

Bellwether

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Edwin Andrews named Dean

Succeeding Dean Robert Marshak at the School of Veterinary Medicine on July 7 will be an alumnus, Dr. Edwin J. Andrews, now vice-president for research and development at Johnson & Johnson Cardiovascular. Dr. Andrews, who took his baccalaureate degree at Penn State in 1964, came to Penn for a V.M.D. in 1967, then added a Ph.D. in 1971 from the School of Arts and Sciences. From 1968-71 he was a research fellow at the Institute for Cancer Research at Fox Chase. Appointed to the Milton S. Hershey Medical Center's graduate faculty of medicine in 1971, he joined the graduate faculty at Cornell in 1974 as associate professor of laboratory animal medicine and veterinary pathology and as director of the Laboratory Animal Diagnostic Resource. In 1977 Dr. Andrews took the first of four management positions he has held with Johnson & Johnson: section manager of its Ethicon, Inc., 1977-79; vice-president for research and development and member of the management board of Vascor,

Inc., 1979-82; worldwide marketing director of Hancock Cardiovascular Products Group, Extracorporeal, Inc., 1982-84; and then the present post in King of Prussia, where he is responsible for regulatory and clinical affairs and quality assurance as well as research and development. While in academic posts, Dr. Andrews served on admissions, curriculum, and animal welfare committees; on National Academy of Sciences/NRC committees involving animal diseases and genetics; and then later on a number of councils of the American Heart Association and on committees of the Association for Accreditation of Laboratory Animal Care. Author of some 50 basic research papers, he has continued to publish and present at scientific conferences since moving to research and development with Johnson & Johnson units. Dr. Andrews is a diplomate of the American College of Laboratory Animal Medicine and a diplomate of the American College of Veterinary Pathologists. He belongs to a number of professional organizations, among them the American and Pennsylvania Veterinary Medical Associations, the Veteri-

nary Cancer Society, American Association for the Advancement of Science, American Society of Laboratory Animal Practitioners, American Society of Industrial Veterinarians, and many others. Dr. Andrews named it "a challenge, an opportunity, and certainly an honor" to follow Deans Mark Allam, now emeritus, and Robert Marshak, who has headed the School for the last 14 of his 30 years at Penn. President Hackney called Dr. Andrews an excellent choice for a school with a tradition of excellence in leadership—citing in Dr. Marshak's case the building of the new small animal hospital in Philadelphia, expansion of the large animal hospital at New Bolton Center, where Dr. Marshak had established the National Cancer Institute-sponsored Bovine Leukemia Research Center in 1965 and where the C. Mahlon Kline Center is regarded as the most advanced equine treatment center in the world.

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Searching for a cause of decreased litter size in swine

Raising hogs for market is competitive business. The farmer looks for large litters to offset the costs of feed, labor, housing, and veterinary expenses. Small litters can quickly eat into the tight profit margin.

"Reduced litter size is an important cause of lowered reproductive efficiency in swine," said Dr. Richard A. McFeely, professor of reproduction at the University of Pennsylvania School of Veterinary Medicine. "And there is increasing scientific evidence from Europe and Japan that chromosome translocations contribute to reduced litter size in swine." To investigate whether such chromosome translocations play a role in reduced litter size in Pennsylvania swine herds, Dr. McFeely has received a grant for a two-year study from the Pennsylvania Department of Agriculture. "At this time there are no reports of chromosome translocations in swine in the United States," McFeely said. "But studies in other countries suggest that this may be a universal problem in swine."

He explained that swine have 19 pairs of chromosomes. Translocation occurs if a piece breaks from one chromosome and attaches itself to another. This can be caused by an insult to the chromosomes such



as radiation, viral infection, or exposure to chemicals. Apparently, it can also happen spontaneously. When translocation occurs, the genetic material of the reproductive cells may become unbalanced and affect the offspring. Scientists have identified nine different chromosomal translocations associated with embryonic death and stillbirth. Animals from small litters may carry the trait and spread it further if they are mated.

A study in Scandinavia on several boars, phenotypically normal and with good semen quality, turned up some startling results. One boar sired litters with 100 percent embryonic mortality, and he showed evidence of chromosomal translocation. His two full brothers sired litters which were 50 percent smaller than those produced by other sires with the same dams. These two boars also had chromosomal translocations. Further studies of two other boars, father and son, showed that the translocation was transmitted to 41 percent of the son's live-born pro-

geny and that 11 percent of embryos and fetuses studied between 10 and 88 days of gestation had translocations which were lethal.

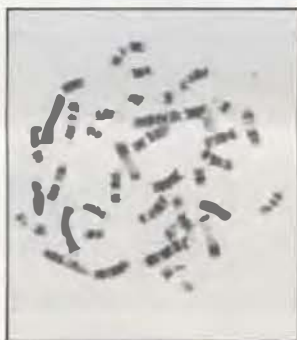
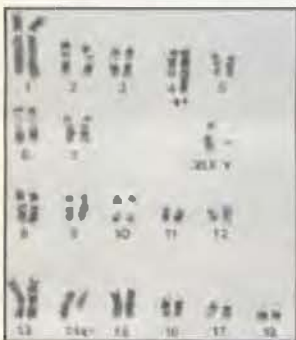
Normally, a litter of swine numbers eight to ten. Dr. McFeely's study will determine to what extent chromosome translocations may be associated with decreased fertility in swine in Pennsylvania. A questionnaire has been sent to swine breeders asking about litter size. Once herds with small litter size have been identified, a second questionnaire will be sent asking more detailed questions. There will be a kit for obtaining blood samples from the boars in the herd. It is planned that the herd veterinarian draw and submit the sample. The swine producer will be compensated at a fixed rate for each sample submitted.

The blood sample will be cultured in the laboratory, and the chromosomes will be analyzed. This will include specialized banding techniques to identify the individual chromosome pairs. The banded chromosomes will be photographed and then karyotyped. They will be matched, and chromosome abnormalities can become evident. If an abnormality is detected, an attempt will be made to obtain a blood sample from a representative sample of the progeny to determine whether the abnormalities are transmitted.

Initially, the study will focus on boars. "A boar in a herd has many more offspring than a sow," said Dr. McFeely. If chromosome translocations or other abnormalities that might cause reduced litter size are found, an economical method for screening prospective breeding animals will be developed. "Such screening could have a profound effect upon the efficiency of reproduction within the Pennsylvania swine herd," he said. "It would result in economic improvement for the individual breeders."

McFeely stressed that participation in the study is voluntary and that all findings are confidential. "Only the owner of the herd will receive the results of the tests," he said. Dr. McFeely and his associates plan to have this study completed by June, 1988.

—H.W.



Translocation pig karyotype

G-banded metaphase spread of pig chromosomes

(photos by Lynne R. Klunder)

Laser Surgery

The surgical laser, developed in 1960, has gradually established its place in human medicine. The Argon laser's most widely publicized application is for repairing retinal detachments in the eye. Uses of the Nd:YAG laser include the transendoscopic removal of laryngeal growths and the palliative treatment of tracheal, bronchial, bladder, and esophageal tumors.

Now, surgeons at the University of Pennsylvania School of Veterinary Medicine are investigating the feasibility of laser surgery in large animals, primarily the horse. "The Section of Surgery at New Bolton Center was fortunate enough to purchase an Nd:YAG laser through the generosity of benefactors interested in helping the horse," said Dr. Eric P. Tulleners, assistant professor of surgery. "The letters stand for the solid substances which produce the laser beam. Our machine is a neodymium-doped, yttrium aluminum garnet, optically pumped laser. The beam is transmitted through a 4-meter-long, flexible fiber, about 2 mm in diameter." A laser beam, a form of electromagnetic radiation, is formed by nearly parallel monochromatic light rays of the same wavelength. The beam is very focused and its intensity varies, depending on the power utilized. The machine at New Bolton provides up to 40 to 60 watts of power for non-contact use, such as vapor-

ization. If a probe is attached for contact use, the power requirement is reduced to 10 to 20 watts. Because the wavelength of the light is injurious to the eye, the surgeon and nurses wear protective goggles when the machine is in use. The unit is portable, self-contained, and it requires a standard 220 volt power outlet. It has its own internal cooling source and is about the size of a washing machine.

A number of horses with upper respiratory tract obstructions have already been treated successfully with the laser at New Bolton Center. The laser can be utilized in open surgery as well as transendoscopically. "We use the flexible fiberoptic endoscope, and the laser fiber is passed through the biopsy channel," said Dr. Tulleners. "The animal does not require general anesthesia; it only needs to be sedated and the area anesthetized with topical (local) anesthetic." Dr. Tulleners feels that laser surgery may be useful in treating such disorders as ethmoid hematomas, entrapment of the epiglottis by the aryepiglottic folds, arytenoid chondritis, pharyngeal polyps, and guttural pouch tympanitis. "Among other soft tissue applications which may lend themselves to laser surgery in the horse are treatment of neoplasms such as sarcoids, posterior digital neurectomies, and cervical adhesions and endometrial cysts in mares."

The intense, focused beam of light produced by the laser can cauterize, incise, or vaporize tissue. All of these procedures can be done through the fiber-

optic endoscope, which has a television camera attached. The surgeon needs to be completely familiar with endoscopic views, and he needs dexterity to accurately manipulate the laser fiber in the small spaces inside the animal's body. A laser scalpel can be attached to the fiber to incise or remove tissue in a conventional open fashion.

Laser surgery greatly reduces the time a horse spends in the hospital. The dangers of infection and other complications are reduced, and the animal often can be returned to training much more rapidly than after open surgery. Furthermore, general anesthesia is often not required, and the procedure can be done on a standing horse. In many instances laser surgery can be done on an outpatient basis.

Prior to deciding to purchase the Nd:YAG laser, Dr. Tulleners and Dr. Benson Martin took several courses, including extensive lectures and laboratories, to become certified in the use of the laser. Recently, a lecture series and wet lab for physicians was held at New Bolton, using the unit. In addition to Dr. Tulleners, Dr. Ben Martin, lecturer in surgery, and Dr. Charles Raker, Lawrence Baker Sheppard Professor Emeritus of Surgery, are also pursuing research with this new device. The School is the first veterinary school in the country to acquire this particular type of Nd:YAG contact laser.

Discovery of a New Dinosaur

Dinosaurs have been in the news a lot recently and Dr. Peter Dodson, associate professor of anatomy at the School, had something to do with that. In December, Dodson introduced *Avaceratops lammersi* to the public at the Academy of Natural Sciences of Philadelphia. This event marked a five-year quest to identify fossil bones found in Montana in 1981.

"*Avaceratops lammersi* lived about 75 million years ago. It was a small, plant-eating dinosaur," he explained. "The first new kind of horned dinosaur found in North America in 35 years, this animal was about the size of a boar and seven feet in length. It is a juvenile and we estimate the adult size at about 12 feet, which is considerably smaller than that of other horned dinosaurs of that period."

Little did Dodson know that a trip to South Dakota to examine some fossil bones would lead to the discovery of a new species. "The first bones were found by Eddy Cole, a fossil collector from Wall, South Dakota," said Dodson. "Cole had travelled to Montana, which is known for dinosaur fossil deposits, to look for bones." Cole began his search on the Careless Creek Ranch, a 46,000 acre ranch located near Shawmut, Montana. Here, in an arid section, he came across dinosaur bones. "Millions of years ago Montana was a wet land, with swamps and rivers and much vegetation. The site of the fossil find is an ancient riverbed, and it appears that the animals perished during a flood. There are many bones from juvenile dinosaurs, crocodiles, turtles, and some mammals."

Good fortune played a large part in Dodson's involvement in the discovery of a new dinosaur. "Cole was somewhat unusual in that he carefully mapped the excavation site and the location of each bone. He also thought that a scientist ought to look at his find before he dispersed the bones." Cole called a friend in Los Angeles who contacted a paleontologist at Harvard. Dodson came into the picture when his colleague asked him to speak to Cole. "It was a bit of a tricky situation," said Dodson. "Paleontologists on the whole are not too keen on private fossil collectors. Also, the bones could have been something quite ordinary."

Dodson visited Cole and examined the 700 fossil bones. The collection was a mixture of remains from a number of species, among them bones from a rare horned dinosaur. Dodson got excited when he spotted a frill, a bony structure extending from the back of the skull of ceratopsids and characteristic of these animals. "I asked whether there were more skull bones at the site," he said. "Cole said 'yes'."

Dodson was determined to obtain the collection of fossils for the Academy of Natural Sciences of Philadelphia. Cole agreed to sell them for \$5,000, even though he had spent about \$8,000 on the excavation. Cole also agreed to take Dodson to the site in 1982. The Academy had no funds available, and Dodson mounted a grass-roots campaign to bring the fossils to Philadelphia. His wife and friends baked dinosaur cookies and created dinosaur buttons. These were sold at paleontology fairs, and Dodson took his message to schools and paleontology meetings. He generated quite a bit of enthusiasm and in ten months the funds were raised.

The National Geographic Society provided a grant which enabled Dodson to travel to the site in 1982. As Cole had promised, there were plenty more bones



Dr. Peter Dodson with a fully reconstructed model of *Avaceratops lammersi*. (photo by David Bennett)

"Millions of years ago Montana was a wet land, with swamps and rivers and much vegetation. The site of the fossil find is an ancient riverbed, and it appears that the animals perished during a flood. There are many bones from juvenile dinosaurs, crocodiles, turtles, and some mammals."

and in a period of four days 100 additional fossils were excavated. "The site is in an arid area, no water, no shade, the nearest house is 4 miles away. We camped and had to bring everything with us. But it was worth it." Dodson returned to the site again in 1984 under the auspices of the Academy and in 1985 and 1986 with funding from the National Science Foundation.

The fossils from the 1981 and 1982 excavations came to Philadelphia in 1983 and were studied at the Academy. At first it was thought that they belonged to a *Brachyceratops*. But soon it became evident that they belonged to a different species. "The animal was 10 percent larger, and there was a significant difference in the frill bones," Dr. Dodson said. "Our skeleton's frill was solid, whereas the frill of the *Brachyceratops* has openings."

To make sure that he indeed had found a new dinosaur, Dr. Dodson travelled to other institutions to examine their collections of ceratopsid fossils. Funding for this was provided by the University Research Fund. It became clear that the skeleton at the Academy was different. "We had a new kind of dinosaur," he said. "It was an important scientific discovery."

Dodson named his animal *Avaceratops lammersi* after Ava Cole, Eddy Cole's wife, and the Lammers family, owners of the Careless Creek Ranch and very

cooperative to the researchers. Ceratops means horned face.

Peter Dodson teaches anatomy at the School. He also has an appointment in the department of geology and is a research associate at the Academy of Natural Sciences, Philadelphia. He served as chief scientific adviser to the Academy's new permanent dinosaur display. "It is quite fitting that the fossil is here in Philadelphia," he said. "Philadelphia was the birthplace of American paleontology in the mid-19th century. The first reasonably complete dinosaur skeleton in the world was discovered in Haddonfield, New Jersey, in 1858."

Dodson has been fascinated by dinosaurs since his youth. "I always wanted to be a paleontologist, and, of course, finding a new species is just like a dream." He studied geology and received his Ph.D. from Yale. "There are few jobs for paleontologists, so you must do something to earn a living. I chose anatomy and I have been teaching here at the School since 1974—and delighted to be here."



Fossil bones at the site on the Careless Creek Ranch. (photo by Eddy Cole)

17th Annual Symposium



The Canine Genetic Disease Information System

The first speaker, Dr. Donald F. Patterson, Charlotte Newton Sheppard Professor of Medicine, and Chief, Section of Medical Genetics, discussed the Canine Genetic Disease Information System (CGDIS). He pointed out that genetic defects now are perceived as an important medical problem by the general public. "The advances in vaccine development, nutrition, and new methods of dealing with parasitism over the last three decades have largely eliminated severe illness due to infectious and debilitating diseases in man and animals," he said. "As a result, there has been a gradual shift in the nature of health problems, away from those that are due to causes extrinsic to man and animal and toward those that are to a large extent genetic in origin."

To date, more than 200 genetic diseases of dogs have been described in the literature. Diseases that have a major genetic component include a large variety of congenital malformations (cleft palate, hernias, heart defects), abnormalities in growth and development (hip dysplasia, cryptorchidism), endocrine diseases (diabetes, hypothyroidism), and progressive degenerative disorders (progressive retinal atrophy, cerebellar atrophy). A rapidly expanding number of metabolic diseases are being recognized (mucopolysaccharidosis, copper storage). Inherited deficiencies in the immune system are now known to cause some dogs to have increased susceptibility to infectious diseases. A genetic component has been recognized in certain forms of cancer (osteosarcoma, mastocytoma), and in a number of degenerative disorders associated with aging (intervertebral disc disease, chronic valvular heart disease).

The variety of dog breeds is tremendous; no other mammalian species shows such diversity. Differences between breeds are genetic, due to selection for various features and qualities. Each breed of dogs represents a genetic isolate, a group of individuals sharing a specific gene pool; and each breed tends to have its own genetic diseases. In selecting for specific breed characteristics, man unwittingly selected also for genes which interfere with proper development in each breed.

Currently, new genetic diseases are recognized and reported every month, and the rate of discovery is accelerating, due to an increasing sophistication of

The Seventeenth Annual Symposium, Your Veterinarian and Your Dog, was held on January 31, 1987, at VHUP. Following are the summaries of the talks and discussions.

diagnostic methods in veterinary medicine. Many more genetic diseases are known or suspected by breeders and veterinarians but are not sufficiently well-studied to be reported in publications. As information continues to accumulate, dog breeders, breed organizations, and veterinarians will have an increasing need for a comprehensive source of information regarding the genetic defects that have been proven to occur in each breed, including their diagnostic features and their modes of inheritance. Also needed is information regarding defects that are strongly suspected but not yet proven to have a genetic basis. Evidence of this kind can serve as a valuable "early warning system" which could be used to alert breeders to an emerging genetic problem.

In the past, compilations of genetic disorders have been made, but they are too limited in scope and cannot be kept current enough to satisfy the present needs of dog breeders and veterinarians. It has become apparent that the expanding body of available information cannot be efficiently organized, kept up-to-date month by month, and made accessible by any system now available. A new method, using modern computer technology, is needed. Computerized access allows the user to answer questions of greater variety and complexity with increased speed and permits the inclusion of additional information as new knowledge evolves. A system of this type will have a number of important benefits to the purebred dog world:

1. It will provide a compendium of current information that can be used by owners, breeders, and national breed clubs to keep track of known and suspected genetic disorders within each breed on a month-to-month basis. If national breed clubs con-

tribute information to the system as well as obtain information from it, the system can serve as a focus around which genetic committees can organize their activities and become more effective.

2. It will create, for the first time, a truly current and comprehensive source of information to help veterinarians recognize the genetic diseases that occur in each of the breeds. This will improve the accuracy of diagnosis and lead to more effective treatment.

3. By providing current information regarding modes of inheritance and tests for the recognition of carriers, the system will assist breeders and veterinarians in developing programs to reduce the frequency of genetic diseases in purebred dogs.

The Section of Medical Genetics, School of Veterinary Medicine, University of Pennsylvania, is developing a comprehensive system that will make up-to-date information on genetic disorders of the dog readily available to breed clubs, breeders, and veterinarians. This project has been made possible by a grant from the American Kennel Club. The CGDIS



Mr. Charles A. T. O'Neill of the American Kennel Club, Mrs. Patricia L. Green, and Dr. Donald F. Patterson at the computer for the Canine Genetic Disease Information System.



Syndrome of Short-Limbed Dwarfism with Ocular Defects in Samoyeds

This is a recessively-inherited defect in the development of the bones. Affected dogs have short legs, outwardly deviated front paws, and defects of the retina and lens of the eye. (Photo reprinted from JAVMA, Vol. 183, No. 9, November 1, 1983)

will be computer-based, using microcomputer capability. The software and information base being developed by the Section of Medical Genetics can be utilized directly by veterinarians, breed organizations, and others with interest in genetic defects of the dog. To make it available to the largest number of users, the program is written for the IBM-PC and compatible machines. Users will be able to obtain updated versions of the information base at intervals. The system will be continually updated on a monthly basis. Information will be gathered from the published literature, research workers, practicing veterinarians, veterinary institutions, breed clubs and breeders, as well as our own genetics clinic.

A monthly survey of scientific journals and breed club publications in this country and abroad will be used to keep the data base current. We also propose to establish a network of veterinary institutions and breed club genetics committees which will provide an additional source of evidence regarding previously undocumented genetic defects. The institutions will include the veterinary schools in this country, and other large teaching hospitals. In some cases, practicing veterinarians will provide information. The genetics committees of the national breed clubs will be encouraged to submit information.

The information will be gathered, extracted, and entered into the computerized system by a coordinator, after review by members of the Section of Veterinary Medical Genetics. The professional personnel involved in the project are: Dr. Donald F. Patterson, project director; Dr. Gustavo A. Aguirre, professor of ophthalmology in medical genetics; Dr. J. C. Fyfe, resident in genetics; Dr. Urs Giger, assistant professor of medicine in medical genetics; Patricia L. Green, project coordinator and bibliographer; Dr. Mark E. Haskins, associate professor of pathology and medical genetics; Dr. Peter F. Jezyk, adjunct associate professor of medicine in medical genetics; Dr. Vicki Meyers-Wallen, assistant professor of

reproduction in medical genetics; Dr. Stephen P. Schiffer, assistant professor of laboratory animal medicine and medical genetics.

The system will contain the following information: name of each genetic disorder and common synonyms; breeds affected; status as to whether established or suspected; system or systems of the body involved; diagnostic features, including age of onset, physical signs, laboratory test findings, and pathology; mode of inheritance; tests for the recognition of carriers of recessively inherited diseases; recommendations for control of the disorder (genetic counseling); references to sources of available information; names and addresses of individuals and laboratories providing special expertise or tests for specific disorders.

The system will contain no information about the identity of specific animals or their owners.

The computer program for CGDIS has been under development for more than a year and the initial version is now nearing completion. The program is designed to be user-friendly and will allow display and printout of information in a variety of formats. Breeders and veterinarians will be able to query the system and obtain information pertaining to currently known or suspected genetic defects in a breed. Diagnostic criteria will be provided as well as age of onset, physical signs, laboratory tests, and mode of inheritance. Veterinarians can use it as a diagnostic aid by listing a specific set of clinical signs and symptoms, and by requesting a list of genetic disorders responsible for such signs. Laboratories performing special tests for specific genetic disorders or carrier detection will be listed. Also principles of genetic counseling for each specific disorder will be provided. In addition, the system can furnish a list of breeds in which a specific genetic disorder occurs. It can also list genetic disorders with a particular diag-



Lethal Acrodermatitis in Bull Terriers

This is a recessively-inherited defect which is first noted as retarded growth and difficulty in eating. Skin lesions develop around the eyes, ears and mouth, and on the feet, and the footpads become hard. The toes are splayed. Affected pups are very susceptible to infection and usually have repeated infections. We believe this to be an inherited defect in zinc metabolism, since the clinical picture and the pathology are identical to zinc deficiency. However, the pups were all fed a diet adequate in zinc content, and zinc treatments do not cure the disease. There is apparently some "block" in the metabolism of zinc which prevents the body from using it. (Photo reprinted from JAVMA, Vol. 188, No. 8, April 15, 1986)

nostic feature, and it can provide literature references and other sources of information regarding any genetic disorder.

It is anticipated that the first version of the CGDIS will be available during 1988 for use and testing by other institutions and breed organizations. Once the system is fully developed, it can serve as an immediate source of information by answering direct inquiries from breeders, breed clubs, and veterinarians. Further, periodic written reports to the American Kennel Club, breed organizations, and the veterinary profession can be provided. It is anticipated that the software and current information base will be made available as a package. The data base will be maintained and updated by the University of Pennsylvania, but other institutions will be encouraged to obtain the software and information base for use locally. That way regional information centers can evolve.

The long-term goal is to encourage the development of a comprehensive program that can be used throughout the United States and abroad to recognize and control genetic disorders in purebred dogs. By cataloging and making available the burgeoning knowledge on the known and suspected genetic disorders in each breed and by stimulating the cooperation of veterinarians and dog breeders in the collection of this information, the stage will be set for the next step, which is to establish comprehensive certification for genetic diseases. A program of comprehensive certification will use the CGDIS as the source of information needed to specify which examinations and laboratory tests are necessary to recognize all of the known and suspected genetic disorders within each breed. Breeding animals could be taken to a veterinary institution and tested for the known genetic defects of that breed. Breeders would not have to take their animals to a number of specialists in different locations. But such certification program is still in the future.

Dr. Patterson then briefly discussed subaortic stenosis, a genetic disorder emerging in the golden retriever. This disease also occurs in the Newfoundland and has been studied extensively in this breed. The disease affects the heart and can cause sudden death due to arrhythmia. It is inherited, apparently through a dominant gene with modifiers. This causes varying expression of the disorder; some animals are hardly affected while others may show symptoms early in life. He pointed out that, once CGDIS is in place, emerging problems in a breed, such as SAS in goldens, can be made known more quickly to veterinarians and breeders. This would lead to earlier testing of future breeding stock and the prevention of the spread of a newly identified genetic disorder.

He then touched on inbreeding, frequently blamed by the popular press for problems in purebred dogs. Dr. Patterson pointed out that inbreeding, the mating of closely related animals, in itself, does not produce defects. Rather, it brings out the defective genes carried by the animals. "Inbreeding is necessary to fix certain genetic traits, but when inbreeding is practiced it is important to realize that hidden genes for genetic defects will become apparent. Of inbred animals, only the best should be retained for breeding."

During the question and answer period he also stated the importance of keeping accurate records to monitor problems and progress in a breeding program. "When trouble occurs, you can refer back," he said. "You may be able to detect a pattern and then something can be done about it before it becomes too widespread." He expressed the hope that the CGDIS will stimulate a dialogue among breeders and that it will facilitate the control of genetic diseases in purebred dogs.



Canine Reproductive Problems

Dr. Vicki Meyers-Wallen discussed canine reproductive problems in the bitch and dog and how they can be recognized, treated, and prevented.

On the average, bitches cycle every seven months and the reproductive cycle can be divided into anestrus; proestrus; estrus; pregnancy; preimplantation period; period of the embryo; period of the fetus; whelping; and lactation. Problems can occur at all stages and the veterinarian must know at what stage the problem is occurring in order to approach it in a rational manner. An important step in preventing and recognizing problems is good record keeping.

Anestrus is a period of reproductive quiescence. Toward the end of this period, hormonal changes occur internally which prepare the bitch to come into season. Bitches that fail to cycle may have problems unrelated to the reproductive system such as hypothyroidism, Cushing's disease, liver or kidney ailments, or other major illnesses which prevent the initiation of a normal cycle.

Proestrus marks the period when external signs such as vaginal swelling and bleeding occur. However, some bitches may cycle but do not present any external signs. The problem can be circumvented by good records and then taking weekly vaginal smears during the period that proestrus is most likely to occur.

Estrus is a very important stage since ovulation occurs during this period. The most frequent problem during this period is that sperm are not present in the oviduct during the periovulatory period, so fertilization does not occur. Good breeding management is essential to correct this. Failure of ovulation is less common. It can be documented by serum progesterone determinations. Abnormal anatomy which prevents the union of sperm and eggs can also occur. This includes the obvious vaginal stricture which is painful and prevents a "tie," and the less obvious abnormalities where part of the uterus or oviducts may be missing, obstructed, or infected, thus preventing the sperm from reaching the eggs in the oviduct, where fertilization normally occurs. Vaginal strictures can be removed surgically. Usually such bitches whelp normally, though one should be prepared for a C-section.

To pinpoint the best days to breed a bitch, vaginal smears should be done, beginning in proestrus and all the way to diestrus. The vaginal cytology changes and, when a bitch is ready to breed, cells will be 90 percent or more cornified. Breeding should be done every other day until diestrus becomes evident in the smear. Dr. Meyers-Wallen explained that the first-day-of-diestrus vaginal smear provides a valuable clue as to when ovulation occurred. Bitches ovulate six days prior to diestrus, and there is a "golden period" when the conception rate is high. It is from 10 to 4 days prior to the onset of diestrus. Studies have shown that bitches bred during this period had a good conception rate and good litter sizes. She pointed out that if a bitch bred in this period misses, then management is unlikely to be the problem and one must look for other causes. Knowing the first day of diestrus also makes the calculation of the whelping date easier. Generally bitches whelp 57 days from that date.

The period of pregnancy is divided into three phases: preimplantation period, period of the embryo, and period of the fetus. During the first phase, which lasts 19 days, the fertilized eggs float in the uterine horns and then attach to the walls. In the next period (19-35 days), organ systems are formed

and the placenta is in place. If the bitch suffers an insult, such as infections, exposure to toxin, etc., fetal deaths can occur and the embryos are resorbed. During the final period, 35 days to birth, the fetus continues to grow. If a fetal death occurs, the fetus will be expelled. Hormonal abnormalities of the bitch and infections of the bitch or fetus are the best known causes of fetal death during this period. Abortion due to *Brucella canis* occurs most often during this time. Routine prebreeding tests of the bitch and stud are recommended to prevent the spread of *Brucella canis*.

Dr. Meyers-Wallen also pointed out the importance of early pregnancy diagnosis. It can be diagnosed by palpation at 28 days and by ultrasonography at 21 days from the first breeding. Routine early pregnancy confirmation is recommended to differentiate between failure of fertilization and embryonic death, since the causes of these two problems may be quite different.

She emphasized the importance of records and recommended that a chart be kept on each breeding bitch. On it the breeder should note the results and date of brucella tests, the date of the beginning of proestrus, estrus and diestrus, breeding dates, palpation date, whelping date, number of puppies, living and dead, and problems encountered. Such records can be a valuable reference in case of problems at a later date, and it can help the veterinarian to determine a treatment to correct a problem.



Sperm with coiled tails



Late Proestrus Vaginal Cells



Estrus Vaginal Cell

A stud dog is an important part of a breeding program, and Dr. Meyers-Wallen emphasized that the male chosen should have superior breed characteristics and should be anatomically normal. He should be free from inherited defects. She recommended that a reproductive evaluation be done soon after puberty, at the age of 10 to 12 months. Such evaluation includes: examination of the reproductive system, behavioral evaluation, and complete semen evaluation.

Examination of the reproductive system should be performed by a veterinarian to be certain that the breeding apparatus is normal. For the behavioral evaluation the young male is introduced to a friendly, estrus bitch in the usual breeding setting every 1-2 weeks if possible. It is not necessary that he actually breed; just give him time to figure out what he is there for. Observe his behavior; he should become more interested and less intimidated with each encounter. He should be easy to handle at all times and not allowed to become aggressive with the bitch or the people handling him. When he begins mounting behavior, he may be ready for his first semen collection.

This collection and the subsequent evaluation should be done by a veterinarian. The semen evaluation includes: measurement of volume, motility, sperm count per ejaculate, and sperm morphology to determine whether the sperm is normal. It is important to remember that the sex drive usually precedes sperm production. If the first collection is not so good, one should wait two months before the semen is evaluated again.

Once semen evaluation is normal, the dog should be allowed to breed naturally to an experienced friendly estrus bitch. If he is to be collected in the

future for artificial insemination or frozen semen, it may be good to occasionally collect him so that he is used to the procedure. This may be best attempted on later breedings, not on his first breeding. Breeders should be sure that the dog is not traumatized by the experience, since he may not forget the experience and become difficult to breed. If the dog is timid, more time should be allowed or a different bitch used.

Good records are essential if problems are to be identified at an early stage. Every breeding should be recorded: bitch, her age, dates of breedings and whether they were inside ties or artificial inseminations. The date of whelping and the number of puppies should be recorded, as well as the bitch which did not conceive. *Brucella canis* tests should be recorded as well as the results of the semen evaluation.

Dr. Meyers-Wallen pointed out that a 75 percent whelping rate is accepted as being within normal expectations. If the dog's rate is below that, he should be evaluated. If his rate is greater but he misses two or three bitches in a row, he should also be evaluated. The number of pups per litter is also useful in that a decrease in litter size can be the first indication that the sperm numbers are decreased. Early detection may prevent irreparable damage to the stud's breeding capacity.

She explained that it takes 54 days for sperm to develop. If germ cells have suffered an insult, such as infection, it will not be evident for quite awhile. She

said that stud dog owners should recommend that bitches be checked early for pregnancy. If a problem is suspected with the dog, then action can be taken earlier than if one waits until the whelping date.

Vaginal smears of the bitch provide a good guide for the proper breeding date, and the stud dog owner should have such smears performed while the bitch is in his/her care.

Dogs which are used frequently should be tested for *Brucella canis* twice a year. A semen evaluation should be done annually. Dogs that have not been used for awhile should also be evaluated prior to breeding.

During the question and answer period it was asked whether the thyroid status is related to reproductive problems. Dr. Meyers-Wallen indicated that, theoretically, hypothyroidism could be responsible for reproductive problems. She cautioned that thyroid replacement drugs should not be given without prior testing. The most accurate test is the TSH test, which measures the function of the gland. Resting levels of T3 and T4 often do not give an accurate result as the values are subject to interpretation.

The question of vaccinating a bitch during pregnancy was raised. Dr. Meyers-Wallen indicated that it is best to vaccinate prior to breeding to get maximum protection for the puppies. False pregnancies should be regarded as normal, as the bitch has a high level of progesterone after estrus, regardless of whether she is pregnant or not.

Dr. Meyers-Wallen stressed the importance of working closely with the veterinarian and the importance of detailed records.

Dr. Vicki Meyers-Wallen is assistant professor of reproduction in medical genetics at the School.



Rabies Update

Dr. Lawrence T. Glickman, associate professor of epidemiology and Chief, Section of Epidemiology, discussed the recent rapid increase in the number of rabies cases in Pennsylvania.

Rabies is a fatal viral disease affecting the central nervous system. It is transmitted through the bite from a rabid animal. The disease can affect all warm-blooded animals, including man. The number of cases seen in wildlife, dogs, cats, and livestock in Virginia, Maryland, and Pennsylvania has increased dramatically during the last seven years. Pennsylvania now has a mandatory rabies vaccination law for dogs and cats. Such vaccination decreases the chances of human exposure to the disease, as vaccinated animals act as a buffer between humans and wildlife.

Many of the new vaccines for cats and dogs are effective for three years; then a booster is needed. An exception is the young animal vaccinated under one year of age that requires a booster at age one and then three years later. At this point there is no vaccine for wildlife, though several researchers are developing such a product.



Dr. Glickman showed a film which illustrated the symptoms of rabies in animals. Contrary to folklore, rabid animals frequently do not become violent or furious. The infection often follows a pattern. The incubation period varies typically from 15 to 50 days after the bite, during which there are no clinical signs. In some cases it may last longer. During the prodromal phase, the animal shows subtle behavioral changes. During the next phase, of excitation, there is usually a more pronounced change in behavior. The animal will be restless, excitable, and it may attack without provocation. It will also lose fear of natural enemies. Animals in this furious stage will eat foreign objects such as stones, straw, and wood; and rabid dogs in this phase will often chew on the

wire and frame of their cages. Paralysis may accompany the behavioral changes or occur by itself. In some animals the excitatory phase may be quite short in duration with a longer paralytic phase.

Any animal suspected of being rabid should be destroyed, taking special care that the head is preserved. The brain is needed for laboratory tests to determine whether the animal indeed was rabid.

Dr. Glickman explained that wild animals, such as raccoons, should not be brought into a household as pets as they are natural reservoirs of rabies. He also warned against hand raising very young raccoons. He advised that if wildlife is observed exhibiting out-of-character behavior, the game warden should be contacted at once. Under no circumstances should one go near such an animal. He feels that vaccination of the general cat and dog population offers the greatest degree of protection to humans, as it reduces the chance of human contact with a rabid pet.

Should one come into contact with a rabid animal such as a bat or other wildlife, a physician should be seen at once so that protective measures can be instituted. There is now a human rabies vaccine which can be administered subcutaneously; it is safe and painless and offers good protection.

Feeding Programs for Problem Dogs

Dr. Susan Donoghue, assistant professor of nutrition, discussed the feeding of problem dogs. She pointed out that for most dogs the nutrient requirements are quite broad and that dogs tolerate a range of foods without problems. The requirements, however, become narrow when one deals with a dog under stress. Such stress may be due to illness, pregnancy or lactation, growth, hard work, or extreme weather conditions. At these times it is vital that the proportions of essential nutrients in the food are correct and available to the animal in the proper amounts.

Dog food is manufactured dry, canned, or semi-moist. The dry foods can be kibbled, expanded, and dense-dry. Most dry foods are cereal-based; they have a varying content of meat, meat by-products, and fiber. Canned food, too, can be cereal-based with little meat. It is important that consumers read the label to determine the ingredients. Main ingredients are listed first, and these are in the food to provide energy and protein. One should also look to see whether the food meets NRC requirements or whether it has passed AAFCO tests.

There is quite a variance between dog foods. Generally, the high-dense foods are better utilized by the dog. They are more digestible and higher in protein content. Dog owners can evaluate the digestibility by looking at the stools. If they are dark and dense, then the dog is utilizing the food well. If they are loose and large in quantity, the digestibility leaves something to be desired.

In order to be of benefit, all the nutrients, vitamins, and minerals in the food should be available to the dog in correct proportions. Unfortunately, this is not always the case; vitamins are lost during processing and storage. Preservatives may interfere, and long-term antibiotic or anti-convulsant therapy can also interfere with utilization of vitamins. Dog food companies try to guard against such losses by adding supplements in such an amount that processing losses can be compensated for. Supplements given by owners may also interfere with the proper utilization of vitamins and minerals. Often animals can become

quite ill because of improper supplementation.

Commercially available dog food can be improved and made more palatable to the dog. The addition of water alone to dry, expanded foods will increase food intake by 10 to 20 percent. Milk is an excellent supplement which will enhance the fat and protein content. However, it should be introduced slowly to give the dog's system a chance to adjust to it. Once a dog is accustomed to milk, it can be fed safely. Fat or oil can be added to boost the energy content, but this has to be done with care. Too much fat introduced suddenly cannot be adequately digested. It also may overwhelm the pancreas. Further, it enhances palatability and the dog may overeat. When fat or oil is added, it should be in moderate amounts.

One can increase the protein content of dog food by adding cottage cheese, which contains high quality protein. Cheese and eggs are also excellent protein sources. Meat can be added; it is high in protein and allows a better utilization of amino acids.

Home cooking is another excellent way of giving the dog a good ration. Recipes are given on the following page. When preparing home cooked foods, it is essential that the list of ingredients and instructions is adhered to. One cannot, for example, substitute ground limestone for bone meal, or use noodles instead of rice. The proportions of the various ingredients in these recipes are carefully worked out to provide optimal intake of food energy. Dr. Donoghue explained that minute rice cannot be substituted for white or brown rice measure per measure. If substitutions are made, the ingredient chart must be consulted and substances should be exchanged on a caloric or protein basis.

She emphasized the importance of regularly monitoring the dog's body weight and condition. Dogs should be bright and alert, and about 1/8 inch of flesh should cover the ribs. One should be able to feel the ribs easily, but they should not stick out. Dogs, like people, are not all the same. Animals of the same size often need different amounts of food to keep in top shape. There can be as much as a 20 percent variation in caloric needs between animals. Thus, a frequent check of individual dogs is important.

Animals out in the cold weather or hard working, such as prolonged hunting or racing, require more

calories and protein. Bitches in late gestation and early lactation also need more energy and protein. This is best done by increasing the protein and fat content with meat-based feed rather than by adding cereal feed.

Dogs also can get too fat. An English study showed that about 20 percent of the dogs seen by veterinarians were obese and 3 percent were grossly obese. The figures are about the same at VHUP. Dr. Donoghue explained that prior to putting a dog on a reducing diet, it should be checked by the veterinarian to be sure that no underlying disease is present. When formulating a reducing diet, one must think in terms of calories and the balance of the individual ingredients.

Dr. Donoghue discussed dogs with frequent bouts of gastritis and said that a low-fiber, low-fat diet may be helpful. She recommended rice as the most digestible carbohydrate, along with lean meat and the proper supplement package. Older dogs present a larger number in the population. Their dietary needs are special. Dr. Donoghue feels that they should be fed a high-protein diet, similar to puppy food or a dense-dry food, to meet their needs. She advised against very low-protein, geriatric diets available in the market.

During the question and answer period she explained that when weaning puppies the food should closely approximate the content of the bitch's milk and be high in protein. She recommended a creep-feeding program where the pups have access to the food away from the bitch. As they get used to it, they can be gradually changed over to a high quality puppy food.

Dr. Donoghue advised against supplementation with kelp, as the seaweed generally available in stores comes from many different sources. Often the iodine content is very high and one can get toxic levels. Veterinarians have seen problems in foals from mares which had been fed kelp. These foals were born with goiters. Also, some kelp may contain high quantities of heavy metals.

Dr. Donoghue reiterated the importance of a proper diet for dogs, tailored to their needs. One must pay attention to the individual dog when formulating a diet and consider whether it is lying around the house or whether it is a dog under stress.





Maintenance* Energy Requirements

Body Weight		Kcal/Day
kg	lb	
1	2	132
3	6.5	301
5	11	441
10	22	742
20	44	1248
30	66	1692
40	88	2099
50	110	2482
60	132	2846

*Maintenance refers to a healthy dog that is not growing, pregnant, lactating or stressed, and is living in comfortable surroundings.

Home-Cooking Diets

The diets shown below have been formulated and developed by Dr. D. S. Kronfeld, University of Pennsylvania, and are reprinted here with his permission.

1. Maintenance Diet

Ingredients:

- 2/3 cup rice, uncooked
- 1/3 cup meat (beef, pork, lamb, boneless poultry, or boneless fish)
- 1/8 cup (= 1 oz) liver
- 3 teaspoons bone meal
- 2 teaspoons corn oil
- 1/2 teaspoon iodized salt

Cooking Instructions: Place rice, bone meal, corn oil, and iodized salt in 2/3 to 1 cup boiling water. Stir, cover, and simmer 20 minutes. Add meat and liver, stir, cover, and simmer 10 minutes. Cool.

Feeding Instructions: The amount of diet shown above provides 800 kcal. This is a sufficient daily intake for a 10 kg (about 23 lb) dog. The diet should be fed in at least 2 *divided* feedings.

2. Bland/Hypoallergenic Diet

- Use lamb (trim excess fat) or skinless poultry as source of meat.
- Use chicken as source of liver.

SOME COMMON DIET INGREDIENTS

Food	Unit	Grams	Water %	Kcal	Protein	Fat	CHO
					----- % ME -----		
Cottage Cheese, 4% lg curd	1 cup	225	79	226	50	40	10
1% 1% Cheddar Cheese	1 cup	226	82	154	73	12	16
1 oz		28	37	115	26	74	1r
Milk, 3.3%	1 cup	244	88	148	22	49	30
2%	1 cup	244	89	125	26	36	38
1%	1 cup	244	90	107	30	25	45
Ice Cream	1 cup	133	61	270	7	47	47
Yogurt, plain	8 oz.	227	85	145	33	25	44
Egg, whole large, raw	1 egg	50	75	82	29	66	5
scrambled	1 egg	64	76	91	26	69	4
Corn Oil	1 tbs	14	0	126	0	100	0
Sardines, canned in oil	3 oz	85	62	161	50	50	0
Steak, round lean & fat	3 oz	85	55	213	45	55	0
Heart, beef	3 oz	85	61	157	69	29	3
Liver, beef	3 oz	85	56	189	47	43	11
Chicken, broiled	6.2oz	176	71	231	73	27	0
canned	3oz	85	65	162	44	56	0
Turkey, chopped	1 cup	140	61	257	68	32	0
Rice, instant, cooked	1 cup	165	73	176	9	tr	91
long grain, cooked	1 cup	205	73	216	7	tr	93
raw	1 cup	185	12	653	7	1	91
Spaghetti, cooked	1 cup	130	64	193	15	5	81

3. "High" Protein and "High" Fat Diet

Use 1/3 cup rice and 2/3 cup meat.

NOTE: ALL OTHER INGREDIENTS REMAIN AS ABOVE.

NOTE: This diet still contains 800 kcal. Only the proportions of carbohydrate, fat, and protein have changed.

4. Low Fat Diet

Use skinless poultry or very lean meat (e.g., beef heart) as meat source.

NOTE: Do not reduce corn oil; it provides essential fatty acids.

NOTE: This diet still contains 800 kcal. Only the proportions of carbohydrates, fat, and protein have changed.

NOTE: These diets should not substitute for a visit with your veterinarian. The diets, and further variations, have best results when used under the supervision of a veterinarian.

Arthroscopy in Horses

The operating room at New Bolton's C. Mahlon Kline Center is quite dark, the only source of light being a television screen which shows the interior of a joint. A group of students listens attentively as the surgeon explains the TV image and the procedure he is about to do. The patient, a horse, lies quietly in anesthetic sleep. Arthroscopic surgery is being performed. This scene, unthinkable six or seven years ago, happens almost daily at New Bolton Center and at other veterinary hospitals.

"Arthroscopy now is a routine procedure when a horse with a joint injury is presented," said Dr. Dean Richardson, assistant professor of surgery at the University of Pennsylvania School of Veterinary Medicine. "It is one of the greatest advances in orthopedic surgery." The arthroscope, a relatively new instrument, was developed in its modern form in the 1950s. Human orthopedics adopted it widely as a diagnostic tool in the mid-seventies, and it was soon utilized in veterinary medicine. Beginning in 1981, it was used for orthopedic surgery in large animals. New Bolton Center began using the arthroscope on clinical cases in 1982, and now about 200 arthroscopies a year are performed here. Prior to the devel-

opment of the instrument, major surgery was necessary to remove chips or debris from a joint. The joint had to be opened widely, involving more trauma to the surrounding tissues. Also, this procedure required a lengthy recovery time.

An arthroscope is a slender optical instrument that permits the surgeon to look into the joint without opening it, and to remove small chips and other debris. "The joint can be accurately examined through a small incision," said Dr. Richardson. "Lesions and conditions not detectable by radiographs can be seen. The procedure is not as traumatic as an arthrotomy and the recovery time is quicker."

The arthroscope is inserted through a protective, rigid small tube or canula. Fiberoptics within the arthroscope permit illumination of the joint interior, and a camera attached to the instrument allows the clinician to examine the interior of the joint. The lens is at an angle so that rotation of the scope permits a wider area of visualization. The incision for the arthroscope is very small, as the instrument is only four millimeters in diameter. When arthroscopy is performed, the joint is kept filled with a sterile fluid to keep the soft tissues from collapsing into the joint space. The fluid runs constantly to keep the

space clean of blood and to maintain distension of the joint. When instruments are used, they are inserted through a second small incision. These instruments are specially designed with long, narrow shanks. They can be manipulated in the tight joint space under arthroscopic visualization. The surgeon needs bimanual dexterity and has to be trained in the interior anatomy of the joints. "With the arthroscope you get a more complete view than in open joint surgery," said Dr. Richardson. "Also, you can manipulate the joint and get different views to help evaluate the extent of the damage."

"We use it for both diagnosis and treatment," said Dr. Richardson. "Infected joints can be examined and flushed out, bone chips or damaged cartilage can be removed, and one can examine multiple joints while the animal is anesthetized a single time." He explained that the joints most often examined are the carpal joints, the fetlock, and hock and stifle joints. The stifle and hock joints, in particular, are prone to osteochondritis dissecans lesions, and these cartilage chips cause lameness. Although the majority of horses undergoing the procedure have a specific problem identified before surgery, the arthroscope can be an invaluable tool in identifying the source of lameness when other means such as radio-

In Memory of Philip B. Hofmann

Philip B. Hofmann, a senior member of the School's Board of Overseers, died on December 30, 1986, at the Miami Heart Institute.

Mr. Hofmann and his wife, Georgia, have had a long and close association with the Veterinary School and the University.

In 1970, the Hofmanns established the Georgia and Philip Hofmann Research Center for Animal Reproduction at New Bolton Center. Mr. Hofmann, a graduate of the Wharton School, received the General Alumni Society Award of Merit and an honorary Doctor of Humane Letters degree from the University. The Wharton School presented him with the Wharton Gold Medal, and, in 1984, the Veterinary School bestowed on Mr. Hofmann and his wife its Centennial Medal.

For 43 years Philip Hofmann was associated with Johnson & Johnson, beginning as a shipping clerk and rising through the ranks of the corporation to chairman and chief executive officer. A marketing genius and entrepreneur, he was a chief architect in building Johnson & Johnson to its present great scale and stature.

An avid horseman, Mr. Hofmann competed in the show ring, at hunter trials, and in three-day events and stadium jumping. Together with his wife, Georgia, he established a racing stable, Wycombe House Stud, and bred and raced the champion sprinter, Gold Beauty, an Eclipse Award winner, and five other stakes winners.

Mr. Hofmann was a moving force in American coaching competition, and he headed the first Johnson Park International Driving Show, held in New Brunswick, New Jersey, in 1970. He was the founder and president of the American Driving Society and served on an international committee to formulate international rules for driving competition. He was elected to the Coaching Club of England, and in 1974 he was the first American driver to represent this country in world-championship driving competition. In 1973, Mr. Hofmann organized the Liberty Run, a two-day coach trip from Wall Street to Independence Hall.



Mr. Philip Hofmann, whip, and Mrs. Hofmann on the Liberty Run from New York City to Philadelphia in 1973.

The Four-in-Hand coach, carrying 2,000 pieces of mail and passengers, traveled along the old post route. The run was completed in 34 hours, with an overnight stop in Princeton, New Jersey.

During his long association with the sport of horses, Mr. Hofmann served as founder and first president of the U.S. Combined Training Association, director of the American Horse Show Association, chairman of the executive committee at Monmouth Park, president of the Florida Thoroughbred Breeders Association, trustee of the Thoroughbred Breeders Association, and member of the executive committee of the American Horse Council. He was also a United States Equestrian Team Honorary Life Member.

In 1986, Mr. Hofmann retired from competitive driving after suffering a heart attack while training for the Royal Windsor Horse Show in England. Queen Elizabeth II honored him at this show for his service to the sport and presented him with a silver-mounted, inscribed Four-in-Hand whip.

Philip Hofmann is survived by his wife, Georgia, and two daughters, Judith and Carol.



graphs and synovial fluid analysis have failed.

Dr. Richardson explained that arthroscopy is not a panacea. "It helps prevent the joint problem from worsening. In order to alleviate the disease, we must determine the cause or underlying injury and eliminate it as much as possible." Arthroscopy has shortened recovery time and lessened the danger of infection or cosmetic blemishes as the incisions are very small. The animal is more comfortable and can resume its work or training sooner when compared to the traditional arthrotomy.

In veterinary medicine, arthroscopy is used primarily in horses. Occasionally, such surgery is also performed on cattle. It is not routinely used in the treatment of small animals as the joints are smaller, though recently researchers have employed the technique when studying changes in the stifle joint of dogs with damage to the ligaments.

According to Dr. Richardson, arthroscopic techniques may be expanded to include the use of the recently purchased laser in the treatment of joint disorders.

—H.W.

Continuing Education Courses for Animal Health Technicians

This summer, Harcum Junior College will be holding two continuing education conferences for Animal Health Technicians. Both will be day-long conferences and will be held on Harcum's easily accessible suburban campus in Bryn Mawr, Pennsylvania.

The first conference will be held on SATURDAY, JUNE 6, 1987. Areas to be covered include: aquatic veterinary medicine, small animal neurology, diagnostic radiology, and zoonoses. Tuition for this conference is \$25.

The second conference will be held on SATURDAY, JULY 18, 1987. It will be a hands-on conference in Intermediate Hematology Wet Labs, and participants are encouraged to bring problem slides with them. This conference is limited to 10 participants, so early registration is encouraged. Tuition for this conference is \$35.

For registration information, please call 215-525-3554. The deadline for registration is May 11, 1987.

Israel and Anna Live Endowment Fund

Dr. Israel Live (V'34) has established the Israel and Anna Live Endowment Fund. Its proceeds are to be used annually towards support of a fourth-year student designated by the dean.

Dr. Live, emeritus professor of microbiology, has been on the faculty of the School since 1934. He is the first graduate of the School to receive a graduate degree. In 1936 he was awarded the M.A. degree, and he received his Ph.D. degree in 1940.

Warhol Painting Donated

Henry S. McNeil, Jr., a member of the School's Board of Overseers, presented a painting by Andy Warhol to the School. The painting, part of Warhol's series "Images of a Child," depicts a parrot.

Animal Crackers



The Cost of Veterinary Education at Penn

Tuition fees have been increasing steadily. At the present time, veterinary students at Pennsylvania pay \$10,890 yearly if they come from Pennsylvania and contract states; all others pay \$12,950. This does not include the cost of living. The average age of the graduating veterinarian is 29.5 years, and he or she has an educational debt (average) of about \$40,000—in some cases considerably more. This usually must be paid off in ten years. Yet the average salary the first years after graduation is around \$22,000.

About as many women as men graduate each year and about half are married, some with children. Applications have been declining, in part because of the potential debt burden. We seem to be facing a situation where only the very wealthy or the very poor can afford a college education. Financial planning must begin early—even before entering high school.

Scholarships are an enormous help to students needing financial help. Endowment funds make it possible to support qualified students and help them avoid the stress and frustration that go with meeting loan payments while trying to learn.



Cryptorchidism

Cryptorchidism is a condition in which one or both testicles do not descend into the scrotum (unilateral or bilateral cryptorchidism). It often is incor-

rectly referred to as monorchidism, which is an extremely rare condition in which only one testicle is present. The undescended testicle does not produce sperm, but does produce the male hormone, testosterone. Thus, if the undescended testicle is allowed to remain when the scrotal testicle is surgically removed, the animal will retain the physical and behavioral characteristics of a male.

The condition occurs in horses (the affected animal may be called a "ridgeling"), and the affected animal acts like a stud rather than a gelding. In swine, the meat become unpalatable, as it does in boars. The treatment is castration before maturity.

In dogs, the condition is a disqualifying fault at shows. It is fairly common and has been found in many breeds, although it seems to occur more often in the smaller breeds. The overall prevalence is about 10 percent. It is considered an inherited condition. Family studies indicate that inheritance of the trait is best predicted by an autosomal recessive model. Affected males must have two genes for the trait, receiving one from each parent. Males with only one gene are not affected but are carriers of the trait. Females, of course, are not cryptorchid, but carrier females have one or two genes for the trait, in which case 50 percent or 100 percent of their offspring will also be carriers. Unilaterally cryptorchid males have nearly normal fertility, since the scrotal testicle can produce sperm. Elimination of the trait is possible only if the affected animal and its parents are not used for breeding. Siblings of affected males may also be carriers. The retained testicle may develop tumors which sometimes cause feminization. Medical treatment is not recommended since it is of little value in inducing testicular descent and because of the inherited nature of the condition. The owner should be urged not to use the dog for breeding.

In many species, both testicles are descended at birth. In dogs, testes normally are descended at ten days of age, but it is difficult to determine at that age since the testes are small. However, both testicles should be in the scrotum by three months of age. As

a rule of thumb, an undescended testicle can be considered permanently retained at six months of age. There are differences of opinion as to whether castration is indicated in young dogs to prevent the development of testicular tumors. Certainly, castration prevents the reproduction of affected individuals.

Preventive Measures—Reminders

CONFINEMENT IN A CLOSED CAR ON A HOT DAY can be deadly. This warning is often ignored. When travelling with a dog, a wire crate is recommended.



ANTIFREEZE is highly toxic but animals seem to be attracted to it. A small amount on the garage floor could be fatal if ingested. Keep containers closed and out-of-reach.

RABIES vaccination now is compulsory in Pennsylvania and other states. A killed vaccine is available. The recommended schedule is vaccination of puppies at three months, re-vaccination in one year, and then a "booster" every three years. Any animals under one year of age vaccinated for the first time should receive a "booster" one year later, then at least every three years.

The increasing frequency of rabies in wild animals (raccoons, skunks, etc.) makes it important to pro-

Project Threshold

The University's Strategic Plan for Computing, published in November, 1983, called for expansion of University support for computing in education, research, and administration. This plan was adopted by the University administration and has provided the guidelines for subsequent developments related to computing in the University.

The President and Provost called upon the International Business Machines Corporation to help us begin implementation of the Plan by providing computer resources to the University. The result of this proposal was THRESHOLD, one of nineteen Advanced Education Projects funded by IBM. Over the past two and a half years, this project has brought nearly six million dollars worth of computing equipment to the University. As indicated by its name, THRESHOLD was intended to bring the University from an environment in which computer use was the exception into one in which computers are widely used for instruction and research.

The following is an overview of how the

THRESHOLD project, now in its third year and nearing completion, has impacted the use of computing, particularly small system computing, in the School of Veterinary Medicine.

Investigators at the School of Veterinary Medicine have been awarded 14 grants through THRESHOLD. Applications in progress include development of a registry of genetic diseases of pedigreed dogs, computerized three-dimensional reconstruction in the teaching of anatomical sciences, development of computerized tutorials of principles of biomechanics to veterinary students, and development of a database on periodontal disease in dogs. Equipment for all of the projects has been received, tested, and set up. There remain some delays due to lack of funding for additional equipment (digitizers, video equipment) and for software development. The thrust of the projects, however, which is to develop innovative microcomputer techniques for teaching veterinary applications and increase student exposure to microcomputers in educational settings, appears to be most successfully met.

At New Bolton Center, the large animal facility in

Kennett Square, several innovative programs are in progress. Dr. David Galligan, lecturer in animal health economics, has developed a nutritional herd monitoring program using spreadsheet software. This program allows a dairy manager to enter milk production parameters and to evaluate the efficiency of milk production. This software is available to students so that they can have experience with the economic and health considerations of herd management. Spreadsheet programs have also been developed by Dr. C. F. Ramberg for nutritional service and teaching applications in dairy and equine nutrition. The programs are currently being used by both students and practicing veterinarians.

In Philadelphia at the Small Animal and Basic Sciences Facility, The Canine Genetic Disease Information System, directed by Dr. Donald Patterson and coordinated by Patricia Green, is intended to provide a comprehensive source of knowledge regarding many aspects of canine genetics. The system will include information on both known and suspected genetic diseases, as well as on the occurrence of these diseases in various dog

fect domestic animals which might come in contact with them.

HEARTWORM DISEASE occurs throughout the United States. Infection may be prevented by daily doses of *Diethylcarbamazine* (DEC). Treatment should be started at the beginning of the mosquito season and continue for several weeks after. In warmer climates, it should be given year round. Have a blood sample checked for microfilaria before starting treatment.

The new drug *Ivermectin*, which is effective when given every thirty days, has not yet been approved by the FDA. It is being tested in tablet form, and very small doses are effective against microfilariae. Some dog owners are using products approved for horses and cattle. It cannot be recommended for dogs until it has passed all tests for safety.

Get It Right!

If Doctor or its abbreviation Dr. is used before a person's name, academic degrees are not given after the surname. Correctly, a name is written as Dr. John Jones or John Jones, V.M.D.

V.M.D. (Veterinariae Medicinac Doctoris) is awarded only by the University of Pennsylvania in the United States. The other schools award a D.V.M. The requirements are much the same for each.

The noun *veterinarian* and the adjective *veterinary* often are used incorrectly. A veterinarian is a graduate of a veterinary school.

To *spay* means to neuter a female animal—the past tense is spayed (not "spaded"). A male is castrated.

Specialists

The American Veterinary Medical Association recognizes fourteen Specialty Boards. After fulfilling prerequisites (advanced training, experience, etc.) and passing an examination, a veterinarian becomes a Diplomate (Board-certified).

The American Board of Veterinary Practitioners has Diplomates in three categories—Companion Animal, Food Animal, and Equine. Their certificate expires in ten years, when a recertification examination is given.

Other Boards are Veterinary Toxicology (the science of poisons—their source, chemical composition, action, tests and antidotes), Laboratory Animal

Medicine, Theriogenology (the study of reproduction in animals), Anesthesiology, Dermatology, Veterinary Internal Medicine (Internal Medicine, Cardiology, and Neurology), Microbiology, Ophthalmology, Veterinary Pathology, Veterinary Preventive Medicine, Veterinary Radiology, Veterinary Surgery, and Zoological Medicine.

The Annual Directory of the American Veterinary Medical Association lists Specialty Boards and Diplomates as well as the prerequisites for examinations.



Book Reviews

The Evans Guide for Housetraining Your Dog by Job Michael Evans (Howell Book House, 230 Park Ave., New York, NY 10169, \$11.95)

This is an excellent book for anyone getting a puppy for the first time. For the more experienced owner, there are new ideas and something to be learned from the author's progressive approach.

Housetraining requires time and hard work, for a time, and this book can be a guide to success. It shows how to do the job so the dog becomes an accepted member of the household.

Some excerpts:

... Problems arise when an individual dog, either through its genetic makeup or mistreating by its owner, comes to think of itself as the leader of the pack.

... Establish eye contact on your own terms ... if you've been yelling at your dog when dealing with a housetraining accident, resolve to stop today. Try using the human equivalent of a bitch's growl.

... You should discipline your dog ... the most you will need, except in chronic cases, is your growling tone of voice and eye contact. Discipline humanely and on a level that the dog can comprehend, because the discipline mimics that of the bitch.

... If you want your puppy or older dog to get housetrained, you simply *must* confine the dog.

... The Umbilical Cord Method: Attach the dog's leash to your belt loop and go about your day. You'll know exactly where your dog is and can more effectively avoid housetraining accidents.

... Schedules are important and it is essential to have one if you want to housetrain effectively.

... What Goes in Comes Out ... Select a good food.

... Housetraining isn't just something that magically happens ... but once it's done, it's done.



The Arabian: A Guide for Owners by Sharon Byford (Alpine Publications, 214 19th St. S.E., Loveland, CO 80537, \$35.00)

This book is a primer for the Arabian horse owner, which covers history, bloodlines, care, breeding, and training. There also is basic information on stable management, health care, grooming, genetics, etc. There is something which should be of interest to anyone who would like to read about horses in general, Arabians in particular.

Some excerpts:

... The Arabian horse is the world's oldest breed. All Thoroughbreds eventually trace to Arabian ancestry.

... The Arabian is characterized by a beautiful, delicate head, often with a "dished" or concave profile below large, prominent eyes; a high-set, arched neck; and a naturally high tail carriage.

... Credit for popularizing the Arabian horse throughout the world belongs to the Crabbet Arabian Stud of Sussex, England.

... A few Arabians were imported to the United States in colonial times.

... The Arabian's affection for people often is attributed to close contact between the desert horses and their Bedouin owners. Foals usually were weaned quite early and were usually dependent upon their owners for care and survival. Bedouin women and children usually raised the young horses, feeding them camel's milk.

... It has been said that they respond more like pet dogs than other breeds of horses.

... The loyalty of the Arabian horse to its owners was legendary in the desert; a celebrated war mare would not leave its fallen rider. Throughout history, the Arabian excelled as a war horse.

... Arabian shows feature a variety of performance classes, such as English Pleasure, Western Pleasure, Reining, Stock Horse, Trail, Pleasure Driving, Formal Driving, Cutting, Side Saddle, Hunter, Jumper, Park Horse, Equitation, and Native Costume.

... Arabian horses will continue to be appreciated for their beauty, intelligence, endurance, spirit, and affectionate nature. It is up to the owners and breeders of today to ensure that the Arabian horse of tomorrow retains the qualities for which it has been valued for thousands of years.

breeds. The database will ultimately offer the opportunity for veterinary students, veterinarians, and breeders to have microcomputer access to current knowledge in the field of canine genetics.*

The goal of Dr. Richard Miselis's project was to implement computerized three-dimensional reconstruction graphics to teach anatomy courses in the Veterinary School. Generally, two-dimensional tissue sections or textbook drawings are used to convey gross structure, microstructure, and ultrastructure in anatomy courses. Dr. Miselis has created a program which inputs this information into the computer and reconstructs an image in three-dimensional perspective, allowing more rapid appreciation and retention of the aspects of the structure being taught. A student database interface is in development. Future goals are to develop this program to aid in interpretation of images obtained from technologies such as CAT, NMR, and PET scans.

The Veterinary Microcomputer Laboratory, directed by Dr. Larry Glickman and coordinated by Linda Domanski, will be used in both teaching and research. The microcomputer laboratory facilitates

the use of programs developed by other THRESHOLD investigators at the Veterinary School. The facility consists of two IBM ATs and four IBM XTs, connected by the IBM PC Network. Currently, the spreadsheet programs developed by Drs. Ramberg and Galligan are available in the microcomputer laboratory and are in use by veterinary students. Other activities include incorporation of clinical decision analysis in the veterinary curriculum, teaching of epidemiologic methods through simulations of epidemics, and providing microcomputer-based statistical software to aid in student research.

THRESHOLD has provided the Veterinary School the capability to develop innovative software focused at a wide variety of veterinary applications and has made microcomputing available to veterinary students.

*The project is supported by funds from the American Kennel Club. It will require three to five years before it is available for general use.

—Linda Domanski

General Alumni Society Trip

The General Alumni Society and the College of General Studies will sponsor an exciting Alumni College Weekend in Charleston, South Carolina, during the Spoleto Festival. This comprehensive arts festival was founded by composer Gian Carlo Menotti in 1977. A full program of sightseeing throughout this charming city will be included, as well as a performance of chamber music; "Footprints" by the Jazz/Tapp Ensemble; "A Road to Mecca," starting and directed by the playwright, Athol Fugard; and the opera "Salome" by Richard Strauss. Dr. Eugene Narmour, associate professor in the music department, will lecture throughout the weekend.

The group will stay at the famous Mills House in Charleston. The dates are May 28-31. For more information, please feel free to call Rhea Mandell at 898-6940.

Rosettes & Ribbons

Dr. Jorge Ferrer, professor of microbiology in Clinical Studies, received a two-year grant from the Robert J. Kleberg, Jr., and Helen C. Kleberg Foundation for "Studies on the control of gene expression in the bovine leukemia virus (BLV) and development of a BLV vaccine."

The School of Veterinary Medicine is supporting the Colloquium on Recognition and Alleviation of Animal Pain and Distress, sponsored by the AVMA on May 15 to 17 in Chicago.

Members of the Bedford County Holstein Association toured New Bolton Center in March.

Recently James D. Shaw, Silver Spring, MD, sent a donation to the Friends of the Small Animal Hospital. In an attached note he informed us that he passed his Boy Scout Badge at the veterinary hospital in 1925.

Dr. Robert J. Orsher (V'79), assistant professor of surgery, received an award from the American College of Veterinary Surgeons for the best clinical research paper by a resident. The paper, "Clinical and surgical parameters in dogs with perineal hernia—analysis of results of internal obturator muscle transposition," was published in 1986 in *The Journal of Veterinary Surgery*.

Dr. Adrian R. Morrison, professor of anatomy, has been awarded a NATO grant for collaborative research at the Institute of Human Physiology, University of Bologna, Italy. Dr. Morrison spoke at a symposium on "Thermoregulation and Sleep" at a meeting of the European Sleep Research Society in Szeged, Hungary, and participated in a workshop on "Cellular Mechanisms of Neural Integration," sponsored by the International Brain Research Organization in Montevideo, Uruguay. Dr. Morrison is a co-organizer and member of the executive board of the recently established Human Clinical Sleep Research Center, which has received initial funding from the Eleanor N. Dana Charitable Trust.

Dr. Sherbyn Ostrich (V'63) was named Veterinarian of the Year by the Pennsylvania Veterinary Medical Association at the association's meeting in October.

Dr. M. Josephine Deubler (V'38) was awarded the Fido Woman of the Year Award during a luncheon following the Westminster Kennel Club show in New York. Dr. Deubler is only the fourth woman to receive this prestigious award for the third time. The award is presented by Gaines Dog Care Center, and nominees are voted for by judges, dog show exhibitors, writers, and other professionals in dogdom.



The School of Veterinary Medicine was a presence at the December 1986 meeting of the American Association of Equine Practitioners. Speakers from the School's faculty comprised 13.5 percent of the number of total speakers at this meeting. The New Bolton Center faculty members giving papers were **Drs. Jill Beech, Thomas Divers, Grant Frazer, William Moyer, David Nunamaker, Virginia B. Reef, Raymond Sweeney, and Robert H. Whitlock.**

Dr. Jill Beech (V'72), associate professor of medicine, was a speaker at the 5th International Conference on Equine Veterinary Medicine at Sao Paulo, Brazil, in December. At the AAEP meeting, Dr. Beech was sessions chairman for the session on respiratory diseases. She has published an original report on "Familial studies of a degenerative disease in the central nervous system in Morgan Horses," which was published in the January 1987 issue of the *American Journal of Veterinary Research*. Dr. Beech also participated and chaired a session at the Second Winrock Workshop for Animal Health Research in January.

Dr. R. Lee Pyle (V'65) has been named associate dean for development, facilities, and information systems at the Virginia-Maryland Regional College of Veterinary Medicine.

Dr. Wilson Haubrich (V'37) was cited at the 1986 Eastern States Exposition as Agricultural Adventurer of the Year. Dr. Haubrich was honored in recognition of his long career and advancement in the field of bovine reproduction.

Dr. Roger Smith (V'57) was elected president of the PVMA. President-elect is **Dr. Kenton Stokes (V'68)**. **Dr. Palace Seitz (V'30)** serves as secretary-treasurer of the organization, and **Dr. Charles Clark (V'61)** serves as assistant secretary treasurer. **Dr. Richard Detwiler (V'48)** was elected alternate delegate to the AVMA.

Dr. Katrin Hinrichs, lecturer in reproduction, presented a talk at the Annual Meeting of the International Embryo Transfer Society in Dublin, Ireland, in January.

Dr. Robert Kenney, professor of animal reproduction, presented a poster at the same meeting. He also presented two talks at the University of Ghent, Belgium.

Dr. David Kronfeld, Elizabeth and William Whitney Clark Professor of Nutrition, presented a series of seminars to the New Zealand Veterinary Association in Auckland, Wellington, and Christchurch, New Zealand, in November.

Dr. Sue McDonnell, post-doctoral trainee in reproduction, presented a seminar at the Equine Symposium in Lexington, KY, in December.

Dr. David Nunamaker (V'68), Jacques Jenny Professor of Orthopedic Surgery, and **Dr. Dean Richardson**, assistant professor of surgery, received a U.S. patent for their external fixation device developed at New Bolton Center.

Dr. Robert Eckroade, associate professor of poultry pathology, has been named as Head of the newly designated Laboratory of Avian Medicine and Pathology.

Dr. Lee Dies

Dr. Donald G. Lee, former professor of anatomy and associate dean of the Veterinary School died on February 16, 1987. A memorial service was held on February 20th in Unionville, Pa.

Dr. Lee graduated from the School in 1936 and joined the faculty as instructor in anatomy in 1937. He immediately assumed a heavy teaching load in gross anatomy and histology and continued this until the 1960s when the Laboratory of Anatomy expanded. Dr. Lee became professor in 1951, and in 1957 he received a joint appointment as professor in the Graduate School of Medicine. He was appointed associate dean in 1962 and served in this capacity until 1973. During these years, he was heavily involved in curriculum matters, and he spent considerable time in student counseling.

In addition to his teaching and administrative duties, Dr. Lee served on many faculty committees, especially the Library Committee and the Admissions Committee. He served as Secretary of the Faculty Forum from 1944 to 1962.

In 1960, Dr. Lee spent one year at the Veterinary School, University of Bristol, England. In 1977, he spent six months at Ben Gurion University of the Negev, Israel.

Dr. Lee was a member of the American Association of Anatomists, American Association of Veterinary Anatomists, World Association of Veterinary Anatomists, and the Phi Zeta Honorary Fraternity. He received the Lindback Award for Distinguished Teaching from the University of Pennsylvania and the Distinguished Veterinarian Award from the Pennsylvania Veterinary Medical Association.

Dr. Lee retired in 1979 and became Emeritus Professor of Anatomy. In retirement he continued to have a keen interest in the affairs of the School.

Dr. Lee was revered by students. He was an excellent teacher whose lectures were always well-prepared. He spent innumerable hours in dealing with student affairs. He was a quiet, extremely courteous individual who exhibited uncommon good judgment in dealing with difficult problems.

—John E. Martin, V.M.D.

Mrs. Samuel F. Scheidy

Mrs. Samuel F. (Henrietta) Scheidy died on February 19, 1987. Mrs. Scheidy, wife of the late Dr. Scheidy, was active in a number of societies related to the veterinary profession, especially the auxiliary of the Pennsylvania Veterinary Medical Association (PVMA). She played a leading role in the establishment of the PVMA Auxiliary Student Loan Fund, which has been used to help many students at Penn finance their veterinary medical education. She was also vitally involved in the Auxiliary of the American Veterinary Medical Association (AVMA) and had a special interest in the student chapter of the AVMA (SCAVMA) at this school. A plaque honoring Mrs. Scheidy and dedicated by the PVMA Auxiliary was placed last year in the student lounge at VHUP.

—John E. Martin, V.M.D.

Grants from the Research Foundation of the University of Pennsylvania were received by Dr. Peter Dodson, associate professor of anatomy; Dr. Steven J. Fluharty, assistant professor of anatomy; and Dr. Richard R. Miselis (V'73), associate professor of anatomy.

Dr. Colin Johnstone, associate professor of parasitology in epidemiology and health economics, has been named director of the Center for Animal Health and Productivity at the School. Dr. Johnstone was also reappointed as a member of the Pennsylvania Race Horse Testing Program.

Dr. Stephen P. Schiffer, assistant professor of laboratory animal medicine, has been reappointed to serve on the Institutional Animal Care and Use Committee. Dr. David K. Detweiler (V'42) also accepted a reappointment to that committee.

Dr. Linda DeChambeau (V'80) received the "Good Doctor Award" from the Maryland Veterinary Medical Association in November. This newly created award, given for samaritan service to the animal community, was presented to Dr. DeChambeau at the annual meeting of the association. Dr. DeChambeau is the first recipient of the award.

Dr. Daniel Cohen, visiting professor of epidemiology, has been re-appointed to serve his 12th year on the Expert Panel in Veterinary Public Health of the World Health Organization.

Dr. Loren Evans, professor of surgery, presented a two-day seminar to the Argentine Equine Practitioners Association in Buenos Aires in December. Dr. Evans also presented three papers at the Eastern States Veterinary Meeting in January in Orlando, FL.

Dr. Robert Whitlock, Marilyn M. Simpson Professor in Equine Medicine, and chairman, Department of Clinical Studies (NBC), presented a paper, "Potomac Horse Fever: Diagnosis and Treatment," at the United States Animal Health Association in Louisville, KY, in October.

Dr. Debbie Wilson, lecturer in anesthesia, presented an abstract at the ACVA meeting in Las Vegas, Nevada. She also became certified for advanced cardiac life support (ACLS).

Dr. Ellen L. Ziemer has been named acting director of the Clinical Laboratory at New Bolton Center through July 31, 1987.

Dr. Raymond Zemjanis, professor and Head of the Division of Large Animal Clinical Services, College of Veterinary Medicine, University of Minnesota, St. Paul, MN, has recently accepted a position of visiting professor of theriogenology in the Department of Clinical Studies, New Bolton Center, for the period of one year, January 1 through December 31, 1987.

Max A. Van Buskirk (V'56) has been elected second vice-president of the United States Animal Health Association. John C. Shook (V'48) became the new secretary of the organization.

Among the newly elected AAEP officers and executive board members are David A. Meirs (V'54), Gary A. Lavin (V'62), and Clyde J. Johnson (V'62).

Dr. Colin E. Harvey, professor of surgery at the School and adjunct professor of surgery, School of Dentistry, was enrolled as a Charter Fellow of the Academy of Veterinary Dentistry following completion of the first credentials and examination process of the Academy. He also was elected secretary-treasurer of the organization.

Dr. Harvey presided at the inaugural meeting of the International Veterinary Ear, Nose, and Throat Association (IVENTA) in Paris, France, in December 1986. The organization was founded by Drs. Harvey and Venker-van Haagen (of the University of Utrecht, The Netherlands). A second meeting of IVENTA is scheduled to be held during the Eastern States Veterinary Meeting in Orlando, Florida, in January 1988.

In April 1987, Dr. Harvey will present the first BSAVA Memorial Lecture, on the subject of Ear Surgery, during the British Small Animal Veterinary Association Congress in London. He will also lecture on veterinary dentistry at the French and Dutch small animal veterinary association meetings in 1987.

In February 1987, Dr. Harvey was guest of the Japanese Animal Hospital Association, presenting seminars and wet-labs on veterinary dentistry in Tokyo, Osaka, Fukuoka, Yatsushiro, and Kawasaki.

From September 1987 to August 1988, Dr. Harvey will be on scholarly leave at the University of Liverpool as a Visiting Professor jointly in the Veterinary and Dental Schools, conducting collaborative studies on spontaneous periodontal diseases of dogs and cats. Because of this commitment, he recently resigned after 5 years as editor of *Veterinary Surgery*, the journal of the American College of Veterinary Surgeons.

Dr. Leslie G. Herr (V'86) has been appointed as a veterinary medical officer by the Food Safety and Inspection Service of the United States Department of Agriculture. Dr. Herr will work with the meat and poultry inspection program, and she will be based in Minneapolis.

Dr. Donald Brown has been appointed lecturer in cardiology during Dr. Knight's scholarly leave.

Dr. Harry Rozmiarek has been appointed professor of laboratory animal medicine in the Department of Clinical Studies, Philadelphia. He is Chief, Section of Laboratory Animal Medicine, and the director of University Laboratory Animal Resources.

Dr. James S. Wilson, a veterinarian and a lawyer, has been appointed lecturer. He will be teaching the practice management and professional foundations courses.

Dr. Jonathan E. Palmer (V'77), assistant professor of medicine, has been appointed associate director of the Unit of Laboratory Animal Resources at New Bolton Center. Dr. Palmer received continued funding from the American Quarter Horse Association for research on Potomac Fever. He also presented seminars at the Equine Symposium in Pittsburgh, the ACVIM and the PVMA meetings.

Dr. Virginia Reef, assistant professor of medicine, was a visiting lecturer in ultrasonography in Sweden and the Netherlands in October and November. She received a grant from the American Horse Show Association for a study on "Diagnostic ultrasound for tendon and ligament injury in the distal extremities of performance horses." She also received a grant from Cardio-Data Systems to study "24-hour continuous EKG monitoring in the horse."

Dr. Corinne Sweeney, assistant professor of medicine, participated in the First International Workshop on *Rhodococcus equi* in Ontario, Canada. Dr. Sweeney received a grant from Transpiration Technologies, Inc. for research on equine exercise induced pulmonary hemorrhage.

Dr. Raymond W. Sweeney (V'82) received funding from Travenol Laboratories to study the nutritional management of horses and calves with gastrointestinal disorders. He also received a Merck Animal Health Education grant.

Dr. Wendy Vaala (V'80), director of the neonatal intensive care unit, has developed a program for veterinary students, nurses, and medicine staff in equine neonatology. She received a grant from AgriTech, Inc. to study "Testing for failure of passive transfer in the horse."

Dr. Alan Beck, adjunct associate professor of animal ecology, has been appointed to the board of directors of the Pennsylvania SPCA.

Dr. Robert J. Rutman, professor of biochemistry, was the general chairperson of the International Pan African Nutrition Conference held in November in Philadelphia. Dr. Rutman was invited to participate in the International Symposium on Science, Technology and Development in New Delhi, India, in March.

Dr. Michael I. Kotlikoff, assistant professor of pharmacology, received a grant of \$35,000 from the American Lung Association and a grant of \$105,000 from the National Institutes of Health to study "Ion channels in airway smooth muscle."

Scholarships

Hill's Pet Products, Inc. has provided four scholarships in the amount of \$1,000 each. The recipients are Anne Crump, a first-year student; Dorothy Hayes, a second-year student; Thomas Hufnagel, a third-year student; and Diane Sot, a fourth-year student.

Barbara Gregory, a fourth-year student, is the recipient of a \$1,000 scholarship awarded by The Lloyd's Underwriters, Lloyd's Brokers and Kentucky Agents Joint Equine Research and Education Program Committee.

The Greater Philadelphia Dog Fanciers Association, Inc. made a contribution to the School's scholarship fund.

Edward Chroscinski, a third-year student, is the recipient of the \$895 scholarship awarded by the Mid-Susquehanna Kennel Club. The Union County

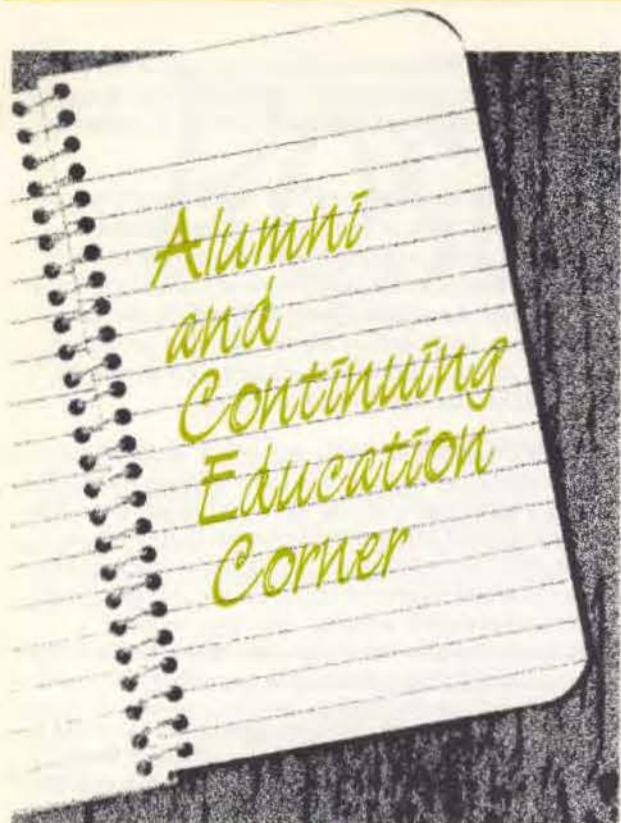
Kennel Club awarded a \$500 scholarship to Nancy Hallam, a junior.

A \$1,000 contribution to the student scholarship fund has been made by the New Jersey Sports and Exposition Authority in memory of Dr. John F. Nugent (V'50).

Jacqueline Burke, a senior student, received the Dr. Samuel F. Scheidy Memorial Scholarship from the Pennsylvania Veterinary Foundation. The Dr. Samuel B. Guss Memorial Scholarship, made available by the same organization, was awarded to Susan Colbassani, also a senior student.



Dean Robert Marshak presented the scholarship checks to Susan Colbassani (l) and Jacqueline Burke (r).



The Class of 1937— A Spectacular 50th Reunion

THE NEED: Renovation of several rooms in the Small Animal Hospital to provide overnight accommodations for visiting faculty and a showcase for antique veterinary books and instruments.

THE RESPONSE: \$22,000 raised in four months by 22 members of the Class of 1937.

THE RESULT: THE CLASS OF 1937 ALUMNI ROOM.

Two furnished bedrooms, a kitchen, and shared bath allowing visiting faculty an attractive apartment.

A hand-made display cabinet has been specially designed to provide space for a rotating exhibit of antique veterinary books and instruments.

The Dean, Faculty, and Students gratefully acknowledge the support of the members of the Class of 1937 whose generosity made the room possible. Special thanks to Dr. Harry F. B. Bartolett, Dr. David Crisman, and Dr. Sydney Rosenberg for organizing this effort.

1987 Penn Annual Conference

THANK YOU TO THE 650 VETERINARIANS ATTENDING THE SCHOOL'S 87th PENN ANNUAL CONFERENCE! The support of our alumni this year was overwhelming.

Drs. Tom Divers and Chuck Newton are already at work on our 1988 Conference, to be held on Wednesday, January 27, and Thursday, January 28, 1988, at the Adam's Mark Hotel. We look forward to seeing you next year.



Thank You

During the past 14 months many clubs have provided generous financial support to the School and to VHUP. These funds have enabled us to purchase much needed equipment, provide financial aid to our students, study specific diseases, and help many of our small animal patients.

We thank the following clubs:

Airedale Terrier Club of Greater Philadelphia.
Allentown Dog Training Club, PA.
Altoona Kennel Association, PA.
American Boxer Club.
American Fox Terrier Club.
American Sealyham Terrier Club.
American Shi Tzu Club.
Back Mountain Kennel Club, PA.
Berks County Kennel Club, PA.
Black Diamond Cat Club.
Bucks County Kennel Club, PA.
Burlington County Kennel Club, NJ.
Capitol Dog Training Club, DC.
Carroll Kennel Club, MD.
Catoctin Kennel Club.
Centennial Shetland Sheepdog Club.
Chesapeake Cat Club.
Chester Valley Kennel Club, PA.

Collie Club of America.
Delaware Valley Yorkshire Terrier Club.
Devon Dog Show Association, PA.
Dog Owners Training Club of Maryland.
Eastern Irish Setter Association.
Elm City Kennel Club, CT.
Finicky Feline Society.
Great Dane Club of America.
Greater Philadelphia Dog Fanciers Association.
Green Mountain Dog Club, VT.
Harrisburg Kennel Club, PA.
Irish Setter Club of America.
Jack Russell Terrier Club of America.
Kanasaga Kennel Club, NY.
Kennel Club of Philadelphia.
Lancaster Kennel Club, PA.
Laurel Highlands Kennel Club, PA.
Lehigh Valley Kennel Club, PA.
Luzerne Dog Training Club, PA.
Mahoning Shenago Kennel Club, OH.
Mantatee Kennel Club, FL.
Meadowbrook Cocker Spaniel Club, CT.
Mid-Jersey Labrador Retriever Club.
Mid-Susquehanna Valley Kennel Club, PA.
Monmouth County Kennel Club, NJ.
Montgomery County Kennel Club, PA.
Monticello New York Kennel Club.
Mountain State Cat Club.
National Capital Kennel Club, DC.

New Brunswick Kennel Club, NJ.
New Pen Del Newfoundland Club.
Owner Handlers Association of America.
Palisades Kennel Club, NJ.
Penn Ridge Kennel Club, PA.
Penn Treaty Kennel Club, PA.
Plainfield Kennel Club, NJ.
Philadelphia Dog Training Club.
Pocono Mountain Kennel Club, PA.
Potomac Cat Enthusiasts.
Raritan Valley Australian Terrier Club, NJ.
Rock Creek Kennel Club, MD.
Rockland County Kennel Club, NY.
Royal Palm Cat Fanciers, FL.
Sand and Sea Kennel Club, NJ.
Sara Bay Kennel Club, FL.
Schooleys Mountain Kennel Club, NJ.
Shenandoah Valley Kennel Club, VA.
Shetland Sheepdog Club of British Columbia.
Somerset County Dog Obedience Club, NJ.
Suburban Dog Training Club of Eastern Montgomery County, PA.
Tri-State Oriental.
Upper Marlboro Kennel Club, MD.
Valley Forge Kennel Club, PA.
Watchung Mountain Poodle Club, NJ.
Westminster Kennel Foundation, NY.
William Penn Poodle Club, PA.
Wilmington Kennel Club, DE.



A. J. Buck and Son, Inc., 1987 PAC Patron



Peterson Imaging, Inc., 1987 PAC Patron



E. I. DuPont Nemours and Co., 1987 PAC Patron

Dr. Charles D. Newton presented certificates of appreciation to Patrons of the Penn Annual Conference.

Alumni Day—1987

SATURDAY, MAY 16, 1987—NEW BOLTON CENTER, KENNETT SQUARE, PA

No driving necessary—transportation to all tours available

Excitement

Winterthur Tour

Beer on Tap

Obviously—you can't help but have a great time!

Longwood Gardens Tours

Tour of New Bolton Center

Opportunities to see the improvements made at the large animal campus

Nice surroundings

Comradery

Eat—Buffet Luncheon

Nature at its best

Talk with your classmates, Dean Marshak, and Faculty Members

Entertainment

Relax and have a great day

SATURDAY, MAY 16, 1987

11:00 A.M. Annual Meeting

12:00 Noon Buffet Luncheon

2:00 P.M. Tours of New Bolton Center, Winterthur Museum, or Longwood Gardens (transportation provided)

6:30 P.M. Veterinary Alumni Reception and Dinner Dance at the Radisson Hotel, Wilmington, Delaware

If you haven't received your invitation yet, please call the Veterinary Alumni Office at (215) 898-4234.

COME ONE—COME ALL TO OUR ALUMNI DAY FESTIVITIES WHETHER YOU'RE CELEBRATING YOUR 5th OR YOUR 50th REUNION; OR JUST COME OUT FOR THE FUN OF IT!!

1987 Continuing Education Courses

The following full-day continuing education seminar is scheduled for the Spring:

WEDNESDAY, JUNE 3, 1987

Small Animal Skeletal Radiology

Dr. Darryl Biery, Professor of Radiology and Chairman, Department of Clinical Studies—Philadelphia

Dr. Sydney Evans, Assistant Professor of Radiology

Dr. Mark Saunders, Lecturer in Radiology

Dr. Jeffrey Wortman, Assistant Professor of Radiology

This program will be a comprehensive lecture/workshop on small animal skeletal radiology. There will be approximately a one-hour lecture followed by a two-hour workshop in both the morning and afternoon sessions. The lectures will emphasize the principles of radiographic interpretation of the spine, skull, appendicular skeleton, and joints. The workshop will be handled as a laboratory with teams of two to three people assigned to a viewbox with the Radiology faculty circulating to assist in radiographic interpretation of selected auto-tutorial cases.

THIS COURSE IS LIMITED TO 30 PARTICIPANTS.

This course qualifies for eight hours of Continuing Education Credit.

Registration Information:

FEE: \$125.00 (Includes Lunch)

PLACE: University of Pennsylvania, School of Veterinary Medicine, Small Animal Hospital, 3850 Spruce Street, Philadelphia, PA. Free parking is available at the School.

TIME: Registration from 8:00 A.M.-9:00 A.M. Course begins promptly at 9:00 A.M. and ends at 5:00 P.M.

FOR FURTHER INFORMATION CONTACT: Ashra Markowitz, Office of Veterinary Continuing Education—(215) 898-1882.

Gifts, Subscriptions, and Bequests

The Development Office reports that gifts, subscriptions, and bequests to the Second Century Fund campaign total \$27,370,008 as of February 6, 1987.

In the last three months, the School has received a grant of \$100,000 from the Marilyn M. Simpson Charitable Trusts for the Center for the Interaction of Animals and Society; a three-year, \$158,000 grant from the Jessie B. Cox Charitable Trust to support a senior faculty position in molecular genetics; and \$160,000 over two years from the Robert J. Kleberg, Jr., and Helen C. Kleberg Foundation to support studies on the control of gene expression in the bovine leukemia virus (BLV) and the development of a BLV vaccine.

To date, gifts and subscriptions for the construction of the Comparative Orthopedic Biomechanics Laboratory at New Bolton Center total \$100,000 toward an estimated construction cost of \$400,000.

Another \$200,000 must be in hand by June 30, 1987, to complete all final phases of the Connelly Intensive Care/Neo-Natal Unit now being built at New Bolton Center. Contributions for this major addition to the Widener Hospital complex are just shy of \$2 million.



Farm Show

State Senator Noah Wenger, stopping by at the School's booth at the Pennsylvania Farm Show, is greeted by Dr. Phillip R. Hunt (V'82), resident in reproduction, while Dr. William Asbury, intern in medicine and surgery, looks on.

Bellwether 20

Spring 1987

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Calendar

- May 16 Alumni Day, New Bolton Center
- May 18 Commencement
- June 3 Small Animal Skeletal Radiology, VHUP
Continuing Education Course



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