Bellwether Magazine

Volume 1
Number 34 Spring/Summer 1993

April 1, 1993

Bellwether 34, Spring/Summer 1993

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Dear Friends:

At long last the School of Veterinary Medicine is emerging from its embattled financial position of the last three years. We expect to move quickly and decisively to ensure that Penn's Veterinary School is the standard of excellence against which all others will be measured.

State funds have been appropriated for both the 1993 and 1994 fiscal years. Although the amounts provided fall short of those necessary, we can balance our budgets with help from the University and our many external friends and supporters. Most importantly, we are now in a position to reinvest in our personnel resources and critical programs. This will include funding for faculty and staff retention, searches for vital new faculty in each department, and plans for a number of much needed facility renovations.

The State recognized the School's importance by a participation in significantly higher amounts to us than the other non-preferred institutions, including the University itself. Yet, we realize that stable funding is of paramount importance to all of our long term goals.

Accordingly, this summer the University administration, Overseers, faculty, staff, and our many friends, especially those in the agricultural community will meet with us to define a more stable relationship with the State.

On behalf of our students, faculty, staff and clients, I extend sincere thanks to all who offered their moral, financial and political support through these difficult years. All of the School's friends and supporters have invested in its future, and we are confident that the trust placed in us will now be rewarded.

Veterinary School Teaching Awards

On April 4 the SPIRIT OF PHILADELPHIA sailed at 7:00 P.M. from the foot of Market Street at Penn's Landing. Aboard were almost 500 students, faculty and staff for the annual STUDENT GOVERNMENT TEACHING AWARDS DINNER DANCE. It was a festive evening and great fun!

Dr. Patricia Serrich, assistant professor of reproduction, received the Carl J. Nutten Distinguished Teacher Award.

Dr. Tony D. Mogg, resident in medicine, received the William B. Boucher Award for Outstanding Teaching at New Bolton Center by a House Officer. The Iams Company Award for Excellence by a Resident in the Department of Clinical Studies, Philadelphia was presented to Dr. Patricia Walters and Dr. Nishi Dhupa. Dr. Robin Pullen, intern, received The Jules and Lucy Silver Animal Bedside Manner Award. The Residents' Award for Outstanding Teaching by a Faculty Member was presented to Dr. Robert Washabau, assistant professor of medicine. Dr. Nishi Dhupa received the Interns' Mentor Award.

The Veterinary Medical Student Government Teaching Awards were presented. Dr. Peter Dodson, professor of anatomy, received the Class of 1996 Award; Dr. James Lok, associate professor of parasitology, received the Class of 1995 Award; Dr. Charles Reil, professor of radiology, received the Class of 1994 Award. The Class of 1993 presented a number of awards: the Faculty Teaching Award was presented to Dr. Lesley King, assistant professor of medicine; the Resident Teaching Award was presented to Dr. Marc Elie; the Intern Teaching Award was presented to Dr. Ruth Darrigrand and Dr. Stephanie Lin; and the Veterinary Technician Teaching Award was presented to Ms. Carla Garcia.
Researchers Reverse Illness Via Gene Therapy

The first example of hereditary illness reversal by gene therapy was reported in the December 24 issue of *Nature* by researchers who described results of transferring a normal gene to bone marrow cells of diseased mice.

John Wolfe of the School of Veterinary Medicine at the University of Pennsylvania in Philadelphia, Edward Birkenmeier of The Jackson Laboratory in Bar Harbor, Maine, and their colleagues at Jackson and St. Louis University, have been researching Sly disease (MPS VII), a rare inherited disease found in humans, dogs, and mice. The disease is caused by an enzyme deficiency due to a defective gene and affects many organs, including the skeleton, heart, eye, liver, spleen, and brain.

Researchers were able to insert a normal copy of the gene that produces the enzyme into the defective stem cells of bone marrow in diseased mice, which resulted in unexpectedly striking reversal of the illness in the liver and spleen, despite low levels of enzyme activity in these organs.

Stem cells were used because they can permanently repopulate most tissues and the blood with cells that are derived from the bone marrow. While the disease was only corrected in a few tissues, the mice appeared to show clinical improvement, in that the mice were more active and looked healthier than age-matched untreated mice.

This research suggests new approaches for treatment of MPS and related diseases. “Eventually it may be possible to partially replace bone marrow in a patient with a small number of corrected stem cells, which may be sufficient to correct the genetic defects in the liver and spleen, without severe complications associated with total bone marrow removal,” said Wolfe.

“It may also now be feasible to deliver therapeutically effective amounts of normal enzyme to patients by gene transfer to tissues such as muscle or the liver, in addition to the stem cells. Even though we’ve only been able to generate low levels of enzyme activity in the mice, the fact that the disease was reversed in the liver and spleen may make it possible for significant and widespread improvement to occur if enough entry points are used for gene transfers. The cumulative effect of the low-level enzyme activity may prove to be an effective treatment.”

In this form of gene therapy, a healthy copy of the defective gene is inserted into the DNA of cells from the patient. The treated cells are then returned to the patient, where it is hoped they will begin to perform their normal function in the body. One of the advantages of gene therapy in the treatment of Sly disease and related diseases is that eventually a patient will be treated by genetic engineering of his/her own tissue, thus eliminating the need for a matched donor, as is now standard procedure for traditional bone marrow transplantation. Researchers say new gene therapy methods eventually may produce greater clinical improvement than transplantation can.

Sly disease is one of the group of inherited diseases (MPS disorders) caused by the deficiencies of enzymes required for degradation of complex sugar molecules. There may be little evidence of this at birth, but symptoms appear as more and more cells become damaged. Many patients have severe progressive disease, resulting in death at an early age. It is estimated that 1 in 25,000 births will result in some form of this disease.

The Medical Genetics group at the University of Pennsylvania’s Veterinary School has a long history of investigating the genetics, biochemistry, pathology, and treatment of animals with genetic diseases. The Jackson Laboratory has been designated as a National Resource for the identification, characterization and distribution of mouse models of inherited human disease. Studies of these naturally-occurring counterparts of human genetic diseases have contributed to understanding both human and animal health.

Endowed Radiology Residency Established

Dr. Edward C. Preston of Southern Pines, North Carolina, a 1937 graduate of the Veterinary School and an active leader in civic affairs, has established a $175,000 charitable remainder trust in honor of his 55th reunion. The trust, which provides Dr. Preston with lifetime income, will ultimately endow the Edward C. Preston Residency in Radiology. Dr. Preston’s gift is one of the largest gifts to the school from a living alumnus.

In Dr. Preston’s words, “I have wanted to do something significant for the School for a long time. I feel privileged to be able to support radiology, an area of special interest to me, in gratitude for the education I received and, in particular, in recognition of the important roles Drs. George Dick and Elias Booth, former faculty members, played in my life.”
Dr. Robert R. Marshak Retires

Dr. Robert R. Marshak, professor of medicine and former dean, retired on May 7, 1993. Dr. Marshak gave a valedictory address at the School to faculty and students entitled Veterinary Medical Education Towards the 21st Century. He was then presented with the Centennial Medal of the School and in the evening the faculty gave a dinner in his honor.

The Medal Citation Follows:

Distinguished member of the veterinary profession, skilled clinician, inquisitive research scientist, energetic academic administrator, champion of and wise counselor to young scholars, tireless worker for excellence in our profession, leader in the establishment of specialty certification, resolution and effective fund raising, recipient of numerous professional awards and accolades worldwide, generous provider of leadership to organized veterinary medicine, champion of the “one medicine” philosophy, critical editor, prolific writer - all these and more you have been during the almost 50 year span of your professional career.

Throughout that career, you have generously given of yourself to advance the goals and aspirations of your chosen profession as you saw them. Never one to take the easy path or champion the safe point of view, you have followed your instincts and led the profession to new heights of stature and scientific accomplishment. You have significantly elevated the profession in the eyes of society and effected a greater fulfillment of our obligations to animals and their well being. An eloquent spokesperson for ranging topics important to veterinary medicine, your voice has never stilled because of opposition and has sounded the call for vital advancement of the profession. The scientific status of veterinary medicine at large, and this academic institution in particular, is a testament to your ability to identify and articulate future imperatives and essential accomplishments for the profession.

Your dreams for veterinary medicine have never grown dim.

For the past 37 years, you have served the School of Veterinary Medicine at the University of Pennsylvania as a member of its professorate, as Section Chief, as Department Chairman, and as Dean. In fulfilling the responsibilities of each position, you have brought to bear the enormity of your energy, the depth of your knowledge, the dedication of your heart, and perhaps most importantly, your never flagging sense of humor and appreciation for the lighter side of any difficult issue. The twinkle in your eye often has been quick to replace the fire in your soul.

In recognition of your extensive contributions to this institution and the veterinary profession at large, the School of Veterinary Medicine at the University of Pennsylvania is honored to present to you this seventh day of May, 1993, our Centennial Medal.

Bob Marshak has given 37 years of service and gifted leadership to the Veterinary School of the University of Pennsylvania. During these remarkable years, Bob pioneered a series of fundamental changes in veterinary education and brought the horizons of veterinary medicine and have been emulated by the profession throughout the world.

Bob has now retired but his reputation persists. As a tribute to this legacy, the School has established the “Robert R. Marshak Distinguished Lectureship in Veterinary Medicine.” To properly endow the lectureship requires a fund of at least $15,000. Those wishing to support this initiative should make checks payable to “The Trustees of the University of Pennsylvania,” designated to the R.R. Marshak Fund, and return to Ms. Catherine Larmore, New Bolton Center, 382 West Street Road, Kennett Square, PA 19348.

Emergency Service to Receive New Equipment

Thanks to a multi-year commitment from Mr. and Mrs. John H. Remer of Villanova, PA the Emergency Service at the Veterinary Hospital of the University of Pennsylvania will benefit from sophisticated new equipment. The Remer's gift will fund the entire equipment requirements of the renovation of the Emergency Service - the hospital's top fund raising priority.

In the words of Jay Remer, "It gives us great pleasure to have the privilege of donating this important equipment as it will save lives. bring additional revenues to the School, and help provide a state-of-the-art service to the community."

For information about how to contribute to the Emergency Service renovation project, contact Ms. Nancy Martino, Director of Development, Philadelphia Campus, at 215-898-4234.
Dr. Robert E. Davies, 1919-93

The sudden death of Dr. Robert E. Davies, Benjamin Franklin Professor and University Professor Emeritus, left many in the University struggling for words to define the loss of a world figure in science, a prize-winning teacher and University citizen who was, Provost Michael Aiken said simply, "one of those remarkable people that a university cannot do without."

Dr. Davies, a lifelong explorer who had scaled the Matterhorn, Mt. Robeson and Fujiyama— and survived being struck by lightning on the peak of the Grand Teton— had gone during Spring Break to revisit a favorite climb of his youth. He died on March 6 of a heart attack in Golspie, Scotland, at his hotel en route to his chosen site in the Cairn Gorm Range near Aberdeen.

Far from retired at 73, Dr. Davies was teaching biochemistry in the School of Veterinary Medicine; co-teaching the popular Astro 6 course in General Honors; chairing the Committee on Open Expression; and heading a task force to revise Just Cause procedures.

"Bob Davies was the quintessential good citizen of the University community," said President Sheldon Hackney. "A scholar of international stature, he found time to contribute mightily to Penn's becoming a more caring and open community. Undaunted by detail, he nonetheless appreciated the broad context of world events as they affected our campus. I know I speak for the whole campus when I extend our sympathy to Helen and their family."

Dr. Davies was born in Barton-upon-Irwell, Lancashire, on August 17, 1919. He earned the B.Sc., M.Sc. and D.Sc. from Manchester and the Ph.D. from Sheffield, and later received the honorary M.A. from Oxford's Keble College and from Penn. After serving on the faculties of Oxford, Manchester and Sheffield in England, and as visiting professor at Heidelberg, he came to the U.S. as professor of biochemistry in Penn's School of Medicine in 1955, continuing on the Board of the Faculty of Medicine at Oxford until 1959. He joined the School of Veterinary Medicine in 1966 as chair of the department of animal biology. In 1970 he was named Benjamin Franklin Professor of Molecular Biology, and 1977 also became University Professor.

Dr. Davies belonged in a worldwide cadre of academic professors with impeccable scholarly credentials who marched, spoke and wrote for academic freedom for colleagues behind the iron curtain during the Cold War. He went further, and joined the handful who volunteered to serve as hostages if the USSR would allow Dr. Yelena Bonner (Mme. Sakharov) to seek medical treatment in the West.

Meanwhile his research was prolific and his graduate teaching had produced, at last count, a dean and five department chairs, at least 11 professors, and two Fellows of the Royal Society.

Dr. Britton Chance, the Eldridge Reeves Johnson Professor Emeritus of Biophysics and Biochemistry at the School of Medicine, said of Dr. Davies: "We have lost a world-renowned innovator in physiology and biochemistry. Among his many outstanding scientific contributions are the elaboration of the mechanism of acid secretion in the stomach, an final solution to the puzzle of energy sources for muscle contraction, and the development of the basic theory linking ion transport to cell energetics (chemiosmotic theory): An inspirational teacher, a leader in the development of new ideas in science and society, and a driving force for innovation and social conscience in the academic community and in our University."

A Fellow of the Royal Society since 1966, Dr. Davies was also an Affiliate of the Royal Society of Medicine and honorary life member of the New York Academy of Sciences, and a member of over 20 other scholarly organizations. In 1978 the Association for Women in Science created the Helen and Robert Davies Award in recognition of the Penn couple's efforts to eliminate sexual and racial bias in faculty appointments.

Winning the Lindback Award for Distinguished Teaching in 1984, Dr. Davies was cited for teaching that was "demanding, stimulating, and permanent in effect" and for "unstinting work to improve curriculum and teaching." Later he headed two task forces on the quality of teaching, and with Dr. Ann Matter compiled a history of the Lindback Awards at Penn.

Dr. Davies took part in virtually every phase of campus life over the years, heading the John Morgan Society, Sigma Xi and Faculty Research Club, and chairing the Faculty Senate, Senate Committee on Academic Freedom and Responsibility, Faculty Grievance Commission and numerous Senate and Council committees.

He held primary or secondary appointments in six schools, and taught in 17 departments. He published over 260 scientific papers and gave more than 100 scientific presentations in the U.S., Great Britain, Germany, Hungary, Sweden, China and Japan. He published still another hundred articles and letters here and abroad on issues such as academic freedom, affirmative action, and the measurement of teaching quality— and on his avocations of climbing, white-water rafting, cave exploration, underwater rescue, and parachuting. (In younger days he also held championships in pole vault and the javelin.)

One of his avocations led to one of the most unusual requests an administration could make of a faculty member, as Chaplain Stanley Johnson and others recall: In October 1969, during a Vietnam War protest, Vice Provost John A. Russell, Jr., called Dr. Davies late at
**Dr. Robert E. Davies**

Continued

night to ask if he would undertake to scale the flag-pole on College Green. The Administration had agreed to fly the flag at half-staff on the one-day national Moratorium, but a faction of the protesters demanded it be kept that way until the War ended. And consultation with faculty, and a petition by hundreds of staff, indicated consensus for returning it to full staff. By day officials announced this decision, but that night on patrol campus police found the flag-cut. Though he opposed the War, Dr. Davies believed in consensus; though he had never before climbed a flagpole he had a book that told how; and though he was, as he jokingly said, a Britisher who had been on the "other side" of a war some two centuries before—nevertheless in a high wind before dawn Dr. Davies went up the rusting pole and restrung the hal­l yard so that the U.S. flag could fly at sunrise. (A few years later when Penn was in a budget crisis, he did it again to preserve funds for academic needs.)

Other friends remember that Dr. Davies helped create the legal defense fund of WEOUP (Women for Equal Opportunity at the University of Pennsylvania); served as an expert witness in grievance cases and lawsuits involving women and minorities; and, with Dr. John deCani and Nancy Geller of the Wharton School, helped develop and publish statistical measures of faculty quality through which discrimination could be challenged.

"Bob Davies has fought for the rights of students, faculty and staff; he supported critical sit-ins and worked tirelessly to advance the status of women and minorities," said his longtime colleague at the Vet School, Dr. Adelaide DellaVeva.

"Affirmative action had a powerful ally in Bob Davies, not only at Penn but throughout academia," added Dr. Phoebe Leboy of the Dental School, a former Senate chair who was the first head of WEOUP and is active in the Association of Women in Science. "As a teacher and scholar of the first rank, he was determined to see quality recognized in all people regardless of color or gender, and he believed in changing the system from within. Bob Davies helped revolutionize the admission of women and minorities in his school, and spent untold hours working to support individual women and people of color for appointment and promotion, both here and on other campuses. In individual cases he was a University colleague to staff grievants as well as faculty; and in the meantime he spearheaded those meticulous, time-consuming studies that laid the groundwork for new policies and procedures to make the system fairer," she continued.

"WEOUP and the University have lost a friend who not only spoke eloquently for equity and diversity, but who worked as hard as he talked."

Dr. Davies is survived by his wife of 32 years, Dr. Helen C. Davies, professor of microbiology and associate dean of the Medical School; two sons, Daniel J. Conrad of Vancouver and Richard D. Conrad of Philadelphia; and a foster daughter, Lisa Edwards of Philadelphia.

The Robert E. Davies Memorial Fund has been established. Gifts may be made to it via checks to the Trustees of the University of Pennsylvania, designating this Fund and mailed to Room 627A Franklin Building, University of Pennsylvania, Philadelphia, PA 19104-6205.

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**Twenty-third Annual Canine Symposium**

The 23rd Annual Canine Symposium was held January 23 at VHUP. Following are summaries of the talks presented.

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**Canine Hyperthyroidism**

Thyroid hormones affect nearly every system of the body. Often referred to as "the great impersonator," hyperthyroidism, the most prevalent thyroid disorder in dogs, manifests itself in many different ways. Dr. Carole Zerbe, assistant professor of internal medicine at VHUP, discussed the disease process, symptoms, diagnosis and treatment of hyperthyroidism.

Hyperthyroidism is characterized by reduced levels of thyroid hormones, triiodothyronine (T3), and thyroxine (T4). Both are produced by the two thyroid glands located in the neck. Hormone production is regulated by signals sent by the brain in the form of thyroid releasing hormone (TRH) and by the pituitary gland produced in the form of thyroid stimulating hormone (TSH). Iodine is also very important for thyroid hormone production.

Thyroxine circulates in the blood in several forms. Usually bound to proteins, about 0.1% exists free in the blood. It is the free hormone that is biologically active. Most of the free T4 is converted into T3 in the blood or within the cells, where it works on the intracellular level to increase oxygen consumption and heat production.

Thyroid hormones increase basal metabolic rate, blood flow to a variety of tissues, and cardiac output. They directly or indirectly increase the rate of breakdown of protein, fat, and carbohydrates. Additionally, thyroid hormones are important in the development of young animals. These hormones are necessary for normal bone growth and maturation.
Normal protein production is necessary for healthy hair and skin, and 95% of hypothyroidism cases in dogs are diagnosed because the owner sought treatment for abnormalities manifest in the skin and coat. Bilaterally symmetrical alopecia, or hair loss, primarily in frictional areas, is a common symptom. Hypothyroid dogs also exhibit dry, brittle coats, "hot spots," hyperpigmentation of the skin, follicular plugging, thickening of the skin and rat-tail appearance.

Other symptoms may include exacerbation of existing bleeding conditions, lethargy, blepharoptosis (drooping of the upper eyelids), reproductive problems, fluid retention and weight gain. Because of a decreased metabolism, heart rate and body temperature also drop and affected dogs can have a cold, clammy feel to their skin and thermophilic tendencies. Recurrent infections of the skin are also common. If thyroid deficiency occurs in young animals they will develop dwarfism characterized by mental retardation.

Diagnosis of hypothyroidism is difficult. This is because most of the thyroid hormones produced by the thyroid gland are actually within the cells and not in the blood. Because thyroid hormones are bound to proteins in the blood and the amount of these proteins changes with different situations the amount of thyroid hormone we measure also changes. Additionally, T4 is converted to the most biologically active hormone, T3, but sometimes it is converted instead to reverse T3, an inactive hormone. The important point here is that the amount of thyroid hormone we measure in the blood may not accurately reflect the activity level of the thyroid. Consequently it must be realized that when thyroid hormones are measured and found to be low, it may or may not reflect hypothyroidism.

For example, many drugs, such as steroids and anti-convulsant medications, as well as certain diseases, cause thyroid hormone levels to drop, rendering a reading that falsely indicates hypothyroidism. "The body has this wonderful protective mechanism that, when it’s sick, doesn’t burn a lot of calories," said Dr. Zerbe. "It doesn’t want to waste energy, and one of the ways it responds to this is by keeping T3 and T4 values low." Thyroxine during these times will probably be converted to a biologically inactive thyroid hormone, reverse T3.

To determine if thyroid hormone suppression is drug/disease-induced, or is low because of hypothyroidism, a TSH stimulation test should be performed: T3 and T4 levels are obtained and TSH is administered. "If the T4 measurement rises above 4.0 ng/dl following TSH dosage, the patient most likely does have hypothyroidism," said Dr. Zerbe. "Suppressed, or "flatline," response indicates the presence of hypothyroidism. Even with this test it may be difficult to determine if the dog actually has hypothyroidism so sometimes we will recommend trial therapy as a way to determine if the clinical signs were in fact related to low thyroid hormone levels."

A major drawback of TSH stimulation testing is the expense and its limited availability. TRH testing is a less expensive alternative whose efficacy as a diagnostic tool as compared to TSH stimulation testing is currently being tested at VHUP.

Treatment and prognosis for hypothyroidism is excellent. The treatment of choice is hormone replacement with a synthetic T4. A recent study showed that the veterinary T4 product is significantly better for thyroid replacement in dogs than products used as replacement for people.

Hypothyroidism is not breed-specific. It can affect any breed large or small, though large breed dogs are most commonly affected. Some breeds such as golden retrievers, Irish setters and great Danes seem to have an unusually high frequency. It is likely that there is a genetic component to hypothyroidism but this has only been documented in congenital hypothyroidism in Scottish deerhounds and the giant schnauzer where it was shown to be autosomal recessive.

Onset of hypothyroidism normally occurs in middle and older age. Screening of puppies is usually not indicative of future problems. Also, "normal" thyroid hormone levels in puppies are much higher than in adults. If depressed thyroid hormone production is discovered in puppies, however, it is important to supplement them with thyroid hormones for normal growth and development.

Ultrasonic Imaging

Ultrasonography for companion animals, once available only at teaching hospitals, is becoming more widely accessible as private practitioners acquire the equipment for their practices. Dr. H. Mark Saunders, assistant professor of radiology at the School, explained the mechanism, indications, advantages and limitations of this valuable diagnostic tool.

Once used primarily to determine pregnancy or fetal viability this noninvasive imaging technique is utilized today to examine thoracic and abdominal organs. Sound wave beams above the frequency limits of human hearing are emitted from a transducer placed on the skin. Black and white images are generated as the computer in the machine analyzes the reflected ultrasound waves. The relative echogenicity, or amount of sound reflected, increases as the tissue density increases. A dense mass returns more sound and appears brighter, or hypechoic, on the imaging screen than the surrounding tissues of lower density. Ultrasound waves cannot penetrate air or bone, thus the technology cannot be used to evaluate lungs or skeletal structures.

Ultrasonography allows the diagnostician to view organs in real time and from different angles. "The images are pie-shaped, very thin slices of the abdomen," said Dr. Saunders. "They provide us with a picture of the interior architecture of an organ whereas radiography gives us only a silhouette."

Animals usually don't have to be sedated for an ultrasound exam. "Animals are placed on their side on the table," explained Dr. Saunders. "The abdomen has been clipped to allow better contact with the transducer. To enhance this contact, a gel is used on the transducer head. Most animals are quiet, some even go to sleep as the room is dark."

Each organ presents a specific ultrasound appearance and the radiologist is able to diagnose abnormalities by the deviation from the normal appearance. "We know, for example, the echogenicity of a normal liver," said Dr. Saunders. "If we get a different picture, we know there is disease. We are not able to diagnose a specific disease from an ultrasound image. However, when we take
into account the patient's history, physical examination findings, radiographic abnormalities and laboratory findings, we can be more specific about the disease process. In some cases an ultrasound-guided biopsy may be needed. This may require sedation, but it is less invasive than traditional surgery.7

Structural abnormalities of the following abdominal organs can be evaluated by ultrasound: liver and gall bladder, spleen, pancreas, stomach, intestines, kidneys, bladder, prostate gland, uterus, testes, adrenal glands and major blood vessels. Ultrasound is also used to examine the heart, in dogs and in horses, tendons.

Ultrasonography is a valuable diagnostic tool and it is not surprising that more and more practitioners are purchasing the equipment. But Dr. Saunders cautioned before spending $25,000 for a portable machine, the practitioner has to determine: Am I going to work with cats and dogs solely, or am I going to do cats, dogs and horses? The transducers required are different for large or small animals.® A veterinarian will have to invest quite a bit of time in developing his/her ultrasound technique before advertising diagnostic service. Practitioners in private practice must realize that their new machine may not pay off immediately; it's usually a long-term investment.

Some Geriatric Diseases in the Dog

Many dog owners label as normal features of their pets' aging process symptoms which are indicative of serious underlying geriatric problems. Dr. Meryl Litman, associate professor and chief of medicine at VHUP, addressed some of the processes, symptoms, diagnostic tests and treatment options relating to renal, hepatic and cardiac failure in older dogs.

Chronic renal failure, which plagues many dogs entering the middle and upper years, typically creeps up slowly and gradually, and is marked by impairment of the kidney's mechanism for filtering and excreting the waste products of metabolism. The salt-water balance in the blood may be disrupted, and acidic waste products may accumulate in the blood, resulting in blood acidosis.

Polyuria (excessive urination) and polydipsia (excessive thirst) usually occur first, and blood abnormalities show up when the kidneys have lost 75% of their function. Other clinical signs include dehydration, constipation, weight loss, lethargy, vomiting, appetite suppression, hypertension, anemia and kidney infection. Protein-losing nephropathy (PLN), one possible cause of chronic renal failure, is marked by the excretion of proteins, important in the prevention of fluid seepage from the blood vessels, walls, into the urine. Low serum protein levels and ascites (fluid accumulation in the peritoneal cavity) result.

Proper diagnosis of kidney failure includes complete bloodwork, urinalysis and urine culture. Most clinicians obtain a urine protein/creatinine ratio and perform abdominal ultrasound or radiography to monitor the size and appearance of the kidneys, which, in older dogs, tend to shrink.

Dogs suffering from iatrogenic renal failure should be properly hydrated, either through plentiful supply of drinking water or with subcutaneous fluid injections. Aluminum hydroxide may be administered to decrease serum phosphorus, sodium bicarbonate to neutralize acid in the blood, and antibiotics if infection is present.

A low-protein, high-carbohydrate diet should be fed to Kidney failure patients not suffering from PLN. Dr. Litman advocated integrating such high-carbohydrate foods as pasta and potatoes into younger dogs' diets to accustom them to such foods, should the need to apply dietary restrictions arise later in life. Dietary salt should also be restricted, and appetite stimulants, antidiabetics and H2 blockers, such as Tagamet and Zantac, administered when needed. Kidney dialysis is an expensive option, usually reserved for acute cases.

Hepatic failure interferes with the detoxification of the blood. Liver failure in older dogs, which may be due to chronic active hepatitis, cirrhosis, nodular growth and liver shrinkage, may present with such vague symptoms as weight loss, lethargy and decreased appetite. "This may be all the dog shows," Dr. Litman said.

It is therefore necessary to have an older dog checked when such relatively commonplace symptoms are present, because they may be indicative of more than the normal aging process. Fevers, vomiting, diarrhea, ascites, edema, jaundice, polydipsia - excessive thirst, and polyuria - excessive urination, are among the clinical signs of liver failure.

Other manifestations include decreased tolerance to drugs and hepatotoxicity - impaired mental function resulting from the accumulation of toxins in the brain. Dogs suffering from hepatotoxicity may experience lethargy (depression), restlessness (mania), and/or seizures.

In diagnosing liver failure, most veterinarians look for low levels of albumin, blood urea nitrogen (BUN) and glucose, and elevated bilirubin, liver enzymes, and serum bile acids measurements. A complete blood count (CBC) is usually done to check for the presence of anemia and infection. Urinalysis, blood, coagulation profile, ammonia tolerance test and abdominoamnioscintigraphy are among other diagnostic tests performed on dogs presenting with signs of liver failure.

A liver biopsy may also be done, but it is not without risks; as dogs with liver failure have low tolerance for anesthesia and are prone to excessive bleeding.

Dietary changes are a key element in the management of liver disease in older dogs. Unless the serum albumin is found to be very low, a high protein diet should be replaced with one high in carbohydrates. Dietary copper and salt should be kept to a minimum.

Many veterinarians prescribe the drug lactulose for dogs suffering from hepatotoxicity. Diuretics, used to reduce swelling caused by ascites, should be used judiciously, and certain drugs that must be metabolized by the liver should be avoided.

The heart, critical to nutrient delivery and waste uptake, may, in the aging dog, undergo rhythm disturbances, impaired cardiac muscle contractility and abnormal blood flow resulting from faulty valves.

Decreased cardiac output and retarded fluid circulation may result in fluid leakage outside of the vascular system and into the chest and abdomen. Pleural effusion (fluid accumulation
Understanding Canine Behavioral Disorders

Every dog owner is a student of canine behavior, and of this complex discipline, there is no better teacher than our own,mutt. According to Dr. Karen L. Overall, lecturer in behavioral medicine, who runs the Behavior Clinic at VHS, owners must use skills of observation and perception to try to understand what their dogs are trying to communicate by their actions. This, she said, is step one towards combating behavioral disorders.

"We often misinterpret many of their signals," Dr. Overall said. "And therein lies the big problem." Dogs and people have co-evolved and, as part cause and part effect, our social systems are homologous in many ways. However, Dr. Overall warned, dogs don't express themselves in the same ways we do, and owners need to learn how to read the signals that they display through their ears, fur, tail, mouth and stance. They must also realize that dogs do not see the world in the same way that people do. For example, she said, "There is a myth that pets and kids go together." If we allow this myth to materialize according to a child's wishes, the results could be lethal, because a dog's idea of play usually differs from that of a child's.

Aggression is the problem most commonly seen at the Behavior Clinic; Dr. Overall said, and most of the 8% of patients euthanized in the Behavior Clinic between 1987 and 1990 were euthanized because of dominance aggression. Such behavior patterns may appear more prevalent in certain breeds, particularly those selected for guarding traits and protective behavior.

Some of the individuals within such breeds as Dobermans and Rottweilers may inappropriately guard against people or objects which pose no threat. From a risk assessment standpoint, certain individuals within breeds selected for specific sets of behaviors could develop inappropriate variations in those traits. This tends to put a false "label" on the breed. Any generalizations about breed-related behaviors, Dr. Overall emphasized, must be made cautiously.

Crucial to the prevention of problems, said Dr. Overall, "is matching the personality of the dog with that of the owner." The adoption process should include research on the behavioral and physical characteristics of different breeds, a project with which the Behavior Clinic and the American Kennel Club (AKC) both offer assistance.

Puppies taken from their mothers at four to six weeks of age or younger may be likely to develop behavior problems as adults because of decreased canine socialization, and it is important to allow them to remain with their mothers throughout this crucial developmental period. Temperament testing in puppies is a valuable screening tool, although it has limitations.

"Do it," Dr. Overall said, "but don't expect it to give you any guarantees."

Many dogs don't develop behavior problems until social maturity, about 18-24 months of age. Onset of such afflictions as idiopathic shyness, hallucinatory disorders, separation anxiety and ritualistic behaviors may be quite sudden, and the help of a specialist is recommended.

Obsessive-compulsive behaviors, found to run in family lines, may be the result of inbreeding. Many owners mistake such behaviors as tail-chewing with boredom, but the real culprit is anxiety, and such anxiolytic drugs as clomipramine can be effective in eradicating ritualistic behaviors.

When we are looking to enhance the quality of our relationship with our own canine companions, we must start with the puppy. Dr. Overall cautioned against justifying a puppy's inappropriate behavior by it's youth. "Puppies need boundaries," she said, "just like the rest of us do...Intervene. Don't decide that the dog is going to set the rules."

The study of canine behavioral disorders may prove as important to human mental health as it is to that of dogs themselves. Many of the same behavioral problems observed in dogs are also found in people. At the Behavior Clinic, Dr. Overall is using dog models to try to determine whether obsessive-compulsive behavior is caused by inappropriate

Continued on page 8
metabolites in the bloodstream.

When studying the behavior of our own little Fido, Dr. Overall reminds us not to lose sight of the big picture. “Our pets are a mirror of a lot of things,” she said. Is a dog “acting out” because of marital turmoil in the home? A new baby? A change of address? The field of animal behavior is a relative newcomer to the realm of scientific research and medical practice, and its emergence is long overdue in the canine world. We share our lives with our dogs and accept them as full-fledged members of our households. Their behavior captivates us, confuses us and impacts our lives in a powerful way. Maybe that’s why seven of every ten clients question their veterinarians about their dogs’ behavior.

When reflecting on canine behavior, Dr. Overall said, dog owners should bear this in mind: “Behavior is not just an event - it’s a process.”

Kleberg Fellowship Awarded

Dr. Alain Bouvet has been selected as the fourth Kleberg Fellow in the Section of Medical Genetics at the School. The fellowships, established in 1989 by the Robert J. Kleberg, Jr. and Helen C. Kleberg Foundation, support a postdoctoral research training program in medical genetics for veterinarians.

The objective of the program is to attract and train talented veterinary scientists in genetics research, emphasizing those fields which provide the greatest potential to advance the understanding, treatment, and prevention of diseases in which genes play a major role. Because of their broad education in the biological medical sciences and their direct involvement in the health and productivity of animals, veterinarians are ideally suited to play a major role in research into the basic mechanisms involved in genetic disease, gene therapy, identification and engineering of genes that will be important in producing disease resistance.

Dr. Bouvet’s work as a Kleberg Fellow will center around the molecular analysis of genetic diseases that are homologs of human genetic disease. Dr. Bouvet comes to Penn from the Department of Molecular and Cellular Physiology, Cambridge Research Station, Cambridge, England, where his research focused on the detection and localization of genes in swine, using flow cytometry and DNA hybridization techniques. Dr. Bouvet received his veterinary degree from the University of Montreal and his Ph.D. degree in biomedical sciences from the University of Guelph, Canada.

Dr. Rosanne Taylor is the other current Kleberg Fellow. Dr. Taylor received her veterinary and Ph.D. degrees from the University of Sydney, Australia, where she became interested in the pathogenesis and therapy of genetic disorders utilizing animal models of human genetic disease. During her graduate work, she studied the use of bone marrow transplantation as a therapeutic approach to the lysosomal storage disease, fucosidosis in the dog. Desiring further training in molecular genetics and gene therapy research, Dr. Taylor entered the Kleberg postdoctoral training program in medical genetics in 1991. She is currently working in the laboratory of Dr. John Wolfe on the gene therapy of murine and canine Mucopolysaccharidosis VII.

The Kleberg Fellowship Program, still the only of its kind in any veterinary school in the world, will have a significant effect on the long-term course of the profession of veterinary medicine and on knowledge concerning the mechanisms and treatment of genetic diseases in animals and human beings. Additional fellowships will be offered to veterinarians with outstanding academic records and demonstrated talent in areas basic to the field of genetics.

Individuals interested in this program should contact Dr. Donald F. Patterson, Chief, Section of Medical Genetics, School of Veterinary Medicine, University of Pennsylvania, 3800 Spruce Street, Philadelphia, PA 19104.
Potbellied Porcine Pets

Although the remarkable popularity of the Vietnamese potbellied pig has been gradually decreasing, there are still regular appearances of this animal in the New Bolton Center appointment books. Calls from referring veterinarians and owners seeking management, surgical, medical, and anesthetic advice are frequent. It is our impression that the local practitioners, particularly those who are small animal oriented, are willing to add this unusual companion animal to their client list and are becoming more confident and proficient in diagnosis, treatment, and surgery of the Vietnamese potbellied pig (VPBP).

Some of the most frequent questions we receive pertain to basic information and management of the VPBP. An overview of proper care and nutrition of these animals, as well as a few comments on preventive medicine, anesthesia, and surgery, will be offered in this article.

Prices for VPBP's have been falling, and many people with no animal experience are buying them on a whim. Many of these owners do not understand that the small pig they purchased at six weeks of age may grow to 80 to 120 lbs., depending on sex and genetics. Some of these pigs may be cross-bred with domestic breeds, and may therefore grow larger. A wide variety of colors and markings are now available; the original VPBP's were medium-sized, black, and hairy. Typically, the female is larger than the male, but both mature at about four to six months of age. A common owner complaint is inappropriate (for a pet) sexual behavior at the onset of sexual puberty. The estrus cycle in the female pig is 19 to 22 days, and heat can last anywhere from 12 to 48 hours. Female VPBP's may become very aggressive when in heat, and frequent problems include property destruction and biting. Male sexual behavior is somewhat more benign, but may include excessive attachment to owner's legs. Since most owners are not interested in breeding, neutering procedures are usually recommended. These will be covered later.

Proper (limited) growth of the VPBP depends on a properly balanced diet. Many feed stores now stock special miniature pig feed (Mazuri® Porcine Feed - Purina), which includes protein and high in fiber. Maintenance feed should be a 12% protein ratio at 2-3% of body weight. The amount fed should be tailored to the pig's condition and use. Obesity is a significant problem in VPBP's, and excess feeding of "treats" must be discouraged. Appropriate snacks are low in calorie and high fiber, such as pieces of apple, banana, or unbutted popcorn, fed in small amounts. Specific nutritional deficiencies are not common in pigs fed diets specifically formulated for swine. Calcium/phosphorus imbalance should be suspected, however, in cases of spontaneous fracture, "downer pig", or non-specific lameness. Vitamin E and selenium are present in commercial feed in adequate amounts, but if it takes a long time to use the feed, the Vitamin E content may be reduced.

Signs of Vitamin E/selenium deficiency may include sudden death in piglets, or weakness typical of "white muscle disease." Iron deficiency is a problem in newborn domestic pigs, and many practitioners will supplement newborn VPB piglets with injectable iron (100 mg/lb. IM), although there is a risk of sudden death with this treatment.

Exercise is an important part of management, and must be stressed to new owners. VPBP's usually play well by themselves or with other pets. Occasionally rooting is a problem. Recommendations include limiting to leach walking, or placement of nose rings. A single ring in the nasal septum tends to pull out easily, so placement of two rings, one in each nostril, is preferred.

The most common surgical procedures done at New Bolton Center are ovariohysterectomy and castration. Both procedures are easily accomplished using techniques developed for small animals.

Cesarean section may be performed. In cases of partial or complete lactation failure, or death of the sow, piglets may be maintained on sow milk replacer, goat or cow milk, or infant formula, at 10 to 15 ml's every three hours. After about a week, the piglets should be able to drink from a pan or bucket.

Finally, a vaccination regimen that may be suggested includes: at 4 to 6 weeks of age, erysipelas bacterin and 5-way leptospirosis bacterin. If the pig is in a large or crowded herd, atrophic rhinitis vaccination may be recommended. The erysipelas and leptospirosis bacterin should also be given, and boosted yearly with the erysipelas bacterin. The leptospirosis bacterin should be boosted every 6 months in the "outdoor" pig. Breeding stock should receive immunization for porcine parvovirus. Fecal exam should be performed every 6 months, and VPBP's may be dewormed with pyrantel pamoate (0.10 ml/lb. po), ivermectin (Ivomec®0.02 ml/lb. subQ) and dichlorvos may be used in adult pigs.

Elizabeth G Lucas, D.V.M.
Section of Surgery

Rebecca Done, sales specialist, Upjohn Company, presents a check to SCAVMA President Kenton Rexford, V M94, while Leon Andrews looks on.
Camille De Clemente, V'94, June Hacker, V'95, Maureen Kenneally, V'94, and Jeff Rubincam, V'95, comprised the Penn student team in the "Clinical Challenges" competition at the 1993 SCAVMA Symposium. They came in FIRST!

Dr. Gerhard Schad, professor of parasitology, delivered the Eleventh Lloyd E. Rozeboom Lecture in Medical Entomology at The Johns Hopkins University School of Hygiene and Public Health in May. In November Dr. Schad and Dr. Thomas Nolan, instructor in parasitology, presented papers at the meeting in Seattle of the American Society of Tropical Hygiene. The last week in November Dr. Schad presented lectures at three medical colleges in Taiwan and during December he was part of a panel on animal models for human parasitic diseases at the International Tropical Medicine Congress in Thailand.

Dr. Stephen Dey, V'88, assisted in the production of a video tape on equine trailer rescue to train police and fire fighter rescue squads and horse owners. Dr. Dey has designed horse extrication drills for emergency response teams in New Jersey.

Dr. Peter J. Hand, professor of anatomy, has been appointed to serve on the Consultative Committee for the Selection of a President for the University's next president. Douglas H. Thamm, V'95, is a student member of the committee.

Dr. Adrian Morrison, professor of anatomy, gave a presentation at the 159th annual convention of the American Association for the Advancement of Science in Boston in February. Dr. Morrison has been elected to the board of directors of iFAR (Incurably Ill for Animal Research). iFAR was organized by patients several years ago to educate the public.

Dr. Morrison has been elected to the University's faculty senate for a two-year term.


Dr. Phillip Scott, assistant professor of parasitology, co-chaired the 13th Philadelphia Regional Immunology meeting in October. He presented the Plenary talk "The role of CD4+ Th Cell Subsets in the Control of Protozoan Parasites" at the VIth International Coccidiosis Conference at the University of Guelph, Guelph, Canada in June.

Dr. Robert Rew has been promoted from adjunct associate professor to adjunct professor of parasitology.

Dr. Robert M. Kenney, professor of animal reproduction, received an award from the Atlantic Breeders Cooperative in recognition and honor of his many years of contribution.

The School and New Bolton Center were well represented at the AAEP meeting in Orlando in November. Papers were presented by: Dr. David P. Freeman, emergency clinician, Dr. Robert M. Kenney, professor of reproduction, Dr. Elizabeth G. Laws, resident in surgery, and Dr. William Moyer, professor of sports medicine.

Dr. Virginia Reef, associate professor of cardiology, Dr. Dean Richardson, assistant professor of surgery, Dr. Patricia Sertich, V'83, assistant professor of reproduction, Dr. Corinne R. Sweeney, associate professor of medicine.

Dr. Wilbur Amand, V'66, the Philadelphia Zoo's first full-time clinical veterinarian, has retired after serving the Zoo for 18 years. He now will serve as a consultant to the Zoo.

Dr. Michael Tomasic, V'85, a lec-
turer in anesthesia at New Bolton Center, received a five-year Clinical Investigator Development Award from the Heart, Lung and Blood Institute of the NIH.

Dr. Joan Hendricks, V'79, associate professor of medicine, has been appointed vice chair of the department of clinical studies, Philadelphia. At the American Thoracic Society meeting in May, Dr. Hendricks and Dr. Sigrid Veasey, her graduate student, presented an abstract at the plenary session; it was selected as one of five to be presented from 3,000 submitted.

Dr. Richard A. Mansman, V'68, coordinated the First International Conference on Equine Rescue, held in Santa Barbara, in February CA. The conference brought together veterinarians, veterinary paraprofessionals and emergency professionals from humane and government agencies.

Dr. Sherrill Davison, V'83, assistant professor of avian medicine and pathology, has been elected to chair the examination committee for the American College of Poultry Veterinarians.

Dr. Peter Dodson, professor of anatomy, and Dr. Philip Gingrich edited a special volume of the American Journal of Science entitled Functional Morphology and Evolution. It was dedicated to John H. Ostrom and was presented during a special ceremony at Yale in February.

Dr. William Donawick, Mark Whittier and Lila Criswold Allam Professor of Surgery, received the AI and Caroline Schiller Distinguished Service Award for exceptional contributions to the American College of Veterinary Surgeons.

Dr. Darryl N. Biery, professor of radiology, was elected to the executive council of the American College of Veterinary Radiologists.

Dr. David Kritcheksky, Wistar Professor of Biochemistry, presented the 19th Annual H. Brooks James Memorial Lecture at the College of Agriculture and Life Sciences, North Carolina State University, Raleigh. The topic of the lecture was: Variation in Blood Cholesterol.

Christine H. Lundy, V'96, received an award from the Trustees' Council of Penn Women.

Dr. Karen Overall, V'83, Dr. Robert Washabau, V'82, assistant professor of medicine, and Dr. Urs Giger, assistant professor of medicine and medical genetics, presented lectures at the British Small Animal Veterinary Association meeting in Birmingham, England in April.

Dr. Jorge Guerrero, adjunct professor of parasitology, has been appointed director general of Merck AgVet in Spain.

Dr. Mark M. Smith, V'82, was recently promoted to associate professor at the Virginia-Maryland Regional College of Veterinary Medicine. He also received the 1992 Norden Distinguished Teacher Award.

Dr. A. Gary Lavin, V'62, has become president of the American Association of Equine Practitioners. Dr. Lavin practices primarily at Churchill Downs and is current president of the Kentucky Thoroughbred Association.

Dr. Alan Kelly, professor of pathology, in collaboration with Dr. Helen Blau, Stanford University, edited a book entitled *Neuromuscular Development and Disease*, published by Raven Press. Dr. Kelly was an invited speaker at the European Molecular Biology Organization Symposium on Muscle Development in Sardinia, Italy in October. He was an invited speaker at an NIH, NIA sponsored workshop on Muscle Reactions to Injury in Bethesda, MD in June.

Dr. John Wolfe, V'82, assistant professor of pathology, was invited to present his work on gene therapy in MPS VII by retroviral and herpes vectors at a meeting at the Pasteur Institute in Paris, France in October. Dr. Wolfe was an invited speaker at the Wenner-Gren Symposium on Gene Transfer Strategies in the Study of Brain Damage and Repair in Stockholm, Sweden in June. Dr. Wolfe was given a secondary faculty appointment at the Wistar Institute, and he was appointed associate director of the new Core Center for Gene Therapy of Cystic Fibrosis and Other Genetic Diseases.

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**Clarification on Retesting for Heartworm Infection**

Last spring, the Bellwether published a summary of my talk on screening and prevention of heartworm infection presented at the *1992 Your Veterinarian and Your Dogs Symposium*. The brief reference to my comments on the subject of retesting dogs receiving heartworm chemoprophylaxis did not fully develop my position on this issue and I fear that it may have conveyed an erroneous impression. Therefore, I want to make sure that my intended message is understood.

Periodic retesting is necessary to ensure that heartworm prophylaxis has been effective. The point I was trying to make is that retesting every year may not be essential for dogs receiving monthly chemoprophylaxis. When monthly prophylaxis has been faithfully and effectively administered throughout the heartworm transmission season, the chances of contracting a clinically significant infection are very small.

Therefore, once a dog has been thoroughly tested and confirmed heartworm negative, and there is reasonable assurance of compliance with the prophylactic regime, then retesting every 2nd or possibly 3rd year may be a sufficiently close interval to monitor the efficacy of prophylaxis. So what I am suggesting is that the intervals between retesting of dogs be based on the individual circumstances of each case. When these dogs are retested, reliance should be put primarily on serologic detection of heartworm antigen, rather than testing only for microfilariae. However, to permanently discontinue retesting on these dogs would be a complete abrogation of responsibility.

This proposal does not apply to dogs receiving diethylcarbamatone daily for heartworm prophylaxis. These animals should be tested for microfilariae each year, and at least periodically for antigen as well.

David H. Knight, D.V.M.
Chief, Section of Cardiology
A Tribute to
Carolyn M. Glass, VMD
1961-1992

We flew "the trench" on May 24, 1987. Carolyn had decided to try her hand at flying the airplane and was seated on the left. I sat in the copilot's seat. Tom and Phil were cramped in the rear of our aluminum capsule, known affectionately at the time as Team Mooney. We may have been the only human beings on earth that Sunday to see the most beautiful part of the Canadian Rockies. From their northernmost point near Watson Lake south to Calgary, I am sure of the date because of an entry in my log book.

The adventure started when Carolyn asked to see me in my office at the University of Pennsylvania, while she was studying veterinary medicine. She told me she and a classmate, Philip Kaufman, were going to Barrow, Alaska, for 8 weeks to participate in the annual survey of bowhead whales, as they migrate along the lead edge of ice in the Chukchi Sea. Carolyn said they would be flying to Barrow, 350 miles north of the Arctic Circle, by commercial airplanes and if she returned the same way she would miss the opportunity to see much of this beautiful land. She knew I flew and asked if I would fly to Barrow to pick them up, so she could see Alaska, the Northwest Territories, the Yukon, and British Columbia at an altitude where the beauty of this vast region could be seen and appreciated. I had flown to Alaska before but not 13,000 miles in May and I had never dared to venture north of the Arctic Circle. I suspect one must be a pilot to completely understand the challenge of flying to Alaska in a small airplane. I accepted, in part because of the challenge, but also to have an opportunity to see the spring run of salmon and see Alaska again.

I asked a friend and skilled pilot, Tom DiCecce, to accompany me. Our intention was to camp along the way, although the closest Tom had ever come to camping was spending several nights at a Holiday Inn. Camping required taking a tent, sleeping bags, cook stove, food, survival gear, an axe, a rifle with plenty of ammunition, a mountain of flight charts, cameras, and a myriad of lenses and film, all in addition to personal needs and warm clothing.

Tom and I left Pennsylvania on May 12, 1987 and arrived in Barrow on May 19th. We stopped along the way to dig for razorback clams and fish for Steelhead and King salmon. Nearly all of the inland lakes were frozen-in and the Brooks Range north of Fairbanks was still completely engulfed in ice and snow. Carolyn and Phil were at Wiley Post, Will Rogers Memorial Airport in Barrow to greet us, but they didn't see us land. The weather was so bad at Barrow we could not see the sides of the runway because of ice fog, and a truck had to be dispatched to find and lead us to the terminal, such as it was.

Carolyn had an exciting time in Barrow, but I could also tell she was anxious to get away from the ice, snow, unrelenting cold, and the monotony of continuous daylight. She had seen, counted and tracked the movement of more than one hundred bowhead whales, become skilled in counting the thousands of greater and lesser eider ducks that winter in that remote area, had sighted polar bears at close range, and witnessed the ritual of Eskimos harpooning a whale by traditional methods from a seal skin boat. Carolyn wanted to show us everything that had become special to her. She stood with me in a small building located on the absolute northern-most tip of land in the United States. From there we watched the sun dip toward the horizon, only to rise again without setting.

Neither Tom nor I knew whether our reliable, single-engine Mooney aircraft would actually fly with the load we had. We agreed to use maximum power and, if we were not airborne by the midpoint of the 6,500 foot runway, we would abort the takeoff and off-load some of our precious cargo. We thought it best not to tell Carolyn and Phil of our concern. On Thursday morning, when we left Barrow, it was clear and very cold, weather features that would provide safety factors of increased lift and the ability to return to the airport if all was not well. Team Mooney landed in Fairbanks, 350 miles, and 3 hours and 45 minutes later. We now knew our trusted Mooney would carry us home safely. We taxied directly to our campsite at the campground, which is a part of Fairbanks International Airport. We were the only ones there, except for the mosquitoes, which I conservatively estimated were the size of eagles.

We visited Anchorage, while enroute in clouds, missed a clear view of Mount McKinley. We stayed in Ninilchik, a village founded at the turn of the 19th century by Russian explorers. We fished for King Salmon as the guests of Al and Cookie Stuefoten. We went down the Kenai Peninsula to Homer where we saw hundreds of bald eagles fishing along the shores of Cook Inlet and huge halibut hanging at the docks of the fishing fleet. We had a beer or maybe it was two, in the Salty Dawg Saloon, on the Spit. It was truly an exciting time. The friendship and camaraderie were of a level I had never experienced before, or since.

We camped on the shore of Watson Lake, in the Yukon Territory before entering the trench. The ice on the lake was gone, the sky was clear, and the temperature was in the sixties. The surrounding low rolling mountains were free of snow and were covered with evergreens. Carolyn and I walked along the shore, most of the time without saying a word, but she did share with me some of her deepest feelings. The only thing to break the silence of the moment was the gentle lapping of waves along the shoreline and an occasional small bush plane arriving or departing this wilderness outpost.

I make much of the trip through the trench because, located in this remote area are some of the most beautiful mountains on earth and, it was, without doubt, the high point of our adventure. Picture, if you can, the feeling on that day in 1987.
It is 450 miles to Prince George and then another 408 miles along the Frazier River valley to Calgary. The mountains reach to more than 10,000 feet. We cannot hope to fly over these mountains with our load, but instead must snake our way southeast in the valley which forms the trench and separates the Muskrab and Finlay Ranges of the Canadian Rockies. There are only three airstrips along the entire expanse and two of them would be unusable to us because of the accumulation of winter snow. There would be no one to talk to by radio, no place to land, and no one to help if disaster should strike. Once committed, the weather had to hold, for there was no turning back. There could be no instrument flying this day.

Balance our apprehension against the beauty and the grandeur of the day. The sun was shining, the sky was a brilliant blue, without hint of smog or pollution, and overhead there were only high cirrus clouds. Think of having the ability to soar like a bird among the peaks, for Carolyn to bank so gently and put a wing tip within a few hundred yards of a sheer granite cliff. Two miles above the valley floor, next to a mountain peak that had been successfully scaled by man just the year before. Visualize our frantic attempts, in the tiny cabin, to change lenses and position a camera to capture on film the most breathtaking views, knowing full well the resulting pictures would never save the three dimensional images our eyes could see and our minds comprehend. and, in an instant, save for a lifetime. As we flew over the glaciers and now green valleys near Lake Louise to the south, we saw a rainbow ahead, reaching to valley floor. It was a perfect ending to a perfect day; one of those truly perfect days in anyone’s life.

Carolyn saw all of this on Sunday, May 24, 1987, and probably much more. I can only describe to you what I saw. I was always convinced she had uncanny insight, uncommon intelligence, and could see, perceive and understand much more about our world than I could ever hope to. Many times, during and after our trip, Carolyn told me how much she enjoyed our trip, how much she had learned about nature and, more importantly, about herself. I have learned more recently that she shared her joy and excitement with her sister, Julie.

I’m pleased to have been a small part of Carolyn’s life and to have enabled her to see her world, in a way most never have a chance to see it. Every time we got together afterwards she would ask when we were going back. I wish we had. I haven’t been back. I still fly the Mooney. When I do go back, most certainly, I will miss her company.

If you should get there before me, please pause long enough to witness the true unspoiled beauty of nature that Carolyn treasured, and say to yourself, “Dr. Carolyn Glass passed by here in Team Mooney in the spring of ’87.”

William J. Donawick, DVM
Mark Whittier and Lila Griswold Allam Professor of Surgery

The Carolyn McKerrow Glass Travel Research Fund at the NOAHS Center has been established in memory of Dr. Carolyn M. Glass, V’88. This travel fund will make possible worldwide research and training expeditions to aid endangered animals. Scientists associated with the NOAHS Center are leaders in their research fields: veterinary medicine, genetics, and reproductive physiology, and the demand for their applications of medical technologies to the plight of endangered species, worldwide, is growing rapidly.

Contributions to the fund should be sent to:
NOAHS Center,
National Zoological Park
Smithsonian Institution
Washington, DC 20008

Dr. Carolyn M. Glass was a 1988 graduate of the School of Veterinary Medicine at the University of Pennsylvania. She dedicated her life and training as a veterinarian to wildlife conservation and the welfare of nature, first in the efforts to save the dolphins, struck by disease along our Atlantic Coast, then as part of the study of the bowhead whales in the Pacific northwest, and finally trying to save the critically endangered Florida panther. In spite of her efforts, and those of many other dedicated workers, the Florida panther is losing its battle for survival and the species is nearing extinction. Carolyn died just after Christmas in 1992. Her last written words to Dr. Donawick were in the form of a reminder that, “in wilderness is the preservation of the world” (H. D. Thoreau).

Dr. Donawick is the Mark Whittier and Lila Griswold Allam Professor of Surgery, School of Veterinary Medicine, University of Pennsylvania. He has been flying for 25 years, has accumulated more than 2000 hours in Mooney aircraft, and holds a commercial license, with instrument, land and sea ratings.

Congressman Robert Walker toured New Bolton Center in March. He is shown here with Dr. Ray Sweeney (left in the Graham French Neonatal Section of the Connolly Intensive Care Unit).
Animal Crackers

Most Popular Breeds

There are over 50 million dogs in the United States. In 1992, 1,528,392 were registered by the American Kennel Club. Labrador retrievers were in first place for the second year. Other sporting breeds high on the list were cocker spaniels in third place, golden retrievers sixth, and English springer spaniels 19th. Rotweilers, in second place, led the working breeds, followed by boxers in 17th and Siberian huskies in 18th and Doberman pinschers in 20th place. Fourth in over-all standings were German shepherd dogs, a herding breed, while Shetland sheepdogs in this group were ninth. Of the non-sporting breeds, poodles led in fifth place, with chow chows in 30th and Dalmatians in 15th. Leading the hounds were beagles in seventh, closely followed by dachshunds in eighth. The most popular toy breed was the shih tzu in 11th place, with Pomeranians 12th, Yorkshire terriers 14th and Chihuahuas 16th. The only terrier breed in the "Top 20" was miniature schnauzers in 13th place.

Chinese shar-pei received full recognition in 1992 and there were 90,081 registered. This total includes the incorporation of the Chinese Shar-Pei Club of America's stud book into the AKC's stud book.

There were 1,155 all-breed dog shows in 1992 held under AKC rules. Too often, a breed becomes popular because of its winning record. Be sure you understand the care and grooming required to keep a dog looking like the ones you see at shows and in pictures.

Home video probably is responsible for the Dalmatians' popularity. Before you decide on any breed as a pet, be sure to investigate the training required to make "movie stars" what they are.

Bits and Pieces

A dog becomes geriatric at an age that is based on its size: giant breeds (over 90 lbs.) at about 7.5 years, large breeds (50 to 90 lbs.) at about 9 years, medium breeds (21 to 50 lbs.) at about 10 years and small breeds (under 20 lbs.) at about 11.5 years. There are many individual variations.

Cats can survive incredible falls, but most of the time they get hurt. Records show that a cat's chance of surviving a fall of seven to 32 stories are twice as good as its chances of surviving a fall of only two to six stories.

Monthly heartworm medications now control additional parasites. Dogs can be protected against hookworms, roundworms and whipworms. There are different prescription drugs available and they must be obtained on your veterinarian's prescriptions.

Paraplegia is a common problem in dogs. Small dogs quickly learn and adjust to the use of wheels instead of hind limbs and lead a good-quality life if given appropriate home care.

Rabies vaccination should always be up-to-date. Rabies in raccoons continues to spread and wild animals (raccoons, skunks, bats and foxes) account for most reported cases.

A report on a "Pet's Weight Watchers' Club" tells of a cat that went from 43 lbs. to 16 lbs. with the help of the program.

A published survey estimates that on December 31, 1991, 54.8 million households (57.9% of all U.S. households) owned a companion animal (dogs, cats, birds, horses and any of several other pets, such as hamsters, gerbils, fish and rabbits). Of these, 34.6 million households owned a dog, 29.2 million households owned a cat, 5.4 million households owned a bird and 1.9 million households owned a horse.

Approximately 40.3% of dog owners also owned a cat. This survey estimates the cat population at 57 million and the dog population at 52.8 million.

Cat Scratch Disease in humans usually causes mild illness and there are an estimated 6,000 cases a year. There is no diagnostic test to determine if a cat is a carrier and the involved cat is invariably healthy. It is always advisable to wash any scratches or bites with soap and water and a cat should not be allowed to lick an open wound. Because of the growing popularity of cats and the increasing number of immunocompromised persons, research is needed on the disease.

The Australian shepherd (erroneously identified as Australian cattle dog in Bellwether 33) is the 15th breed recognized by the American Kennel Club and will be shown in the herding group. The Shiba Inu will be added to the non-sporting Group soon. There are varieties in nine breeds: cocker spaniels (black, particolor, ASCOB), beagles (under 1" and 13-15"), dachshunds (longhaired, smooth and wirehaired), collies (rough and smooth), bull terriers (colored and white), Manchester terriers (toy and standard), Chihuahuas (smooth coat and long coat) English toy spaniels (King Charles and Ruby, Blenheim and Prince Charles) and poodles (toy, miniature and standard).
**Book Reviews**

**TEACH YOUR DOG TO BEHAVE:** Simple Solutions to Over 300 Common Dog Behavior Problems from A to Z. by Bashkim Dibra with Elizabeth Randolph (Dutton, 375 Hudson Street, New York, NY, $21.00)

This book’s A-to-Z format gives a diagnosis and treatment plan for most behavior problems. It gives the reader ideas for making their pets Canine Good Citizens.

In the beginning, there are descriptions of major canine attitudes which include aggressive dominant, fearful, friendly and playful. It helps with problem-solving if you can interpret your dog’s body language, facial expressions and vocalizations.

On the problem of chewing objects or clothing, we read “Because chewing is an ingrained, normal habit of dogs, you shouldn’t try to prevent your dog from chewing. You should redirect your dog’s chewing instinct so it chews what you want it to.”

Do dogs have ESP? “Dogs’ ESP is due to their exceptionally acute senses. They can hear, see and smell things we can’t. This accounts for their ability to ‘predict’ meteorological events and home in on lost or buried people and faraway locations.”

“Jumping on people or other dogs is a problem to be cured right away. The treatment includes getting the dog’s attention before it begins to jump, say ‘NO!’ and praise it lavishly when it remains by your side.”

“Sympathy lameness” that can be turned on at will by the dog is usually exacerbated by an owner who responds just the way the dog wants. Be sure to get a veterinary assessment if this is not an obvious bid for attention.

Nail-clipping problems can upset the owner as well as the dog. To prevent this, make a point of touching and holding a puppy’s paws and legs on a regular basis. “To make a dog’s nails easier to clip, soak its feet in warm soapy water or salty water for a few minutes before you begin. This will soften the nails and will also act to desensitize the animal’s feet.”

“In order to teach a dog anything at all you have to learn to time your responses to concur exactly with the action you want to praise or correct. You have to catch the dog in the act for your praise or correction to mean anything at all.”

The book has many simple solutions for making the human-canine relationship work.

**CANINE LEXICON** by Andrew De Prisco and James B. Johnson (T.F.H. Publications, Inc., Third & Union Avenues, Neptune, NJ 07753, $79.95)

With over 3,500 entries, alphabetically arranged, and over 1,300 full-color photographs, this book is a good reference source for much basic information about dogs.

**Special Gifts**

The following made a donation to the Friends of New Bolton Center in memory of Mr. Benjamin Welsh.

- Mr. Bob Albrey
- Mrs. Judy Casalou-Swirlak
- Ms. Rita Collins
- Mr. and Mrs. Dave Farehart
- The Fwing Family
- Mr. and Mrs. Jim Fry
- Ms. Mary Kathleen Grossbeck
- Sergeant Michelle Hall
- Mrs. Beverly Hornbeck
- Mr. and Mrs. Ralph Hughes
- Michigan Justin Morgan Horse Association - Region East
- Ms. Dorothy Monday
- Mr. and Mrs. Mark Rohrig
- Mr. and Mrs. Ron Skoyer
- Master Sergeant James Sims
- Mr. Bill Sonnerville
- Mr. and Mrs. Ray Taylor
- Mr. and Mrs. James Truss
- U.S. Army Readiness Group Selfridge
- Ms. Regina Welsh
- Mrs. Sandi Wright

Following are gifts to the Friends of New Bolton Center in memory of or in honor of the persons listed.

- A gift in memory of Mr. John A. Ballard was given by Dr. and Mrs. James G. Logue.
- A gift in memory of Mr. John A. Ballard was given by Ms. Camille M. Logue and Mr. Michael Hauzelet.
- A gift in memory of Dr. Marvin E. Bright was given by Dr. Mark B. Guise.
- A gift in memory of Mrs. Angela Hargreaves was given by Mr. Barrick W. Groom.
- A gift in memory of Mr. Francis G. Killeen was given by Mr. Stewart O. Bates.
- A gift in memory of Dr. F. Towler Maxson was given by Mr. and Mrs. Elbert E. Huston.
- A gift in honor of Dr. John Enck was given by Ms. Christine Davis.
- A gift in honor of Dr. Ashley was given by Mr. Christine Davis.
- A gift in memory of Ch. Kinvale Evergreen Destiny was given by Mr. Richie Pavlik and Ms. Meg Heinek.
- A gift in memory of FOXY J. C. was given by Dr. John W. Lee, Jr.
- A gift in memory of SEBASTIAAN was given by Dr. John W. Lee, Jr.
ICU-Reunion Party

Two weeks before Christmas the VHUP waiting room was transformed into holiday party space for the second ICU Reunion Party. Forty canine and feline guests attended together with their owners. Santa Claw was there to greet everyone. Former patients and nurses and doctors became reacquainted and everyone marveled how happy and healthy these ICU “guests” now looked. Nancy Shaffran’s poem, summed it up quite nicely.

The ICU Christmas Poem

’Tis two weeks before x-mas
And back to our hospital
Come our patients, now healthy
That we once though impossible.

There are doctors and nurses
Who have labored intensely.
And mothers and fathers
Who have loved you immensely.

There were x-rays and blood tests
And needles and pills,
Some very strange haircuts
Some very large bills.

We treated diseases
And contagious infections,
We stuck lots of tubes
In outrageous locations.

We fed you our lunches
When no one was looking,
If you ate we requested
Your favorite home cooking.

You put up with our poking
And prodding and squeezing,
While we tried to unravel
The cause of your sneezing.

We attached you to monitors
Beeping all night.
There were times when you gave us
A terrible fright.

But you made it, you made it,
And we’re glad that you’re here
But please stay home
For the rest of the year!

Boston International Seafood Show

Usually the School has a booth at the Pennsylvania Farm Show and at the Kennel Club of Philadelphia dog show to inform people about research and service in the farm and companion animal fields. In 1992 members of the Laboratory for Marine Animal Health attended the Boston International Seafood Show for the first time. This year they were back, with a new display, to let the seafood industry know about the research and service the LMAH provides.

The spectacular photographs in the display were made possible by Dr. William Hardy, V’66, an avid underwater photographer, and by Fedor Piscator, who gave permission for the use of the photo of the Tealia anemone.

Shown here staffing the booth are Dr. Laurie Landeau, V’84, and Jeff Roberts, associate dean for development and planning. Drs. Donald Abl, Robert Bullis, and Wade Lawrence, all housed at the LMAH at Woods Hole, also staffed the booth.
Problem Prevention Classes

Puppy Problem Prevention

Beginning in September of 1993, the Behavior Clinic at the Veterinary Hospital of the University of Pennsylvania (VHUP) will be offering a 4-week course in preventing behavioral problems in puppies. These classes were started in response to the demand by pet owners and veterinarians for early puppy training. They were designed after a preliminary study done at VHUP determined that working with pups at an early age could decrease behavioral complaints.

The classes will be held on four consecutive Saturdays with each session lasting 1 1/2 hours. They will be no larger than six puppies in order to give individualized attention. The class is tailored to young puppies. At the start of the sessions pups need to be at least seven weeks of age and no older than six months of age.

Each meeting will feature puppy play periods where puppy communication and normal behavior will be discussed. The small class size will allow problems and questions to be addressed in a timely manner when it can make the biggest difference. The last session will focus on anticipating and preventing common behavioral problems that develop at later ages.

Problem Prevention and Socialization

In response to repeated requests from veterinarians, animal shelters, and pet owners, the Behavioral Clinic at the Veterinary Hospital of the University of Pennsylvania (VHUP) is offering a 4-part socialization and problem prevention class for dogs over six months of age.

These sessions will be held on four consecutive Saturdays with the exception of Thanksgiving week, each lasting 1 1/2 hours. Small classes of no more than six dogs will allow for individual attention to each owner’s specific problems.

Common concerns such as housebreaking, nutrition, disease prevention, leash manners, appropriate play behavior, selecting the right obedience class, and raising and training a puppy will be discussed.

Radiotelemetric electrocardiograms giving precise readings while the horse is exercising at speed can detect cardiac arrhythmias. A videoendoscope allows for visual examination of the upper airway while the horse is exercising at speed. This greatly assists in identifying dynamic upper airway abnormalities.

"We can also do blood gas analyses and muscle enzyme analysis during or just right after the animal has been exercised," said Dr. Martin. "This provides us with more accurate values and may help us in determining why the animal’s performance has decreased." Dr. Martin explained that these diagnostic procedures have shown a higher incidence of subclinical "tying up."

The treadmill is also used for fitness testing, high speed lameness examinations and a treadmill exercise program for horses being brought back into training.

"The Jeffords Treadmill Facility has opened many diagnostic avenues," said Dr. Martin. "We can now observe and test the animal under high speed conditions and suit them to their performance careers (racing, three-day, show, etc.).

The cost for all four 1 1/2 hour sessions is $100. Ask for a discount voucher when adopting a dog from humane societies or the SPCA. The cost with the voucher is $50 for all four 1 1/2 hour sessions.

For information and/or reservations, please call:
Dr. Karen Overall
Behavior Clinic/VHUP
215-898-3347

Treadmill Exams Provide Interesting Insights

New Bolton Center's Jeffords Treadmill Facility has provided some interesting insights into the causes of poor performance of the equine athlete. "So far, we have examined 105 horses and have found some unusual reasons for the drop in performance," explained Dr. Benson Martin, director of the facility.

"We diagnosed an aortic thrombosis in one horse brought to us for poor performance, and several horses with ventricular premature contractions or atrial fibrillation. These results were unexpected."

The high speed treadmill permits examination of a horse while running at top speed. New Bolton Center specialists have an array of sophisticated diagnostic tools available to examine the animal while it is running. Heart monitors and radiotelemetric electrocardiograms give precise readings while the horse is exercising at speed can detect cardiac arrhythmias. A videoendoscope allows for visual examination of the upper airway while the horse is exercising at speed. This greatly assists in identifying dynamic upper airway abnormalities.

"We can also do blood gas analyses and muscle enzyme analysis during or just right after the animal has been exercised," said Dr. Martin. "This provides us with more accurate values and may help us in determining why the animal's performance has decreased." Dr. Martin explained that these diagnostic procedures have shown a higher incidence of subclinical "tying up."

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"The Jeffords Treadmill Facility has opened many diagnostic avenues," said Dr. Martin. "We can now observe and test the animal under high speed conditions and suit them to their performance careers (racing, three-day, show, etc.), and this provides a more accurate picture of the horse's physical condition. We are very excited by the enhanced diagnostic capabilities as they allow us to more completely evaluate the patient's cardiovascular, respiratory, and musculoskeletal systems at speed."
VHUP Wolf Hybrid Policy

The information following is provided to help the public understand why we no longer treat wolf hybrids. We do understand that some wolf hybrids can be wonderful pets, but there is ample evidence that this experience is not universal. We respect both dogs and wolves, and developed this policy with that respect in mind. Our foremost concerns are twofold. We want to insure that no one is inadvertently injured while treating or handling these animals because they are unaware of the manifestations of the non-domesticated or wild component. We also do not want to appear to condone the breeding or ownership of wolf hybrids, although we know that many hybrid owners have rescued these animals from abusive situations. A compromise solution would be to treat these animals, but to house them separately and treat them as exotic animals. We do not currently have a clinician in the specialty of exotic animal medicine which unfortunately precludes this choice at this time.

In Pennsylvania it is illegal to own wolves or hybrids without a permit. In New Jersey it is unlawful to own pure wolves, but not hybrids. The AVMA has a published policy that states that they do not condone and strongly discourage the breeding and ownership of wolf-hybrids. They are joined in this by the National Association of State Public Health Veterinarians (NASPHV) and the Council of State and Territorial Epidemiologists (CSTE). All these organizations recommend that wolf-hybrids not be kept as pets, and that they are not created by cross breedings. Their reasons for this involve both infectious disease considerations and behavioral, public health considerations.

First, rabies is an infectious disease that is considered epidemic in some regions in the country (the greater Philadelphia area is one such region). 31% of the rabies cases diagnosed in the United States from 1 January 1992 to 28 November 1992 came from the Mid-Atlantic States region which includes New York, New Jersey, and Pennsylvania. Wild animals are absolutely not to be vaccinated for rabies since no rabies vaccine is licensed for use in wild animals. This rule was first created because of the use of live vaccines which provided a potent reservoir for mutation and vaccine-induced cases of the disease. The vast majority of vaccines currently used in the U.S. are inactivated, decreasing the probability of vaccine-induced rabies, but are not tested for efficacy in wild animals. These vaccines may provide a lesser degree of protection than they would in domesticated animals, giving anyone who possessed or interacted with such animals a false sense of security. This is potentially dangerous. Given this, the Compendium of Animal Rabies Control (1993) states that "vaccination of wildlife is not recommended..." and "hybrids (Offspring of wild animals bred with domestic dogs or cats) are considered wild animals" (JAVMA, Vol. 202, No. 2, 15 January 1993: 199-204).

Furthermore, Randall Lockwood, Ph.D., vice president for Field Services of the Humane Society of the United States, a biologist with expertise in carnivore behavior and the epidemiology of dog bites, has stated in the official platform for HSUS that "private ownership of wild canids and hybrids must be strongly discouraged" because of the risks to animal welfare and the risks to the safety of people, pets, and other domestic animals. He is referring both to the health risks discussed above and to the risks to the safety of individuals with whom the animals come into contact. Others with unquestionable expertise concur. The September/October 1991 issue of Pet Veterinarian labels wolf hybrids as a "dangerous fad." Wolf Haven, a wolf research park in Washington state, is officially, and in writing, opposed to the breeding and selling of wolf hybrids.

Reasons for the above attitudes are supported by the biology and behavior of the wolf and of the wolf hybrid. Below some highlights of wolf behavior and comparisons with that of wolf hybrids and domestic dogs are briefly outlined.

I. Physical and Exercise Capabilities and Requirements: Wolves and wolf hybrids have an exercise requirement that is not within the realm of normal for
domestic dogs: wolves routinely cover more than 30 miles per day in their annual peregrinations. They also can jump more than 6-8 feet vertically from a standing position, and can dig or tunnel equally deeply in a short time. Wolf hybrids redirect their energy to destructive behavior in the house or in pens or yards.

2. Interspecific Vocal and Non-Vocal Communication: Regardless of the postulated or stated percentage of wolf in the hybrid the fact remains that wolves have very different communicatory systems than do domestic dogs. In the process of domesticating dogs and creating breeds, humans have selected for traits that both appeal to them and are understandable because of convergence in the communicatory system. This means that expecting hybrids to behave in the same manner as domestic dogs and to believe that they communicate their intentions in the same manner is both wrong and dangerous. We expect and have encouraged through breeding dogs that bark and growl. If this is noted, most people would anticipate that some aggressive event was about to occur or was occurring. Wolves do not bark and growl; they howl in packs as long range communicatory signals. The absence of this bark and growl in hybrids could be dangerous. Wolves have not been selected to use facial signals that communicate with humans, as have domestic dogs. Hence, they show less tilting of the head, wiggling of "eyebrows", and movements of the jaws that humans, often unconsciously, use to interpret domestic dog behavior. This trait renders hybrids dangerous to humans.

3. Sociability and Protectiveness: Partly because of these communicatory traits and partly because of the socialization of wolves, wolves are shy around people. According to releases from the International Wolf Center in Minnesota, this trait is not lost and is little diminished in hybrids. The prevailing myth is that hybrids will be better at attack and protection than domestic dogs. This is false. Their inherent shyness makes them poor protection animals, but increases the probability that they will react inappropriately and out of context. This is one reason that the International Wolf Center discourages breeding and ownership of hybrids.

4. Sexual Maturity and Social Systems: Wolf maturity occurs later than in domestic dogs (2-3 years v. 6 months) and can affect the manner they interact with other canids and with humans. Many domestic pet dogs begin inappropriate aggressive behavior at social maturity. Any inappropriate aggressive propensities will be compound in wolf hybrids because of problems interpreting their social and communicatory systems.

5. Urine Marking - Olfactory Communication: Wolf and wolf-hybrids urine mark to an extent not seen in even the most motivated domestic dog. Given that olfactory communication is such a critical component of their social system it is unreasonable to expect that humans, no matter how well intentioned, will be able to assay the effect of this on social interactions, and so will be ill equipped to deal with changes in social status or with olfactory statements by the wolf or wolf hybrid.

6. Predatory Behavior: Hybrids retain components of wolf predatory behavior to varying degrees. The silent, stealth-like communication discussed above is one component of this. Another is the willingness to track and pounce upon small, erratically behaving, vocalizing individuals. This latter scenario defines small children. Predatory pet dogs (which do occur), wolves, and wolf hybrids will all respond to such individuals by pouncing and biting. When pet domestic dogs behave in this manner it is considered out of context. Inappropriate behavior because we have selected these animals, through breeding in domestication programs over a period of 12,000 years, to recognize any human as a non-prey item. This is obviously not true for wolves, who should have been subject to no human intervention, nor can it be true for wolf hybrids, who have been subject to no rigorous breeding program that would decrease predatory tendencies. The extent to which these predatory instincts are so easily triggered in wolf hybrids, in a manner that appears out of context, makes them particularly dangerous in unsupervised situations where children are present. In addition, the jaw and musculature configuration of wolves and wolf hybrids differs from that of domestic, pet dogs. The former have more powerful jaws and are liable to do more damage during the initial bite. This renders them particularly risky for small children.

7. Genetic Conservation of the Wolf: Finally, some proponents of wolf hybrids maintain that hybrids are a way of saving the wolf as a species by maintaining the genetic stock. This is an untapped and mistaken statement that perpetuates a view that is wrong and dangerous.

**Ophthalmology Equipment to Arrive Soon**

The Section of Ophthalmology at VHUP is purchasing two new pieces of equipment for dogs and cats with ocular problems. The equipment is made possible through the generosity of the Devon Dog Show Association, the Kennel Club of Philadelphia, Montgomery County Kennel Club, Bucks County Kennel Club, Harbord Dog Club, Ms. K. Carol Carlson, and Dr. Felix Gzowski.

The electroretinography (ERG) machine is an important diagnostic tool to determine the viability of the retina, as well as identify potential inherited genetic defects, prior to cataract surgery. The phaco-emulsification surgery unit, by breaking up a cataract into fragments, allows for a very small incision, thereby minimizing inflammation and irritation following surgery; vision is restored almost immediately. Both machines are slated to arrive shortly.
Scholarships

The Pocono Mountain Kennel Club awarded a scholarship to Elizabeth Wade, V'94. The Berks County Kennel Club awarded scholarships to Kelly McCrae, V'96, Krista Price, V'95, and Michael Yarnall, V'96. The Lehigh Valley Kennel Club made a donation to the Lehigh Valley Kennel Club Loan Fund at the School.

Randy Siler, V'93, is the recipient of the Dr. Samuel B. Guss Memorial Scholarship offered by the Pennsylvania Veterinary Foundation. The Dr. Samuel F. Scheidt Memorial Scholarship, offered by the same organization, was awarded to Lynne Mazzonc, V'93, and Elizabeth Wade, V'94, is the recipient of the Dr. Palace H. Stitz Memorial Scholarship offered by PVF.

Jennifer Hyman, V'94, received a scholarship grant from the Dr. Harry Schultz, Jr. Memorial Scholarship Fund of the Maryland Veterinary Foundation. Daryl Drzewiecki, V'96, and Joseph Ewaskiewics, V'96, have been named J. Maxwell Moran, Sr. Dean's Scholars.

Willard Stuttleus, V'93, is the recipient of a Merck AgVet scholarship because Dr. Craig Rowan, V'48, winner of the 1992 Beef Award, sponsored by Merck AgVet and presented by the American Association of Bovine Practitioners, chose the School to receive the Merck scholarship donation.

Johanna Lee, V'94, received a scholarship from the Gundaker Foundation, Inc. and from the William Goldman Foundation. Arthur Jankowski, V'94, also received a scholarship from the Goldman Foundation. The Clark Foundation awarded a scholarship to Joshua H. Clay, V'95.

Patricia M. Khuly, V'95, received The Lois F. Fairchild Scholarship in Veterinary Public Service for the academic years 1993-94 and 1994-95. Carolyn J. Littel, V'94, is the recipient of a scholarship from the Amlan Foundation.

Pet Memorial Program

Instituted in 1982, the Pet Memorial Program provides a thoughtful vehicle for practitioners to express their sympathy for the loss of a client's pet. The program helps strengthen the bond between veterinarians and their clients, while generating important unrestricted dollars for the School.

In the words of one grateful client...

Loy C. Awkerman, VMD
Frederic K. Affi, VMD
Richard J. Baron, VMD
Michelle C. Bartus, VMD
Michelle B. Beriste, VMD
Robert L. Bergman, VMD
Frank A. Botto Jr., VMD
Harvey A. Braff, VMD
Charles E. Brown, VMD
John S. Bush, VMD
Thomas Carreras, DVM
Andrew W. Cleland, VMD
Kevin P. Cough, VMD
Evelyn M. Cushing, VMD
Henry L. Cusack, VMD
Cliford G. Cummings, DVM
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Paul W. Donovan, VMD
Diane Ruth Eigner, VMD
Shelley R. Epstein, VMD
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Gregory W. Gedron, DVM
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Carol A. Gray, VMD
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Michael H. Keasbey, DVM
Anne Marie Knoebel, DVM
Lloyd B. Kumpf, DVM
Theodore J. Leifer, DVM
Lawrence Jay Linnet, VMD
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Don Rosenberg, VMD
Charles Francis Ruggiero, VMD
James R. Rummel, VMD
Charles Schwick, DVM
Ira H. Silver, VMD

Each year the Westminster Kennel Club Foundation invites the recipients of its scholarships to attend the Westminster Kennel Club show at Madison Square Garden. Just before the Best in Show judging begins, the veterinary students are introduced to the audience.

Mr. Robert F. Fairchild established the Lois F. Fairchild Scholarship in Veterinary Public Service. During a visit to New Bolton Center in November he met the current scholarship recipients shown here, from left to right, are Mr. Peter R. Van Brunt, WKC member, Lance Bassage, V'93, Jeannette Lyn Donovan, Cornell University, Michael J. Blain, Michigan State University, and Mrs. Robert V. Lindsay, member of the foundation committee.

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Penn Annual Conference

Over 600 veterinarians and 150 veterinary technicians attended the Penn Annual Conference in January. A special thanks to the following exhibitors who sponsored lectures at the Conference:

Research Awards

Dr. Sherril Davison received funding from the Animal Health Commission of Pennsylvania for a project entitled "The Use of Contraceptive Techniques to Reduce or Eliminate the Rodent Reservoir of S. enteritidis in Poultry Houses." Dr. Charles Benson and Robert Eckroade are co-investigators.

Dr. Robert Washabau received funding from the Trustees of the Estate of Pamela Cole to study hepatic encephalopathy in dogs. Dr. Washabau received funding from the Robert H. Winn Foundation to study the "Pathogenesis of Colonic Smooth Muscle Defect in Feline Idiopathic Megacolon." The Winn Foundation also provided funding for another project undertaken by Dr. Washabau, in cooperation with Dr. Chantal Parent: "Serum Trypsinogen Immunoreactivity in the Diagnosis of Acute Pancreatitis in Cats."

The Research Foundation of the University of Pennsylvania awarded funds to three researcher at the School: Dr. Peter J. Felsburg for "Model of X-Linked Severe Combined Immunodeficiency;" Dr. Paula Henthorn for "Comparative Gene Mapping of Canine-Linked Severe Combined Immunodeficiency (SXCID);" Dr. Gerhard Schad for "The Role of Chemosensory Neurons in the Development of Parasitic Nematodes."

Researchers at the Laboratory of Aquatic Animal Medicine and Pathology at Woods Hole received a number of research awards. Drs. Donald Abt and Wade Lawrence received a two-year grant to study the "Pathology and Epidemiology of Eye Diseases in Captive Pinnipeds" (seals). Dr. Roxanne Smolovitz received a two-year grant from the USDA and a one-year grant from the National Marine Fisheries to study "Diseases of Oysters."

Bellwether 34

Bellwether is published by the School of Veterinary Medicine at the University of Pennsylvania.

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