleaned with household detergents and bleach. Like the dog runs, the cat enclosures have outdoor space too.

"The cats may choose whether they want to be inside or outside," Mr. Loveridge explained.

In addition to offering environmental enrichment, he said, this indoor/outdoor design gives the animals temperature variation. "Cats and dogs seem to like small spells of being very hot or very cold."

The tom cats live in individual runs equipped with climbing poles and window sills for perching. The queens, how-

ever, are group housed. When inside, they lounge in "social rooms," complete with heated beds, window sills, scratch pads and toys.

Pregnant queens demand special care, Mr. Loveridge said. From the start of gestation, the pregnant queen begins to gain weight. Only about a third of this extra weight is attributed to the placenta and kittens; the rest is reserve body tissue that stores energy to be used post partum. During lactation, weight loss occurs as these stored calories are utilized. Waltham's lactating queens are fed nutritious, palatable foods, and in greater quantity, so that they can end their lactation at or near their pre-pregnancy weight.

Kittens also receive special care at Waltham's diet-testing facility. Each newborn is injected with a microchip and weighed at birth. It is housed with its siblings and mother in an easily-cleaned, tiled enclosure that contains a cardboard box lined with absorbent bedding (for the kittens) and walled shelves (for the queen).

Waltham's kittens are closely monitored for weight gain. At birth, the kittens weigh about 100 grams each. But by about five weeks old, their individual genetic potentials become apparent, as kittens born to heavier queens are typically larger than their counterparts. By 20 weeks of age, individual weight differences are even greater. The kittens' growth efficiencies decline over time, and their weights even dip slightly following vaccination, likely from stress. Newly-weaned kittens are moved to new quarters, where they are group housed and provided with safe children's toys.

The next stop for the kittens is the palatability testing building, where feline enclosures are furnished with bell ropes, cardboard boxes of different heights, and other feline recreation accessories. Here, food preference tests — in which the young cats are offered a variety of meals from which to choose — are conducted. Chemical analyses are done on both the food and the urine and feces in order to assess food digestibility. At 16-20 weeks

of age, both the kittens and the pups, which are socialized as much as possible while at Waltham, are adopted out to permanent homes.

Nutrition testing for pets is a critical function at Waltham, which is a division of Mars International. The center is careful to assess the dietary needs of dogs and cats separately. "It wasn't very long ago that cats were considered to be just small dogs," Mr. Loveridge said, "whereas we know, in fact, that they've got very specific nutritional demands."



Calamitous Cats: An Overview of Feline Behavioral Problems

Behavioral problems outpace infectious, metabolic and neoplastic diseases combined as the number one reason for death among domestic cats and dogs. But whether or not behavioral disorders culminate in euthanasia or outplacement, said Dr. Karen L. Overall, lecturer in behavior medicine at the School and director of VHUP's Behavior Clinic, heartbreak almost invariably enters the picture.

Cats represent the majority of pets in the U.S., yet only account for only some 20 percent of the Behavior Clinic's clientele. Owner's often fail to recognize or acknowledge their cat's behavioral anomalies. Dr. Overall reasoned. "People will tell you that cats are asocial," she says. "Cats are not asocial. They are elegant social beings."

Normal feline social development is segmented into several discrete stages. From two to ten weeks of age, kittens are engaged in the social play period, a critical part of early feline psychosocial ontogeny. "If you want to guarantee that your kittens will be as friendly to people as possible, you have to handle them intensely between two and seven weeks of

age. If you miss this period," said Dr. Overall, who referred to adopted feral cats that never become socialized to people, "then you have a problem."

By about 12 weeks old, social play gives way to social fighting. Cats are sexually mature by about six months of age, but continue to mature socially until two to four years of age. At about this time, some cats vie for status within the household and may exhibit aggression toward people and other cats.

An aggressive cat communicates its state of mind through often subtle facial and postural responses, altering the angle of its head with respect to its body, and the position of its tail and ears. In their evolutionary history, cats, which are obligate carnivores, have developed complex social dynamics in order to flourish as hunters. As a result, said Dr. Overall, "cats are different. They don't express plain fear and plain aggression. It's overt versus covert aggression, passive versus active aggression, defensive versus offensive aggression."

Feline aggression comes in a variety of patterns, including predatory aggression, fearful aggression, play aggression, territorial aggression, maternal aggression, redirected aggression, and aggression due to lack of socialization. The most common feline aggression problems seen at the Behavior Clinic are status-related aggression and inter-cat aggression.

Often manifest as the "leave me alone" bite, status-related aggression usually occurs when the cat is being petted. Typically, the cat solicits attention and then suddenly bites the handler and flees. Here, the cat is attempting to control when the attention starts and when it ceases. Since this behavior can lead to injury, owners are encouraged to watch for signs of impending aggression (i.e. dilated pupils, flattened ears, flicking tail and low growl). At the first sign of such behavior, the handler should rise and let the cat fall from the lap. This type of aggression can be modulated with behavioral and environmental therapy, as well as psychotropic drugs.

Though common between toms, inter-cat aggression is more often based on conflicts within social hierarchies than on sex. Among toms, early neutering (before 12 months of age) has been shown to decrease fighting by about 90 percent.

Feline aggression is potentially dangerous and owners are advised to be wary when around a cat that is behaving in a truculent manner. Cats remain reactive for a long period of time after being thwarted from aggressive interactions, and should not be approached until they appear calm.

Feline temperament is mediated by several factors, Dr. Overall said. Friendliness is largely determined by the father's genes. Coat color has been associated with aggressive propensities. Perinatal nutrition influences brain development. These factors should be considered by a prospective cat owner in selecting a kitten.

While feline aggression is a daunting problem, inappropriate elimination behaviors constitute the most common behavioral problems in cats. They can take several forms, including spraying, non-spraying marking, and substrate or location aversion or preference. Diagnostic tests, such as urinalysis, should be performed to distinguish behavioral from systemic etiologies, such as cystitis.

Obsessive-compulsive disorders can also be seen in cats and can manifest as self-mutilation, pica, self-directed aggression, and ritualistic vocalization and motor behavior. As for aggression disorders, a variety of pharmacological approaches exist to treat behavioral elimination problems and obsessive-compulsive syndromes. These, combined with behavioral and environmental intervention, can improve the affected cat's quality of life.

"We become more humane when we realize that cats are complex social beings," said Dr. Overall, "and that they have problems that can be corrected."

Joan Capuzzi

Rosettes & Ribbons

Dr. James Serpell, Marie A. Moore Associate Professor of Human Ethics and Animal Welfare, received a Provost's Interdisciplinary Seminary Fund grant for a seminar series on "*Human Relations with Animals and the Natural World.*"

Dr. Harry Rozmiarek, professor and chief of laboratory animal medicine, was reappointed to the Board of Trustees of the Association for Assessment and Accreditation of Laboratory Animal Care International. In July he was installed as the president of American College of Laboratory Animal Medicine.

Dr. Larry Gerson, V'75, was elected vice president of the Pennsylvania Veterinary Medical Association.

Marcela Salas, V'00, was selected as a Ballard student by the Morris Animal Foundation and she is the foundation's ambassador here at the School.

Dr. Adrian Morrison, professor of behavioral neurosciences, lectured in a continuing education course on sleep disorders for Italian neurologists in Bertino, Italy. He recently was interviewed on animal-use issue in biomedical research by *Technopolitics*, a PBS show.

Francesca Cozzi, a second year neurology resident, passed the European College of Neurology board exam.

Dr. Gary Smith, professor of population biology and epidemiology, gave an invited seminar at the Institute of Parasitology at McGill University, Quebec, Canada. In October he was the plenary speaker at the 10th Brazilian Conference on Veterinary Parasitology in Itapema, Santa Catarina, Brazil.

Dr. Peter Dodson, professor of anatomy, was the guest of the Chinese Academy Sciences during the summer. He spent a month in China and presented a seminar on studies of growth in dinosaurs at the Institute of Vertebrate

Paleontology and Paleoanthropology. He also visited Liaoning Province in north-eastern China where he examined deposits containing some of the earliest known birds and putative dinosaurian ancestors.

Dr. Mark Haskins, V'69, professor of pathology, spoke at the Nobel Symposium on Correction of Genetic Disease by Transplantation in Stockholm, Sweden on "Bone Marrow Transplantation in Animal Models of Lysosomal Storage Disorders."

Dr. Samuel Chacko, professor of pathology, presented two papers at the Meeting of the European Society for Impotence.

AVMA meeting on psychopharmacology. Her book, *Clinical Behavioral Medicine for Small Animals*, is in its third printing and is being translated into Japanese.

Dr. E. Neil Moore, professor of physiology, presented a lecture and a workshop at the University of Florida School of Medicine Symposium on Cardiovascular Patient Management Update.

Dr. Eric Parente, assistant professor of sports medicine, gave a presentation at the 1997 American College of Veterinary Surgeons Veterinary Symposium.

Dr. Dana King, and **Dr. Celia**

Davenport, surgery residents at New Bolton Center presented papers at the American College of Veterinary Surgeons Annual Meeting in Orlando, FL.

Dr. Michael Ross, associate professor of surgery, spoke at the American Association of Equine Practitioners Annual Meeting.

Dr. Eric Tulleners, Lawrence Baker Sheppard Associate Professor of Equine Surgery, spoke at the Second Dubai Equine Symposium in April. Dr. Tulleners also spoke at the European College of Veterinary Surgeons Annual Meeting in Versailles, France, and was a member of the European College of Veterinary Surgeons Examination Committee. He also spoke at the American College of Veterinary Surgeons Veterinary Symposium in Orlando, FL.

Dr. Paul Rothaug, resident in surgery, was awarded the Lawrence E. Ensor, Jr. Annual Award in Equine Research.

Dr. Corinne Sweeney, associate professor of medicine and **Dr. Jill Beech, V'72**, professor of medicine, gave presentations at the Second Dubai Equine Symposium in Dubai, United Arab Emirates.

The design of the **Marshak Dairy Facility** won an honor award from the



Dean Alan M. Kelly accepts the 1997 Dr. Wayne Moutan Memorial Media Award for *Animal ER*, the TV piece produced by Turner Productions, from PVMA President Dr. Willi K. Weichelt.

Dr. Mark Donaldson, V'93, assistant professor of medicine, equine field service, is now board certified in internal medicine. **Dr. Julia Williams, V'79**, lecturer in bovine medicine in field service, passed the boards of the American College of Theriogenology.

Dr. Karen Overall, V'83, director of the VHUP Behavior Clinic, presented two research papers at the American Veterinary Society of Animal Behavior meeting in Reno, Nevada. She also gave a talk at the

Philadelphia Chapter of the American Institute of Architects.

Dr. Lesek Rubin, research associate professor in animal biology, presented a lecture at the National Research Institute in Okazai, Japan. He also presented a talk at the Meeting on Sleep and Breathing at Edinburgh, Scotland.

Dr. Jian Fei Wang, a visiting scholar from China at VHUP, was recognized by the National Academy of Science for his work in translating the *Guide for the Care and Use of Laboratory Animals* into Chinese. The Academy has underwritten the cost of printing and the book will be distributed in China.

Dr. Richard Miselis, V'73, professor of anatomy, gave invited lectures at the Chinese Society for Neuroscience Meeting in Xian, and at the West China School of Medicine in Chung Du. He gave presentations at the First International Meeting of the International Society for Autonomic Neurosciences and at the Circumventricular Organ Meeting in Australia. He also gave an invited lecture at Semmelweis University of Medicine in Budapest, Hungary.

Dr. Joan Hendricks, V'79, professor of medicine, was appointed head of the newly created Section of Veterinary Critical Care at VHUP. She also received a grant from NIH Institutes of Heart, Lung and Blood, and the Institute of Arthritis and Musculo-Skeletal Disease to study "Rest and Long-Term Memory Consolidation on *Drosophila melongaster*."

Dr. Cindy Otto, assistant professor of medicine, received a new NIH grant in addition to her American Lung Association grant.

Dr. Deborah Mandell, V', was appointed lecturer in critical care. She passed her boards and is a diplomate of the American College of Veterinary Emergency and Critical Care.

Dr. Jim Orsini, associate professor of surgery, presented a paper at the American College of Veterinary Surgeons Meeting.

Dr. Dean Richardson, Charles W. Raker Associate Professor of Surgery, gave a poster presentation at the American College of Rheumatology meeting.

Dr. Robert Eckroade, associate professor of poultry pathology, was re-elected secretary-treasurer of the American

Association of Avian Pathologists. He was an invited speaker at two poultry meetings in Canada and was the World Veterinary Poultry Association bureau member who represented the United States at a meeting in Budapest, Hungary in August.

Dr. Urs Giger, professor of medicine and medical genetics, has been appointed Charlotte Newton Sheppard Professor of Medicine. The professorship was previously held by Dr. Donald Patterson who is now an emeritus professor. The Charlotte Newton Sheppard Chair in Medicine was the second

cardiology, is the program chairman of the Triennial Symposium of the American Heartworm Society in May; talks on feline heartworm infection will comprise about 2/3 of the program.

Dr. John Wolfe, V'82, professor of pathology and medical genetics, gave a plenary lecture at the 4th Workshop for Gene Therapy, held in Tokyo, Japan. He also presented lectures at the Jikai University Medical School, Tokyo, and the Osaka University Medical School, Osaka. He then went to China to present lectures at



Speakers at the Dubai National Equine Symposium included (l to r) Dr. John L. Robertson, V'76, Virginia-Maryland Regional College of Veterinary Medicine; Dr. Scott Palmer, V'76, New Jersey Equine Clinic; Dr. Eric Tulleners, associate professor of surgery; Dr. Jill Beech, professor of medicine; Dr. N. Edward Robinson, Michigan State University; and Dr. Corinne Sweeney, associate professor of medicine.

endowed professorship at the School, it was also the second established by the Sheppards, the first was the Lawrence Baker Sheppard Chair in Surgery.

Dr. Jay Farrell, professor of parasitology, gave an invited talk at a Brazilian scientific meeting in Sao Paulo. He then taught a course in graduate immunology at the Federal University Minas Geras in Belo Horizonte, Brasil.

Dr. Mary Jane Potter, V'97, is attending the Institute for Parasitology at the Royal Danish Veterinary College in Copenhagen, Denmark.

Dr. Susan Kimmel, an intern at VHUP, received the 1997 BASF Growth is a Promise Scholarship for a research project in nutrition.

Dr. James Buchanan, professor of cardiology, presented two talks at the meeting of the British Veterinary Cardiovascular Society in Coventry, England.


Dr. David Knight, professor of

Nanjing University Medical College, Nanjing, and at Yangzhou Agriculture University and Veterinary College, Yangzhou.

Lee Gutkind's book *An Unspoken Art* is selling so well that a paperback edition is planned for next summer. It will have a different title, *The Veterinarian's Touch*.

Dr. Robert R. Shomer, V'34, received the AVMA President's Award for "contributions to ethics and humanity in the veterinary profession through a lifetime of service in veterinary organizations."

Dr. Harvey Bendix, V'75, will take office as president of the Pennsylvania Veterinary Medical Association in January 1998.

Dr. John C. Simms, V'74, received the PVMA's Pennsylvania Distinguished Veterinary Service Award "for revitalizing the Capital City VMA, for his 15 years as chairman of the PVMA's Agricultural Liaison Committee and for his dedication to organized veterinary medicine." 

An Evening in Old Saratoga

The gala benefit "An Evening in Old Saratoga," held August 2 at Saratoga, NY for the benefit of New Bolton Center by A Weekend in Old Saratoga, Inc. raised \$100,000 for the planned new Imaging Building. During the five years that the organization has held annual galas to benefit New Bolton Center at Saratoga, it has raised \$507,000 for Center projects. Among them are a colorflow Doppler imaging system and the development of the first trans-esophageal probe.

This year's gala and surrounding activities were again special. In addition to the festive carriage outings and the New Bolton Center race at the Saratoga track, there was a ceremony retiring "New Bolton Center Graduate" Victorian Hill, the all-time money winner in American Steeplechasing. Vic, the 12-year-old gelding, became an NBC "graduate" under rather trying circumstances. In 1991, at the peak of his career, he suffered a severe bout of colic which led to half his colon being removed. His chances of survival were slim, but this plucky horse made it through the surgery and then recovered to race again. He won six graded stakes and stake races and earned an additional \$300,000 after his surgery. He is truly a special "graduate!"

Events like "An Evening in Old Saratoga" require strong guiding spirits. Mrs. Lawrence E. Ensor is one of the prime movers behind the gala and the other activities connected with the event at Saratoga. Dean Alan M. Kelly recognized Mrs. Ensor for her superb efforts on behalf of New Bolton Center and presented her with the School's Bellwether Medal during a luncheon in November. 🐾



Mrs. Ensor presents the money raised through the 1997 Gala An Evening in Old Saratoga to Dean Kelly and Dr. Virginia Reif, professor of medicine, who spearheads the expansion of the imaging program at New Bolton.



Carriages at Saratoga.



Dean Kelly presents the Bellwether Medal to Beverly Ensor.



Victorian Hill during the retirement ceremony at Saratoga Race Course on August 2 accompanied by (l to r) Dean Kelly, Dr. Benson Martin, Dr. Virginia Reif, Mrs. William C. Lickle, Mr. William C. Lickle, his owners, Ms. Janet Elliot, his trainer and Mr. Jeff Teter, his jockey.

1997 American Gold Cup

Faculty, students and staff were out in full force September 11 to 14 for the American Gold Cup held at the Devon Show Grounds in Devon, PA. This year, for the first time, New Bolton Center, was the beneficiary. Saturday was Dr. Mark Whittier Allam and Lila Griswold Allam Day and both were very much in evidence during the day's events, greeting their many friends in the equine world.

Students, faculty, staff and Friends of the School helped at the ticket booth, worked as gate keepers, sold programs, acted as hosts during the champagne buffet and helped at the School's booth, the M.A.S.H. tent, the dog show and the art contest. It was very hectic, but a great deal of fun. Everyone is looking forward to next year, when the American Gold Cup will be held September 10 through 13.

We hope that many alumni and friends will come and join the School at this beautiful event. Box seats will again be available. For information on purchasing a box, please contact Ms. Catherine Larmore at New Bolton Center, 610-444-5800, ext. 2500. 🏠

Clockwise, from right: Mr. Fitz Eugene Dixon, honorary chair of the event and Dr. Allam; Dr. Allam and Ms. Caroline Moran, who chaired the Champagne Buffet; Mrs. Elizabeth Moran, Dr. Kelly, and Mrs. Mark Allam; Dr. Robert Washabau, associate professor of medicine, explains endoscopy; Dr. Kelly, Mr. Vincent Murphy, member of the School's Board of Overseers, Dr. Mark Allam, Mrs. Murphy; Judge Mrs. Alan Robson looks at a competitor in the dog show at the Gold Cup; The School's exhibit building, complete with a demonstration of the sling; Dean Emeritus Mark Allam listens to a young "pet" owner in the M.A.S.H. tent; A young "pet" owner assists in the treatment of his teddybear.



New Concepts In Horse Behavior Learned From Free-Running Horses

Dr. Sue McDonnell, research assistant professor in medicine and reproduction, is the large animal behaviorist at New Bolton Center. Her work includes watching horses behave and misbehave. Among her study subjects at the moment are approximately 50 ponies pastured on some 32 acres at New Bolton Center. They reveal a glimpse of the day-to-day life of equids. Dr. McDonnell has studied equids in the wild, and loves to do that whenever opportunities arise. But studies of wild horse populations are limited by environmental constraints such as wide range of herd movement through difficult terrain. Human presence can disturb ongoing natural behavior of wild populations.

She has developed a semi-feral model herd of ponies on-site, just a short walk from her office and laboratory. Semi-feral means that they are domestic stock, but have been turned out to organize and fend mostly on their own. They are provided preventive and emergency health care, and additional forage in winter. Interference by humans is deliberately kept to a minimum. Because they are domestic stock and are acclimated to people, they seem to be little disturbed by daily year-round observation and necessary handling.

Their social organization and behavior reflect the equid social order, mares, stallions, and foals just doing what comes naturally. Comparison of the reproductive behavior of these ponies, and of other free-running or pasture breeding equids, with the normal and dysfunctional reproductive behavior of hand-bred horses has taught Dr. McDonnell several important lessons.

In the course of domesticating animals, the art of animal husbandry and selective breeding created a whole set of rules that are often quite different from nature. Over the centuries breeders developed methods for breeding horses which the horses for the most part comply with. However, these are in many ways different from the behav-

ior Dr. McDonnell is observing. She says, "The lessons I learned from watching horses at liberty imply simple changes from currently accepted or recommended breeding farm management practices, either for all horses, or for use when standard practices fail for certain individual animals. Implementation can save considerable time and effort, and in some cases can rescue the breeding career of individual animals."



Flehmen response.

Horses or ponies at liberty organize into two distinct social groups: the harem bands with one stallion with several mares and the all-male bachelor bands. The harem stallion interacts with his mares almost continually.

"Interactive behaviors include quiet affiliation or "tending," approaching and retreating, olfactory investigation of urine and feces, flehmen response, and the precopulatory teasing sequence of mares in estrus. The amount and type of interaction varies throughout the cycle and among individual mares, but nonetheless is remarkably frequent and continuous," explains Dr.

McDonnell. He is, also, quite attentive and gentle with his offspring. It appears that in free-running conditions the harem stallion performs a good portion of the parental care. Bachelor bands are composed of stallions that have not attained, or let's say, are waiting to get a harem. In contrast to the harem stallion, these stallions have contact mostly with other males. Their reproductive and aggressive behavior is subdued compared to harem stallions.

Most domestic breeding stallions do not have much of the harem stallion experience. On the modern breeding farm stallions and mares have minimal or no contact until they are brought together in the "breeding shed". The typical breeding stallion today is housed in an individual stall or paddock away from mares.

If there is more than one stallion on a farm, they are often stabled together. Dr. McDonnell states, "It is quite remarkable that most domestic stallions can have a normal breeding career with minimal contact of mares.

Some actually never touch a mare. There are many stallions, however, that simply require or breed much more efficiently with more contact with mares." Dr. McDonnell has documented repeatedly in field studies that the harem stallion is more aggressive and has more libido than a bachelor. His testes and accessory sex glands are larger, and higher numbers of sperm are produced when he becomes a harem stallion than when he is a bachelor. She explains, "Many cases of serious sexual dysfunction or infertility can be overcome by providing greater access to mares. This is particularly the

case for slow starting novice stallions, stallions that tend to sour with the routine during the breeding season, or lifelong low libido stallions. Data is now accumulating suggesting that simple exposure to mares can positively affect stallion endocrinology and so may mediate enhanced sexual interest and response as well as reproductive physiology.”

It's interesting to note that when a stallion is removed from his harem, another stallion from one of the bachelor

sis. Mares that are in the ambivalent early stages of estrus or that are mistakenly in diestrus pose a clear safety threat in close quarters.

Mares at liberty actually solicit the stallion for his attentions. The mares do not do this by turning their rump to the stallion and standing quietly. Instead they approach and interact with the stallion head to head. There seems to be titillating flirtation that transpires, vocalization, sniffing, nuzzling, nipping, or flehmen response all of

chance for injury to animals and personnel.”

Another concern is that allowing a stallion to mount without an erection prolongs the total breeding time. This is not typically the case, and in fact, for some stallions mounting without erection can actually speed the breeding process. Each year at The Georgia and Philip Hofmann Research Center for Animal Reproduction Dr. McDonnell repeats a demonstration experiment for students which nicely illustrates this lesson. Newly acquired research stallions are initially assigned to one of three handling protocols for their first semen collection sessions: 1) mount without erection and dismount allowed without interference from the handler; 2) mount without erection allowed, but followed immediately by forced dismount; and 3) mount allowed only after erection is achieved. The stallions allowed to mount without erection and allowed to dismount at will usually finish breeding in the least amount of time. Those allowed to mount without erection and forced to dismount usually take the longest time to breed.

Another important lesson from watching horses breed at liberty concerns what happens at the end a breeding encounter. The mare that is free to move will slowly and gently walk out from under the stallion, easing him gently down to the sod where he rests a few moments. In the typical modern breeding shed the stallion is required to immediately “dismount” and is rushed to leave the breeding shed, with little time to recover from the extreme use of his energy and the natural surge of endogenous opiates associated with copulation. The breeding floor is often slippery and provides for a hard landing. The unnatural dismounting requires a great effort after the extraordinary hind-limb work of supporting the weight and thrusting during copulation. This can be a considerable problem for older and/or lame stallions already at a physical disadvantage. It is no wonder then, that after only a few breedings as described these stallions seem to anticipate the negative



Mares interacting with stallion.

herds will unceremoniously take that stallion's place. The new harem stallion's behavior immediately changes from the subdued bachelor type to the aggressive harem type. The change in social status is closely followed by a change in his physiology. Within sixty days this stallion now has all the physical and behavioral attributes of his predecessor. Should he lose his harem status his behavior and physiology will revert to bachelor type.

Another important observation is that the female is a far more important player in mate location and stimulation of the male than is assumed or typically allowed for hand-bred horses. In domestic breeding, the mare is typically restrained or tranquilized so that she will stand still. She is also unable to show the full complement of normal estrous behavior and postures. This practice has a reasonable practical ba-

which involves the stallion seeing and interacting with the mares' heads and forebody. There may be some mock confrontational displays. All of this seems to excite the stallion. The stallion, whether he is a novice or a seasoned campaigner, will mount the mare, usually two or more times before achieving an erection.

The domestic breeding stallion is rarely allowed access to the mare's head and is typically disciplined if he should try to mount without an erection. Dr. McDonnell says, “The basis for intolerance for a stallion mounting without erection is no doubt complex, and in my experience the managers' explanations include fascinating anthropomorphic references. There certainly are reasonable safety concerns for avoiding repeated mounting. In tight indoor quarters, the greater the number of mounts the greater the

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New Concepts In Horse Behavior

(continued from page 15)

experience and become reluctant to breed. They may also begin to dismount early, before breeding is completed, seemingly in anticipation of the rush to dismount and leave. If the mare is simply allowed some mobility she typically will take care of the dismount

mare to move. The mare needn't be turned loose with the stallion but perhaps tied on a loose tether from a pole in the middle of a paddock so that she feels as though she has the room to maneuver.

For the stallion with virtually no libido or low sperm count without an

of stallions may impose bachelor status on breeding stallions. If the stallion does not seem interested at the time of breeding lead him to the mare's head and allow some natural equine exchange to take place. This is especially useful for the novice breeding stallion. When all else fails consider turning the stallion and mares out together. Once a stallion puts it all together and has one or two good experiences he can then be brought back to hand-breeding. It is a fact that most stallions and jacks exhibit much more sexual endurance and fertility when breeding at liberty than when hand-bred. Dr. McDonnell states, "Stallions and jacks at pasture breed as often as every one or two hours throughout the day and night with excellent sustained fertility. For most hand-bred stallions libido and fertility diminish with breeding schedules of more than once or twice per day."

Dr. McDonnell's ongoing observational study of equid behavior is a Dorothy Russell Havemeyer Foundation project. Collaborators in this research include academic and practicing equine clinicians and scientists from throughout the world. Students assisting with this work include Havemeyer Foundation Summer Veterinary Research Trainees, graduate students, middle and high school biology students, veterinary technician and nursing students, and community volunteers. 🐾

M.B.



Stallion interacting with foal.

by walking forward and allowing the stallion to slide off her back slowly and gently. Providing a cushioned surface with good footing, particularly around a "dummy mount," can also help. And above all, adjusting handling practices to provide, as Dr. McDonnell puts it, "...gentle, respectful accommodation of the stallion's needs or limitations can resolve or avoid most problems".

Dr. McDonnell does not advocate that all breeding operations revert to pasture breeding. She explains, "Certainly, when you have a million dollar mare and a stallion worth even millions more you do not want to take any chances." However, she does encourage breeders with horses that have reproductive behavior problems to take a look at what works in nature and carefully consider applying it in their own operation. For the "rogue mare" that readily explodes before the stallion has even mounted her, consider less restraint and give some room for the

identifiable physical cause, consider simply housing him in the barn with mares. Just being in close proximity for several months is likely to produce a positive outcome. According to Dr. McDonnell data is accumulating which indicates that traditional group housing

Dr. Delluva Honored



Dr. Adelaide Delluva, Emeritus Professor of Biochemistry, was honored with a party by the Department of Animal Biology on the occasion of her 80th birthday and presented with a miniature bronze of Benjamin Franklin. Dr. Delluva earned her Ph.D. degree in biochemistry in 1946 and joined the faculty in the Medical School. There she taught biochemistry to veterinary students, among others. In 1969 she joined the faculty at the School of Veterinary Medicine as assistant professor of biochemistry and was appointed professor in 1978. Dr. Delluva served on many School and University committees and still is involved in committee work. She took a keen interest in the students and their welfare and each December is a great "donating" and "bidding" presence at the SCAVMA auction.

Workshop on Animal Abuse and Neglect

It has been recognized that a connection exists between animal abuse and family violence. Not only are the household animals abused but often also spouses and children. This puts the veterinarian in a very difficult position. VHUP's Ethics Committee has developed a policy covering clinicians' responsibilities when animal abuse is suspected. To discuss this policy and its implications in depth, a Discussion Workshop on Animal Neglect and Abuse was held on September 16 at VHUP.

The event was organized by Dr. James Serpell, Marie A. Moore Professor of Humane Ethics and Animal Welfare, and chaired jointly by Dr. Serpell, Dr. James Wilson, adjunct associate professor of practice management, and Dr. Tom Van Winkle, associate professor of pathology. Members of the humane community participated as did students and faculty. Phil Arkow of the Animal Welfare Association and author of the Latham Foundation's publication *Breaking the Cycle of Violence* presented the Grand Rounds lecture with the topic "Domestic Violence, Animal Abuse, and the Veterinarian."

During the workshops that followed, VHUP's policy statement on animal abuse/neglect was discussed and feedback requested with an emphasis on diagnostic criteria for recognizing abuse. Also discussed was the need for the collection of data on animal abuse/neglect cases, and the concept of a veterinary forensic residency program here. Another session addressed legal and other liability issues for veterinarians reporting suspected cases of animal abuse/neglect.

The second part of the discussions covered parallels with child abuse and domestic violence; current local veterinary involvement in the reporting of suspected animal abuse/neglect; and fighting dogs.


VHUP, being located in an urban area, has a heavy case load, particularly in the Emergency Service. It is here that many of the suspected abuse/neglect cases are seen. The determination of suspected animal abuse/neglect is often an educated guess. The account of how the injuries occurred differs from the signs

present. Sometimes family members indicate that they are frightened of another family member and insist on a particular scenario out of fear. Clinicians had long been unsure how to handle these cases. The policy outlines a protocol that establishes them as medical investigators whose role it is to represent the animals' and the families' interests and request that appropriate agencies with knowledge of animal abuse and/or child abuse review the facts and evaluate the environment into which their patients will be discharged after medical care has been provided.

A chain of reporting has been established and a list of animal agencies that need to be contacted is on hand. VHUP's personnel have no legal jurisdiction to intervene on behalf of an animal, that is the responsibility of the SPCA's officers who have police power to investigate reports of alleged animal abuse and who take custody of such animals. The policy includes a list of signs of suggestive abuse and/or neglect and covers reporting the suspected abuse/neglect to the SPCA and how to handle the clients. VHUP will protect the clinicians from legal actions in these cases.

The issue of fighting dogs is not covered in the policy and is handled differently. In the event that abuse of persons is suspected, the hospital's social worker is informed.

The workshop was enthusiastically received and brought the shelter community into closer contact and discussions, not only with faculty, but also with students. Those wishing further details on the workshop or the hospital policy on abused/neglected animals can contact Dr. James Serpell at the School.

A few weeks after the workshop, Drs. Serpell, Wilson and Van Winkle led a panel discussion on animal abuse and domestic violence at the American Humane Association's annual Shelter Veterinarian's Conference in Philadelphia. 

Benefit Events

The Brandywine Carriage Driving Club held its annual Brandywine Carriage Driving Show in June. For the third consecutive year, the club donated the proceeds of the event to the New Bolton Center Field Service. The 1998 show will be held on June 7.

The International Sporthorse Registry and the Oldenburg North America Mare, Foal and Stallion Inspection were held September 4 and 5 at Hilltop Farms, Inc. in Colora. MD. Proceeds from the event were donated to New Bolton Center for the planned new Imaging Building.



"George" Constantine Pournaras receives a plaque marking his more than 40 years of service to the School from Dr. Lawrence Soma with Dr. Charles Raker looking on. A ceremony was held in October at New Bolton Center to mark Mr. Pournaras' retirement, though he won't be totally absent as he will continue to work part-time as an anesthesia technician.



Animal Crackers

Dog Show Disqualifications

The Rules of the American Kennel Club state. "A dog which is blind, deaf, castrated, spayed, or which has been changed in appearance by artificial means except as specified in the standard for its breed, or a male which does not have two normal testicles normally located in the scrotum, may not compete in any show and will be disqualified." The only exceptions are that a castrated male may be entered as Stud dog and a spayed bitch may be entered as Brood Bitch in these classes, and neutered dogs and spayed bitches may compete in Veterans Classes only at independent specialties or all-breed shows which do not offer competition beyond Best of Breed (no groups or best in show).

A number of breed standards have disqualifications including weight, height and color. If a dog is disqualified on three separate occasions, by three different judges, under its breed standard or for not having two normal testicles, this dog may not be shown again.

A.K.C. lists eleven surgical procedures which would make a dog ineligible to compete in shows because their appearance has been changed by artificial means.

1. The correction of entropion, ectropion, trichiasis, or distichiasis.
2. Trimming, removal or tattooing of the third eyelid (nictitating membrane).
3. The insertion of an eye prosthesis.
4. Correction of harelip, cleft palate, stenotic nares, or an elongated soft palate resection.
5. Any procedure to change ear set or carriage other than that permitted by the breed standard.
6. Restorative dental procedures, the

use of bands or braces on teeth, or any alteration of the dental arcade.

7. The removal of excess skin folds or the removal of skin patches to alter markings.
8. Correction of inguinal, scrotal, or perineal hernias.
10. Alteration of the location of the testes or the insertion of an artificial testicle.
11. Altering the set or the carriage of the tail.

Another list gives procedures undertaken to restore the health of the dog and would not, in themselves, render the dog ineligible to compete.

1. The repair of broken legs, even if such procedures involve the insertion of pins, plates or wires.
2. The removal of damaged cartilage.
3. The repair of ligaments that have ruptured or been torn.
4. Caesarian sections.
5. The repair of umbilical hernias.
6. The removal of tumors or cysts.
7. Gastric torsion/bloat surgery.
8. Splenic torsion surgery.
9. Tonsillectomy.
10. Correction of "Cherry Eye", (which involves the *gland* of the nictitating membrane).
11. Debarking.
12. The removal of dewclaws if a regular practice in the breed.

Inherited problems are a growing concern. Concealing defects by surgical means can only result in the deterioration of a breed. AKC provides limited registration (litters produced by the dog are not eligible for AKC registration but the dog may compete in all AKC-licensed events except breed competition). This limited registration serves as proof that the dog is purebred for those not interested in breeding or exhibiting at championship shows.

The Perfect Puppy — How to Choose a Dog By Its Behavior

By Benjamin L. Hart, D.V.M. and Lynette A. Hart

(W.H. Freeman & Co., 41 Madison Ave., New York, NY 10010, \$12.95 soft cover)

This book, first published in 1988, is now in its ninth printing. It gives a character analysis of 56 popular dog breeds based in interviews with veterinarians and obedience judges who understand how different breeds act in different situations. Different breeds are suited for different environments. The authors use thirteen behavioral characteristics in ranking breeds — excitability, general activity, snapping at children, excessive barking, playfulness, obedience training, watchdog barking, aggression toward other dogs, dominance over owner, territorial defense, demand for attention, destructiveness, and ease of housebreaking.

Home environment is most important in selecting a dog. There are different requirements for families with children, a person living alone and away at work most of the day, and elderly couples who want the dog for companionship.

Impulse buying should be avoided. This book is a great help in selecting a puppy that will fit into your household, based on breed characteristics. Take time to think about the breed which will be "right" for you for the next ten years or so.

Canaan Dogs and Jack Russell Terriers

In August 1997, Canaan dogs became the 141st breed recognized by the American Kennel Club as eligible for championship competition. They are in the Herding Group.

The Canaan dog is an ancient breed which developed in the relatively small region defined today as Israel. Dogs very similar in type appear in tomb drawings dating as far back as 2200 B.C. In 1934, Professor Rudolphina Menzel, who had emigrated from Austria to the British mandate of Palestine (now Israel), was asked by the Jewish defense forces to set up a service dog organization. She used local pariah dogs which roamed freely in the desert and were sometimes used as flock guardian and herding dogs. They exhibited remarkable survival skills, tolerating heat, needing comparatively little water and getting by with little food. Menzel began to domesticate them, calling them Canaan dogs. With their highly developed sense of territory, they made natural watchdogs, and also quickly became devoted and loving companions. During World War II and the Israeli War of Independence, Menzel's Canaan dogs served as sentries, messengers and landmine locators. In 1953, the Israel Kennel Club accepted the standard prepared by Menzel, which is similar to the one accepted by the AKC. The first Canaan dogs were imported to the United States in 1965.

The standard states that the Canaan dog is a herding and flock guardian, aloof with strangers, inquisitive, loyal and loving with its family. It has a wedge-shaped head with low-set erect ears, a bushy tail that curls over the back when the dog is excited and a straight, harsh, flat-lying coat. Dogs generally weigh 45 to 55 pounds and bitches approximately 35 to 45 pounds. Dogs less than 20 inches or more than 25 inches and bitches less than 18 inches or more than 23 inches are disqualified. One breeder describes the Canaan dog as quick-minded and keenly sensitive, alert, intelligent and responsive, whose physical features reflect the natural economy of survival: moderation, balance, adaptability and natural toughness.

The Jack Russell terrier is another breed recently recognized by AKC. It will be eligible for competition in the Miscellaneous Class January 1, 1988. This is a step on the way to eligibility to compete in a variety group at AKC shows. No championship points are

awarded from the Miscellaneous Class. Other breeds in this category are Anatolian shepherds, Havanese, Lowchen and Spinoni Italiani.

The Jack Russell has become extremely popular and appears frequently on television. This terrier was developed in the south of England in the 1800s. It is named after the Reverend John Russell, whose terriers trailed the hounds and bolted the fox from dens so the hunt could ride on.

Their ideal height is 14" at the withers for a mature dog, 13" for a bitch. Under 12" or over 15" is a disqualification. The coat may be smooth or broken. Color is predominantly white with black and/or tan markings which preferably are confined to the head or root of the tail. The standard includes overt aggression toward other dogs or humans as a disqualification. The temperament is given as bold and friendly, athletic and clever. At work he is a game hunter, tenacious and courageous. At home he is playful, exuberant and overwhelmingly affectionate. He is an independent and energetic terrier and requires his due portion of attention. He should not be quarrelsome. Shyness should not be confused with submissiveness. Submissiveness is not a fault.

The Jack Russell Terrier Association of America has a Code of Ethics to protect the breed. It makes welfare and health the first criteria in breeding Jack Russell terriers.

Statistics

Statistics estimate that there are 59 million cats and about 53 million dogs in the United States. Another report concluded that there are 6.9 million horses in this country. When this figure is broken down according to activity, 725,000 horses are involved in racing and race horse breeding, nearly two million are used in showing and three million for recreation, while 1.2 million are used in other activities, such as farm and ranch work, rodeo, polo, police work, etc. The horse industry is a \$25.3 billion business.

Poison Control Center

The ASPCA National Animal Poison Control Center is a 24-hour emergency

service. It is the only animal-oriented poison control center in North America. The Center is staffed by veterinary health professionals who are familiar with different species' response to poisons and treatment protocols. The staff can make specific, accurate recommendations for your animals.

1-900-680-0000

\$20 for 5 minutes and \$2.95/minute thereafter.

1-800-548-2423

\$30/case, credit card only (Visa, MasterCard, Discover or American Express ONLY).

When calling, be ready to provide:

- Your name, address and telephone number;
- The substance your animal has been exposed to, if known;
- Information concerning the exposure (the amount of substance, the time since exposure to the substance, etc.);
- The species, breed, age, sex, weight and number of animals involved;
- The problems your animal is experiencing.

The service is available to animal owners as well as veterinarians.

Greyhounds

Graceful, strong, intelligent and sensitive are words aptly describing the greyhound. Far more than just a racing dog, the greyhound has been a favorite household and hunting companion.

Interesting facts are found in Cynthia A. Branogan's book, *The Reign of the Greyhound* (Howell Book House):

- Greyhounds are the only breed of dog mentioned in the Bible.
- Greyhounds appear in both Greek and Roman mythology.
- Alexander the Great's favorite dog was a greyhound.
- Greyhounds were the first European dog in the New World, brought from Spain in 1493.
- General Custer coursed his 14 greyhounds the night before the Battle of Little Big Horn.
- Each year in the United States, over 16,000 retired racing greyhounds begin new careers as pets. 🐾

V.M.D. — Ticket to the World

Earlier this year Christine Connelly, a member of the School's Board of Overseers, mentioned that she had met Dr. James T. Cavanaugh, V'69, while in Nairobi and that he was involved with the Kenya Wildlife Service. *Bellwether* contacted Dr. Cavanaugh at the American Embassy in Kenya and he sent back a brief synopsis of his life since graduation. His V.M.D. certainly is a ticket to the world.

"I graduated in 1969 from Pennsylvania and worked in a mixed and small animal practice in the U.S. until 1978 when I joined the Animal and Plant Health Inspection Service (APHIS), a branch of the United States Department of Agriculture (USDA). My first temporary duty assignment was in Brazil to oversee the testing of Brazilian cattle for importation into the U.S. in 1979. My first post was to Tegucigalpa, Honduras, covering Honduras and Belize primarily to establish a surveillance network with the national veterinarians for the differential diagnosis of Hog Cholera vs. African Swine Fever and Vesicular Stomatitis vs. Foot and Mouth Disease (1980-1984). It was also a great way to learn Spanish.

The following assignment was to Manila, Philippines, covering all of Asia and the Pacific, 1984 - 1986, then to Panama to supervise APHIS programs in Central America, Panama and Colombia until we were evacuated in June 1989 and transferred to Mexico City, Mexico to supervise APHIS operations throughout Latin America and the Caribbean. Much of the work was at the time devoted to NAFTA negotiations on Veterinary and Plant Health technical issues (1990-1992).

Finally in 1992, I was transferred to Nairobi, Kenya, covering Africa and the Middle East, dealing with Rinderpest control and eradication along with CBPP and many other enzootic diseases present here. I will retire in June of 1998 and remain in Kenya.

My veterinary degree from Pennsylvania has given me the opportunity to have literally traveled the world and see places, people and animals I would never have been exposed to under any other

Dr. Lavin and Dr. Robbins Honored

During the Alumni Reception held at the Annual AAEP meeting in Phoenix in December Dean Kelly honored two outstanding alumni, Dr. Gary A. Lavin, V'62, and Dr. Jack Robbins, V'45, and presented each with the School's Bellwether Medal. Following are the citations:

A Citation of Gratitude to Gary A. Lavin, V.M.D.

For over thirty years you have been an immensely respected equine practitioner in Louisville, Kentucky and Hot Springs, Arkansas. As President and Executive Board member of both the Kentucky Thoroughbred Association and the Kentucky Thoroughbred Owners and Breeders, and as a director of the Breeders Cup, your contributions to the equine industry are notable. You command immeasurable regard among your peers.

The first veterinarian to be elected to the Jockey Club in 100 years, you bring great distinction to the profession. Your service as a Steward of the Jockey Club and as a director of the Grayson-Jockey Club Foundation continues your incomparable leadership. As a board member and outstanding president of the American Association of Equine Practitioners, you served with distinction. The Lavin Cup, named in your honor, is a tribute to your strong commitment to equine welfare management.

As a family long involved in Thoroughbred racing, with your wife and life partner, Betsy, you founded the Longfield Farm in 1979 and raised innumerable stakes winners.

The University of Pennsylvania School of Veterinary Medicine has chosen the occasion of the 1997 American Association of Equine Practitioners' Annual Meeting to pay tribute to you and your myriad of accomplishments. We applaud your challenge to veterinarians to take pride in the rich achievements of equine medicine, to promote responsible welfare management of horses, and to advance both the stature of the profession and our alma mater.

A Citation of Gratitude to Jack Robbins, V.M.D.

For many years you have been a leader in equine veterinary medicine. As a founding member of the American Association of Equine Practitioners in 1954 and as one of its illustrious presidents, you served with distinction. Your legacy includes a strong commitment to the industry, most notably as the first chair of the American Association of Equine Practitioners Practice Committee and by a 22 year tenure on the committee that monitored medication rules and ethics.

As a racetrack practitioner in California, you brought the veterinary profession to an elevated level of respect. As a founding director of the Oak Tree Racing Association, a director of the Horsemen's Benevolent and Protective Association, and as second veterinarian to be elected to the Jockey Club, we applaud your incomparable achievements and the recognition they bring to your alma mater. We commend you for establishing training centers and surgical facilities for equine medicine and for the support you give to the Grayson Foundation for research. By observing your actions and many contributions to the profession, you have given others a beacon to follow.

Throughout these worthwhile endeavors your devoted wife, Maggie, supported your achievements and was a successful partner in breeding, owning and racing Thoroughbreds.

The University of Pennsylvania School of Veterinary Medicine has chosen the occasion of the 1997 American Association of Equine Practitioners' Annual Meeting to pay tribute to you and your exceptional accomplishments. We applaud your challenge for all to contribute to the advancement of the equine profession and to foster a better understanding of equine medicine and its critical role in society.

circumstances. It's been wonderful and exciting. I plan to carry on with my passion here which has been to identify and study the behavior of the lions and cheetahs that inhabit Nairobi National Park. I can truly say that I have spent my entire life looking for the "right place" and was very lucky to find it on my last assignment for APHIS here in Kenya."

Since 1992 Dr. Cavanaugh and his wife have studied the prides of lions (four in 1996) and the three adult males in the park. All the lions are individually identified and are carefully tracked through observations. The purpose of the study is to provide a long term record (20 years or more) of the lions in Nairobi National Park. 🐾

Symposia for Breeders and Owners of Companion Animals

January 31, 1998

*The Twenty-Eighth Annual Canine Symposium
"Cancer in the Dog"*

The following topics will be covered:

Cancer Terminology and Symptoms, The Words We Use And What We Look For

Kim Cronin, D.V.M., D.A.C.V.I.M.,
Lecturer of Oncology

Cancer Detection Through Imaging Studies

Jeffrey Wortman, V.M.D., Ph.D.,
D.A.C.V.R., Associate Professor of Radiology

Breed Related Cancers

Michael H. Goldschmidt, M.Sc.,
B.V.M.S., Professor of Pathology

Cancer Treatment Options

Karin Sorenmo, C.M.V., D.A.C.V.I.M.,
Assistant Professor of Oncology

Quality of Life Issues for Canine Cancer Patients

Lillian Duda, V.M.D., D.A.C.V.R.,
Lecturer in Radiation Oncology

Nutritional Needs of Canine Cancer Patients

Kathryn Michel, D.V.M., M.S.,
D.A.C.V.N., Clinical Assistant Professor of Nutrition

The Mari Lowe Center for Comparative Oncology - Services and Goals

Narayan G. Avadhani, Ph.D., Harriet Woodward Professor of Biochemistry

Canine Osteosarcoma

Amy Kapatkin, D.V.M., D.A.C.V.S.,
Assistant Professor of Orthopedic and Neurosurgery, and Dr. Kim Cronin

Canine Brain Tumors

Dr. Kapatkin, Charles Vite, D.V.M.,
Post-doctoral Fellow of Neurology

Mammary Cancer

Dr. Karin Sorenmo

From the Laboratory Bench to the Patient's Bedside

Andrei Tikhonenko, Ph.D., Assistant Professor of Pathology

April 4, 1998

The Twenty-First Annual Feline Symposium

The following topics will be covered:

History of the Cat

James Serpell, Ph.D., Marie Moore
Associate Professor of Humane Ethics and Animal Welfare

What Does it Mean to be Owned by a Cat - an Owners Perspective

Janet Wolf

Losing a Best Friend - Coping with the Death of a Cat

Kathleen Dunn, M.S.W., Social Worker, VHUP

Parade of Breeds: illustrating breed characteristics with the help of cats from different breeds.

Mr. Richard Gebhardt, Past President of the Cat Fanciers Association and a CFA judge.

Feline Oral Health: Disease and Preventing It

William Rosenblad, D.V.M., Resident in Dental Medicine

Feline Renal Transplantation

Lillian Aronson, V.M.D., Assistant Professor of Surgery

Caring for the Critically Ill Cat

Deborah C. Mandell, V.M.D.,
D.A.C.V.E.C.C., Lecturer in Emergency Medicine

The symposia will be held in Room B101, VHUP.

The cost for each of the all-day programs is \$50, which includes lunch and parking. Reservations are required and can be made by contacting Dr. Josephine Deubler, VHUP, 3850 Spruce Street, Philadelphia, PA 19104, Tel.: 215-898-8862.



1997 - 1998

New Bolton Center Public Lectures

The University of Pennsylvania School of Veterinary Medicine will offer a series of free lectures for the public throughout 1997-1998 at New Bolton Center (NBC) in Kennett Square, PA. All lectures begin at 7 PM and take place in the Woerner Amphitheater in the George D. Widener Hospital. Parking is free. Topics and dates are as follows:

Preventative Medicine for Horses, the Basis for Establishing Effective Communication With Your Veterinarian

Thursday, February 5, 1998 7 PM
Peggy Marsh, DVM, Resident, Section of Medicine, NBC

Ultrasound Examination of High Risk Pregnant Mares, What Can They Tell Us?

Thursday, March 26, 1998 7 PM
Dr. Virginia Reef, Virginia B. Reef, DVM, DACVIM, Professor of Medicine, Director of Large Animal Ultrasonography and Cardiology, Chief Section of Sports Medicine and Imaging, NBC

Managing the Injured Horse — First Aid Principles Every One Should Know


April 16, 1998 7 PM
James A. Orsini Thursday, DVM, DACVS, Associate Professor of Surgery, NBC

Ensuring a Healthy Puppy

Thursday, April 30, 1998 7 PM
John Melniczek, VMD, Resident in Medical Genetics and Pediatrics, VHUP

Basic Management Practices in Small Ruminants

Thursday, June 4, 1998 7 PM
Jane Axon, B.V.Sc. M.A.C.V.Sc., Resident, Section of Medicine, NBC

While these courses are free, RESERVATIONS ARE REQUIRED as space is limited. Please call the Communications Office at NBC (610)-444-5800, extension 2182 for further information and reservations. New Bolton Center is located at 382 West Street Road, Kennett Square, PA 19348-1692. 

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Warren Animal Hospital in memory of "TIM," "ROBIN," and "HUGH E."
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Ms. Janeth Martin in the name of St. Anthony - Patron Saint of Animals

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For more information on how to make special gifts please call the Development Office, either at the Philadelphia campus at 215-898-1480 or at New Bolton Center campus at 610-444-5800, ext. 2500.

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Mr. & Mrs. (Barry & Marcia) Miller in memory of "FLUFFY"

The following have made a donation to the Humanitarian Fund in Memory of a Pet:

Mr. Thomas Ralicki in memory of "APOLLO"

The following have made a donation to the Small Animal Hospital in Honor of Those Listed:

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The following have contributed to the Humanitarian Fund in Memory of L. Stewart Cochran:

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 Mrs. (Robert & Helen) Stein
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The following have made gifts to the Small Animal Hospital in Memory of the persons listed:

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We'd like to hear your praise, criticisms, or comments. Please address your correspondence to:

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Mark Your Calendar

January 28 and 29, 1998

Penn Annual Conference

Adams Mark Hotel, Philadelphia

January 31, 1998

28th Annual Canine Symposium

Entire program on oncology for dogs
VHUP, Philadelphia

April 4, 1998

21st Annual Feline Symposium

VHUP, Philadelphia

May 17, 1998

Alumni Day

New Bolton Center

If you receive two copies of Bellwether, please pass the extra one along to a friend.

Alumni Notes

We want to keep you up-to-date on your classmates' activities, but we can't do it alone. Please cut out this form and let us know what you are doing. Place in an envelope and mail to: University of Pennsylvania School of Veterinary Medicine, Alumni Office, 3800 Spruce Street, Philadelphia, PA 19104.

Name _____ Class _____

Address _____

City _____ State _____ Zip _____

Home Phone _____ Business Phone _____

E-mail _____ Type of Practice _____

School of Veterinary Medicine Graduates, send us your news about what is going on in your life — your practice, activities, professional advancement, travels, hobbies, family or other news you'd like to share. We want to hear from you!

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School of Veterinary Medicine
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