4-1-1983

Bellwether 7, Spring 1983

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Transgenic Mice

Two mice were the stars of a press briefing in December 1982. One looked like any other laboratory mouse and the other was almost twice as big. Though they were siblings, the big one carried genetic material from another species. It had genes for rat growth hormone. The birth of this mouse and six others marked the first time that scientists had succeeded in making DNA from one mammalian species function and be expressed in another mammal in such a dramatic manner.

These mice were the culmination of several years of research by Ralph L. Brinster, V.M.D., Ph.D., Richard King Mellon Professor of Reproductive Physiology, School of Veterinary Medicine, University of Pennsylvania, a principal investigator in these studies which were supported by grants from the National Science Foundation and the National Institutes of Health. The co-investigators were Dr. Richard P. Palmiter, Howard Hughes Medical Institute, University of Washington, Seattle; Michael G. Rosenfeld, University of California, San Diego; Neal C. Birnberg and Ronald M. Evans, Salk Institute for Biological Studies, La Jolla, California; Robert E. Hammer and Myrna E. Trumbauer, Laboratory of Physiology, School of Veterinary Medicine, University of Pennsylvania.

Dr. Brinster and his colleagues have been conducting basic research to study gene regulation and the genetic basis of development. In their experiments they introduced foreign

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Transgenic Mice

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genes into mammalian embryos at the earliest stage of gestation. The technique utilized was gene-splicing where DNA from one species was attached to the mouse metallathionein (MT) gene and then micro-injected into fertilized mouse eggs which were implanted into foster mother mice.

The MT gene enables the body to bind heavy metals and have resistance to these substances. It is present in most tissues and most prominently found in the liver. The gene is activated when the organism ingests heavy metals, then messenger RNA is produced which enables the cells to bind heavy metals. In earlier experiments Dr. Brinster, et al., had fused the mouse MT gene with a virus gene to measure specific viral enzymatic activity in the cell. The altered genes were micro-injected into fertilized mouse eggs which were implanted into female mice. Some of the offspring showed the enzyme activity, generated by the virus gene, when they were given heavy metals. This experiment helped the researchers to identify the sequence responsible for heavy metal inducibility on the mouse MT gene. It was this sequence that was attached to the rat growth hormone gene.

In the latest experiment Dr. Brinster and his colleagues modified the rat growth hormone gene by removing its regulatory sequences and replacing these with the regulating part of the mouse MT gene. The section of the MT gene used was the sequence which contains the MT promoter that helps control expression of the gene in the cells of the organism. The altered gene was cloned, and the new gene was placed into fertilized mouse eggs by micro-injection. The researchers modified 170 eggs and these were implanted into foster mother mice.

Some gave birth and twenty-one offspring resulted. Tests showed that seven of these had inherited the altered gene. After weaning, these mice were fed a regular diet and small quantities of zinc, a heavy metal, were added to their water to activate the altered gene. Six of the mice showed an accelerated growth rate prior to the addition of zinc to their diet. One of these was removed from the zinc supplement after two weeks and continued to grow faster than normal.

Studies on the mice found that growth hormone was produced in the liver and other tissues. Normally this hormone is produced in the pituitary gland. Some of the mice had up to 800 times more growth hormone than normally expected in mouse blood. It appears that the overproduction is due to a lack of feedback, a mechanism which regulates the production of the hormone when it is produced by the pituitary gland. It was found that mice with the greatest amount of growth hormone had the largest quantity of the altered gene in their tissues. The experiment was carried further. Mice possessing the altered gene were mated to normal mice and of the nineteen offspring, ten carried the gene. The offspring with the new gene also grew larger than normal.

These mice demonstrate for the first time that genes can be transplanted from one mammalian species to another and can be expressed phenotypically in such a manner as to affect basic metabolic function. This has great implications for research. These mice can serve as a model to study gigantism, a human genetic disease. It was found that the amount of growth hormone produced by the mice far exceeded the amount which can be produced by conventional methods. Thus the technique of fusing the MT gene to other genes controlling protein production in mammals may lead to "genetic farming" where such altered genes are utilized to produce protein substances such as blood clotting factors used for hemophilia.

The use of growth hormone may also have agricultural application; perhaps one day it may be possible to alter the growth pattern of animals produced for food so they can reach the market in a shorter time. The fusion technique may also be utilized in development of cows with greater capabilities of milk production.
Rabies on the Rise

The number of reported rabies cases in Pennsylvania, Maryland and Virginia has risen dramatically during the last two years. In 1981, Virginia reported 102 cases of raccoon rabies as compared to seven cases in 1980. By November there were seventy confirmed cases of rabies in Pennsylvania in 1982. These included not only wildlife, but also four dogs and one cow.

"The risk to humans has been increased by the spillover of rabies into domestic animals," said Dr. Lawrence T. Glickman, Chief, Section of Epidemiology, School of Veterinary Medicine, University of Pennsylvania. "In November 1982 a dairy cow from Lancaster County was admitted to the Large Animal Hospital at New Bolton Center. The animal had to be euthanized after four days and was found to have rabies. Veterinarians, veterinary and laboratory technicians, students and nurses, had to undergo rabies post-exposure prophylaxis. This included thirty-two people in all at New Bolton Center and six additional people who had come into contact with the cow on the farm and during transport to New Bolton Center. The entire herd from which the cow originated was placed under a ninety-day quarantine."

This incident illustrates the need for veterinarians to suspect the possibility of rabies in animals showing neurologic signs or abnormal behavior. Dr. Glickman recommends that veterinarians, veterinary personnel, and wildlife personnel receive a three-dose pre-exposure rabies prophylaxis regimen. "A new killed vaccine is available," he explained. "Unlike the earlier vaccine which was developed from duck embryos and which could have severe side effects, the new vaccine is produced on human diploid cells, and was developed by the Merieux Institute of Miami, Florida, and side effects are uncommon." The vaccine is usually given as 1.0ml intramuscularly, though studies have shown that it is just as effective when given in smaller doses (0.1ml) intradermally for prophylaxis. Dr. Glickman explained that the latter course is followed here at the school where vaccination is offered to all students. "The vaccine, once reconstituted, has to be used within three hours," he said. "It is not packaged for intradermal injection; therefore, when using this technique, one needs a group of people to take advantage of the savings. A 1.0ml intramuscular dose costs about $45 whereas a 0.1ml does costs about $9 if you get seven or eight people together. This is why we use this technique; it makes the vaccine affordable to our students." Dr. Glickman did point out that the intradermal technique has not yet been approved by the FDA. However, the Immunization Practices Committee has accepted the ID regimen for pre-exposure vaccinations. All students who want to work with the Wildlife Service at the school must be vaccinated against rabies.

He also added that pet owners should be advised to have their dogs and cats vaccinated against rabies. "They provide a buffer between wildlife and the human population," he said. "They are more likely to come into contact with rabid wildlife and if they are not vaccinated, they can transmit the virus to people." He also added that pet owners should be advised to have their dogs and cats vaccinated against rabies. "They provide a buffer between wildlife and the human population," he said. "They are more likely to come into contact with rabid wildlife and if they are not vaccinated, they can transmit the virus to people."

He added that people should purchase or take in wild animals as pets. "This can be quite dangerous because in some animals the incubation period for rabies is long, particularly in skunks. It is best to leave wildlife alone. If one must handle wildlife, it should be done with great care."

Rabies is invariably a fatal disease and if a person has been bitten or has come in contact with an animal suspected of having rabies, it is imperative that medical help be sought at once. "The virus has a varying incubation time; it may take as little as three weeks to manifest itself, or as long as six to nine months," he said. "Each year about 30,000 persons in the United States receive post-exposure treatment for possible rabies exposure. This is quite expensive; it may cost between $500 to $700 to treat one individual."

One European country is experimenting with an oral vaccine for foxes, which are their major reservoir for rabies. No large-scale program is being tried for wildlife here in the United States.

The current epidemic of raccoon rabies, which began in the 1970s in Florida, will probably continue its march up the eastern seaboard. The only way of preventing the disease from reaching the human population is to have all cats and dogs vaccinated regularly and to avoid contact with wildlife. Veterinarians and other persons coming into contact with animals should consider pre-exposure vaccinations. Exposure to a rabid animal can affect quite a number of people as shown by the dairy cow at New Bolton Center and can be devastating psychologically. In the case of raccoons, prevention through vaccination is a lot wiser and cheaper than post-exposure treatment.
Each year the agriculture industry suffers heavy losses from calf diarrhea, a common disease of young calves. "It is a major loss to the cattle industry during the first year of life of cattle," explained Robert H. Whitlock, D.V.M., Ph.D., Chief of Medical Services at the Large Animal Hospital of the School of Veterinary Medicine, University of Pennsylvania, at New Bolton Center. "Approximately forty-eight to fifty million calves are born each year, according to USDA statistics. The average mortality per year is 3.5 million calves and the average annual loss exceeds $100 million."

Researchers found that calves are born with little maternal antibody protection. In order to obtain protection, calves must nurse within a few hours of birth to receive colostrum from the dam. It was found that calves can only absorb antibodies during this brief time span (first twenty-four hours of life), and that absorption is at its optimum during the first two hours of life. Thereafter the percentage of antibody absorption steadily declines. Between 15 and 40 percent of the calves born fail to absorb sufficient antibodies. Some animals are unable to absorb the antibodies; others are rejected by their dams. This often occurs with first calf heifers. In other cases the dam may have mastitis, or its udder is so full that the dairyman has to milk the cow, drawing out the colostrum, and in some cases the calf is too weak to suckle properly. Efficiency of colostrum absorption was found to be seasonal. During the winter months it is not as well absorbed as during other times of the year. It was also found that maternal behavior of the dam, such as licking and nudging her calf, increases absorption of colostrum.

Calves without sufficient antibody protection are prime candidates for calf diarrhea. "It can be caused by a number of different agents, though the most common one is E. coli, a bacteria which is abundant in the environment. The E. coli strain causing the disease in calves produces K99, an antigen that allows the bacteria to adhere to the intestinal lining. Dr. Whitlock noted that a calf with diarrhea can lose between three and five pounds of body weight per day and that this can be life threatening in a very short time. The average birth weight of a newborn calf is between ninety and 120 pounds. Dr. Whitlock emphasized the importance of continuing to feed calves milk after they have been taken from the dam. "We found that whole milk rather than milk replacer is better and more economical," he said. "Milk may contain antibodies against E. coli and these prevent adherence of the bacteria to the intestine. They may provide a protective antibody coating K99 cannot penetrate. Milk also provides antibodies against other disease causing agents." Calf raising practices have undergone significant changes during the last few years. "Calves are now left with the dam only for the first twenty-four to forty-eight hours and then are placed in individual hutches rather than being raised in an inside calf pen. This is the most important advance made in recent years. The hutch isolation effectively prevents the spread of calf diarrhea to other neonatal calves and cuts down on the economic losses to the farmer."

Dr. Whitlock and his colleagues at New Bolton Center are conducting research about the causes of calf diarrhea. "It can be caused by a number of different agents, though the most common one is E. coli, a bacteria which is abundant in the environment." The E. coli strain causing the disease in calves produces K99, an antigen that allows the bacteria to adhere to the intestinal lining.

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ium, cryptosporidia, campylobacter, salmonella and others. In order to determine which organism is implicated in the disease, the veterinarian needs to do laboratory examinations and sometimes more sophisticated tests are necessary to determine the course of treatment for the individual calf. While E. coli alters the function of the intestinal cells, a virus like the coronavirus destroys a portion of the lining. In both cases the calf improves only after the altered or damaged cells have been replaced by healthy ones. During the course of the disease all that can be done is to offer supportive treatment.

Dr. Whitlock explained that many dairymen treat their cattle with antibiotics at the first sign of trouble. "Antibiotics are of no value in viral diarrhea and of questionable value in bacterial diarrhea," he said. "They are given primarily to prevent septicaemia." He explained that antibiotics kill certain bacteria in the calf but do not affect those fluid secreting cells which are the reason the calf has diarrhea. Antibiotics may prevent the adherence of additional bacteria as new cell growth takes place and contaminated cells are eliminated from the body. "But we see resistance to antibiotics due to indiscriminate and improper use of these drugs and we find many organisms which are resistant to commonly used antibiotics." To reverse such a trend in a herd can be very costly. "We restrict the use of antibiotics in the meantime the dairyman may lose some healthy ones. During the course of the disease all that can be done is to offer supportive treatment.

A student working on a research project about malnutrition needs to know whether such cases were seen at VHUP during the last year. This may appear to be a task involving a lot of record searching, and in previous years this would have been true. Then all diagnoses were recorded on Termatrix cards, a coding system punched on cards. To obtain information the researcher had to examine many cards to find the relevant patient files.

Now the researcher contacts Rosanne Hinrichs, director of medical records at VHUP. She, together with her staff of three, instituted a computerized medical records system at the hospital. All it takes is to pose the question to the computer and in minutes a printout listing all the cases, the specie, and the discharge status appears. It shows that the cases of malnutrition seen at VHUP during the last year occurred primarily in exotic animals. Armed with the case numbers the investigator can do further research and examine each patient file.

Four years ago, when Mrs. Hinrichs, an Accredited Records Technician, came to VHUP from the Department of Onpatient Medicine at HUP, medical records was a complicated system where records and cross references were kept in different places. "We found that the old system, where a new case number was assigned to the patient each time it was admitted, could not handle the growing case load," she explained.

The new system is patterned after the medical records system used in human hospitals. Each animal is assigned a six-digit number which is used for all subsequent visits and the records are kept together under this number. "This provides continuity of care, it considers the animal as an entity and makes it easier for faculty and researchers to obtain information," Mrs. Hinrichs said.

The computer program which replaced the key punching and much of the manual record keeping was developed and written by George C. Farnbach, V.M.D., Ph.D., assistant professor of medicine. It was designed to meet not only the record keeping needs of the hospital but also the research and teaching requirements. The program, which is not a particularly large one, allows for storage of information on 800 diseases and disorders, each coded with a number.

It is not in its final form. "We get input from the staff," Mrs. Hinrichs said. "We continually ask what is needed in terms of information, and we upgrade the system as the needs are discovered."

The system permits many uses, such as determining the number of cases of fracture, infection, viral diseases, and the like. It can be helpful in determining whether an outbreak of a disease is occurring in an area, or in a particular specie.

To ensure that all the required data reach the computer, a two-step procedure has been instituted. When an animal is admitted, information such as species, sex, age, owner's name, and so on, is recorded on the admission form and a plastic imprint card with the patient number is prepared. This initial information is fed into the computer when the record comes to medical records after the visit. The record, which also contains information about the illness, general condition of the animal, treatment, laboratory tests, and other findings, is not filed until it is completed by the clinician in charge who records the diagnosis and the discharge status. Then the record is coded, the diagnosis and discharge information are added to the computer records, and the file is placed in storage. Under this system files can be located quickly. Currently there are 60,000 files in the medical records office on the second floor and each year about 18,000 are added. Mrs. Hinrichs explained that the computer records are up-to-date, enabling researchers at the school to obtain current information on the nature of cases seen.

Medical records is responsible for having available the records of animals that come in for repeat visits. Such records are pulled the day prior to the visit when the medical records office receives the appointment schedule. In emergency cases, when an animal comes in during the night, records can be pulled because the emergency service has access to them. Incomplete records, where the final diagnosis has not been recorded, are kept track of through a card system. Clinicians are reminded periodically to complete a record so it can be coded and filed. "We get good cooperation from the staff. They know that records can be located quickly and that they are available to them," Mrs. Hinrichs said. "Under the old system they often kept the records in their offices and it was very difficult to locate specific files."

"Medical records is a supportive service. The hospital is here to heal. We make it easier by having the data available when needed. We are a clearing house for information."

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**Medical Records, A Supportive Service**
A new puppy is brought home and a few days later it is taken to the veterinarian for vaccinations and an examination. The visit includes a worm check and the diagnosis is roundworm. The owner is sent home with medication and instructions to worm the puppy twice. Roundworm is a common parasite in young puppies and most people regard it as a harmless nuisance, a puppy affliction one doesn’t have to worry about.

But one should worry, insists Lawrence T. Glickman, V.M.D., Dr.P.H., Associate Professor of Epidemiology and Public Health at the School of Veterinary Medicine, University of Pennsylvania. “Roundworm larvae, when ingested by humans, can cause serious disease and, in rare instances, death. Toxocara canis, and, to some extent, Toxocara cati (cat roundworm) are a public health problem in this country and all over the world. Soil samples taken from parks and playgrounds in different areas of the United States and Canada show that one third of the sampled areas were contaminated with Toxocara canis eggs.”

Dr. Glickman has devoted considerable time to the study of diseases caused by roundworm larvae, and with two other researchers he developed an enzyme-linked immunosorbent assay (ELISA) to detect the presence of larva infection in people. The test has been available since 1975 and it has been used here at the Veterinary School, and at the Centers for Disease Control, Atlanta, to make a definite diagnosis of visceral larva migrans (VLM) or ocular larva migrans (OLM), two diseases in humans caused by Toxocara larvae.

Toxocara —a public health threat

Toxocara canis, a common parasite in young puppies, is a public health threat. Scientists first speculated in 1921 that Toxocara from non-human hosts might be implicated in human disease. This notion was confirmed in the 1950s when Toxocara larvae were found in tissues from eyes, brains and livers of children during biopsies and autopsies. The disease was named VLM and OLM, depending on where the larvae occurred. It is not widespread but it can cause serious illness and in some cases death. Almost all the VLM cases have been reported in children between the ages of one to six years; the OLM patients tend to be children in the age group six to thirteen years.

OLM and VLM have different clinical manifestations. Both are caused by the ingestion of Toxocara larvae. Most of the children with VLM have a history of dirt eating, and they pick up the larvae when eating contaminated soil. These ingested eggs hatch in the stomach of the child and then the larvae migrate to the liver where the body attempts to fight the invaders through an immunologic reaction. At this stage the child shows signs of illness. If the larvae infestation is greater than the immune system can handle, larvae move from the liver to the lung and from there to other organs in the body. The migration is accompanied by further immune reactions and the patient may show signs of asthma, pulmonary disease or seizures, depending on where the larvae are located.

VLM can take a long time to manifest itself. Diagnosis is often difficult because the signs of the disease vary depending on the organs involved. The ELISA test is of great help to confirm the presence of Toxocara larvae. There are no drugs currently available which can be given to kill the larvae in human tissue. Present therapy is supportive and aimed at controlling the inflammation caused by the larvae. The patient has to be removed from his environment to prevent the child from reinfection by eating contaminated soil. VLM is rarely fatal, though one death was reported in Philadelphia recently where an autopsy of a six-year-old child revealed massive larvae infestation in the brain.

Ocular larva migrans (OLM) is a Toxocara infestation confined to the eye. OLM patients rarely exhibit the signs of VLM, and there have been only a few cases reported where a patient had both OLM and VLM. In the eye the larvae can cause severe problems, even blindness. In the past, OLM patients were often diagnosed as having retinoblastoma and the eye was removed because OLM resembles that tumor.

Now with the ELISA test physicians can make a definite diagnosis of OLM and attempt to save the eye. Patients are treated with anti-inflammatory drugs to reduce the ocular inflammation but the larvae cannot be removed. They may become dormant only to begin the disease process at some later time when migration occurs.

Dr. Glickman thinks that OLM patients probably had such small numbers of Toxocara larvae that the immune response of the liver and other tissues was not sufficiently stimulated and the larvae could migrate randomly through the body. “It’s pure chance that they eventually wind up in the eye,” he said. “More research is needed to determine at which levels Toxocara larvae activate the immune system.”

OLM patients usually do not have a history of dirt pica and they tend to come from a higher socio-economic group than VLM patients. Many parents of young OLM patients are not aware that their child has the disease and often these children are identified during routine check-ups at schools or by the pediatrician.

Dogs and cats are all around us, they live in homes or as strays in streets and parks. Thus, even with tough dog laws, it is very difficult to eliminate Toxocara eggs and larvae from playgrounds and backyards. There is, however, something which can be done, according to Dr. Glickman. “The key to reducing the prevalence of Toxocara larvae in the ground is by preventing roundworms to mature in puppies.”

More than 90 percent of all puppies are born with the parasite and these worms are the primary source of eggs and larvae. Roundworms have evolved a complex life cycle which permits intermediate hosts and which makes eradication of the worm almost impossible.

Adult dogs and bitches carry roundworm larvae in their tissues, but they do not nor-
health danger

mally cause the reaction seen in humans. When a bitch is pregnant, after the forty-second day of gestation, these larvae migrate to the fetus where they settle in the liver. Once a puppy is born, the larvae migrate to the lungs and from there into the trachea where they are swallowed. They develop into adults in the small intestine.

By the time a puppy is three weeks old it has adult roundworms which are capable of laying eggs. These worms can live up to six months and a female can produce up to 200,000 eggs a day. Puppies may receive additional larvae from the bitch while nursing, through transmammary migration. This influx reaches its peak at the second week of the puppy’s life and ends about thirty-two days after birth. These larvae will also mature into reproductive adult roundworms.

Roundworm eggs are not infective until they have embryonated. This process takes between two to five weeks. Embryonated eggs, when ingested by humans or animals, hatch larvae. It was found that unembryonated eggs can survive for years if conditions are favorable. So far no agent, other than extreme heat, has been found to destroy the eggs. They can remain in the soil and embryonate later when environmental conditions are favorable.

By the time a puppy is five weeks old it has begun to develop an immunity toward roundworm. Most of the ingested larvae no longer develop into worms but instead migrate to tissues to resume migration if the host is female and becomes pregnant. Then the cycle begins anew. It has been shown that adult dogs, other than lactating bitches, rarely have roundworm infestations.

Common practice is to worm puppies at six and eight weeks of age. However, by then a puppy has shed millions of eggs. Dr. Glickman advocates worming puppies and nursing bitches for the first time when the litter is two weeks old. There should be subsequent wormings at four, six, and eight weeks. This practice eliminates most of the adult roundworms in puppies and greatly reduces the shedding of eggs.

Dr. Schantz and his colleagues at the Centers for Disease Control conducted a random survey of 100 veterinarians to find out what worming routines were recommended to clients. They found that only 7 percent of the veterinarians surveyed recommended the worming of puppies at less than three weeks of age; 34 percent recommended worming by the fourth week, and the balance of the sample recommended worming between six and eight weeks. It was also discovered that 77 percent of the veterinarians would not treat for roundworm without a fecal sample; only 23 percent routinely wormed puppies without a sample. “The veterinarians can have an important role in eliminating this public health hazard by routinely recommending to their clients that the puppies and the bitches be wormed at two, four, six, and eight weeks,” Dr. Glickman said. “The veterinarian has to educate his clients and explain the hazards of Toxocara infection and the importance of keeping the whelping area and the yard cleaned up to prevent eggs from settling into the soil.”

Dr. Glickman goes a step further. He advocates that each puppy which is placed in a new home he accompanies by a certificate stating that it has been wormed and is free of this parasite. He feels that this should be law and should apply to all puppies, whether they come from a private breeder, a pet shop, or an animal shelter. He also advocates strict enforcement of leash laws and greater efforts to eliminate the stray dog population. Such preventive measures, together with early worming of all puppies, would decrease the incidence of OLM and VLM in children and reduce the stigma of dogs as a public health hazard.

Toxocara cati

Penn Annual Conference

We’re getting older, bigger, and better! As the School nears 100 years, a very special Penn Annual Conference is planned for January 25 and 26, 1984, at the Franklin Plaza Hotel in Center City Philadelphia—and if the 1983 Penn Annual Conference is an indication, we can expect a turn-out large enough to warm the whole month of January.

The 1983 Conference held at the Philadelphia Hilton attracted 800 participants including: 450 practitioners, 100 speakers and faculty, 100 students, and 60 scientific exhibits staffed by 120 representatives.

Small Animal topics covered a variety of medical and surgical problems such as: bleeding and skin disorders, epilepsy, parasitology, anesthesia, radiology, hormone imbalances, and human/animal interactions. Dr. Bradford Smith, from the University of California School of Veterinary Medicine, spoke on equine salmonellosis, liver diseases, and pneumonia in foals. Other large animal topics included bovine orthopaedic problems, bovine medicine, calf diarrhea, equine botulism, radiology, and ophthalmology.

The Robert S. Brodey Memorial Lecture was presented by Dr. William Hardy, Head of the Laboratory of Veterinary Oncology at the Memorial Sloan-Kettering Cancer Center in New York. Dr. Hardy lectured before an audience of over 300 on Retroviruses and Animal Cancer Genes.

During intermissions and lunch, senior veterinary students had time to meet future employers. Sixty practitioners (37 Small Animal, 21 Mixed Practice, 2 Large Animal) requested interviews with students to fill positions in their practice. The students supervised the interview schedule from a private interview room. The School is proud to be able to help its students and area practitioners find mutually beneficial employment opportunities via the Penn Annual Conference.

Another important function of the Penn Annual Conference is to allow students, faculty, practitioners, and staff to meet and mingle in an informal atmosphere. On Wednesday evening, January 26, the Dean hosted a reception and buffet where conversation ranged from sports, finances, and auto repairs to complex medical and surgical problems.

Twenty auto-tutorial programs were available in a private screening room for those who wanted a break from the lecture format. Video and slide programs on Orthopaedic and Soft Tissue Surgery, Exotic Animals, Rubies, Lame­ness, Conformation, Gait, Biopsy Techniques and Chest Tube Placement were popular items with practitioners.

The Penn Annual Conference offers ten hours of continuing education credit, thus fulfilling the requirement for relicensure in Pennsylvania.
William D. Hardy, Jr. ('66) delivered the Brodey lecture at the 83rd Penn Annual Conference. "I felt very honored to be asked," Dr. Hardy said. "Dr. Brodey was a good friend and it was he, who, together with Bob Marshak, encouraged me to go to Memorial Sloan-Kettering Cancer Center where I got in on the ground floor of cancer immunology." Today Dr. Hardy is the head of the Laboratory of Veterinary Oncology at that institution.

He produced the first antiserum to feline leukemia virus in 1968 and identified the interspecies (gs-3) antigen that is found in most mammalian oncoviruses in 1969. Dr. Hardy developed a rapid and sensitive indirect immunofluorescent antibody test for feline leukemia virus. In addition to his work at Sloan-Kettering he heads the National Veterinary Laboratory in Franklin Lakes, N.J., a private laboratory which tests for the feline leukemia virus. "We get blood slides from all over the world," he explained. "Cats can be carriers without showing signs of the infection and, because the virus is spread through the saliva, it is important to identify carriers."

Dr. Hardy loves his work but to get away from the demanding schedule he skin-dives and sails. It is his love for sailing which caused him to buy the Lindö, a three-masted topsail schooner. He co-owns the ship with two others, Dr. Tony Palminteri, a veterinarian, and an advertising executive from New York. "She is a Baltic trader and was in service for forty years between Greenland and Scandinavia," he explained. "In 1970 she was bought by a Canadian who had her refitted into a yacht. The work was done in Denmark and the craftsmanship is superb." Dr. Hardy and his friends bought the Lindö five years ago. Her deck is ninety-two feet long and twenty-two feet across and she sleeps ten guests and a crew of eight. "She is in the Caribbean where she is chartered to individuals or corporations for cruises," he said. "The Lindö has a permanent captain and a crew of five. The crew are mostly young people, many are college students who take off for six months to work abroad. The captain loves the ship and keeps her in tiptop shape. It's expensive owning her. She was bought as an investment, but she is no money maker."

Dr. Hardy spends about two weeks a year on the Lindö and he was aboard when she came to Philadelphia last year to participate in Philadelphia's 300th birthday celebration. She was part of the flotilla of Tall Ships sailing up the Delaware. The faculty of the veterinary school had a first-hand opportunity to inspect the ship during a party given by Dr. Hardy.

"It is hard work sailing her, everything is done by hand. The sails have to be hoisted by hand and this can be dangerous. During one hurricane off Bermuda several years ago the captain and one member of the crew were pinned on the yards when they tried to reduce the square. They were caught up there for a long time. Fortunately they were not hurt and we did not lose the sails or the mast," Dr. Hardy said.

On a trip this summer the Lindö was not quite so fortunate. "She had been chartered for the filming of All The Sad Young Men and had to be brought to Chicago through the Great Lakes. It took five weeks to get her home from Chicago and we lost three sails." This was not the first film for which the Lindö provided a set. She also starred in The Island and was the "main character" in a NBC documentary of the 1980 transatlantic race from Boston to Norway. "She came in second overall in that race," Dr. Hardy said proudly. He
hopes that a sponsor can be found for next year's transatlantic race. "Last year there was no American ship in the race, even though it originated in Newport, Rhode Island."

When sailing on the Lindo or other ships, Dr. Hardy is not content resting on deck. He pursues his other hobbies, skin diving and underwater photography. "I love skin diving and I dive to photograph," he usually carries a developing kit and processes his slides right on board. "That's easy and then you can see whether you have the correct light. If things didn't turn out, you can go back and take more pictures."

Last summer Hardy traveled to Australia to join a diving trip to a remote atoll in the Coral Sea which lies beyond the Great Barrier Reef. "There was a reporter from The New York Times aboard to do a story about the voyage. One of my pictures was used when the article was published," he said.

His love for diving and underwater photography take him to many parts of the world. "In 1977 I helped start the Society for Aquatic Veterinary Medicine," he said. "We have about 300 members from the USA and Europe. We travel all over to dive, to get together and to discuss marine biology. We meet about three to four times a year to dive all day and lecture all night. Usually there are about twenty veterinarians on these trips; most are avid photographers."

A new referral system at the Veterinary Hospital of the University of Pennsylvania (VHUP) went into effect in December 1982. The new procedures, according to Dr. Kenneth C. Bovee, Chairman of the Department of Clinical Studies, were designed by a joint committee of hospital clinicians and local veterinary practitioners to facilitate communication between hospital and practitioner.

Cases are regarded as referrals only if the practitioner sends along with the client either a letter or a referral form stating particulars about the animal, its treatment, a provisional diagnosis, or the reason for referral. Practitioners are asked to send along records of laboratory tests and radiographs. "This gives us an idea of what the practitioner is thinking about and it makes it easier for the clinician," said Dr. Bovee. "In addition, it saves time and money as tests do not have to be repeated."

Once the referral case has been seen, the animal may be sent home on the same day with intermediate treatment measures. A referral post card, mailed by the hospital within twenty-four hours, will inform the practitioner about which clinician saw the animal, the tentative diagnosis, if the animal was hospitalized, and what therapeutic measures were prescribed if the animal was sent home after the consultation.

In cases where an animal is seen through the Emergency Service, practitioners are asked to call the service to provide the pertinent information and to alert the staff that the owner is bringing the animal. If the animal is admitted through the Emergency Service, the post card with a diagnosis follows after the animal has been assigned to a medical service.

In order to provide a complete diagnosis, it may be necessary to wait until the results of all tests and studies are complete. This may take several days to more than one week. The hospital clinicians will call or write the referring veterinarian with a complete diagnosis within two weeks of the client’s visit. A monitoring system has been instituted to ensure that the practitioners receive this final report. Dr. Bovee encourages practitioners who find that this policy is not being followed to contact the hospital administration, either Barry Stupine, Hospital Director, or Dr. Bovee.

Practitioners, rather than owners, are advised to contact the hospital if questions about a case arise. "We are always available for such consultation and we encourage this contact with the School; however, because we are a teaching institution, we are not able to function like a regular medical office," said Dr. Bovee. "Our clinicians are not on hospital duty full time. They have teaching, administrative, and research duties and most are in the clinic only two or three days a week." Clinicians will make every effort to return practitioners’ calls as soon as possible.

Referrals provided by practitioners enable students and staff to gain access to difficult and challenging cases. In addition, the sophisticated diagnostic facilities at VHUP provide practitioners with assistance for patients with rare or complex diseases. More than half of the 19,000 cases seen at VHUP during the last year were referrals. Keeping open lines of communication between hospital and practitioner is essential. In addition to the new system for referrals, VHUP encourages practitioners to visit the hospital—to look around and observe procedures. "This helps practitioners to make contact with the staff and to get to know them. It creates a better atmosphere and makes for a better relationship between us and the outside world," Dr. Bovee added. Such contact is also encouraged through the continuing education program, the annual conference, and meetings with area practitioners.

Dr. Bovee hopes that the new system of handling referrals, the information booklet about the services at VHUP, the referral form, and the feedback post card will provide additional channels of communication and enhance the cooperation between the teaching hospital and practitioners.

Dr. Kennueth C. Bovee
Chairman of the Department of Clinical Studies

It is not surprising that Dr. Hardy has such great interest in marine life. "I have always been interested in marine biology and had applied to graduate school to pursue it," he said. "I was also accepted at Penn and I chose then to become a veterinarian. But my interest in marine biology remains." Dr. Hardy has a busy schedule. He lectures at the Cornell Graduate School in New York and he is adjunct associate professor of oncology here at the Veterinary School. He also travels extensively to lecture to veterinary groups all over this continent. "I like it. I enjoy meeting and speaking to practitioners. Recently I gave an all-day lecture in Manitoba, Canada." During the ski season he tries to combine lecture trips with a ski vacation for his family. "We try to get out West each winter," he said.

He lives with his wife Susan and their children, Billy and Suzanne, in Northern New Jersey. His children enjoy the sailing and his wife prefers the skiing. The family has four pets, three cats and a Labrador retriever puppy.
Alumni Society Briefs

Planning for class reunions and Alumni Day is underway. Veterinary classes celebrating class reunions are being contacted by class presidents and reservations for parties have been made at inns in the Kennett Square area. Most classes are celebrating in conjunction with Alumni Day activities scheduled for May 21 at New Bolton Center. The Class of 1933, celebrating its fiftieth, and the Class of 1958, celebrating its twenty-fifth reunion will be honored with a dinner at Allam House the evening of May 21.

Alumni Day will begin with a coffee reception with Dean Marshak, a video presentation, and tours of NBC conducted by the faculty. Alumni will gather at Alumni Hall for the annual meeting of the Veterinary Medical Alumni Society, chaired by Dr. Nancy Brown.

Following the meeting, during which awards will be presented by the Society to outstanding veterinarians, alumni will spend the afternoon enjoying a traditional barbecue and visiting. The party atmosphere will be heightened with music, flying of class flags and a display of the buggies and wagons kept at New Bolton Center.

Information regarding both reunion and Alumni Day will reach alumni by mid-April. Further information is available by contacting the Veterinary Alumni Affairs Office.

Annual Giving 1982-83

As the Annual Giving year enters its final months, alumni, parents, and friends of the School of Veterinary Medicine are once again responding to the challenge of meeting the goal for 1983—$200,000.

Over the years there has been a remarkable increase in the amount of annual giving. Ten years ago, the Fund received $77,228. Meeting this year's goal by June 30 will mean an increase of nearly 200 percent. This has been possible through the increased participation of alumni classes in the effort.

According to Dr. Nancy O. Brown, Alumni Society President, the classes of the Seventies have responded to appeals with increasing participation and amounts. Increasing the number of donors as well as the total receipts has become very important to the School. "The percentage of participation among alumni, rather than the size of the gift, is often an important factor when corporations and foundations review grant proposals," explained Elizabeth Caulk, Director Of Annual Giving for the Veterinary School. Last year, the Class of 1968 gave $12,285. The Class of 1952 mustered 69 percent of its members as contributors.

Chairman of the Annual Giving Campaign 1982-83, is Dr. William B. Boucher, Emeritus Professor of Medicine. He has appealed to alumni and friends alike to continue and increase their support of the School through the Annual Giving habit because this money provides an essential source of unrestricted funding for support of the hospital and laboratory services as well as the high quality of teaching, research, and clinical programs of the School.

Sports Day

The student lounge of the Rosenthal Building was filled with hungry, muscle-sore veterinary students and faculty, and their families on Saturday night, January 8. As beer, donated by the Alumni Society and SCAVMA was quaffed, hoagies and pretzels were munching, the results of Sports Day 1983, were tallied by Jim Reed, third-year student coordinator.

Sponsored annually by the Veterinary Alumni Society, the day brought some 250 faculty and students into friendly competition. At Hutchinson Gym teams representing each class and the faculty battled away at badminton, basketball, squash, racquetball, volleyball, and swimming. Levy Pavilion hosted a series of tennis matches. The Alpha Psi House was filled with ping-pong tournaments. By afternoon, veterinary runners were huffing through a three-mile course along Boat House Row in Fairmount Park. Points achieved by winners in each event were tallied to find an overall team winner.

A large bronze Sports Day plaque, to be engraved with the name of each year's winning team, will soon hang in the WHUP student lounge. The plaque donated by Adelphia Graphic Systems, will show "The Class of 1984" as a two-time winner of the event. Second place went to the second-year class, organized by Barb Flickinger. Third place was captured by the faculty team, organized by Dr. Charles Newton, Associate Professor of Orthopedic Surgery, and his assistant, Dr. Chris Hutson. Other coordinators were Rick Grunich, fourth-year, and Karen Blumrick, first-year class.

As food and beer disappeared, Sports Day participants "limped" out to begin another semester of study and pressure. All agreed that this was a great way to get the winter semester off to an energetic start.
the sex chromosome of the male is XY and that of the female is XX. Males with the XXY Syndrome develop as males but are sterile. Females with the XO syndrome develop as females but are sterile. This is diagnosed by microscopic study of the chromosomes.

There are five types of intersexes (often called hermaphrodites) recognized in dogs where it is not possible to tell definitely by observation whether the animal is a male or female. There are also male pseudohermaphrodites with XY chromosomes but incomplete masculinization. Female pseudohermaphrodites have XX chromosomes and ovaries but their other genital organs are masculinized and the animals may be raised as males. In some cases, this condition has been shown to result from administration of male hormones during pregnancy.

Dr. Donald F. Patterson spoke on Disorders of Sexual Development. In mammals, including dogs, there are male pseudohermaphrodites with XY chromosomes but incomplete masculinization. Female pseudohermaphrodites have XX chromosomes and ovaries but their other genital organs are masculinized and the animals may be raised as males. In some cases, this condition has been shown to result from administration of male hormones during pregnancy.

Dr. Patterson said that cryptorchidism is the most common defect of sexual development in dogs, occurring in 10-13 percent of male dogs presented to veterinary clinics. Based on present evidence, a substantial reduction in the frequency of cryptorchidism could be brought about if unilateral cryptorchid males, as well as their parents, are excluded from breeding.

Dr. Peter F. Jezzyk's topic was New Developments in the Understanding of Inherited Metabolic Disease. These diseases are the result of altered structure and function of proteins and enzymes. The results may be inconsequential or lethal. Testing procedures are available to detect these conditions which may be one of the causes of neonatal death.

Dr. Mark E. Haskins described Lysosomal Storage Disease in Dogs. These are genetic diseases caused by enzyme malfunction. Six diseases have been described in dogs, some have a neurologic course resulting in death before one year of age. In some of the diseases, abnormal facial characteristics are seen. Children have diseases almost identical to those in the dog.

Canine Epilepsy was discussed by Dr. George C. Farnbach. He emphasized that seizures and epilepsy are not identical. Seizures are signs of disease. Dogs with true epilepsy have seizures as part of an as yet undetermined disease. The American Canine Epilepsy Service has been established to study the disease.

Dr. Michael H. Goldschmidt's topic was Cancer in the Dog. Diagnosis is by microscopic examination of tumor tissue which helps determine if the tumor is benign or malignant (life-threatening). The most frequent sites of growths submitted to the Pathology Laboratory at the University of Pennsylvania, School of Veterinary Medicine, are skin and connective tissue, mammary glands, lymphoid organs, including the spleen, oral cavity, male genital system, respiratory system and bone. The incidence of cancer in the dog is not known—it could be more than 1,100 new cases per 100,000 dogs per year.

Inherited Skin Diseases were covered by Dr. Vicki J. Scheidt. She described a hereditary blistering disorder (Epidermolysis Bullosa) reported in Collies and Shelties and Canine Color Mutant Alopecia, an abnormality primarily affecting the hair follicle in color mutants (blue, fawn) of certain breeds. She also discussed familial diseases: allergic inhalant dermatitis, hypothyroidism, seborrheic dermatitis and generalized demodectic mange.

Tapeworms are a common intestinal parasite of dogs and cats and can be difficult to control. Usually they are not harmful to the animal, but the segments are unsightly and owners become concerned. There are several species of tapeworms and all require an intermediate host. Dipylidium caninum is the common dog tapeworm and its life cycle requires the flea (or louse). The flea ingests eggs which have been passed in the tapeworm segments, the parasite develops in the flea and the dog swallows the flea. The worm matures in the dog's intestinal tract and its head becomes firmly imbedded in the lining of the intestine. The head produces segments which eventually are passed. These segments may be seen "crawling" over fresh fecal material and around the dog's tail. The segments soon dry up and look like grains of rice.

Treatment will be ineffective unless the head of the worm is destroyed. A newly injected drug (Pranziquantel) is giving good results. However, even if all the tapeworms are removed, re-infection is probable unless the intermediate host is eliminated. Flea control must be considered part of the treatment for Dipylidium.

Taenia is another species of tapeworm found in the dog. It is found more commonly in country dogs which acquire the worms by eating infected rabbits, mice or other rodents which are the intermediate host.

There are a number of other tapeworms which may be found in the dog. A textbook on parasitology would be required to cover the subject. There have been many reports of "epidemics" of tapeworms which do not respond to treatment. It's surprising how many owners don't understand the problem. Worrying the dog is only part of the solution.

Identification. A photograph might help identify a dog if there are unusual markings, but describing a "lost" dog can be difficult especially when many breeds appear identical—Black rocker Spaniels for example. Tattooing is a way to be sure a dog can be correctly identified. Usually a number is placed on the hairless skin of the inner hind leg. It lasts a lifetime.

Another advantage is positive identification of show dogs. It might be difficult to find where proper equipment is available but tattooing is being done and is a simple procedure.

Heartworm Prevention. Heartworm Disease occurs in almost every part of the United States. It is transmitted by mosquitoes and preventive medication may be recommended by your veterinarian. This is not a do-it-yourself situation. It is important that a blood test be done to determine whether or not infection exists. Preventive medication should be used only if tests are negative. The medication must be given daily. Your decision may be based on the mosquito population in your area, whether or not the dog is outside at night when mosquitoes are most active or even the cost of medication. Your veterinarian is the one to help with your decision.

Somali Cats. A reader writes that the Somali is a long-haired Abyssinian and, except for the medium-long coat, is exactly like an Abyssinian. In the last issue of Bellwether (#8), cat coats were described as Short-haired or Long-hair. The Somali has a medium-length coat—the tail is a very full brush, and was incorrectly described as Short-haired.

In the same paragraph, the Rex was shown as Red. That was a typographical error. The Rex is a Shorthaired cat with curly hair.


Popular Breeds of Dogs. The American Kennel Club has released registration figures for 1982. Based on numbers of each breed registered, Poodles were in first place (88,650), followed by Cocker Spaniels (87,218), Doberman Pinschers (73,180), Labrador Retrievers (62,465), Golden Retrievers (51,045), Miniature Schnauzers (38,502), Beagles (36,368), Dachshunds (32,635) and Shetland Sheepdogs (30,512). Of the 125 breeds of dogs and the 1,037,149 total registrations, the bottom of the list includes Sealyham Terriers, American Foxhounds, English Toy Spaniels, Curly-Coated Retrievers, Belgian Malinois, Hounds, Field Spaniels, Sussex Spaniels and English Foxhounds. Foxhounds are not a "rare" breed but owners use other registries.

Age of Dogs and Humans. Any comparison is an "educated guess" but it's often said that one year in the life of a dog is the equivalent of seven years in man. A recently published chart states that it has a more accurate measure:

Dog/Human
1 yr./15 yrs.
2 yrs./24 yrs.
3 yrs./28 yrs.
4 yrs./30 yrs.
9 yrs./52 yrs.
12 yrs./64 yrs.

There is no hard and fast rule, as there are great variations in different breeds. Small breeds seem to mature earlier and live longer. Giant breeds mature more slowly and their average lifespan is shorter.

In animals, including dogs, the teeth can be a guide in determining the age. Puppies have no teeth at birth, but the baby teeth come in at three to four weeks. At four to five months of age, the permanent teeth come in. After about one year of age, the amount of wear is an indication of age, but there is so much variation in individuals, it becomes a guesswork game. A dog is considered a puppy until it is one year old, so the teeth can do little more than indicate whether or not it is puppy or adult.
Immediately after the death of Dean Raymond A. Kelser in April 1952, Dr. Mark W. Allam was called to the office of the President of the University and asked whether he would accept an appointment as acting dean of the Veterinary School. He accepted, and served in this capacity until February 1953 when he was appointed dean. Dr. Mark Whittier Allam was the eighth dean of the School.

Although there had been some real progress under Dean Kelser, the new dean inherited a school which had severe problems. In fact, soon after he was appointed dean Dr. Allam posed the critical question of whether the School could, or should, survive. This question was asked of a small group of faculty, and after much soul-searching a decision was reached that an all-out effort should be made, not only to solve the problems, but to put the School on a pathway to future greatness. Considering the problems at hand, this was a brave decision.

At the time the following were recognized as being imperative to the School's future: The image of the School in the University family must be greatly improved, the School must win the support of important agricultural groups in Pennsylvania and use this, and other support, to obtain increased appropriations from the Commonwealth; the physical plant must be renovated and expanded; the faculty must be upgraded and enlarged, the relationship of the School to its alumni and the private sector needed great improvement. All of this would require considerable time, but under the energetic and astute guidance of Dean Allam a beginning was made in all of these problem areas. An essential feature in the renaissance program would be the wholehearted support of the faculty. In fact, the next three decades were a period in which the faculty came together as a cohesive, productive unit.

Before becoming dean, Dr. Allam had already developed some close, lasting friendships with important individuals in the university. These included Dr. Isadore S. Ravdin, vice-president for medical affairs, Dr. A. Newton Richards, and Dr. Robert Dripps. Through these and other individuals the Veterinary School began to receive support from the University in many areas that were important to its future.

On the advice of Dr. Alexander Webb, an influential alumnus, Dean Allam joined various agricultural organizations, attended their meetings and carried the message that the Veterinary School intended to provide Pennsylvania with the very best in veterinary medical service, research, and education. Many of these groups become loyal supporters of the School, and this, along with Dean Allam's persuasive education of state legislators about the potential contributions of the Veterinary School, led to a progressive increase in Commonwealth appropriations.

Soon after Dr. Allam became dean he was able to obtain some funds from the University to renovate portions of the Small Animal Hospital and by 1955 a Faculty Study Group was diligently at work developing plans for a new basic science building on the Philadelphia campus. This structure, completed in 1963 and known as the Rosenthal Building, not only provided the School with urgently needed space for research, teaching and a library, but also marked a turning point in the School's relationship with the Commonwealth. To construct this building, the Pennsylvania State General Authority, through its General State Authority, provided a $2.2 million loan. At the time, Dr. Allam recalls, those who had been advocating a veterinary school at Penn State University "backed off."

The matter of recruiting a larger, better trained faculty was a slow, difficult process. Since its inception, in 1884, the School had largely depended upon its own graduates to staff its faculty. While this process resulted in the appointment of some excellent individuals who were the backbone of the School for many years, this inbreeding process also resulted in a faculty lacking individuals with advanced training and rather parochial in its views. Following World War II most veterinary schools began to undergo some pronounced changes; other schools were developing faculties with larger numbers of individuals who had done graduate work and were expanding their research programs. The Veterinary School at Penn suffered by comparison, especially in its research activities. A saving feature at Penn was the presence, in the early 1950s, of a small nucleus of faculty who had begun some major research. Particularly noteworthy were Dr. David K. Detweiler and Dr. John T. McGrath; Dr. Evan L. Stubbs was continuing his outstanding research on poultry diseases. Dean Allam set about attracting faculty from other institutions and also from among Penn graduates who had a desire for advanced training. An important feature in this building process was that individuals on the Veterinary School faculty were able to engage in graduate work in the Faculty of Arts and Sciences and in the Graduate School of Medicine. Through this process, and the attraction of individuals who had already established themselves, a strong cosmopolitan faculty was developed.

One essential step in the renaissance of the School was the acquisition of a rural campus, New Bolton Center, in 1952. At that time the Veterinary School was in danger of losing its accreditation because of the very low clinical load of farm animals and horses. New Bolton Center provided the means of answering this problem. More about this in the next issue.

A National Award

Bellwether has won a national award from the Dog Writers Association of America (DWAA). This award, made by the DWAA at their annual banquet and meeting in New York City on February 13, 1983, was in the category of Special Interest Animal Magazines. Last year Bellwether received a national CASE award.
Student Chapter of the American Veterinary Medical Association (SCAVMA)

The members of the Student Chapter of the American Veterinary Medical Association (SCAVMA) in the School of Veterinary Medicine, University of Pennsylvania, elected the following officers for 1982-1983:

President: Jim Lunig
Vice President: Amy Worrell
Secretary: Cathy Catanzaro
Treasurer: Holly Lechter

The faculty advisor is Dr. David Kowalczuk, assistant professor of pharmacology and toxicology. SCAVMa and its auxiliary, each year, sponsor a number of events. These include: a fall and spring picnic, a square dance and a dinner dance, garage and T-shirt sales to raise money for financing student delegates to attend the annual symposium sponsored by the national association of SCAVMa, guest lecturers for monthly meetings, an auction and raffle to raise money for the Student Emergency loan fund.

Students joining SCAVMa have the following benefits: immediate membership in the American Veterinary Medical Association (AVMA) with a waiver of dues for the first year and reduced dues for the next two years of membership; reduced subscription rates for the AVMA Journal, and the American Journal of Veterinary Research, access to the AVMA Auxiliary Student Loan Fund for juniors and seniors, group term life insurance policies, and malpractice insurance which is available for students in externships and preceptorships, placement service for senior students, assistance for obtaining speakers, and access to a film library.

Continuing Education Program

The final continuing education program for the 1982-1983 calendar year, Health and Economic Programs for the Large Dairy Herd, will be held on Wednesday, May 18, 1983, at the Baltimore Hilton Inn at Reisterstown Road in Baltimore, Maryland. Dr. Kenneth Braun, Professor of Preventive Medicine, from the University of Florida School of Veterinary Medicine; Dr. Lawrence Heider, Professor of Preventive Medicine, from the Ohio State University School of Veterinary Medicine; and Dr. John Fetrow, Associate in Animal Health Economics, from the University of Pennsylvania School of Veterinary Medicine will discuss nutritional consultation, reproductive programs, mastitis control programs, record systems, and practice economics in large dairy herds. This course is co-sponsored by the University of Maryland, the University of Pennsylvania, and Penn State University.

For further information and registration please contact: Ashra Markowitz, University of Pennsylvania, School of Veterinary Medicine, 3800 Spruce Street, Philadelphia, PA 19104; or call (215) 893-4234.

Spring 1983

Just in Time for Christmas

On December 25, 1982 between 9:30 and 9:45 a.m. the Philadelphia Zoo received a very special Christmas gift: a baby male gorilla. Measuring approximately two feet and weighing three and a half pounds, the infant is the second gorilla to be born at the Zoo in the last two years. A female, Jessie, was born in 1980.

For almost a month the new gorilla was nameless. But in late January a name was selected from among 12,000 entries in a contest co-sponsored by The Daily News and the Philadelphia Zoo. Mrs. Joan Veloski of Drexel Hill entered the winning name, Justin, because the baby was "just in time for Christmas." Mrs. Veloski will be present at Justin's public debut in early February.

Justin and Jessie share the same father, John, however, their mothers are different. Jessie's mother is Samantha and Justin's is Snickers. Snickers, who suffers from arthritis and is partially paralyzed on her right side, gave birth to a stillborn infant in 1974. Last year doctors performed tests on her to determine fertility, and during the second test they discovered her pregnancy. According to keeper, Patti Kunzmann, Snickers' labor was short and the birth was relatively painless. Mother and infant will share the same cage as Snickers is expected to nurse Justin for six months to a year. Snickers was present during Jessie's birth and for the past nine months she has spent time watching the interaction between Samantha and Jessie.

In the wild, gorillas live in groups with as many as twenty to thirty members. Their behavior is learned through three steps of socialization: maternal, parental, and juvenile, and the group is integral in the learning process. Captive animals are often separated from each other, consequently, they must be taught behavior patterns concerning copulation and infant care.

Snickers, Samantha, and John arrived at the Zoo along with two other males, Toby and Bobby, in 1969. At that time the Zoo became interested in the treatment of primates in captivity. It was impossible to duplicate the environment of the wild gorilla in the Rare Mammal House where the gorillas were housed. The facilities are poor and the cages are too small to foster much group interaction. Yet Dr. Robert Snyder, Director of the Penrose Laboratory, believed that some aspects of the social group should and could be reconstructed. He especially stressed the importance of a close mother/infant relationship. Each animal was placed with a surrogate mother (a zoo keeper) who remained with the gorilla seven days a week for three years. All of the gorillas also ate and played together in their early years under the guidance of animal specialists.

Currently the gorillas are in a stage of intermittent experimental progress. A new primate center, designed by the Philadelphia firm, Venturi, Rauch and Scott Brown, is under construction and should be finished by 1986. It is hoped that the new facility will enable the gorillas, Justin and Jessie included, to form a gorilla nucleus and to interact with each other even more closely.
Rosettes & Ribbons

Congratulations to the Kennel Club of Philadelphia on their highly successful dog show held on December 18, 1982. There were over 2,500 entries in the 88th annual show.

Dr. Peter Hand, professor of anatomy, recently presented a talk at two locations in Taiwan. The talk was entitled “An autoradiographic deoxyglucose study of some central effects of acupuncture.” This was presented first at the plenary sessions of the First International Symposium on Acupuncture and Moxibustion held in Taipei on November 19-21, 1982, and then on November 23 at Taichung.

Dr. Peter Dodson, associate professor of anatomy (palaeontology) was awarded a grant by the Board of University of Pennsylvania Research Foundation for a project titled “Comparative analysis of a new small horned dinosaur.” Dr. Dodson was the subject of a recent story in The Philadelphia Inquirer. The dinosaur in question dates back 75 million years and Dr. Dodson describes it as “an extremely rare, small horned dinosaur that doesn’t fit the public’s conception that dinosaurs were huge species.” The small horned dinosaur was about four feet long and two feet high. Dr. Dodson points out that “If there were people around then—which there weren’t—this dinosaur would have been completely harmless and inoffensive.” The bones were discovered in 1981 in central Montana.

Ralph E. Werner, Jr. (V’68), recently became a diplomat of the newly formed American Board of Veterinary Practitioners. Dr. Werner practices in Somers Point, N.J.

Dr. Alan Klide, associate professor of anesthesia, had an active lecture schedule in 1982. In February he spoke at the School of Veterinary Medicine, Guelph, Canada on “Anesthesia for Exotic Species,” and at the Ontario Veterinary Association Conference on “Theory and Equipment for Veterinary Acupuncture in Horses: Practical Application.” In May, Dr. Klide spoke on “Veterinary Acupuncture” at the meeting of the Western New York Veterinary Association.

Dr. Robert J. Rulman, professor of biochemistry, was recently appointed to the Board of Directors of the Leukemia Society of Southeastern Pennsylvania and treasurer of the Philadelphia Region of the Martin Luther King, Jr., Center for Non-Violent Social Change of Atlanta, Georgia.

On February 8 and 9, 1983, William Ellsworth Jones, the New York correspondent for the Sunday Times of London visited New Bolton Center. The Times is producing a “magazine” on racehorses that will be released at the start of the English racing season. Plans call for a separate article about New Bolton Center, focusing on the advances in surgery now available to save injured racehorses.

Dr. Samuel K. Checkoff, professor of pathology, was awarded a Senior Research Fellowship from the Fogarty International Center of the National Institute of Health. During the tenure of this fellowship, Dr. Checkoff will perform collaborative research on the biochemical regulation of arterial smooth muscle with Professor Setsuro Ebashi, University of Tokyo. The collaborative research is expected to probe into the regulatory mechanisms by which the arterial walls from normal and hypertensive individuals contract and relax.

Dr. Richard Misella, associate professor of anatomy, was also awarded a Fogarty Fellowship, and will spend seven months at the Flori Institute of Experimental Medicine, Melbourne, Australia where he will conduct neuroanatomical and physiological studies on water balance in sheep. This is an extension of his current work on laboratory animals and will include the use of immunohistochemistry. While in Australia Dr. Misella will present two papers, one at the International Physiological Congress, and the other at a satellite meeting of the Congress.

A new text, titled Current Therapy in Equine Medicine (W. B. Saunders Co., Philadelphia, 1983) has been dedicated to Dr. William Boucher, emeritus professor of medicine. The dedication reads as follows: “High standards of professional integrity, careful clinical observation, humane concern for the patient, an awareness of the owner’s requirements of the animal, and a broad knowledge of medicine make Bill Boucher an outstanding role model for all of us fortunate enough to have been his students.”

Dr. Rosalyn Eisenberg, associate professor of microbiology at the Veterinary School, and Dr. Gary Cohen, professor of microbiology at the Dental School, have received a grant from the Lederle Laboratories of the American Cyanamid Corporation to conduct research on developing a vaccine against herpes. Drs. Eisenberg and Cohen have been collaborating on this work for the past six years.

Help for Epilepsy

A new booklet titled Epilepsy in Dogs has been published by the American Canine Epilepsy Service under the direction of Dr. George Farnbach, assistant professor of neurology. This concise review of the problems of epilepsy in dogs and contains the following sections: What is Epilepsy?; What Causes Seizures?; How Harmful Are Seizures?; Is There a Treatment for Canine Epilepsy?; What Anticonvulsant Will Work for My Dog?; and What is the Role of the Canine Epilepsy Service? If you are interested in receiving this informative booklet, contact Dr. Farnbach, Veterinary Hospital of the University of Pennsylvania, 39th and Spruce Sts., Philadelphia, PA 19104.

Errata

In the last issue we reported that the dental work on the Siberian tiger, Kundur, at the Philadelphia Zoo was done by students from the Dental School. Actually the work was done by Dr. Carl Tinkelman, assistant professor of endodontics at the Dental School. In reporting on the chairs in the Veterinary School we omitted the Richard King Mellon Professorship of Reproductive Physiology occupied by Dr. Ralph L. Brinster.

Resource Update: VHUP

In addition to the Clinical Services offered by VHUP, there is also an Exotics Pet Clinic one evening a week. Appointments can be made by calling (215) 898-4680. The clinic days for Orthopedics have been changed to Tuesdays and Fridays. This section only accepts appointments after the referring veterinarian contacts the Small Animal Hospital to explain the specifics of the case.
Veterinary Medical Scientist Training Program

For many years the School of Veterinary Medicine has been a major supplier of academic scientists and faculty for other veterinary schools as well as for medical schools and universities. In 1969 the training of one group of these scientists, those studying for both a V.M.D. and a Ph.D., received national recognition by the award of a training grant from the National Institutes of Health. The program was at that time, and still is, the only V.M.D./Ph.D. training program at a School of Veterinary Medicine to compete successfully for such support.

About twenty medical schools, including Penn, have such training grants but many other medical schools have not been successful in obtaining this type of training grant support. Thus, our program continues to be highly competitive with those at the best research-intensive medical schools. Five years ago the veterinary program and medical programs were merged into one administrative unit since training was quite similar in many parts of both.

The plan for the coming five years will not see major shifts in direction in this program since it has been very effective during the past thirteen years. However, gradual modifications will be instituted to take advantage of our growing experience with training opportunities and feedback from graduates. Basically our plan is to appoint two or three trainees each year from entering students or the first-year class. The competition is intense with about forty superlative applicants competing for the positions. The successful applicants will then follow a combined V.M.D./Ph.D. program full time for six to seven years. Each trainee has an individually tailored course of study based on providing the best foundation for the student's chosen career goal. It is anticipated that the graduates of this program will enter academic medicine and staff the faculties of schools of veterinary medicine and science departments in medical schools. They will be superbly qualified to bridge the gap between basic science and clinical departments, bringing knowledge of health problems into basic science laboratories and knowledge of basic science investigative power into clinical medicine. Already the graduates of this program have been enormously successful and are highly sought after upon graduation. We regard this as one of our elite programs that greatly enriches the School and contributes some of our most gifted and highly trained graduates to the profession and to academic life. During the coming five years we expect to graduate two to three individuals per year from this program.

Developments

At the end of the first seven months of the fiscal year, 390 donors had contributed $69,952 to Annual Giving. The Friends of Small Animal Hospital had 742 members contributing $41,970 and 99 Friends of New Bolton Center contributed $32,450.

The American Kennel Club has awarded a grant of $20,000 for our work in canine epilepsy (see Bellwether 4).

The American Livestock Insurance Company and Harding and Harding, Inc., of Geneva, Illinois, granted $7,500 to support Dr. Loren Evans' work in laminitis, and the Basset Hound Club of America granted $1,000 to Dr. Vicki Meyers to continue her work in canine pyometra.

The Delaware County Kennel Club (PA) gave the Veterinary Hospital $3,000 toward the purchase of equipment to computerize the medical records system in the Small Animal Hospital, and the Montgomery County Kennel Club (PA) gave us another $1,750 toward this project.

The Devon Dog Show Association (PA) contributed $3,500 to the Friends of the Small Animal Hospital, and the Empire Cat Club (NY) joined the Friends of the Small Animal Hospital with a gift of $1,500.

The Firestone Foundation granted $20,000 to Dr. Loren Evans for his work on an improved table for large animal surgery, and the foundation granted an additional $100,000 to New Bolton Center as part of its recent decision to liquidate its assets.

Mr. and Mrs. Philip B. Hofmann gave the Thoroughbred stallion REAL SUPREME to New Bolton Center, and Laxmont Farms donated the Standardbred stallion WESTWARD to the Hofmann Research Center for Animal Reproduction.

The oil painting, Endangered Species, by Tucker Bobst was given to the Veterinary Hospital by Richard Mainly and now hangs in the hospital's Clark Pavilion.

The Pennsylvania Society for the Prevention of Cruelty to Animals contributed $10,000 for student loans, and the Ware Foundation granted $8,000 toward our program in ovine medicine at New Bolton Center.

The Richard King Mellon Foundation awarded the School a major grant of $250,000 to provide operational endowment for the Laboratory of Reproductive Physiology and Genetic Engineering under the direction of Dr. Ralph Brinster, the Richard King Mellon Professor of Reproductive Physiology.

Two anonymous gifts totalling approximately $20,000 were given for the renovation project now under way in the Old Small Animal Hospital, and another anonymous gift of just under $10,000 was given to the Friends of the Small Animal Hospital.

Spring 1983
The Veterinary Class of 1952 was the 1983 recipient of the "Award of Merit" of the Organized Classes of the University of Pennsylvania. Recognizing the University alumni class which has exhibited outstanding qualities of solidarity and allegiance to their School and the University, the award has been presented annually since 1957. At the January 21 dinner of The Organized Classes, Rosemary MazzaTenta, chairperson of the Awards Committee, presented the award plaque to Drs. John E. Whitehead, class president, and Loy C. Awkerman, class agent. Noting that this was the first class of the School of Veterinary Medicine to receive the award, Ms. Mazzatenta praised the Class of 1952 for its outstanding participation in Veterinary Alumni activities, communication among class members, and financial support of the School and University through Annual Giving. The class has an average of 65 percent participation in Annual Giving each year, "a performance challenging all classes in all schools," according to Ms. Mazzatenta.