Bellwether 24, Summer 1988
Philadelphia Pet Survey Leads to Rabies Prevention

Over a thousand Philadelphians answered a telephone call recently and discovered their pets were the focus of interest. The information was needed by VHUP Researchers Dr. Alan Beck, Dr. Larry Glickman and Ms. Jody Smith to assist Philadelphia public health officials in developing rabies prevention strategies for the city. The number of pets unvaccinated for rabies and the pets and sections of the city at risk were some of the important questions studied in the city-wide survey.

Rabies vaccination statistics are particularly important to the city. In Philadelphia the last case of dog rabies occurred in 1948; however, recently rabies was discovered in a dog, a cat, a horse and in raccoons in nearby Chester and Delaware Counties. Beck pointed out that the rabies strain causing the epidemic is carried by raccoons and that the disease spills over from this population to other animal species. The large number of raccoons in Philadelphia makes such a spill-over possible.

Philadelphia's costs related to animal bite treatment would soar if any rabies cases occurred in the city, given the life-threatening nature of the disease. This is because a series of preventive rabies vaccinations is required for bite victims if the animal's vaccination status is unknown. The cost for the procedure is borne by the person or the City Public Health Department because most private health insurance plans do not cover this type of care.

To ensure protection of Philadelphians against rabies, all dogs and cats should be vaccinated regularly against the disease. This is mandatory under state law but difficult to enforce. Beck and Glickman proposed surveying Philadelphians to learn about their knowledge of rabies and about pet ownership patterns in order to target intervention strategies. Both pet owners and non pet owners were included in the survey since risk from animals bites exists for both. The study received support from the Philadelphia Department of Public Health and the Geraldine R. Dodge Foundation.

For the study the city's ten health districts, which will have responsibility for carrying out the programs, were grouped into four sections. The telephone survey, based on random digit dialing procedures, was conducted by Chilton Research, a national survey research firm, using 1288 households.

continued on page 9.
From the Dean

It is hard to believe that my first year in the Deanship has passed and with it my staff and I have reflected on what has been accomplished. Typically, in the early stages of an administration, there are changes noticeable to outside observers. Not unlike an iceberg, however, the majority of change and achievement lies beneath the surface, beyond the view of a casual observer.

We've laid an even firmer foundation for the School's future by providing a new budget framework and fiscal policy. In place is the necessary staff to deal with a variety of important areas and constituents, ranging from our students, to alumni, to friends, and legislators.

New programs and policies for dealing with the health and safety of our faculty, staff and students will assure that their well-being and working environment are important elements in maintaining their interest, loyalty and productivity. A spirit of collegiality and high morale exist in the School. Yet, we realize that there is still much to be done.

We've focused on communications, a “glassnost” of sorts, at all levels; on research, and how to better liaison with interested funding agencies, foundations and industry; on facilities, and the completion of our commitments to donors and our agricultural constituency.

Our greatest strength, however, is the refocusing on ourselves and our educational mission.

With the help of our Board of Overseers and the guidance of senior University administrators, we are poised to set off in new directions. In basic science we’ve focused on molecular biology; in our clinical areas, on health care delivery, especially at the New Bolton Center campus where we have the capability of servicing the needs of the Mid-Atlantic region.

New directions of leadership are expected to flow from the upcoming 10th anniversary celebration of the Center for the Interaction of Animals and Society as well as from our addressing the ethical concerns of students and faculty regarding the use and welfare of animals.

It's been a fruitful beginning and I look forward to the next several years when we can accomplish much more.

— Edwin J. Andrews, V.M.D., Ph.D.

Second Century Fund Passes the $38,000,000 Mile Post

The Second Century Fund is now into the home stretch! Over the past four months, generous gifts from our many friends helped the School travel the last turn, and we are now driving towards the finish line. On August 1, 1988, we passed the $38,000,000 mark with a total of $38,031,092. We are very grateful for the continued support of our capital objectives, endowment goals, research activities and educational programs.

Building an endowment is an investment for the future. We are particularly blessed that many recent contributions were made to create or enlarge the School's endowment fund accounts. Mrs. Gladys E. Rogenthal honored her husband by establishing the Alfred H. Rogenthal Endowment for Small Animal Medicine. This fund will support the training of veterinarians “truly competent” in “small animal medicine and the development of service oriented facilities capable of providing high quality patient care for a large number of animals.”

We received an additional $150,000 from the Estate of Judith A. Sankey to support a post-doctoral researcher in Molecular Genetics. Mr. and Mrs. Hardie Scott completed their generous contribution to the Dr. Charles W. Raker Chair in Equine Surgery. The Dr. M. Josephine Deubler Student Scholarship Fund received a $15,000 gift from the Kennel Club of Philadelphia, and a contribution from the Maryland Kennel Club. The Estate of Winona Ann Syder and Elizabeth S. Zies also established new student scholarship funds.

The inclusion of these new monies is especially important at this time because the University's overall endowment performance during the past year was impressive. Even with the calamitous events last October, the University's Associated Investments Fund still gained a 4.4 percent total return. When compared to other national indices that lost on a total return basis, the University's performance is even more noteworthy. The School of Veterinary Medicine is proud to report to our many friends that their endowment gifts are managed by some of the best people in the business.

The contributions to support student scholarship endowment were reinforced by other term gifts for student aid. A total of $43,950 was given by: Lisa Hopen, V.M.D.; Mr. Robert Lind; Merck Company Foundation; The New York Farmers; Estate of Pauline O'Rosky; Town of Thomaston, Maine; H. Fred Troutt, V.M.D.; and, The Westminster Kennel Foundation.

Mrs. Anne French Thorington completed her pledge commitment for the construction of the Connelly Intensive Care Unit and the Graham French Neonatal Section. In addition, Mrs. Thorington was instrumental in organizing a symposium on “Serious Problems in Neonates and Adult Horse — Candidates for Intensive Care.” The proceeds from the symposium were used to purchase needed equipment for the ICU. Further contributions for ICU equipment were made by Delaware Equine Center; Mrs. and Mrs. Henry E. 1. DuPont; Mrs. Kathyn Johnston; John Lee, D.V.M.; Midge Leitch, V.M.D.; In Memory of Joseph Manger, Jr.; and, Mrs. Elice McDonald, Jr.

Additonal generous gifts were made by the following individuals: Mrs. Jill Cohen; Mr. Richard A. Dorr, Sr.; Mr. Raymond C. Firestone; Estate of David George Jones; Mr. Edward B. Lipkin; J.D. McCullough, V.M.D.; Mrs. Laura Thorn; and Mr. Charles Wolf.

These individual contributions were matched by: a grant from the American Kennel Club to support research by Drs. K. Ann Jeglum, Donald Patterson and Robert Washabau; a grant of $125,000 from The Jockey Club to Drs. Larry Soma and Corinne Sweeney to study the effects of LASIK® on race horses; a $13,000 donation from the Island Foundation to support the Aquavet program at Woods Hole, Massachusetts; and a $22,200 award from the Fannie E. Rippet Foundation to Dr. Jules Melbin to study the failure of cardiovascular prostheses. Other important donations were made by: Animal Rescue League of Philadelphia; Biery Family Foundation; E.I. DuPont de Nemours and Company; Pennsylvania Poultry Foundation; San Diego Cat Fanciers; Tri-Tech Corporation; Universal Veterinary Research Association; and World Health Organization.

We appreciate the generosity of our alumni, Board of Overseers, close friends, corporations, foundations and associations to the Second Century Fund over this past year. In the year since Dean Edwin J. Andrews began his tenure, he has built strongly upon the accomplishments of former Dean Robert R. Marshak. Since July 1, 1987, nearly $6.7 million was added to the Second Century Fund. We thank you for your help and for your commitment and support for our final drive to the finish line. Each and every one of you can make a difference and with your financial muscle behind us, we can cross the wire in a record effort.
Equine Symposium

On April 30, 1988 the School hosted an Equine Symposium at its New Bolton Center campus. The event, entitled Serious Problems in Neonates and Adult Horses — Candidates for Intensive Care, consisted of five short lectures by faculty members and area practitioners. The symposium was designed to acquaint owners and farm personnel with ways to prevent serious medical and surgical problems in the horse; to provide knowledge of treatment when emergencies occur; and to understand the potential supportive benefit and limitations of intensive care. The program was moderated by Mr. Mark McDermott, executive secretary, Pennsylvania Horse Breeders Association. Following are summaries of the talks.

Philosophy of Preventive Medicine

Dr. John Lee, a Unionville practitioner, began the program with a discussion of the Philosophy of Preventive Medicine. Traditionally preventative medicine, in general, has consisted of a program covering immunizations and parasite control. However, it should encompass more than these two subjects. Concerns such as nutrition, pasture management, ventilation and appropriately timed veterinary examinations and clinical testing should all be included.

To have a successful program the veterinarian and the farm manager/owner need to be involved as a team. As the sophistication of treatments available to the equine industry increases, as exemplified by the new intensive care facility at the University of Pennsylvania School of Veterinary Medicine, so should the determination to prevent as many of the problems in advance as possible.

The information following not only applies to the mare and the foal, but also to the equine population in general. Dr. Lee stressed that a complete vaccination program can reduce the risk of life threatening diseases such as botulism, tetanus, encephalitis and rabies. It can also reduce the incidence of respiratory disease by protecting against infections caused by the rhinoviruses and influenza viruses. Table A outlines a program recommended by Dr. Lee.

Parasite damage and its secondary effects are still considered to be the cause of the majority of surgical and medical colics. Parasite control consists not only of frequent wormings and fecal examinations to measure the success of the wormer, but also includes pasture management. The effectiveness of worming is often negated by overgrazed, poorly managed pastures which act as a constant source of re-infection by *Strongylus vulgaris* and other internal parasites. The current recommendation is to worm all horses younger than two years every month, and older than that every eight weeks. The veterinarian is the best source of information as to the type of wormer to use and in what rotation.

A number of problems can be eliminated through non-medical management. It is important that horses be kept in a well-lit and well ventilated barn. Ventilation is often overlooked as a contributor to disease, particularly in foals. They, due to their height, occupy the lower half of the stalls, where often the airflow is inadequate and this situation frequently increases their susceptibility to respiratory infections.

Dr. Lee also advised that horses which arrived from another facility be kept in isolation for a period of time to prevent the introduction of infectious diseases into the herd. He emphasized that close attention has to be paid to proper nutrition. It has been shown that a balanced diet can reduce the incidence of such common problems as metabolic bone disease and contracted tendons in the foal. In the adult athletic horse nutrition is of prime importance in obtaining maximum performance. Poor hoof growth, tying up, and impaction colics are other examples of possible nutrition problems.

Pasture plays an important part in the nutritional and exercise needs of the horse. It is often a neglected part of a farm's parasite control program. Dragging, vacuuming, and rotating of livestock all need to be considered as well as frequent fertilizing and replanning of grasses.

The time-honored procedures of digging the navel of the newborn with iodine and giving an enema shortly after birth are still the first lines of defense against such problems as navel ill and meconium impaction. The foal should be kept in a warm, draft free environment, however, it should not be too humid as this situation stresses the foal's respiratory system. All foals should be tested by twelve hours past the first nursing to determine whether they are absorbing maternal antibodies from the colostrum. If there is a failure of passive transfer, additional colostrum can be given to the foal. Poor hoof growth, tying up, and impaction colics are other examples of possible nutrition problems.

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The mare's colostrum should be checked for its antibody level. This allows the veterinarian to know if the foal is likely to have received adequate antibodies. If the foal has too low an antibody level, this may be frozen for future use will be worthwhile to keep on hand.

The preventive steps reviewed here are quite basic, however they can reduce veterinary costs and help in the maintenance of a herd of healthy horses.

TABLE A: VACCINATIONS AND OTHER PREVENTATIVE MEASURES

<table>
<thead>
<tr>
<th>Immunization</th>
<th>Vaccinations and Other Preventative Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tetanus toxoid: Foals</td>
<td>— two injections four weeks apart, starting at 6-8 weeks. Annual boosters thereafter. Given to pregnant mares 4-6 weeks before foaling date. If the horse is injured, it should have a current tetanus shot within six months, or a booster is required.</td>
</tr>
<tr>
<td>Influenza: Foals</td>
<td>— two injections four weeks apart, starting at 6-8 weeks. Six months through two years of age — booster every three months. Given to pregnant mares 4-6 weeks before foaling date. Heavily campaigned horses should have boosters every 60-90 days.</td>
</tr>
<tr>
<td>Rabies</td>
<td>— initially one injection, then annual booster. Foals — should be over three months of age.</td>
</tr>
<tr>
<td>Eastern and Western Encephalomyelitis: Initially two injections given in the spring four weeks apart. Annual booster thereafter.</td>
<td></td>
</tr>
<tr>
<td>Botulism</td>
<td>— primarily given to pregnant mares — initially three injections given at 7, 9, and 10 months of pregnancy. One injection 4-6 weeks before foaling date thereafter.</td>
</tr>
<tr>
<td>Worming</td>
<td>— ideally foals should be started at 6 weeks of age and wormed every four weeks thereafter until two years old. Adult — should be wormed every eight weeks. Pregnant mares — should be wormed every 8 weeks up to the last 6 weeks before foaling.</td>
</tr>
<tr>
<td>Coggings</td>
<td>— once a year. Horses shipping out of state may need to have one current within six months.</td>
</tr>
<tr>
<td>Teeth floating</td>
<td>— once a year. Young and old horses should be checked every six months.</td>
</tr>
</tbody>
</table>
Foals Responsive to Intensive Care

Dr. Wendy Vaala, lecturer in medicine, provided a brief overview of foals requiring treatment in the neonatal intensive care unit.

In order to achieve the most favorable results from neonatal intensive care, the patient must be identified as early as possible. Factors predisposing to neonatal illness may be related to the mare's health and pregnancy, to events surrounding delivery, and to the foal's behavior and vital signs during the first days post partum. Table I lists normal parameters regarding pregnancy, birth and post partum foal behavior. Abnormal conditions associated with neonatal illness are listed in Table II.

Neonatal septicemia, a bacterial infection, is one of the most common causes of morbidity and mortality in the newborn foal. Early recognition and aggressive treatment are essential for a successful outcome. A case history will reveal that the birth in most cases was normal. If the infection was acquired in utero, the placenta may be thickened, edematous or abnormal in texture. The mare may have been ill. Affected foals often have not received enough colostrum.

The early signs of neonatal septicemia are generalized weakness, weak or absent suckle, depression, dehydration, elevated heart and breathing rates, variable body temperature (subnormal temperature if infection is acute). The late signs of the disease are pneumonia (nasal flare, nasal discharge, cough), septic arthritis/phyllitis (swollen joints, periarthritis edema, lameness, fever), diarrhea, meningitis (seizures, disoriented behavior), infected umbilicus. Laboratory data indicative of neonatal septicemia are: low white blood count initially, hypoglycemia (low blood glucose), acidosis (low bicarbonate); dehydration (elevated hematocrit); low arterial oxygen levels.

Affected foals should be rehydrated, receive energy and be treated for acidosis. They should be fed, either through nursing, bottle feeding, or tube feeding. If the foal cannot tolerate enteral (orally administered) feeds then intravenous glucose or intravenous parenteral nutrition (fats, protein, glucose, vitamins) should be given.

General nursing care and careful monitoring of vital signs are very important. These foals need to be kept warm on a 24-hour a day basis. The body temperature should be maintained, the foal should be turned and helped to stand. When lying down, the animal should be kept in a sternal position, and the bedding should be kept dry and soft to prevent pressure sores. Arterial blood gas samples are monitored to determine if supplemental oxygen or ventilatory support is required.

Animals with low blood oxygen should receive intranasal oxygen. These foals have low blood sugar levels. They should wear protective head gear and have their legs wrapped. To ease their breathing these animals should be kept in a sternal position. She also said that sick foals should be transported in a heated vehicle, wrapped in blankets.

Premature or immaturity foals present a challenge to the practitioner. Usually gestation is less than 320 days. Often this is due to an abnormal intrauterine environment; the mare may have been old or sick or undernourished, or the placenta may have been abnormal due to infection or twining.

These foals have a low birth weight, their forehead is domed, the coat is silky and the ears are floppy. They show joint and flexor tendon laxity. Their body system is not able to maintain body temperature or normal blood sugar levels. The lungs are immature and cannot be fully expanded, resulting in low blood oxygen and increased carbon dioxide. These foals are not able to tolerate the normal volume of milk, they are prone to colic and intestinal distention. They are also highly susceptible to infection.

Premature foals have to be kept warm on well padded bedding. They need to be kept in a sternal position to help them breathe. Physical therapy should be given to help strengthen muscle and tendons. They need supplemental feeding and IV glucose or parenteral nutrition to maintain normal blood glucose levels. Antibiotics and IV plasma may also be necessary, as may intranasal oxygen or mechanical ventilation.

Dr. Vaala explained that sick foals should be brought along to the veterinarian, as well as a complete history of birth and post partum treatment.

### Table I: Normal Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Time to suckle reflex</th>
<th>Time to stand</th>
<th>Time to nurse</th>
<th>Heart rate</th>
<th>Body temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foal behavior</td>
<td>5 to 20 minutes</td>
<td>60 minutes</td>
<td>111 minutes</td>
<td>1.5 minutes of life = mean 70 BPM 6-60 minutes of life = mean 135-150 BPM 9 hours to second day of life = mean 96 BPM</td>
<td>99°F - 101°F</td>
</tr>
</tbody>
</table>

### Table II: Conditions associated with High Risk Foals

<table>
<thead>
<tr>
<th>Maternal conditions</th>
<th>Periparturient events</th>
<th>Neonatal conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abnormal vaginal discharge</td>
<td>Premature parturition</td>
<td>Meconium stained fluid on foal; meconium aspiration</td>
</tr>
<tr>
<td>Fever</td>
<td>Abnormally long gestation</td>
<td>Neonatal sepsis, meconium aspiration</td>
</tr>
<tr>
<td>Extraordinary accumulation of fetal fluids</td>
<td>Prolonged labor</td>
<td>Neonatal bowel atony</td>
</tr>
<tr>
<td>Colic surgery/general anesthesia</td>
<td>Dysstocia</td>
<td>Neonatal bowel obstruction</td>
</tr>
<tr>
<td>Endotoxemia</td>
<td>Induction of labor</td>
<td>Meconium aspiration</td>
</tr>
<tr>
<td>Severe maternal illness</td>
<td>Early umbilical cord rupture</td>
<td>Neonatal pneumonia and/or bowel atony</td>
</tr>
<tr>
<td>Excessive drug administration</td>
<td>Cesarean section</td>
<td>Neonatal bowel atony and/or obstruction</td>
</tr>
<tr>
<td>Pelvic injury/hindlimb instability</td>
<td>Premature placental separation</td>
<td>Neonatal bowel atony and/or obstruction</td>
</tr>
<tr>
<td>Poor nutritional status</td>
<td>Neonatal infection and/or sepsis</td>
<td>Neonatal meconium aspiration</td>
</tr>
<tr>
<td>Premature lactation</td>
<td>History of having premature or foal</td>
<td>Neonatal bowel atony and/or ileus</td>
</tr>
<tr>
<td>History of having premature foal or foal with neonatal sepsis</td>
<td>Premature placental separation</td>
<td>Neonatal bowel atony and/or ileus</td>
</tr>
<tr>
<td>History of having premature or foal with neonatal sepsis</td>
<td>Neonatal placental separation</td>
<td>Neonatal bowel atony and/or ileus</td>
</tr>
<tr>
<td>Premature transport prior to parturition</td>
<td>Neonatal placental separation</td>
<td>Neonatal bowel atony and/or ileus</td>
</tr>
</tbody>
</table>

a. Premature and sepaticic standard bred colt shown here in our foal sling used to help him stand and to prevent excessive weight bearing on his incompletely calcified humes. Infusion pumps seen in the background. Foal was being fed intravenously. b. Premature Thoroughbred foal being supported in sternal recumbency; tape around muzzle is holding trnasnasal oxygen catheter in place. c. Premature Thoroughbred foal with immature lungs on the high frequency ventilator. Note pillows for support and protection.
Emergency Treatment on the Farm

Dr. Midge Leitch, a practitioner from Cochranville, PA, spoke about emergency treatment which can be handled on the farm. She explained that the decision whether to take the animal to a hospital or to attempt treatment on the farm depends on the facilities available and the experience of the veterinarian.

Colic or abdominal distress is one of the most frequent causes for an emergency call to the veterinarian. Some can be treated on the farm. The veterinarian performs a physical exam; basic laboratory tests such as complete blood count, electrolyte and a peritoneal fluid analysis are helpful in making the diagnosis and determining the cause of the condition. The veterinarian may perform a gastric lavage and give analgesics to make the animal more comfortable. Lavage, a therapeutic measure, also is of help in establishing a diagnosis. Fluids and electrolytes may be administered, orally, if it is a mild case, and intravenously if the animal is in severe distress, to achieve stabilization of the patient.

Mares, in addition to having abdominal diseases common to the horse, can be prone to additional problems such as large colon displacement which most frequently can occur between foaling and six weeks later. The displacement may be partial or complete. Uterine torsion can also happen prior to foaling; it is discussed in more detail in Dr. Orsini’s presentation.

Newborn foals often develop abdominal trouble. One of the major causes is meconium impaction. It can be relieved by an enema or a laxative. However, one should be cautious with the laxative to avoid diarrhea.

Diarrhea in a young foal can be life-threatening and a prompt determination of the cause is necessary. Fluids and electrolytes are absorbed by viral/bacterial infection or milk allergy. Dr. Leitch recommended that treatment with anti-diarrheal medication and fluids be commenced at once to prevent the young animal from becoming dehydrated and weak. Gastric/duodenal ulcers are a great problem in young foals, particularly if the animal is stressed due to disease. It is important to recognize the early signs such as colostrum refusal, salivation, retching and depression. Treatment consists of the administration of anti-ulcer medication and drugs to coat and protect the stomach and determination of the underlying cause of stress.

Young foals are also prone to urinary bladder rupture. Such foals often have a pot-bellied appearance by the third day of life and appear depressed. Tests show electrolyte imbalance. The animals may be able to urinate streams of urine, though they have a small leak in the bladder. Treatment is by surgery. Complications due to foaling can result in two patients, the mare and the foal. Dyscoelia can cause damage to the mare’s reproductive tract and sometimes she can suffer a secondary cardiovascular collapse after dystocia. If a mare has been severely stressed during foaling, there is the danger of laminitis occurring. Stressful birth also causes complications for the foal and such animals often are prime candidates for intensive care. Dr. Leitch recommended that horse breeders keep oxygen on hand for a distressed foal and that they make every effort to keep the young animal warm.

Dr. Leitch briefly discussed musculo-skeletal problems which constitute an emergency. Septic arthritis and osteomyelitis require prompt treatment to prevent permanent damage. Signs are lameness, joint or soft tissue swelling, and septicemia. Treatment consists of joint lavage, systemic antibiotics and in many cases, referral for arthroscopy/curareg. Fractures are another emergency situation. She stressed that the fractured limb needs to be supported by an appropriate bandage and recommended using pillows to create a support bandage. The animal should be referred to a clinic.

The summaries of the remaining three presentations will appear in the Winter issue. The topics are: Life-Threatening Complications in the Mare; Serious Injuries to the Athlete: Laminitis.

Equine Breeders Short Course

The Georgia and Philip Hofmann Research Center of the University of Pennsylvania School of Veterinary Medicine will conduct a two-day Equine Breeders Short Course on Oct. 7 and 8, 1988 at the School’s New Bolton Center campus. This course will cover concepts and practical application of various equine techniques and management arrangements.

The first day of the event will be devoted to the care of the brood mare. Faculty members and clinicians will discuss various aspects of breeding. Topics will include mare anatomy, teasing, behavior problems, embryo transfer, pregnancy detection, the newborn foal, hormone tests. Sessions on the second day will cover the care of the stallion. Topics discussed will include stallion anatomy, stallion management, semen laboratory, semen shipping, behavior problems, AV/phantom training, and fertility problems.

Morning sessions each day will consist of lectures. Demonstrations and participation laboratories will be held each afternoon. The cost for the two-day program is $450 per person. The fee for each additional person from the same farm is $375. There is a $25 early registration discount for reservations received before September 1. Registrations are limited.

For further information and a registration form, please contact the Section of Reproduction, School of Veterinary Medicine, University of Pennsylvania, New Bolton Center, 382 West Street Road, Kennett Square, PA 19348 or call (215) 444-5800, ext. 2220.

Welcome

The new residents and interns at VHUP and New Bolton Center began their duties on July 1. The new interns at VHUP are: Dr. Mary Beth Callan (V’88), Dr. Timothy W. Cameron (V’88), Dr. E. C. Cavus (V’88), a second-year student at the School of Veterinary Medicine; Dr. Della M. Garell, New York Bolton Center, has been appointed a lecturer in Orthopaedics Laboratory. The new residents at VHUP are: Dr. Keely G. Charlton (V’88); Dr. Janet Douglas, Cambridge University; Dr. Robert O’Brien, Radiology; Dr. David Thomson, Small Animal Medicine; Dr. Malcolm MacDonald, Orthopaedics Laboratory.

Dr. Sandy Perkowski (V’88); Dr. Christopher Smith, Massachusetts College of Veterinary Medicine; Dr. John Fyfe as lecturer in neurology/ophthalmology.

Dr. Jennifer Garber (V’88), University of Florida; Dr. Kent Sullivan (V’88), University of California; Dr. James E. James, University of California; Dr. Kyle G. Mathews, University of Wisconsin; Dr. Carlos M. Mongi, Louisiana State University; Dr. Deanna W. Parvis (V’88), Dr. Kenneth W. Simpson, University of Edinburgh.

The new residents at VHUP are: Dr. Kelly G. Akol, Dr. Claire Mainwaring, Dr. Michael Rosenweig, small animal medicine; Dr. William Saxson, small animal emergency medicine; Dr. David Daclos, dermatology; Dr. Steven Heyman, orthopedic surgery; Dr. Malcolm MacDonald, cardiology; Dr. Katherine Michel, clinical nutrition; Dr. Robert O’Brien, radiology; Dr. David Thomson, soft tissue surgery.

At New Bolton Center the new interns are: Dr. Patricia Blakesley (V’88), field service; Dr. Carolyn

The summaries of the remaining three presentations will appear in the Winter issue. The topics are: Life-Threatening Complications in the Mare; Serious Injuries to the Athlete: Laminitis.

Calendar

October 7, 8 Equine Breeders Short Course, New Bolton Center
November 8 Equine Therapeutics Continuing Education course New Bolton Center
January 25, 26 Penn Annual Conference Adam’s Mark Hotel Philadelphia
January 28 Your Veterinarian and Your Dog 19th Annual Canine Symposium VHUP, Philadelphia
February 8 Small Animal Non-Plating Orthopaedics Laboratory Continuing Education course VHUP, Philadelphia
February 22 Small Animal Spinal Neurosurgery Continuing Education course VHUP, Philadelphia
March 8 Small Animal Surgical Emergencies Continuing Education course VHUP, Philadelphia
March 29 Bovine Therapeutics and the Legal Responsibilities of the Practitioner Continuing Education course New Bolton Center
April 5 Small Animal Anesthesia Continuing Education course VHUP, Philadelphia
April 15 12th Annual Feline Fanciers Symposium VHUP, Philadelphia
April 16 Cat Show Class of 1923 Ice Rink 3110 Walnut Street Philadelphia

Summer 1988 5
Use of Radiation Therapy in the Management of Feline Neoplasia

Cancer in the cat is less common than cancer in dogs and or humans. About 40 percent of feline cancers are related to the skin or the alimentary tract, particularly in the oral cavity. Feline leukemia is associated with about 25 percent of feline cancers.

Dr. Sydney M. Evans, assistant professor of radiology, discussed the use of radiation therapy in the treatment of cancer in cats.

Cancer affects different parts of the body and tumors vary in their characteristics. For some types of tumors treatment prognosis is quite good while others are difficult to eradicate or keep in check. To design the best treatment strategy, the veterinarian needs to know the type of tumor which can be determined through a biopsy by a veterinary pathologist.

Skin and oral tumors in the cat can be treated with radiation therapy. Dr. Evans explained that the same therapy options exist for animals as do for people.

"The first line of treatment is often surgery. When this is not enough then additional treatment options are employed, such as chemotherapy, immunotherapy or radiation therapy. Sometimes two or three different treatment modalities may be employed successfully or simultaneously." 1

"The first objective is to reduce the cancer mass. Once this is accomplished, either through surgery or chemotherapy, then radiation can be used to further shrink the tumor. In radiation therapy ionizing radiation breaks the DNA in cells, causing their death. The form of ionizing radiation used at VHUP is x-rays. Other veterinary and human hospitals use higher energy radiation such as cobalt and linear accelerators.

Cancerous cells are sensitive to radiation because of their rapid growth rate. When exposed directly to radiation, cancerous cells die or become incapable of reproducing. Healthy cells are damaged by radiation but are able to heal themselves. Since radiation kills both normal and abnormal cells, careful treatment planning is required to eliminate the greatest number of tumor cells while sparing normal tissue.

"The dose of radiation is carefully calculated for maximum effect on the cancer and minimum effect on healthy tissue. Many factors determine the number of treatments and thus the amount of radiation given. The most important consideration is the total amount of radiation that can be administered to a patient without compromising the ability of healthy tissue to heal.

"For treatment the animal is anesthetized to be perfectly still during the treatment. Treatments last from four to 18 minutes in length, depending on the tumor size, location and type. During treatment, the animal is monitored by closed-circuit TV."

Most pets receive radiation therapy three times a week, Monday, Wednesday, Friday accumulating 10 to 15 treatments. This is as often as it is practical to subject the animal to sedation or anesthesia. It also provides rest time for normal tissue to recover from the effects of radiation. At times, more extensive rest periods are required.

"The radiation treatment is not painful and the nausea/vomiting reported in humans does not occur in cats and dogs. There are two types of side effects of the radiation therapy: acute (immediate) and chronic (late). The acute effects start near the end of treatment and last up to three weeks. The most common of these is radiation dermatitis or "burn". This is damage to the normal skin in the treatment area. At its peak, a radiation dermatitis looks like a serious sunburn in the treatment area. Animals may be modestly uncomfortable and need to be kept from rubbing or scratching the area. Appropriate medicines can be prescribed to keep the animal comfortable. This "burn" will heal on its own in two to three weeks. In cats receiving treatment in or around the mouth, bad breath and drooling may occur for two to three weeks. Teeth supported in an area of the tumor may be lost. Most common chronic or late skin changes consist of hairless and dry skin in the treatment area. If the eye is included in the treatment area, another late change, "dry eye" (lack of tear production) and cataracts may occur.

"Most cats are sedated with two drugs, a narcotic and a tranquilizer. The advantage of this combination is that the effect of the narcotic can be eliminated by giving another drug, a narcotic antagonist. Even with this narcotic antagonist, occasionally the animal will be returned to the owner looking fairly awake but it will fall asleep during the ride home and may sleep through the afternoon. This is acceptable as long as the animal is able to eat that evening. Some pets may cry for about a half hour after treatment. They are not in pain but are recovering from the effects of the sedation. It is best to protect the animal from stairs or high furniture while it is under the effect of sedation so it cannot injure itself.

"Radiation therapy can only be employed against local tumors. Lymphosarcoma generally is not treated this way as the cancer cells are usually spread throughout the body. If the disease is confined to one lymph node, then radiation therapy can be employed. One of the more common tumors treated with radiation therapy is a localized nasal tumor. It rarely metastasizes. However, if left untreated, this tumor can invade the bones surrounding the nasal cavity. The tumor is thought to occur in one out of every 100 cats. Signs include nasal discharge sometimes bloody, tearing eyes and facial masses. In a recent study, Dr. Evans determined that the average survival rate of cats treated for nasal tumors with surgery and radiation therapy is two years and longer.

"Radiation therapy is not inexpensive: it runs about $800 to $1,200 for 10 to 12 treatments. The length of survival is increasing as treatment modalities improve. "Here at Penn we are on the cutting edge," said Dr. Evans. "We employ a number of different chemotherapy drugs and agents to sensitize the cancer cells to radiation. As we use new treatments, we may be able to improve the survival statistics."

"Feline squamous cell carcinoma, a very common, sun-induced skin tumor on the tips of the ears or on the nasal plate responds well to radiation treatment. If the tumor occurs in the mouth the outlook is not so optimistic. Dr. Evans explained that some conditions may give the appearance of a squamous cell carcinoma, but are not. To be sure, a biopsy has to be performed. The outcome of the treatment is more favorable if the tumor is treated early. This is particularly important if the tumor occurs in the oral cavity because it can attack bone as well as soft tissues. Early detection and treatment are important in all tumors."
The Feline Diabetic Patient

The first speaker, Dr. Douglas K. MacIntire, assistant professor of medicine, discussed diabetes in the cat. She said that the emergency service at VHUP sees about 30 such cats annually and that feline diabetic patients usually are presented as emergency cases.

Diabetes mellitus is an endocrine disease of the pancreas resulting in a relative or absolute deficiency of insulin. In humans, two types of diabetes are recognized: Type I diabetes (insulin dependent), and Type II diabetes (non-insulin dependent). Type I diabetics require insulin injections. Type II diabetics can be managed with diet and oral hypoglycemic agents, except in time of stress, when they become prone to ketoacidosis, similar to the Type I diabetics. Type I diabetics may not permanently require insulin injections if the underlying illness is treated and the cause of stress removed.

Diabetic dogs are Type I diabetics and require lifelong insulin injections. Cats, on the other hand, may be either Type I or Type II. Some cats become transient diabetics during episodes of severe stress and then spontaneously recover from their insulin dependence.

Insulin is an anabolic hormone. It promotes storage of fat in adipose tissue, and storage of glucose in the liver as glycogen. Insulin is necessary to permit entry of glucose into fat and muscle cells. Insulin release is stimulated by high glucose levels in the blood stream. When insulin is absent, blood glucose levels become very high, but the cells are unable to use this glucose for energy. To provide extra sources of energy, muscle protein and fat are broken down. As a result, weight loss occurs. In the absence of insulin, glucose levels in the blood stream are so high that excess sugar is filtered through the kidneys and lost in the urine. The large amount of sugar in the urine pulls body water with it. Therefore, one of the classic signs of diabetes mellitus in animals is excessive urination and increased thirst.

Stress can exacerbate diabetes because hormones are released which increase glucose formation through breakdown of body tissues. Diabetics have decreased immunity and are prone to infection, especially in the urinary tract. Infection or underlying disease often cause elevated levels of stress hormones which can result in two emergency conditions: 1) ketoacidotic diabetes and 2) hyperosmolar diabetes.

In ketoacidotic diabetes, breakdown of fatty tissues results in high levels of ketone bodies in the blood stream. Although these substances can be used for energy, the body becomes overwhelmed and is prone to infection. They are produced in large numbers. Ketone bodies are acidic and they lower the pH of the blood. As a result, the animals become nauseous and vomit. They are unable to keep up with the tremendous water loss in the urine and they become rapidly dehydrated. Ketoacidotic diabetic animals are a medical emergency. Without intravenous fluid therapy and insulin, they will die. Even with proper veterinary care, these animals are very critical and the prognosis is guarded.

Osmolality is a measure of particles in the blood such as electrolytes, glucose, and urea in comparison to body water. Some diabetic animals become extremely hyperosmolar as a consequence of high blood glucose, dehydration, and impaired kidney function. Hyperosmolality is associated with abnormalities of the central nervous system including restlessness, staggering, incoordination, twitching, tremors, seizures, coma and death. The hyperosmolar diabetic is also a medical emergency. In these patients, serum osmolality must be lowered very gradually with intravenous fluids and insulin. If it is corrected too fast, serious brain swelling and deterioration of mental status may result.

Diabetes mellitus occurs more frequently in dogs than cats. However, the majority of dogs are uncomplicated diabetics, while the cats are usually quite ill. Most cats are presented to the veterinarian in a ketoacidotic or hyperosmolar state, either because the signs of diabetes were not noticed or because of the rapid progression of the disease in cats. Early signs of diabetes include increased thirst and urination accompanied by weight loss. Other diseases, such as hyperthyroidism and kidney failure, have similar signs and should be ruled out with blood testing by the veterinarian.

As the disease progresses, common signs include depression, weakness and loss of appetite. If the cat becomes ketogenic, dehydration, vomiting, and rapid respiration are common. Hyperosmolar cats may exhibit various degrees of abnormal brain function including stupor, coma and seizures.

The goals of treatment include restoration of electrolyte and acid-base balance, replacement of body fluids and lowering the blood glucose. Short-acting (regular) insulin must be used at this stage of treatment. At VHUP regular insulin is administered as a slow continuous intravenous drip. An infusion pump is used to deliver the proper dose, and these patients are closely monitored. The cat should remain on the intravenous drip until the urine ketones are negative, which often takes 24 to 36 hours.

When ketones are negative and the cat begins to eat, a longer-acting insulin should be administered subcutaneously. In cats NPH insulin has a peak effect 2-4 hours after administration with a duration of 4-10 hours. It is usually given to cats twice daily. PZI insulin has its peak effect 4-10 hours after administration and has a duration of 12-30 hours. One daily administration of PZI insulin is effective in most diabetic cats.

Cat owners should practice giving insulin injections under the veterinarian's guidance until they feel comfortable with measuring and injecting insulin. Saline can be used to practice giving injections. The insulin syringes have very small needles and most cats do not mind the injection. Cats will learn to stand still for the injection if it becomes part of their daily routine and they are fed immediately following the shot. For fracative or excited cats, a "cat bag" can be made from a towel which has a slit to allow for injections in the back area.

Diabetic cats should be fed twice daily. Semi-moist foods should be avoided because of their high sugar content. Medications such as steroids and megesterol acetate (Ovaban®) should be avoided since they induce insulin resistance. Cats should also be neutered or spayed for better control of the diabetes.

If it is a good idea to keep a daily log to show to the veterinarian if problems arise. Increased water intake and urination may indicate that the diabetes is not well controlled. The urine should be periodically checked with test strips for glucose and ketones. The veterinarian should be called if ketones are present, or if glucose is persistently present. To get a urine sample, plastic wrap can be placed over cat litter.

Certain cats may develop hypoglycemia (low blood sugar) when insulin is given. As a veterinary emergency, a glucose gel should be given immediately, and food offered if the cat is able to eat. If the cat is seizing or no improvement is seen, veterinary attention should be sought.

Occasionally, effective control of diabetes cannot be achieved. Reasons for poor control include existing illness, insulin injection technique, improper dose, insulin resistance, and rapid metabolism of insulin. After ruling out problems with insulin or injection technique, a veterinarian should be consulted. The cat will probably have to be admitted into the hospital to determine a 24-hour glucose curve. There is a great deal of individual variability among cats in their response to insulin. By determining the time of peak effect and the duration of the insulin, it is possible to more finely regulate the diabetes. In general, the blood glucose should not drop below 100 mg/dl or increase above 350 mg/dl.

Although diabetes mellitus cannot be cured, it can be controlled with proper management. Diabetic cats may live for years as happy, functional pets. There are many diseases of small animals which can be controlled but not cured with medication (i.e., chronic skin disease and arthritis). Diabetes is unique in that the medication must be given by regular hypodermic injections rather than orally. Once the technical aspects of hypodermic injection have been mastered, however, it is really less trouble in most cases than giving a cat a pill.

Feline Reproductive Problems

The first speaker of the afternoon session, Dr. Vicki Meyers-Wallen, discussed feline reproductive problems. She briefly described the normal male and female cat and explained that the sex of an animal is determined by chromosomes. A female has two X chromosomes and a male has an X and a Y chromosome. Early during embryonic development animals with the XY configuration develop testes which produce testosterone, a hormone which promotes development of the male reproductive organs. This hormone also plays an important role in the development of male characteristics and behavior when the animal reaches puberty.

Sometimes, during the formation of the eggs or sperm, at fertilization or during early embryonic development, the chromosome distribution is disturbed. As a result animals may have two X chromosomes and one Y chromosome, or they may have just one X chromosome. An XXY animal outwardly appears like a male, but it will not be fertile. The XXY defect is common, since it is known to appear in one out of every 700 human male births. In cats, it is the most frequent karyotype found in male calico cats. Chromosome karyotyping can help to make a positive diagnosis of this defect. An XO cat will appear to be a female, but is too infertile.

In addition to defects attributable to chromosomal errors, there can be a number of other inborn errors continued on page 8.
Feline Reproductive Problems

continued from page 2
which prevent a cat from reproducing. Cats with a male appearance can be born with a uterus, and cats which outwardly appear to be female can have testes. There can also be physical defects of the external genital organs which prevent reproduction of the animal.

In addition to these defects, the sperm may be defective such as having coiled tails, being incompletely formed, or being immobile. Such conditions are often not diagnosed until the cat has failed to impregnate a queen. Then a semen analysis is done. This is not easy in cats that are not trained to accept semen during ritual mating. Most animals need to be anesthetized and then electroejaculated to obtain sperm for examination. For this reason it is advisable to use the male first with a proven female, if that is not successful then these tests are the next step. Because of the difficulty of routinely obtaining sperm from male cats, artificial insemination is rarely used.

Female cats are highly seasonal in their breeding cycle. They need 12 to 14 hours of light a day to cycle. If an animal is kept indoors in a darkened room, it will not cycle. When a female cat (queen) is in season behavioral changes occur. These are the only indication that the animal is ready to breed.

Cats are induced ovulators, unlike dogs which ovulate spontaneously during their heat cycle. The stimulation of the breeding process causes the brain to release luteinizing hormone, a substance which causes the follicles to release the ova. Thus ovulation needs only to be slight. The process of ovulation through ultrasonography, but is generally performed at 21 to 28 days of pregnancy. Palpation can also detect embryos between 21 to 28 days of gestation.

A number of things can interfere with a successful gestation. The animal can have an undetected uterine infection or embryos may die due to chromosomal defects. It is possible for a queen to lose a litter later in pregnancy (abortion). This can be due to viral disease, such as a herpes infection, or to hormonal disorders. Thus early pregnancy detection is important as it helps the veterinarian with a diagnosis. Failure to carry full term presents a different medical problem from failure to conceive.

Giving birth is easy for most queens, but there can be complications such as uterine ineria or malpresentation of a kitten. Veterinary help is indicated in each of these conditions. Dr. Meyers-Wallen said that a predisposition to uterine ineria could possibly be an inherited problem, and she advised studying the bloodline if such a problem occurs. She also said that Caesarean sections can be performed in cats, and that Queen and kittens usually do fine.

She did stress that in most instances it is important for most queens since the bloodtest has to be run every day. It is best to breed a queen repeatedly to induce ovulation. Studies have shown that the luteinizing hormone peaks within 90 minutes of repeated breedings. It is recommended to leave the queen and the male together for some time so they can breed more than once.

Once the queen has ovulated, progesterone levels in the blood rise. If the animal is pregnant, the level stays high for the first half of the pregnancy and then gradually declines by the time of birth (64 days). If the cat ovulates but does not become pregnant, the progesterone level will drop earlier (45 days) and the queen will come into season again. A cat can also have a false pregnancy.

The gestation period is about 64 days. In a difficult to breed queen, it is important to determine whether the animal ovulated and whether it is pregnant. Pregnancy can be detected as early as 20 days after ovulation through ultrasonography, but is generally performed at 21 to 28 days of gestation.

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She did stress that in most instances it is important to have kittens nurse as soon as possible. They receive the colostrum (protective antibodies) from the dam, and nursing stimulates the production of prolactin, a hormone necessary for milk production.

Pyometra, uterine infection, can go undetected in cats and be a cause of infertility. Pyometra can occur both in very young and in middle aged cats. Vaginal discharge may be undetected and other symptoms may be absent. Owners have to be very observant to detect this condition early. If it is not treated quickly and allowed to become chronic, kidney diseases can develop.

Pyometra can be treated with prostaglandin in dogs which causes the uterus to contract and expel the pus. The drug has some transient side effects such as panting, salivation, vomiting and restlessness. The level of white cells in the blood should be carefully monitored before and after treatment. The white cell count should go down within normal range after treatment. If the cell count goes down but then becomes elevated again, further treatment is generally indicated. Once treatment is complete, the queen should be bred on her next heat. Unfortunately pyometra can recur, thus prostaglandin treatment is only recommended for breeding queens. The recommendation for pet cats with this condition is ovariohysterectomy (spay).

Cats should not be bred until they are mature and have reached their adult size and weight. Dr. Meyers-Wallen explained that very young queens generally are not good mothers. Cats can be bred twice a year if they are in prime health. She said that, although cats usually do not cycle while nursing, it is possible for this to occur.

She emphasized that good records are a great help to the veterinarian should problems arise. She also stated that vaccinations during pregnancy are not recommended, and that it is best to have the cat vaccinated and wormed prior to breeding.

Dr. Meyers-Wallen is assistant professor of reproduction at the School. She is in the section of medical genetics and deals with genetic, pediatric, and reproductive problems of cats and dogs.

A Line of Dwarf Mice

Researchers at the Laboratory of Reproductive Physiology at the School have developed a line of dwarf mice produced by genetic ablation of growth hormone expressing cells. For the last two years, Dr. R. Lee, Brinster and Dr. Richard R. Behring here at Penn, and Dr. Lawrence S. Mathews and Dr. Richard D. Palmiter of the University of Washington, have been developing a method for selective ablation of specific cell lines in transgenic mice. Genetic ablation is a technique which utilizes genetic engineering to delete specific cells.

In multicellular organisms the diverse cell lineages which develop into organs, bone, tissues, etc. are generated from a hierarchy of stem cells. By using ablation techniques to delete specific cells, the relationship between stem cells and cell lineages can be studied. Such a system would be very valuable in studying the origin of distinct populations of cells which form tissues or organs in the body.

In these experiments, the switching region of the growth hormone gene was fused to part of the diphtheria toxin gene, and the hybrid gene was introduced into the animal's chromosomes by microinjecting the gene into the egg from which the animal developed. When the cells that make growth hormone began to differentiate in that animal and to make growth hormone, they also made the toxin. This killed any cell that made growth hormone but no other body cell. Thus the growth hormone cells never developed, and no cell that might arise from a growth hormone cell could be formed. A dwarf mouse developed. This demonstrated the utility of the method and established a model for dwarfishm.

The dwarf mice are about one-third to one-half the size of normal mice. Growth hormone could not be detected in these animals and insulin-like growth factor I, the blood level of which is stimulated by growth hormone, was reduced eight-fold in comparison to normal animals. The researchers found that the dwarf mice cease growth at approximately six weeks of age, maintaining a weight of 10 to 15 grams.

The research demonstrated that the genetic ablation of specific cell types in transgenic mice can be a useful method for understanding cell lineage relationships and the role of particular cell types in morphogenesis. It was also demonstrated if the cell type produces a hormone, one can generate a hormone deficient animal model. The technique should be valuable in generating unique models of human and animal disease.

Dwarf mouse (l) and normal mouse
Dr. Detweiler Steps Down as Graduate Group Chair

Dr. David K. Detweiler, professor of physiology, has stepped down as chairman of the Graduate Group in Comparative Medical Sciences, a post he has held since the group's inception in 1970. Dr. Kenneth C. Bovee, Corinne and Hol11 Bower Professor of Medicine, has been appointed as the new chairman.

Dr. Detweiler's association with graduate studies here at the School dates back to 1954 when he was appointed head of the Veterinary Department in the Graduate School of Medicine, an institution affiliated with Graduate Hospital and established to facilitate the advanced training of physicians.

Graduate studies for veterinarians were not formally offered here at Penn until 1950 when graduate courses were first listed in the School's Bulletin. This coincided with an increasing interest in specialization in various areas of clinical veterinary medicine. Dr. Detweiler was instrumental in the development of veterinary cardiology as a clinical specialty.

In the early 1950s graduate work was offered through the Graduate School of Arts and Sciences, Division of Biological and Medical Sciences. With the establishment of the Veterinary Department in the Graduate School of Medicine (1954) veterinarians could also take graduate work there, receiving a M. Med. Sc. degree.

In 1970 the Graduate Group in Comparative Medical Sciences was created, under the auspices of the College of Arts and Sciences here at the University. The degree program was expanded to include a Ph.D. degree. This graduate group is one of 11 programs in biomedical graduate studies offered at the University. It is primarily for those with a degree in veterinary medicine, however, individuals with a degree in medicine or dentistry with a special interest in comparative medical science can also be considered for admission to the program.

Many of our current faculty were trained in this program," said Dr. Detweiler. "Quite a few graduates of this program have gone on to positions in other academic institutions. Since 1970 33 individuals have earned advanced degrees in the Graduate Group in Comparative Medical Sciences. Twenty were awarded masters degrees and 13 achieved the Ph.D. degree. Currently there are 18 advanced degree candidates in the program.

There are two other graduate groups headquartered here at the School, the Graduate Group in Pathology and the Graduate Group in Parasitology. Recently the administration of these programs was combined and an administrator appointed to assist the chairman.

Before Dr. Detweiler began his affiliation with the graduate program, course offerings were limited to veterinary bacteriology, virology and immunology, biochemistry, physiology, and pharmacology. During his long association with graduate studies he has been instrumental in the expansion of the program. Today the program description reads:

"The instructional program emphasizes preparation for a career in research rather than residency training in a clinical specialty."

Rabies Survey continued from page 9.

The same percentage of households, 18 percent, own dogs and cats; however the average number of animals per household differs. The average pet owning household contains 1.3 dogs and 1.5 cats. Thus, regarding domestic animals, there are approximately 20 percent more cats than dogs in Philadelphia, and together they number nearly a third of a million. Currently birds and fish are approximately equal in popularity.

The way in which Philadelphia was divided for the study is shown in Figure 1. Table 2 shows the dog and cat population in each area. The Northwest section of the city, i.e. Germantown, Mt. Airy, W. Oak Lane, Roxborough, and Chestnut Hill, have on average more animals per pet owning household, 1.6 dogs and 1.6 cats. Nevertheless, Lower North Philadelphia, Center City, and South Philadelphia, designated Area 1, have the largest number of both dogs and cats. The second largest number is found in Northeast Philadelphia (Area 4), i.e. the Near Northeast, Frankford, and the Far Northeast. The Northwest is third in the dog and cat count and West Philadelphia and Southwest Philadelphia, which together comprise Area 2, are ranked fourth.

Dogs were considerably more likely to have had a rabies vaccination than cats. The vaccination rates obtained from owner reports were 63 percent of dogs vaccinated for rabies within the last year versus 49 percent of cats. The survey revealed that approximately 140,000 Philadelphia cats and dogs were not vaccinated for rabies within the last twelve months.

In the current phase of the work being carried out by Beck, Glickman, and Smith questionnaire data from veterinarians in the city and immediate suburbs are being analyzed. Later, information will be obtained from physicians who are likely to be involved with the treatment of bites. The Veterinary School is interested not only in better understanding the epidemiology of rabies in animals, but also is working with local health authorities to develop more effective prevention strategies. Both efforts will require more accurate information on the relationship between people and their pets. Thus, it is not surprising that the rabies survey is part of the educational and research program of the Center for the Interaction of Animals and Society at the Veterinary School.

Table 1

<table>
<thead>
<tr>
<th>Pet</th>
<th>Percent Households</th>
<th>Number of Households</th>
<th>Number of Pets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dogs</td>
<td>18.0</td>
<td>113,630</td>
<td>143,468</td>
</tr>
<tr>
<td>Cats</td>
<td>17.9</td>
<td>113,141</td>
<td>171,648</td>
</tr>
<tr>
<td>Ferrets</td>
<td>2.2</td>
<td>1,469</td>
<td>2,938</td>
</tr>
<tr>
<td>Birds</td>
<td>3.0</td>
<td>19,102</td>
<td>19,102</td>
</tr>
<tr>
<td>Fish tanks</td>
<td>2.9</td>
<td>18,612</td>
<td>18,612</td>
</tr>
<tr>
<td>Small mammals</td>
<td>1.5</td>
<td>9,306</td>
<td>9,306</td>
</tr>
<tr>
<td>Reptiles</td>
<td>9</td>
<td>5,872</td>
<td>11,755</td>
</tr>
</tbody>
</table>

The total population of dogs and cats is shown in Table 2. For information on dog population, see Map for Area boundaries.
Anti-Dog Legislation

Nationwide press and television coverage of biting incidents reminds us of the problems existing because of vicious dogs. There are many aspects of these problems. Unfortunately, many dog laws are not enforced, particularly those which require licensing and vaccination against rabies. Dog fighting continues in many areas and owning a fighting dog has become a fad. Unfavorable publicity about so-called "pit bulls" has resulted in an "identity crisis" for the four breeds in this category. American Staffordshire terriers, Staffordshire bull terriers and bull terriers, registered by the American Kennel Club, and the American pit bull terrier registered by the United Kennel Club, are developing a canine citizenship problem. Responsible dog ownership must be encouraged. They are developing a canine citizenship program. Recognizing that dogs are not born trained nor are their owners born knowing how to train them, the program's premise is the belief that all dogs should be trained to be under control, a pleasure to their owners and a nuisance to nobody.

Be on the look-out for breed-specific dog laws. There can be no objection to laws against vicious or biting dogs. The American Kennel Club has a hotline number for reporting breedspecific or any other anti-dog legislation and to help concerned individuals and organizations work to prevent legislation which discriminates against a specific breed. The hotline number is 1-800-252-8355 (1-800-ASK-TELL). This number can be used only for information about legislation.

Notes on Drugs

Ivermectin, the drug used to prevent canine heartworm disease, is given once a month instead of daily. It prevents the development of adult Dirofilaria immitis by eliminating the tissue stage of heartworm larvae. The first dose must be given within a month after the first exposure to mosquitoes and the final dose within a month after the final exposure. The drug is not effective against adult worms in the heart and has some action against circulating microfilariae. All dogs should be tested for existing heartworm infection before treatment with ivermectin. Infected dogs should be treated to remove adult heartworms and microfilariae before ivermectin is given. 

Ivermectin (DEC) is the drug most often given in daily doses to prevent heartworm disease. This drug is also effective against roundworms (ascarids). When changing from daily to monthly preventive treatment, control of roundworms and hookworms will require other drugs.

Ointments containing benzocaine should not be used on cats. A recent case report describes a case where respiratory distress and collapse appeared about 20 minutes after the owner used a cream containing benzocaine on a young cat with a history of itching skin disease for three weeks. It is recommended that extreme caution be used when treating cats with benzocaine, which is an ingredient of some over-the-counter preparations.

Drugs should not be used in pregnant females unless absolutely necessary. The most critical time in a bitch is the second and third week after mating. In the queen (cat), the critical period is the first two weeks after mating. Most drugs have the ability to cross the placental "barrier" and enter fetal circulation and tissues, causing adverse effects. Most antibiotics are "safe" except for the tetracyclines which may result in a permanent yellow staining of growing teeth. Some drugs are known to be contraindicated during pregnancy but there usually is a safe choice. The veterinarian should be consulted before any drug (including vaccines) is given to a pregnant animal.

Diarrhea

Diarrhea is a term used to describe excessive frequency and fluidity of the feces. It is not a diagnosis in itself. There are many causes including functional disorders such as excitement, scavenging, changes in diet, over-feeding and unfamiliar water. It may be a sign of generalized disease or it may accompany intestinal parasitism and other diseases of the gastro-intestinal tract.

Home treatment should be limited to withholding food for 24 hours and giving a product such as PeptoBismol or Kapectate every four hours. Ice cubes may be offered. On the second day, feed small amounts of bland food such as boiled rice, cottage cheese, cooked hamburger or baby food. Seek veterinary advice if the diarrhea persists for more than 24 hours, or if there is persistent vomiting, any sign of blood in the stool, elevated temperature or generalized signs of illness.

It is unsafe to use antibiotics unless prescribed by the veterinarian and hesitate before using any of the many "home remedies" (except Kapectate, PeptoBismol or similar products). These may do more harm than good.

If diarrhea as a continuing problem, the cause must be determined before it can be treated successfully. In many cases, medication is not the answer.

Lyme Disease

There have been frequent newspaper reports of Lyme Disease in people and in dogs. The cause, Borrelia burgdorferi, is a spirochete carried by a tick, Ixodes dammini, frequently found on deer. The tick is very tiny, about half the size of the head of a pin. It may be found in brush and tall vegetation along trails and paths, in forests and in fields.

In humans, a characteristic rash develops after a variable incubation period of weeks or even months. This rash has not been observed in dogs which usually show signs of pain in the joints and lameness. Prompt treatment with antibiotics (penicillin or tetracycline) is curative. If the disease is not diagnosed and treated, permanent joint problems, neurological disorders or heart disease may result. The disease was first identified in 1975 in children living near Lyme, Connecticut, and has since been found in 35 states. It is something to be concerned, but not alarmed, about. Physicians and veterinarians have been alerted, and possible exposure to ticks is considered in diagnosis.

A Bit of History

The University of Pennsylvania Kennel Club held its first and last Dog Show on Franklin Field in Philadelphia on Friday, June 2, 1911.

There were 13 judges, mostly from the Philadelphia area, but one came from Massachusetts and two from New York. There were 370 dogs representing 38 breeds in 660 classes (most dogs were entered in more than one class). Over 200 trophies were offered. The largest entry was 33 Bulldogs and there were 27 Pomeranians, 20 Rough Collies and 17 Fox Terriers. A Memorial Trophy was entered in Miscellaneous. Its name was "Sport" and its date of birth, breeder and pedigree were unknown. This was an American Kennel Club licensed show and most entries had a registration number, date of birth, name of breeder and owner and pedigree ( sire and dam).

A number of entries were listed for sale. The prices for Russian Wolfhounds ranged from $125.00 to $250.00 Peeking Spaniels were first registered in 1906 and the show catalogue lists prices offered by the Pekingese Club of America. Probably some old terminology added "Spaniel" to the breed.

One of the show veterinarians was William Jacob Lentz, a 1904 graduate of the University of Pennsylvania's School of Veterinary Medicine. He served on the Faculty from 1907 until his retirement in 1948, and devoted most of his career to the small animal clinic. His patients included many well known show dogs.

Very little information about the Kennel Club is available and the show catalogue is about the only record of its existence. We would be happy to hear from any reader who might know about it.

Poison Hotlines

The National Animal Poison Information Network (NAPIN) provides daily, round-the-clock information on poisons. The headquarters are at the University of Illinois and a second regional center has been established at the University of Georgia. It has been proposed that eventually there will be 10 or 12 regional animal poison information centers.

Rodenticides account for the highest percentage of calls, followed by insecticides, toxic plants, human medications and household products. There have been calls about dogs being affected by lawn herbicides. All information is entered into a central, computerized data base, which currently has information on 4,000 naturally occurring and manmade agents.

Calls should be made by veterinarians, if possible, but they are accepted from animal owners.

Illinois Animal Poison Information Center (217) 333-3611

Georgia Regional Center (404) 542-6751
Referral Coordination Under New Direction

Carole Conte, director of nursing at VHUP, has been appointed referral coordinator as part of her new position as director of nursing and technician education at VHUP.

"Carole is ideally suited as coordinator," said Barry Stupine, associate dean and director of VHUP. "She was the ICU nurse for 12 years and we brought her into referral coordination because of her medical background. Her knowledge of procedures and her ability to understand the medical terms should enhance the feedback system and make it easier for practitioners to obtain information on referral cases."

Ms. Conte monitors the referral cases, and, when a practitioner calls on the hotline, she can quickly check the animal's status and provide the practitioner with an update. This should eliminate the delay incurred when the staff clinician in charge of a case is not available at the time. It should also ease the pressure on clinicians as pertinent information can be provided by someone other than the clinician. Ms. Conte's role is not designed to eliminate communication between referring veterinarians and staff clinicians, rather it is designed to augment it.

Ms. Conte is also coordinator of the Marcellus practicum at VHUP. Currently there are 80 students enrolled in practica at the School. The School is planning to offer continuing education programs for animal health technicians working at VHUP. "We hope to offer lectures and seminars dealing with the different specialties," said Ms. Conte. "It will provide the technicians with a broader base of information. At this point everyone here is specialized and the lectures and seminars will offer an opportunity for technicians to learn about other areas." The program will carry continuing education credits. Such credits are required if a technician wishes to maintain the state license.

The School is also trying to develop a continuing education program for technicians working for private practitioners. "We would like to offer a day-long program," said Ms. Conte. "We are seeking input from practitioners for topics to be covered in such a program."

In addition to one-day continuing education programs, the School plans to offer a new internship program for veterinary technicians. "This will be a full-time internship geared to those who wish to change direction within the profession," said Mr. Stupine. "We will offer training in clinical care, business management, and laboratory animal science, and we will have the potential of zoo medicine/aquatic medicine as an elective area."

The length of the internship will be between six to 12 months and it will be organized around a core/elective system. Participants will receive a small stipend and housing will be available. Participants must be certified animal health technicians.

"Participation in such a program can open up another whole new field for a technician," said Ms. Conte. Currently the internship animal health program is planned for VHUP only. For further information please contact Ms. Conte.

Pet Tag Sales Benefit the School

Best Friend Pet Tags, a company based in Las Vegas, will donate $1 for each tag sold through a veterinarian to the veterinary school of the practitioner's choice. Tag displays with order forms are placed at the veterinary office and this choice of school is registered with the company. When an order is received by Best Friend Pet Tags, the donation is sent to the school. A number of our alumni are participating in this program and the School has received checks. We think that this is a great way to help the School, and hope that our alumni will participate.

1988-1989 Veterinary Medical Alumni Society Board Members

The 1988-1989 Veterinary Medical Alumni Society Executive Board was installed on Alumni Day. The Society's mission is the advancement of veterinary education; animal and public health; promotion of the interests of the Veterinary School and the Alumni Society; and the encouragement and perpetuation of the spirit of good feeling and comradeship among the interests among graduates of the Veterinary School.

As representatives of the Alumni body, the members of the Executive Board welcome your comments and suggestions. Please address correspondence to Dr. Jay J. Simmons, President, c/o the Alumni Office.

Jay J. Simmons, V'56 President
Max J. Herman, V'59 Vice President
Vice Chairman, Liaison Committee
M. Josephine Deubler, V'38 Secretary/Historian
Jarvis J. Badgley, V'59 Veterinary Alumni Annual Giving Chairman and Phonathon Co-Chairman
Darryl N. Biery, OU'64 Faculty Member
Daniel D. Blecher, V'53 Member at Large
Harriet A. Doolitle, V'61 Member at Large
Gwen K. Fox, V'44 Benjamin Franklin Society Chairman and Phonathon Co-Chairman
Lawrence J. Gerson, V'75 President
Sheldon Gerstenfeld, V'46 Member at Large
Joseph Gruber, V'64 Reunion Chairman and Phonathon Co-Chairman
George L. Hartenstein, IV, V'68 NBC Liaison
Howard Hughes, Jr., V'67 Awards Committee
Francine Mallon, V'86 Alumnae Association and General Alumni Board
Kathy Mockler, V'90 Student Government President
Michael P. Ratner, V'59 Member at Large
Donald R. Shields, V'63 VHUP Liaison
Joseph D. Slick, V'53 Long Range Planning
Kenton S. Stokes, V'68 P.V.M.A. President
Joseph Tall, V'68 Continuing Education
Patricia L. Thomson, COR'60 P.V.M.A. Liaison Committee
Robert H. Whitlock, COR'65 Faculty Member
President's Installation Remarks

When I was a student at our Alma Mater, I would sit in the student lounge and, when not studying, read the Philadelphia Inquirer. Many of you remember that each day, on the editorial page, there appeared a poem... usually very short and written by a Mr. Metcalf. To my great surprise, between Anatomy and Histology break, there appeared a poem called "The Veterinarian." I cut it out and carried it in my wallet, next to my wife's picture, for several years. The poem was cut from the Philadelphia Inquirer. Many of you remember it, that I had a professional artist do it. "The Veterinarian"... It has been in my waiting room for 30 years. When I have a tough day, or someone wants to see me, or calls me names, or complains (which is so commonplace anymore)... I walk over to the poem and I feel better. I would like to read it to you, and then tell you of its significance today! Please excuse the male chauvinism; this was written 32 years ago.

"The Veterinarian"

We think of him as someone who attends to dogs and cats prescribes a little medicine and gives them loving pats... Who keeps them from distemper and rabies when they stray and boards our precious animals the weeks we go away... But seldom do we realize when we pay his little fee how hard he has to study for his medical degree... His knowledge of our horses and cows and hogs and sheep, and how he serves in peace and war to earn his humble keep...

And who is there to estimate his everlasting worth as he devotes his life to all God's animals on earth...

The simple expression... "How hard he studies for his medical degree..." rebounds like a great echo in these hallowed buildings... because without these buildings and those dedicated veterinarians who run things... none of us would be sitting here if we didn't care. I care a lot about our School... because I owe her a lot, and need her more than ever. I know that you feel the same.

I, therefore, plead for your continued support of our students, their professors, and our new Dean. In conclusion, I would like, with your permission, to repeat the end of the poem...

And who is there to estimate his or her everlasting worth as he or she devotes his or her life to all God's animals on earth...

Veterinary Alumni Annual Giving

Thanks to the generosity of our alumni, $225,000 was contributed to the 1987-1988 Annual Fund. Here's the breakdown:

Alumni designated gifts to VHUP totalled: $32,125
Alumni designated gifts to NBC totalled: $26,365
Alumni designating gifts to Student Scholarship Aid totalled: $24,188
Alumni designating gifts for General School Purposes totalled: $142,122

Ed Andrews, V'67, offers his personal thanks to his alumni colleagues for their support during his first year as Dean.

Alumni Award of Merit

The Alumni Award of Merit is presented annually during Alumni Day to honor our School's distinguished graduates. This year, six alumni received the award. The presentation was made by Dr. Howard Hughes (V'67), chairman of the awards committee.

Left to right: Dr. Sherwyn W. Ostrich (V'63), Dr. Robert E. Swope (V'43), Dr. Stuart A. Fox (V'53), Dr. Jack O. Knowles (V'38), Dr. Harold M. S. Smith (V'43), Dr. Midge Leitch (V'73).

The Executive Board of the Veterinary Medical Alumni Society solicits suggestions for nominees. Among the criteria:
1. Scientific contributions to the advancement of knowledge in biomedicine;
2. Contributions to the welfare of animals through public education of animal owners;
3. Contributions to society through civic activities which foster the advancement of the profession and good name of the University;
4. Perceptions of the individual by peers within the profession and community.

Data in support of nominations should be submitted to:

Alumni Office
University of Pennsylvania
School of Veterinary Medicine
3800 Spruce Street
Philadelphia, PA 19104

Nominees are accepted regardless of year of graduation; however, emphasis is placed on alumni graduated during the current (1989) reunion years (any year ending in a 4 or 9 — e.g., 1939, 1944, 1949, 1954, etc.)

Reunions

Class of 1943

Class of 1948

Class of 1958

Class of 1963

Class of 1973

Class of 1978

Class of 1983

Alumni Day — 1989

Alumni Day 1989 will be held at New Bolton Center on Saturday, May 20. The Veterinary Alumni Dinner Dance will be hosted by Dean Andrews at the Hotel duPont in Wilmington, Delaware on Saturday evening. Save the date on your calendar.

The following classes will celebrate reunions in May 1989:
1939 - Paul Landis, Class Agent
1944 - Richard Guise, Class Agent
1949 - Sidney Mellman, Class Agent
1954 - Robert Flowers, Class Agent
1959 - Leigh Marsh, Class Agent
1964 - Willi Weichelt, Class Agent
1969 - D. Ray Hostetter, Class Agent
1974 - George Glanzberg, Class Agent
1979 - Joan Regan, Class Agent
1984 - Steven Peoples, Class Agent

Alumni Day

Alumni came to the Philadelphia campus on May 21 to participate in the Alumni Day activities. The oldest graduate present was Dr. Evan L. Stubbs (V'11). Many classes had reunions and the day was spent reminiscing, touring VHUP, and visiting with classmates. In the evening the action moved to the Four Seasons Hotel for dinner, dancing and more socializing.

Dr. Lawrence Gerson (V'75), Immediate Past Pres. VMAS,
Dr. George Hunteinstein IV (V'68), Alumni Annual Giving Director

Class of 1948

Class of 1958

Class of 1963

Class of 1973

Class of 1978

Class of 1983
Teaching Awards
Each spring, toward the end of the semester, teaching awards are announced and presented. Dean Andrews was instrumental in making the awards presentation a festive, memorable celebration. Students, faculty, alumni and staff gathered for dinner, the presentation and dancing at Longwood Gardens. The event attracted 360 people.

The program was supported in part by contributions from The Upjohn Company, Pennsylvania Veterinary Medical Association, Bertholon Rowland Agencies, The American Animal Hospital Association, Veterinary Medical Alumni Society, General Ecopeak, Inc., Peterson Imaging, Inc., Pfizer-Moore, EVSCO Pharmaceuticals, Mrs. Ann Eldridge, and Mr. Barry Stupine

Last year the University announced a new Provost's Award, open to untenured, track academic staff but judged by the same Lindback Committee using the same criteria for distinguished teaching. Like the Lindback Awards, this prize will be given annually to one member of the health schools and one from elsewhere in the University. Dr. Paul Orsini, lecturer in large animal surgery and anatomy, was the first recipient of this award.

The Norden Faculty Teaching Award was presented to Dr. Richard O. Davies, professor of physiology.

Dr. Paul Orsini receives the award from the Deputy Provost.

Erich Twitchell (V '89) presents the Norden Award to Dr. R. O. Davies.

The IAMS Company Award is presented to Dr. MacDonald.

Dr. Susan DeVries receives her award from Dr. Biery.

Dr. Steven Fluharty receives the Beecham Research Award.

Dr. Deborah Gillette.

Dr. Grant Fraser.

Dr. William Bernard.

Dr. Alan Ruggles.

Ms. Susan Barbour.

Mark Lutschang.

Scholarships
Linda Molesworth (V '88) was the recipient of a scholarship provided jointly by the Harness Tracks of America, Harry M. Stevens Corp., and the Peter Haughton Youth Foundation, The N. J. V.E.F. Ridgeway Memorial Fund granted its first scholarship to Richard A. Dorr.

Nancy Brennan-Gorman is the recipient of the Amlan Foundations Scholarship. Amy Greer was selected as a 1988 Student Scholarship winner by the Association for Women Veterinarians. The Lancaster Kennel Club, Inc. awarded five scholarships to students at the School. The recipients are Donna Marina Dambach, Kirsten Haight, Mary Kirk, Stephen Long, and Michael Moyer.

Laurie M. Giannella received the 1988 Pfizer Veterinary Scholarship Award. Cail I. Jones is the recipient of the Westminster Kennel Club Foundation Scholarship Award. Encarnation Arias-Karolewski and Rose Ciscari are the recipients of the David I. and Victoria R. Greenberg Memorial Scholarship.

Gerald Frye has been admitted to the Pennsylvania Department of Agriculture's Bureau of Animal Industry training program. The Pennsylvania Department of Agriculture-University of Pennsylvania cooperative program awards a full-tuition scholarship to a senior student who will pursue special training in epidemiology and accept, immediately following graduation, a one-year appointment with the Bureau of Animal Industry. The award is made from the University's Training and Applied Research in Veterinary Epidemiology and Animal Health Economics Grant.
The Master Farmers Association of Chester County also visited New Bolton Center for a tour.

Segments for the public television 13-part series "The Gentle Doctor: Veterinary Medicine," were filmed at New Bolton Center and WHUP and are currently being edited. Dr. D. Widener Hospital for Large Animals was the site of filming for a segment of Outdoor Pennsylvania, to be aired over Pennsylvania's public television stations in November.

Dr. James F. Wilson, adjunct assistant professor of business management, and acting medical director at VHUP, has published Law and Ethics of the Veterinary Profession, a complete reference book on law and ethics for the veterinary profession.

Dr. Leon Z. Saunders, adjunct professor of pathology, has been elected an active member in the American Oiler Society. The Society's membership, comprised of physicians and historians, is limited to 75. Dr. Saunders is the first veterinarian to be elected.

Dr. Robert Gowen (V'83) has been hired to oversee the drug testing and quality assurance program of the Association of Racing Commissioners International.

Dr. Sherrill Davison (V'83) has been appointed lecturer in avian medicine. A major portion of her time will be devoted to field investigation on new or serious disease problems of poultry in Pennsylvania through the Center for Animal Health and Productivity.

Dr. Daniel Vernon (V'59) operates a small animal practice in Mendham, NJ. He is also a vintner and produces award-winning wines under the Tewksbury label.

Dr. Gerhard Schad, professor of parasitology, has been elected President-Elect of the American Society of Parasitologists.

Dr. Raymond W. Sweeney (V'82) has been appointed assistant professor of medicine in clinical studies (New Bolton Center). Dr. Elaine Watson has been appointed assistant professor of reproduction in clinical studies (New Bolton Center). Dr. Kevin Shanley has been appointed assistant professor of dermatology. Dr. Gail Smith (V'74) has been promoted to associate professor of orthopedic surgery in clinical studies (Philadelphia).

The School received a $300,000 grant from Penn's in-house Research Facilities Development Fund, which supports the improvement, renovation and construction of research facilities and acquisition of major items of equipment. The grant goes toward the $1.1 million renovations of laboratory animal facilities at New Bolton Center and the Philadelphia campus.

Dr. Robert R. Shomer (V'34) received the AVMA award at the 125th annual meeting in July. The award is given to an AVMA member in recognition of distinguished contributions to the advancement of veterinary medical organizations. Dr. Shomer has served for 30 years as the New Jersey representative to the AVMA House of Delegates. He has served on the AVMA's Committee on Animal Technicians Activities and Training, and on the association's impaired veterinarians program. Dr. Shomer is past president of the New Jersey and North New Jersey Veterinary Medical Associations and the American Veterinary History Society.

Dr. David Kritchevsky, professor of biochemistry, appeared on the cover of the June 15, 1988 issue of Cancer Research.

Dr. Fred H. Troutt (V'62) received the Award of Excellence in Preventive Medicine from the American Association of Bovine Practitioners. Dr. Troutt serves as director of the Veterinary Medicine Teaching and Research Center at the University of California, Davis, in Tulare. He was selected for this recognition by AABP for the development of two approaches in preventive herd health veterinary medicine. Concurrently, Dr. Troutt emphasized the veterinarian's need to understand nutrition in order to facilitate production and to decrease digestive and metabolic disorders in cattle populations. The award is sponsored by MSD AGVET, a division of Merck and Co., Inc., which provided a $1,500 general scholarship in Dr. Troutt's honor here at the School.

Dr. H. Fred Troutt (V'62) receiving the AABP Award for Excellence in Preventive Veterinary Medicine from Dr. Keith E. Steurer (r) and Dr. Edward Boruski (V'69), director, Technical Services, U.S. Operations of MSD AGVET.

Dr. Victoria Voith, adjunct assistant professor of medicine, participated in a special symposium on comparative cardiology at the American College of Cardiology annual meeting. Dr. Voith gave an invited lecture at the American College of Veterinary Surgeons.

Dr. E. Neil Moore, professor of physiology, participated in a special symposium on cardiology at the American College of Cardiology annual meeting. Dr. Moore gave a paper and a poster. Dr. Moore was awarded the 'Senior Investigator Achievement Award' by the American Heart Association, Southeastern Pennsylvania affiliate.

Dr. M. Josephine Deubler (V'38) received the 1988 Distinguished Service Award presented by the Association for Women Veterinarians. Dr. Deubler was cited for her "outstanding contributions to the advancement of the status of women in the profession of veterinary medicine." The award was presented during the AVMA meeting in July.

Dr. Joan C. Hendricks (V'79), assistant professor of medicine, received a large five-year grant from the National Heart, Lung, and Blood Institute to study Neural Inhibition in REM Disordered Breathing.

Dr. Lawrence T. Glickman (V'72), professor of epidemiology, received the 1988 Award of Recognition (Member) from the Association of Teachers of Veterinary Public Health and Preventive Medicine. The award is presented annually to a member of the association who has made significant contributions in veterinary public health and preventive medicine.
Commencement exercises for the 103rd graduating class were held on May 16, 1988 at the Zellerbach Theatre. Baxter Black, D.V.M., a poet, humorist and philosopher from Colorado gave the Commencement Address. Dean Edwin J. Andrews then presented the diplomas to 106 members of the Class of 1988 and one member of the Class of 1987.

Class President Brent Carlson gave an address and was presented the Class Flag by Dr. Jay Simmons (V’36). Dean Andrews, assisted by Dr. Paul Orsini, then presented awards and prizes to a number of graduates and recognized those graduating with honors. The administration of the Veterinarian’s Oath by Dr. Kenron S. Stokes (V’68), president of the Pennsylvania Veterinary Medical Association, concluded the ceremony and everyone gathered at a reception for the graduates and their families.

Award Recipients

The Leonard Pearson Prize
Michael G. Nosko
The J.B. Lippincott Prize
Jennifer A. Punt
The 1930 Class Prize
Charles H. Dufy, III
The Women’s Auxiliary to the American Veterinary Medical Association Prize
Ellen N. Behrend
The Women’s Auxiliary to the Pennsylvania Veterinary Medical Association Prize
Patricia E. Blakney
The 1930 Class Medal for Achievement in Pathology
Brent L. Carlson
The James Hazlett Jones Prize in Biochemistry
Jennifer A. Punt
The Milburn Prize
Richard N. Solomon
Ronald C. West
American Animal Hospital Association Award
Ronald G. Bernhard
Merck Awards
Mark W. Sherwood
Deanna W. Purvis
George M. Palmer Award
Stephen P. Day, III
Phi Zeta Award
Deanna W. Purvis
Ewelling Prize for Cardiology
Ronald C. West
El. L. Stubbs Avian Medicine Award
George D. Boggan
The Large Animal Surgery Prize
Jennifer L. Garber
The Large Animal Medicine Prize
Vincent V. Sventovec
The Morris L. Ziskind Prize in Swine Medicine
Stephen W. Triol
The Morris L. Ziskind Prize in Public Health
Michael S. Bodri
EYSCO Award
Michael S. Bodri
Hills Award for Nutrition
Eric V. Dunayer
Janet E. Crawford
The Purina Award for Swine Medicine
Linda C. Moleworth
Upjohn Awards
Kent E. Sullivan
Mark T. Lutschauing
Auxilliary to the Student Chapter of the American Veterinary Medical Association Prize
Chrysann Collatos

Class of 1988

F. Joy Archer
Mary Louise Beers
Ellen Nicole Behrendn
Ronald George Bernhard
Glossia Jean Binkowski
Patricia Ellen Blanklee
Evans S. Blumer
Michael Steven Bodbi
George Douglas Boggan
Maribeth Jordan Bosshole
Kathleen Mary Brasky
Karen A. Breuninger
Inge Lisa Brunner
Jill Ann Bullis
Deborah Ann Burgoon
John Clement Calhoun
Mary Beth Callan
Brent Lee Carlson
Carolyn Agnes Charlton
Edward Alexander Chrobiski, Jr.
Chrysann Collatos
Jane Eileen Crawford
Anne Allison Cumpsonne
John Joseph D’Lascamo
Jo Ann Carroll DeWesc
Stephen Perrine Day, III
Doris Elaine Do
Charles Hubler Duffy, III
Eric Kent Dunayer
Doreen Joyce Eger
Maria Isabel Esteves Loyd
Lisa Susan Evans
Susan Barbara Evans
Michele Lea Ferraro
Andrew Mark Fitzgerald
Lisa Jo Forrest
Salvatore Frasca, Jr.
Laurita Ann Gantz
Jennifer Lynne Garber
Donna Jean Gaska
Linda Mae Gelsingner
Carolyln McKerrow Clark
Kirsten Karen Haigh
Nancy Jane Hallam
Victoria Anna Hampshire
John Wenger Harfield
Mark Root Hodgdon
Thomas Joseph Hufnagel
Ann Louise Jackson
Philip Richard Kaufman
Patrice Noelle Klein
John W. Kreider
Suzan Turnball Laeryy
Andrea Landsberg
Andrea Holly Lerner
Gregory Aldo Lewbart
George Weldon Lewis
Deborah Beechert Lichtenberg
John Allen Linn
Judith Lombardi
Jeanne Crocker Ludlow
Nancy Phyllis Lung
Mark Thomas Lutschauing
Marcia Anne Malhe
Richard Best Marshall
Linda Sue Mathias
Scott Alan McManus
Elisabeth Marie McMurry
Susan Lloyd Meyer
Michael A. Mikovsky
Robert Lantz Miller, Jr.
Linda Christie Molesworth
Jeske Inette Noordergraaf
Michael George Nosko
Eric Jeremy Otis
Michael David Paver
Sandora Zofia Perkowski
Michael Thomas Provost
Jennifer Aldrich Punt
Deanna Wayne Purvis
Michael Anthony Recupero
Richard Albert Rockar
Gary Edward Rothman
Farid Charbel Saleh
Frederick Paul Schuler
Lisa M. Sepesy
Mark Worshley Sherwood
Bruce Frederic Smith
Richard Neil Solomon
Patricia Marie Stevens
Margaret Mary Stiavanage
Richard Henry Stoneback, Jr.
Lisa Anne Strollie
Kent Edward Sullivan
Vincent V. Sventovec
Andrea Dimitri Tasi
Marie Veronica Taylor
Louise Terrell
Stephen Wieden Triol
John Harold Weiler, Jr.
Salie Christian Reveley Wele
Ronald Clark West
Steven Robert Wilson
Stephen Wolfson
Toby Susan Woodward
David Barry Zelnick
December 23, 1987
Kenneth Lee Mohr

**Summa Cum Laude
**Magna Cum Laude
*Cum Laude

Presentation of the Class Flag
Taking the Veterinarian’s Oath
Resource Update

New Bolton Center

Direct dial telephone numbers have been added for a number of services at New Bolton Center Campus. They are:

- Clinical Laboratory Medicine - (215) 444-4686
- Medicine - (215) 444-4281, 444-4283
- Bovine Surgery - (215) 444-3595
- Equine Surgery - (215) 444-3201