

# Bellwether

# 1

University of Pennsylvania

Fall 1981



*Amelia C. Van Buren*  
Thomas Eakins  
Photograph, c. 1891  
Philadelphia Museum of Art  
Given by Seymour Adelman

## Humans & Companion Animals

### *A Relationship Explored*

Animals have always been a part of human experience, not just as a source of food, but also as a source of companionship. Consider the multitude of breeds of dogs and cats and you'll realize that animal companions are important to people. Many breeds were originally developed to fulfill a function, such as herding, guarding, or hunting, but breeds simultaneously came into being whose sole purpose was to provide companionship.

In an urban society, the need for companionship is as great as ever and companion animals play an important role in the lives of people. The bond between people and animals has long been acknowledged, although it has not really been studied scientifically until recently. The Center for the Interaction of Animals and Society at the

School of Veterinary Medicine of the University of Pennsylvania will host an international conference on the Human/Companion Animal Bond October 5 through 7. According to Dr. Alan M. Beck, director of the center, this will be the first conference ever held in the United States in which data-based papers on the human/companion animal bond will be presented.

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Recent developments in veterinary medicine have had far-reaching implications for society beyond the simple health care of animal patients. Our school is well situated to draw upon the strengths of other areas of the University of Pennsylvania to the advantage of students, faculty, and the world of learning. The School of Veterinary Medicine has become an increasingly important citizen of our vital and complex campus while achieving growing recognition outside in the neighborhood, city, Commonwealth, and region. The respect and support of the school, at the state level, is one in which we, at the University, take particular pride since it reflects the advantages of the unique relationship that exists between the University and the Commonwealth of Pennsylvania.

A major pleasure of my first spring at Pennsylvania has been the chance to participate in the final stages of long-awaited developments at the University's School of Veterinary Medicine. The school is now firmly positioned to continue its leadership into the twenty-first century, as a pioneer in teaching, research, and delivering expert care to both the urban and rural animal communities, on which human society so greatly depends.

*Sheldon Hackney*

**Sheldon Hackney**

President, University of Pennsylvania

During my months at the University of Pennsylvania, I have been impressed by the quality and diversity assembled on this campus. As one of the earliest of the great American universities, with an exclusive history dating back to the colonial college founded by Benjamin Franklin, this institution has shown a marked ability to develop and adapt to changing circumstances in the course of its two-hundred-and-twenty-five years. As we enter the last decades of this century, we combine traditional strengths with the flexibility necessary to satisfy the increasingly stringent demands placed on higher education, by the students we train and the society we serve, while continuing to preserve and to create knowledge.

Among the educational assets that have made Pennsylvania a center of specialized as well as liberal study, the School of Veterinary Medicine occupies a very special place. The only veterinary school in the mid-Atlantic region, it is a leader in education and practice in the nation and the world. Soon to celebrate the centenary of its founding in 1884, the school is at the forefront in basic and clinical investigation and the development of new fields, including research into animal and human interactions and the crucial area of aquatic medicine.

With facilities both at the New Bolton Center and on our Philadelphia campus, the school can boast the oldest building belonging to the University, as well as spectacular new facilities for training and service to the agricultural and the urban communities. The George D. Widener Hospital, dedicated just over a year ago, provides superior new facilities for the treatment of large animals, along with the teaching and research space necessary for sophisticated investigation of the diseases and productive capacity of food animals. At its rural campus, the University continues to make major contributions to animal agriculture in the Commonwealth and to the horse-racing industry of the entire region, through the research and expertise of its veterinary facility. With the very recent opening of the Veterinary Hospital on our Philadelphia campus, the University acquired, after years of careful planning, a fantastic new resource—the world's most advanced facility for the integrated housing, research, and care associated with small animals, from household pets to the exotic inhabitants of aquaria and zoos.





# EDITORIAL

## A Mandate for Man

### Bellwether Readers

In making the commitment to publish a quarterly newsletter of some quality, I hope to rid myself of a long-standing frustration—our seeming inability to find an effective and regular means of communicating the story of veterinary medicine at the University of Pennsylvania to our many constituencies. We are pleased to have fair-share representation in *Health Affairs*, and this will continue, but as the name suggests, *Health Affairs* is concerned with the University's Academic Health Center in its entirety. Of necessity, the space devoted to any one school is rather small, but we also think the circulation of *Health Affairs* is too restrictive to satisfy our growing needs.

Our newsletter may never win a prize, but we shall endeavor to deliver interesting, accurate information on every facet of the school's activities in a format that will invite and hold your attention. Dr. John E. Martin, editor, whom graduates of the '50s and early '60s will remember fondly as a professor of pharmacology and therapeutics, was one of the best teachers in the school.

In preparation for our centennial celebration in 1984, Dr. Martin is also hard at work on a history of the school with particular emphasis on the last fifty years. Looking back to the beginning, to 1884, when the University admitted its first class of veterinary students, Dr. Martin has uncovered data that have a particular fascination, as we prepare to occupy the new teaching hospital in West Philadelphia. He discovered that in 1884, the building that was to house the entire School of Veterinary Medicine cost a mere \$16,900, almost precisely *one-thousand times less* than the cost of the new teaching hospital. In that same year, the Trustees' minutes record an allocation of \$350 to equip the newly-founded school. This original facility stood on what is now the site of the Medical School Laboratory Building on Hamilton Walk, approximately three city blocks southeast of the new hospital.

As between 1884 and now, it is hard to imagine a more sharply contrasting physical and intellectual



environment. Yet, through nearly ten decades, the school's educational philosophy and achievements can be traced unmistakably to those humble beginnings, when a few sagacious men determined to establish a veterinary school in a great center

of humanistic learning and academic medicine.

In this newsletter we shall often cite the achievements of our students and faculty, both individually and in the aggregate, but mainly we hope to acquaint you with the school's remarkable spectrum of activities and to bring to your attention those advances and areas of endeavor which are of particular interest to alumni and to all the constituencies—farmers, horsemen, owners of companion animals—served by veterinary medicine.

*Robert R. Marshak*

Dr. Robert R. Marshak  
Dean, School of Veterinary Medicine

*No one, of course, has ever been able to fix a point in time when our species emerged. Although the word "impossible" is an anathema to us, I fear we must admit that that search is an impossible one. We are destined never to be certain about where we first appeared or in what moral or intellectual condition. And perhaps that is best. We never stop wondering; we never stop looking; and we will never stop arguing about it. But we will never really know.*

*We do know rather more, however, about where we are going. We can get a reasonable fix on the end of our story if not on the beginning. Given our technological capabilities and our rate of intellectual growth, in which we are said to be able to double our technology every five years, a task that once took an estimated 100,000 years, we have only two ways to go. We shall become benevolent or we shall become extinct.*

*Benevolence, more than any other single force in our changing, evolving, turbulent condition is concomitant to our own survival—and a good thing, too. A less sensitive master plan might have come up with an altogether different construction. I, personally, find an endearing imperative in the fact that we simply have to learn to be nice to one another and to our one and only planet in order to survive. It is a little ironic that benevolence had to be mandated, but it has been, and all avenues of logic proclaim it. It is further mandated by logic and time that we take heed rather quickly. Our hate-love affair with ourselves has brought us to the edge without much spare time to do anything but say, "Yes it is so, benevolence here we come."*

*How then shall we record our own history? Where are the peaks and valleys from those unknown beginnings to that benevolent future? I suggest that evil is not a fair measure of the true human being who will emerge, perhaps, from us. Wars have always been counterproductive dips, and since we usually forget what they are about, or who started them, or why, I propose to you, in the innocence of the non-historian, that we do not count them stepping stones. Rather, I think, the pavement we follow, our path and markers, are moral ones, just ones and, above all, gentle ones. And I do not play Pollyanna here. These are the harsh realities of our survival versus our extermination. In this case, of course, by reason of suicide.*

*It is a fact that the moral and gentle things we do outlast the wicked, obscene, bizarre, and dangerous. Quite probably, the third oldest cultural complex we still embrace is pet-keeping. Think about that. First, certainly, came hunting and gathering, a cooperative venture. The second oldest was probably story telling. That, too, was cooperative. What was the third? In all likelihood the beginning of the domestication of the little southern wolf, *Canis Lupus pallipes*, a companion animal. That may have been as long as 150 to 250 centuries ago. And what has come and gone in the interim? Slavery, even if it was a moral disaster, and cannibalism as a ritual and human sacrifice. One of these was a solution to*

Roger Caras, author of this  
Bellwether editorial



*the eternal protein shortage and the other got rid of a lot of undesirables. All of that has gone by the way, however, the companion animal idea has not only lingered on, but has become a very important part of our way of life. Psychological benefits were acknowledged long ago, of course. As a result of studies at this University, as well as at others, it now seems certain that there are profound physical effects as well—things like longevity, our own longevity.*

*Not long ago I was in Amsterdam with my wife, my daughter, and some friends. I was moved to give them all a brief history quiz. "Who," I asked, "was the prime minister of the Netherlands when the Nazis invaded the low countries? What was his name?" Puzzled looks. "When he was unseated? Who did the Nazis put in his place as the Dutch quisling?" More puzzled looks. "All right," said I with mock disgust, "who was the German general who conquered this part of Europe?" No one knew. "Just two more questions," I promised. "Who was the head of the Gestapo in the Netherlands?" When no one seemed to know, I protested again with mock disgust, "But these were men who had the power of life and death over millions of people—and wielded it without mercy. These were the movers and shakers of their time and they wore shiny belt buckles and daggers. O.K., one last question, who was the twelve-year old girl who remained hidden in a small room here in Amsterdam for two years, kept a diary, and then died in a concentration camp?" The chorus, of course, was immediate. "Anne Frank."*

*Does that tell us something about power—dark, corrupting, unlimited, and evil? I think it reflects directly on what we were just talking about. It suggests that quiet, benevolent, positive human acts and actions, people with ideas, goals, and thoughts are the high places in our past, present, and future. All the rest of it happens down in the valleys, in the cuts, hollows and draws, the dank places and the dark, the places that real history forgets once you add time.*

*As might be expected of a race, a species coming from the primitive time of skull bashing and cannibalism and overall brutish behavior toward a mandated, no-alternative place of gentle care and benevolence, we peak at the good and suffer briefly, and mercifully forget the bad. Nature has been kind. Men and women cannot remember pain.*

*To tie up the loose ends, to package it, as they say in my world of show and tell, I think our purpose in being here today has a great deal to do with everything I have been talking (continued on page 4)*



# Humans & Companion Animals



**D** is for Dash, who nicely sits up.

(continued from page 3)

about. This structure could contain almost anything: a printing press for political obscenities, a terrorist's bomb factory, a research lab for biological warfare, a Gestapo interrogation center, a prison, or an X-rated movie house. It could be a place of evil or a place of good. But by chance it is a structure for good—a building built specifically to be a high point for us in this great journey of ours. What will be done here is destined to be felt and remembered. Kind and gentle people of the best intent will be taught the art of their benevolence here. The intelligence exhibited here will well match our own ultimate mandate. It will be—it already is—a shrine to the success of suffering. The broken will be fixed here and made whole. Men and women will watch, learn, and participate—the better to go forth and repeat the miracle of that brand of benevolence all around the world.

This is a building, built at great financial cost certainly, but with an even greater investment in good will. The returns will be beyond measure for they shall echo and grow into the future. Without doubt the things learned here, proven here, and done here for the first time will cross over that ever-strengthening bridge between the healing arts of human medicine and veterinary medicine. This building will radiate those qualities in us that assure us of a future of our own, and it can be viewed, as well, as a means of repaying a very old debt. For we owe much to our ancient anions, our non-judgmental forgiver of all sins.

So, we have come here to celebrate today one more peak attained and one more critical step toward benevolence. The cannibal and the destroyer in us move back another inch; the sunlight is a little closer and a little warmer. Our future is the better assured, we are reinforced, made more nearly complete in our inevitable, mandated, and ultimated form. At least we approach it.

Today is a celebration. A speech, in fact, seems less than what was called for. A trumpet call first and then a song would have been a better choice. Heartfelt thanks and certainly congratulations to everyone involved in making this dream, this landmark in benevolence, come true.

This talk was given by Roger Caras at the dedication of the new Veterinary Hospital of the University of Pennsylvania on May 15, 1981. Mr. Caras is an author, naturalist, photographer, lecturer, and recent recipient of the Joseph Wood Krutch Medallion.

Mr. Caras has authored more than forty books on nature, environment, and animals. He is a special correspondent on those subjects for the ABC news television network and a commentator for CBS radio on pets and wildlife. Mr. Caras recently became a member of the Board of Overseers for the School of Veterinary Medicine.

(continued from cover)

The Center for the Interaction of Animals and Society is housed in a brownstone building on Spruce Street, not far from the School of Veterinary Medicine. In September 1981 the center will move to the school. In 1977, the center was established to provide a more comprehensive understanding of companion animals and to gather data about all aspects of the human/companion animal bond.

Funding came initially from the Marilyn Simpson Charitable Trusts, individual donations, and a training grant. In 1979, the Geraldine R. Dodge Foundation provided a five-year grant to the School of Veterinary Medicine, which enabled the center to expand and establish a core staff. It now has a full-time director, Dr. Alan M. Beck, who holds a master's degree from California State University in Los Angeles and a doctor of science degree from The Johns Hopkins University School of Hygiene and Public Health. Dr. Beck was director of the Bureau of Animal Affairs of the New York City Department of Health prior to joining the center.

Other members of the core staff are a full-time social worker and two animal behaviorists. The center has become truly interdisciplinary. Psychiatrists, veterinarians, anthropologists, social workers, and animal behaviorists are jointly developing research programs which, according to Dr. Beck, "will be examining many of the roles animals play in society, so as to better understand them, to better utilize them to the advantage of all living things, and to correct those roles that are not in the best interest of people and animals."

The field is complex and the topics covered in the papers and workshops at the international conference give an indication of the many disciplines involved. There will be fifteen workshops:

- Evaluation of Animal Behavior
- Ethical Constraints on the Use of Animals
- Experimental Design of Pet Facilitated Therapy Programs
- Evaluation of Horseback Riding Therapy Programs
- Ethology and the Study of Companion Animals
- Animals as Symbols—Anthropological Study of Companion Animals
- Programs Using Animals with the Aged
- Companion Animals and Human Health
- Legislative Aspects of Animals in the City
- Animals and the Family
- The Human/Companion Animal Bond

in the Veterinary Curriculum

- Social Work Practice and Veterinary Medicine
- Nursing Practice and the Companion Animal
- Management of Grief and the Loss of a Companion Animal
- Legal Counseling of Problems Related to Companion Animals



*Child with Dog*  
Unknown American artist  
Oil on canvas, 19th century  
Philadelphia Museum of Art  
The Louise and Walter  
Arensberg Collection

The conference will present current information on the nature of the relationship between human beings and their companion animals. Speakers are coming from many parts of the United States, France, and Great Britain. There will be an emphasis on basic psychological, sociological, and ethological studies, as well as information about projects using companion animals to improve the quality of life and health of people. The conference is sponsored by the Latham Foundation's Delta Group, and co-sponsored by the American Animal Hospital Association, the American Psychiatric Association, and the American Veterinary Association. It will be held at the University City Holiday Inn. Participation in the conference qualifies as two units of continuing education credit.

Philadelphia was the natural choice for the conference because the Center for the Interaction of Animals and Society had initiated several innovative programs at the School of Veterinary Medicine of the University of Pennsylvania. No longer are students trained only to treat diseases, they are also taught to consider the relationships between pet and owner and to keep in mind basic principles of human and animal behavior. Students, in five elective courses, receive information about people, their pets and the



significance of their relationships. The social role of animals in contemporary society is also covered and the implications of pet ownership are addressed.

Training doesn't stop in the lecture hall. The Center has established a Companion Animal Behavior Clinic at the School of Veterinary Medicine where people, who own animals with behavior problems, are counseled by Dr. Victoria Voith, the veterinary medical director of the clinic. Senior veterinary students attend this clinic as part of the school's clinical rotation core. They also attend the clinical conferences where the behavior cases are presented and discussed.

The Companion Animal Behavior Clinic served more than 300 cases during the last two years. It was established to treat and study animals with behavioral problems as opposed to problems of organic dysfunction or disease. Dr. Voith, who is trained in veterinary medicine, psychology, and animal behavior, supervises the clinic, which supplements traditional veterinary medicine as it helps pet owners cope with a problem that is not medical, yet which is one that can become so pressing that it may lead to the eventual destruction of the pet.

The majority of cases presented at the clinic are those of aggressive behavior by a dog towards people and other animals. In families with children, this problem is particularly acute since the safety of children must be kept in mind, while remembering that a dog can serve many positive roles. In many cases, owners ignored the fact that a dog is a pack animal and needs a strong leader. Through counseling, the owner and the animal are trained to assume their proper roles as leader and pack member, respectively. Sometimes behavior-modification techniques and drug therapy are used. According to Dr. Voith, the drugs are employed to reduce the anxiety of the dog.

Other problems presented to the clinic include failure to housebreak; destruction of furniture and other property; and excessive barking and hyperactivity. Cats, too, are brought in with aggression problems, though failure to use the litter box is the most common problem here. The clinic sees about sixty-eight percent dog cases, thirty-one percent cat cases, and one percent of the cases involve exotic animals. The clinic follows through on the counseling with telephone calls. The success rate for correcting the problems is more than ninety percent.

The School of Veterinary Medicine of the University of Pennsylvania is unique in that it has appointed a professor of the School of Social Work to teach veterinary students. Professor Eleanor Ryder holds appointments at both schools and conducts research on how to expand the utility of companion animals to the elderly and to people in mental hospitals. The School of Veterinary Medicine also has a full-time social worker on its staff. Jamie Quakenbush, a predoctoral fellow in the School of Social Work, sees about fourteen cases a month. His primary function is to help



**K** is a Kitten, that plays with a ball.

clients cope with the loss of a pet. He has counseled people with pets as varied as dogs, cats, birds, and monkeys. "For the older person the loss of a pet is often a major setback," Quakenbush said. "In rare instances people can get so depressed that they contemplate suicide." Jamie has found that the intensity of the relationship between pet and owner varies according to the length of time. "I am called in more frequently when people have owned an animal for more than six years," he explained, "because the loss then is much more traumatic."

Quakenbush also serves as a link between veterinarian and client. The latter often is confused by the medical terms and is not able to evaluate the options open to him regarding the pet's treatment. The social worker translates so that client and veterinarian can communicate. He also, particularly in the case of elderly clients on a limited budget, works with the hospital to develop the best and least expensive treatment plan for the pet and arranges for time payments. Practitioners sometimes contact Quakenbush to help them comfort a client who has, or will, lose a pet. The social worker also spends a lot of time with clinicians and students, covering the social aspects and implication of pet ownership. His services are free and he is on-call at the hospital during regular hours.

The School of Veterinary Medicine and the School of Social Work have joined, through the Center for the Interaction of Animals and Society, to acquaint not only their professions, but also the medical, psychiatric, and psychologic disciplines with the significance of pet ownership, through courses at both schools and through publishing material. An article, "Social Work Service in a Veterinary Teaching Hospital," by Professor Eleanor Ryder, was part of the Compendium on Continuing Education for the Practicing Veterinarian.

In addition to providing services to animal owners and adding to the traditional veterinary curriculum, the Center for the Interaction of Animals and Society is very much engaged in research. Drs. Aaron Katcher and Erika Friedman found that animal owners had a significantly improved survival rate following a heart attack than non-animal owners, who were alike in all other respects. Katcher identified seven functions of pets which would be expected to decrease morbidity and mortality from a broad spectrum of physical diseases. Pets decrease loneliness; are something to care for; something to keep a person busy; something to caress and fondle; something to look at; something that makes a person feel safe; something that provides a

stimulus for exercise. Katcher believes that a question about pet ownership should be included in epidemiological surveys because it would provide information about the strength of the companion animal bond.

Dr. Katcher's group investigated the interaction between people and animals, such as talking to or touching a pet. The survey showed that most people talked to their pets and that many felt that the pets understood the feelings expressed. Researchers also found that the owner's blood pressure was lower when talking to his or her pet than when talking to another person. They concluded that people feel comfortable talking to animals because they believe that the pet is empathic and one does not have to fear the animal's evaluation.

The group also studied how people touch their animals. They found that men touched animals with the same frequency and manner as women and that the size of the pet did not influence the kind or frequency of touch. An abundance of touching had the character of idle play or inattentive petting.

Dr. Beck feels these observations have significant implications for our culture and for the dog family. Apparently, dogs provide an outlet for the comforts associated with touch for men in a culture that ordinarily inhibits men from physical contact. All breeds can serve, permitting people to choose the dog most appropriate for their lifestyle. It was also found that stroking a dog lowered the blood pressure of both human and dog.

Dr. Beck and Dr. Katcher also discovered that blood pressure in people can be lowered by having them look at a tank full of fish. Research is currently being conducted to study this effect in people with labile hypertension.

The companion animal bond is not only evaluated in a clinical setting but also in home situations. Dr. Sharon Smith, a post doctoral ethologist, stays in a volunteer's home and observes the interactions of family and dog. The center anticipates that this study will provide important insights into the role dogs play in the lives of people.

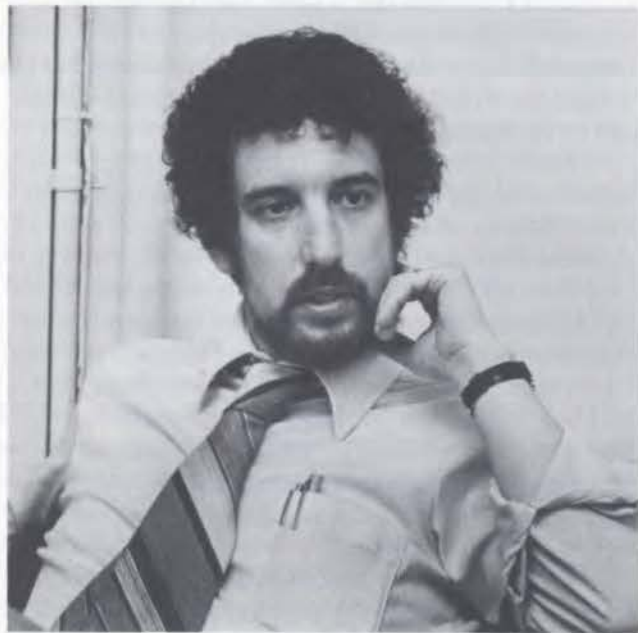
Dr. Robert Fagen, the first Dodge Scholar, is studying play behavior in cats. Dr. Barbara Jones, an anthropologist, is studying the role of the horse in the lives of young people.

Apart from the work at the center and at the Small Animal Hospital, members of the Center for the Interaction of Animals and Society are also available to discuss their work and findings in the media and with community groups, and have generated much interest in the field. Dr. Beck summarizes the role of the center, "The key ingredients of the Center for the Interaction of Animals and Society is interdisciplinary interaction . . . today, animals are so much a part of our lives, having a place in our homes, recreation, work, and our general feeling of well-being, that it takes the varied skills and experiences of a whole university complex to understand and best utilize the very special relationship that exists between people and their companion animals."



# PROFILES

## Barry Stupine: Meeting the Challenge



If you are looking for Barry Stupine, the young, tousle-haired director of the Small Animal Hospital, and associate dean for Administration, you may have to search the hospital and laboratories. Stupine, who came to the Small Animal Hospital three years ago, is not an administrator who spends his days at a desk. Instead, he's everywhere in the hospital, darting in and out of doorways, giving a friendly smile and a wave to everyone. He takes time to listen and to talk to all, and his words are accompanied by many gestures.

Barry likes challenges on the job, on the racquetball court, and in his favorite pastime, mathematical games. He assumed the directorship of the Small Animal Hospital in 1978, because it would be stimulating; and so it is. Stupine became the first non-veterinarian to administer a small animal hospital affiliated with a veterinary school and a trend began. Today, about five other schools have hired professional administrators for their veterinary hospitals. Stupine helped to establish a professional organization for these administrators, and they meet annually to exchange views and experiences.

The hospital environment is not new to Stupine. While studying for an MBA in health care administration at George Washington University, he spent one year at HUP as administrative resident. After receiving his master's degree, Stupine stayed at HUP for one year as evening administrator and as assistant administrator of the hospital. The next six years were spent as associate administrator at the Hospital of the Medical College of Pennsylvania, and it was from there that Barry came to the Small Animal Hospital. In addition to his master's degree, Stupine holds an undergraduate degree in economics from Temple University.

Since beginning his tasks at the Veterinary School, Stupine has made many changes directed toward making the Small Animal Hospital the best. He streamlined procedures, and organized the hospital to parallel those of a human hospital, though he notes that, "An animal hospital is unique because there is no third party insurance; clients must pay for the

services and the costs to the client are not tax-deductible. We therefore must be very cost-conscious."

Expenses are important to the client, the hospital and the school. "The school is mandated to break even, and it has for the last three years, without a rise in tuition," Stupine said. "We even have been able to pay back some of our debt to the University. The hospital itself does lose some money; last year we spent \$1.7 million and took in \$1.5 million, the smallest loss in recent history. In a teaching situation, some procedures just cannot be charged in full to the client." Bills, however, are now itemized by *units of actual services* to determine where revenue is generated and an incentive system for clinicians and staff has been instituted to encourage the complete recording of treatments and charges.

Shortly after his arrival, Stupine discovered a shortage of staff and technicians. "This is a teaching hospital and to provide proper service, one must have proper staff," he said. Currently interns number ten and there are fourteen residents, in addition to about thirty-five faculty members from the Department of Clinical Studies. The number of veterinary nurses has been increased to eight in the wards, and a registered nurse is in charge of the operating rooms. The intensive care unit is currently staffed around the clock with trained nurses. Also, the clinician on duty in most of the sections of the Department of Clinical Studies can now be reached for emergency consultation through a beeper.

The hospital now serves about 17,000 cases each year and the emergency service, which handles 5,000 cases annually, has been upgraded by adding staff during evening and weekend hours. Also, to meet the need, a Parvovirus isolation ward has been added. The clinical laboratory is now open evenings and weekends. The referral service has been improved and a system has been instituted to keep the practitioner informed. "When a case has been seen at the hospital," Stupine said, "we send a post card to the referring veterinarian, giving him the date and the name of the clinician in charge. We then furnish clinicians with a form to complete for treatment and diagnosis and request that they return it to the appointment secretaries. Then the forms are mailed to the practitioner. We have also installed a special telephone line to get the referring veterinarian through to the appointment desk; thirty percent of our cases are referred." Stupine believes that although we have taken some steps to improve our referral procedures, still more needs to be done.

The medical records retrieval system has been improved by hiring a medical records librarian. "We now have ninety-eight percent of the records on hand at the proper time," Barry advises. "This has improved morale. Clinicians no longer need to horde records for fear of never being able to find them." The

white coats with the clinician's name on them are further evidence of Stupine's professional philosophy as are the uniforms of each student who works at the hospital.

Despite his many tasks, Barry still finds time to lecture to students and conduct seminars for students and practitioners on the business aspects of veterinary practice. He also helps other veterinary schools with administrative problems and serves as a consultant to the federal government in the area of distress grants for medical and veterinary schools.

When Stupine arrives at home, the Small Animal Hospital becomes secondary to playing with his two children, tossing a ball for his golden retriever, or settling down with a mathematical puzzle. He relaxes by playing the piano and works off his nervous energy lifting weights or playing racquetball.

The new hospital will bring additional concerns to its administrator because of higher utility costs and greater space to maintain. But this doesn't worry Barry Stupine because he knows that the new building, with its expanded diagnostic and treatment facilities, will make the Veterinary Hospital of the University of Pennsylvania "the best veterinary hospital in the world."

## Dr. William Boucher: The Teacher



"Big Bill," as he is affectionately known to several thousand graduates and to many of his faculty colleagues, has participated in many great changes at the School of Veterinary Medicine and, yet, has remained virtually unchanged himself. This immediately tells us a great deal about the character of Dr. William Boucher.



Dr. Boucher joined the faculty in 1940 as an Assistant Instructor and is now Professor of Veterinary Medicine. He will retire on December 31, 1981. Dr. Boucher is a man of formidable physical proportions and strong opinions. For four decades he has stood out as a Rock of Gibraltar in the affairs of his alma mater. Bill Boucher is a very direct person, but by his own admission, he is quite reticent, especially when talking about his aims and ambitions. For example, when asked about plans for retirement, he quickly answered, "that's not for publication." When interviewed on other occasions, he used this same answer concerning certain achievements. As he nears retirement, he does admit to a "real satisfaction" and a "sense of achievement" in knowing that he has devoted a lifetime of work to "something good."

Despite his lifelong interest in farm animals Dr. Boucher was not reared as a farm boy. He spent his early life in Millington, NJ, about forty miles west of New York City. He spent a year at Bucknell University and then entered the Veterinary School.

When Bill joined the faculty in 1940, Dr. George A. Dick was dean and since that time three others have occupied that office—Dr. Raymond A. Kelser, Dr. Mark W. Allam, and the present dean, Dr. Robert R. Marshak. Before Dr. Marshak became dean in 1973, he and Dr. Boucher had spent seventeen years together in clinical medicine. The first encounter between these two gentlemen is typical of both. In 1956, Dr. Marshak had come to Philadelphia in response to an invitation from Dean Allam to interview for a position of professor of medicine. During his visit, he attended a dinner at New Bolton Center and met the clinical staff. During the course of the evening, he recalls that he was the subject of a "harrowing inquisition" by "a large individual, who was both unsmiling and unimpressed"—Dr. Boucher. In his own turn, Dr. Boucher admits that he had Dr. Marshak "on the grill." Despite this rather ominous beginning, both men came away with a feeling of respect for one another. Dr. Boucher soon came to believe that "here was our man," and Dr. Marshak, who became professor of medicine, decided that he wanted Bill Boucher as a mainstay in his department. The relationship ripened over the years with each complementing the other in important ways. Today, Dean Marshak counts Bill Boucher as "one of my closest friends."

Dr. Boucher is recognized as an accomplished clinician and a proven administrator, but most of all, he is a teacher. When he joined the faculty, he resolved to dedicate himself to the improvement of the teaching of medicine, as it pertained to farm animals. From 1940 to 1968, he was associated with the ambulatory clinic, later called the field service unit. In this work, he took groups of students to farms as part of their clinical training program. Initially, the ambulatory clinic had its headquarters in Philadelphia and traveled to farms that were then located in the southwestern outskirts of the city and in New Jersey. In 1945, after the clinic moved to Media, PA, the

Boucher family moved to the second floor of the clinic building, while small groups of students lived on the first floor. Many graduates fondly look back upon this experience as they were close to Mrs. Boucher's fabulous cooking. Ultimately the service moved to New Bolton Center where it was greatly expanded once the school went on to a direct-practice basis. In this work, Dr. Boucher developed his uncommon ability as a diagnostician and students learned the value of careful physical examination, history taking, and inspection of the farm premises. Today, Dr. Boucher views the ready availability of blocks of diagnostic tests with mixed feelings. He recognizes that while they do offer improved diagnostic techniques, they also tend to deter the clinician from making careful examinations.

Dr. Boucher is known and appreciated by students for his organization of lecture material and for his ability to act as a bridge between the practical aspects of medicine and the increasingly complex body of scientific information. He encourages younger faculty members to obtain advanced training while he devotes his attention to teaching and providing clinical service.

The fact that Dr. Boucher has remained more or less unchanged should not be taken to mean that he is not adaptable to new situations. This is borne out by his statement that "I always do it the way I see it at the time." This attitude is reflected in the role he played in a major change that took place in the clinical department. At one time, the members of the department were grouped as equine clinicians and bovine clinicians, as well as in groups for other farm animals. As the teaching of clinical subjects became more complex, it became evident that a different staff arrangement was needed. A division was made on the basis of medicine and surgery, rather than on a species basis. At the time (and even today), Dr. Boucher's personal preference was for things to remain as they were. However, he did recognize that "times had changed" and he supported the change since it was necessary to improve teaching methods.

Dr. Boucher's contributions as a teacher and clinician have been recognized through various awards. In 1979, the Pennsylvania Veterinary Medical Association selected him as *Distinguished Veterinarian*. In 1968, he was the recipient of the Norden Teaching Award, and in 1981, he received the *Christian and Mary Lindback Award for Distinguished Teaching*. The prestigious Lindback award is made each year to eight teachers selected from the University at-large. Dr. Boucher was cited as a "superlative teacher who has contributed immeasurably to student attainment of clinical acumen."

No story about Bill Boucher would be complete without mentioning his family. They have always been a part of everything he has done at the School of Veterinary Medicine.

Almost from the very beginning of his teaching career, Bill and his lovely wife, Doris, have opened their home to students. As Bill says, "Doris was always genuinely interested in people, and has especially enjoyed her friendships with students. Opening our home to students has been our great pleasure." Many hundreds of graduates have fond memories of evenings spent with the Boucher clan. Bill would conduct a short "skull session," and then play his guitar while others joined in with other instruments. Later, Doris would serve some of her delicious baked goods. For many years, the Bouchers prepared a senior class picnic and also hosted Christmas dinner for students, interns, and residents who were on duty during the holidays. On one occasion, over sixty attended one of these festive affairs in the "home away from home."

Doris has always been active in student affairs. This includes the many hours she has spent helping with the annual Christmas Bazaar, held for the benefit of the Student A.V.M.A. She often prepares goodies for various functions to support the scholarship fund. Mrs. Boucher's service to the school has gone beyond these extracurricular activities, however. When the ambulatory clinic was stationed in Media, she spent much time in answering the telephone and keeping records. Bill says, "We seldom went out together for fear of missing a call from a client who needed our service."

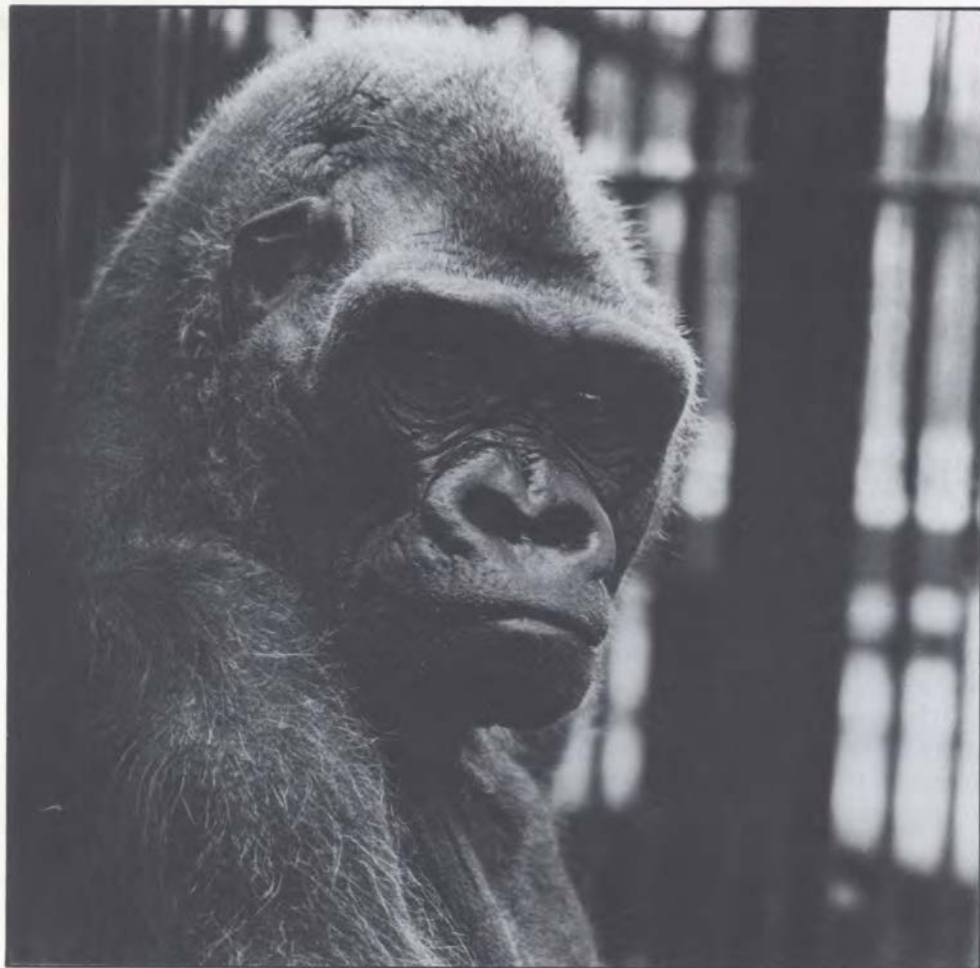
The Boucher children grew up as a part of the school and contributed their part to making life more enjoyable for students and junior faculty. Today, most of them live far from home. One daughter, Holly, married a graduate of the class of 1970. Today, she and her husband, Dr. Luis Colon, live in Puerto Rico. The other two daughters, Cheryl and Joanne, are both married and live in California. Joanne has three children and teaches nursing, while Cheryl has one child and is involved in operating a day-care center. The only one of the children to remain close to home is Bill, who works for Wyeth Pharmaceuticals and lives in West Chester. The six grandchildren are an obvious delight to the grandparents. Despite the distances involved, the family visits as often as possible. On Alumni Day this year, all three daughters were in Philadelphia to renew friendships with many who had enjoyed the hospitality of their home.

Fortunately, the retirement of Dr. Boucher does not mean "adieu." Bill and Doris will continue to live in their comfortable home at New Bolton Center. Despite his declaration that his retirement plans are "not for publication," it is obvious that Bill plans to spend much time in gardening and on projects about the house.

Dr. Boucher's legacy is one that is not measured in terms of great scientific achievements, but rather in what he has given to people. Here's to Bill and his family for the many good things they have done to make the Veterinary School a better place. We wish them an abundant life. May the wind always blow at their backs.



# Massa — The Big Boss



## Anim

Massa is a lowland gorilla who has been living at the Philadelphia Zoo for forty-six years; he celebrated his fiftieth birthday in January. Of the 219 or so gorillas in captivity, Massa holds the world's longevity record for his species. And although there is often speculation on whether animals in captivity enjoy the best of possible worlds, in Massa's case, captivity is, indeed, the secret to his long life.

Since Massa's arrival to the Philadelphia Zoo in 1935, he's lived a calm and happy existence. Massa's earlier life, however, was not as uneventful. When Massa was about one month old, his mother was foraging a West African jungle for fruits and berries with a band of gorillas, with her son upon her back. The gorillas liked to visit the *shambas* (a Swahili word for a plantation), because the jungle gardens grew such sweet and luscious fruits. Suddenly, angry natives appeared and, before the gorillas could escape, attacked and killed them, sparing only Massa.

The natives took Massa to their village where they fed and cared for him, with the idea that he'd do very well in either their cooking pot, or as a trade item for an animal dealer. Fortunately, a trader visited the village before Massa fell victim to the former plight. A short time after, Massa was the object of another transaction and became the property of a trader in a large, West African, seaport village. It was from there that a Captain Phillips purchased Massa for his Brooklyn, NY friend, Mrs. Gertrude Lintz.

During the voyage to the United States, Massa contracted pneumonia and lapsed into unconsciousness. During the five or so days after his arrival, Mrs. Lintz—a devoted animal lover who specialized in rearing baby exotic animals and especially primates—nursed

Massa as one would a child, until the crisis passed. It was Mrs. Lintz who named Massa, which is Pidgin English for "Master" or "Big Boss."

Mrs. Lintz taught Massa to do many people tasks—how to put on clothes and how to wash a floor, for example. One morning, while Massa was busy scrubbing the kitchen floor, Mrs. Lintz, who had tiptoed in to observe, slipped on the wet floor and inadvertently kicked the bucket causing a wave of soapy water to drench Massa. Frightened, Massa attacked Mrs. Lintz. Luckily, a young woman friend was in the next room and saved Mrs. Lintz from further harm by grabbing a heavy skillet and crashing it down on Massa's head. It required seventy stitches to close Mrs. Lintz's wounds.

The spell between mistress and pet was broken. Clearly, Massa realized that he could defy her orders no matter how sternly she commanded obedience. Reluctantly, Mrs. Lintz decided to sell Massa, then believed to be female, to the Philadelphia Zoo, who had been looking for a mate for Bamboo, another lowland gorilla.

In August 1935, zoo officials announced that Massa was discovered to be male and that the "Zoo's Gorilla Wedding Is Off..." Despite the gender confusion, Massa and Bamboo were allowed to be together as companions. The relationship was not amicable and, after five days of fisticuffs, they were permanently separated.

Since that time, Massa has lived in seemingly splendid solitude, enjoying the attention and gifts of his keepers and visitors.

**Fleas** are a year-round problem which seems to get worse in warm weather. They are easy to detect—black specks in the hair-coat, noticed during grooming are usually flea droppings. A simple test is to moisten a few of the particles on a piece of white paper. A red stain indicates blood eliminated by the fleas. Scratching may lead to "hot spots," which are secondary bacterial infections. Some dogs are so allergic to flea saliva that they require special treatment to desensitize them. Dips and powders usually will eliminate the adult fleas present.

Flea control requires a knowledge of the life cycle of the parasite. The flea visits the dog only to feed, then it drops off and lays eggs. Any place where the flea-ridden dog sleeps will have eggs which will hatch in a week or two. If the rug is vacuumed, the eggs will be in the vacuum bag and infect your closet. If you go on vacation and close your house for a few weeks, the eggs will hatch and an army of hungry fleas will be waiting to attack your dog and any other warm-blooded creatures which enter. None of the insecticides destroy the eggs, however, foggers are now on the market which can kill adults and larvae in rugs, drapes, cracks, upholstered furniture, etc. Pets will attract most of the fleas in a home and it may be necessary to fumigate the house to keep the situation under control, in addition to regularly treating the animals.

If animals are outdoors, there is no way to fumigate the environment. There are organophosphate insecticides, given by mouth, which are said to be 99% effective in flea control. Many shampoos have ingredients which help control fleas, ticks, and lice. Flea collars are also often effective, as well as dips and powders.

Flea control requires constant vigilance. There is no easy "one-shot" way to do it.

**Parvovirus Disease** continues to be a primary concern of many dog owners. Unfortunately, because it is something new and of great reader interest, every publication has had articles, many of which contain misinformation. It has been called a "killer disease"



# Birth Announcement

*As this is being written it is safe to speculate that thousands of calves are being born around the world. However, it is a fact that none of these or any previous births were quite like the appearance of "Virgil," a handsome Holstein calf born on Tuesday, June 9, 1981, at New Bolton Center. Virgil, you see, is the world's first "test tube calf."*

Virgil had his beginning back on September 3, 1980 when specially treated bull semen was used for the *in vitro* insemination of an egg obtained from a donor cow. This sounds rather elementary but actually a number of years of dedicated work had already taken place in order for this laboratory event to occur. For example, in 1968 Dr. Benjamin J. Brackett, who heads the research team responsible for this work, was able to fertilize rabbit eggs in the laboratory and in 1980 showed that the same could be done with bovine ova. In the case of Virgil, it was observed that the egg exhibited evidence of fertilization twenty-four hours after it had been exposed to sperm, and was in the two-cell stage in forty-one hours. After forty-seven hours, the ova had reached the four-cell stage and at that time it was placed in the oviduct (fallopian tube) of the recipient cow. A normal pregnancy followed.

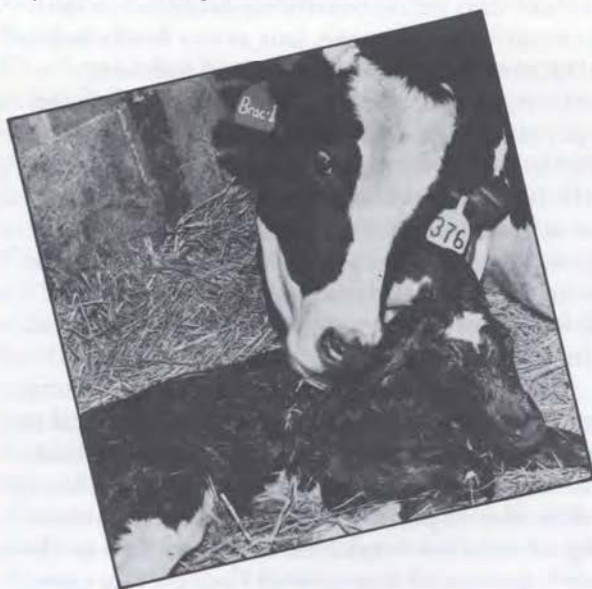
The birth of Virgil represents a major step forward from the commonly used embryo transfer technique. During the last decade thousands of cattle resulted from embryo transfer procedures in which genetically valuable embryos were harvested from donor cows five to twelve days after fertilization, and placed directly in less valuable donor cows who nurture the valuable offspring. Now a major technological barrier has been over-

come to enable bovine fertilization to take place when eggs and sperm cells are brought together under exacting incubation conditions that duplicate the normal site of fertilization in the female tract.

While the birth of Virgil clearly demonstrates that normal development can take place after *in vitro* fertilization in the cow, the significance of the research goes further. The work, for example, provides a useful model for more study on animal and human infertility. It opens the way for new technology in animal breeding and in improving the efficiency of food animal production.

Scientific details of the work are scheduled for presentation at the fourteenth annual meeting of the Society for the Study of Reproduction in Corvallis, Oregon, on August 13, 1981.

Dr. Brackett has been working in this field since 1962. The research team headed by him at New Bolton Center included Daniel Bousquet, D.V.M., Ph.D., Canadian Research Fellow; Melinda L. Boice, M.S., Junior Research Fellow; William J. Donawick, D.V.M., Professor of Surgery; James F. Evans, V.M.D., Instructor; and Michael A. Dressel, M.S., Junior Research Specialist.



We don't have all the answers. Check the source of any rumors or scare stories and be sure the information you have is up-to-date.

**Hypercalcemia** is now being more often recognized as a result of the widespread use of automated biochemical analyzers and routine determination of serum calcium is included in routine "Chem-Screens."

Writing in the *Journal of the American Veterinary Medical Association*, Frederick H. Drazner, DVM, MS, states that an excess of calcium in the blood may cause disturbances of gastrointestinal, neuromuscular, cardiovascular, and renal function.

Diseases which may be associated with hypercalcemia are parathyroidism, hypervitaminosis D, and conditions which result in destruction of bone.

Oversupplementation with Vitamin D, usually in large dogs, can be harmful. The ingestion of jasmine can produce similar results. This is an interesting report because very little information is available on the interpretation of high-calcium values. Normal ranges have been established but, in the absence of clinical signs, a higher value may be of little significance. Results of blood tests must be carefully interpreted. Too much Vitamin D can cause bone problems and lameness—a high serum calcium could be a warning. Get expert advice before using it.

**The Aging Phenomenon.** At the Annual Meeting of the American Animal Hospital Association, Jacob E. Mosier, DVM, MS, spoke on Canine Geriatrics. His comments included the causes and effects of aging. Under-exercising and overfeeding were given as factors contributing to shortening of life.

Dr. Mosier states that the average life span is somewhat dependent on body size. Small dogs generally live longer than large breeds, with the average ranging from twelve to fourteen years. The maximum is about twenty-seven years, although relatively few dogs reach the age of twenty.

As the dog ages, the hair becomes gray and the skin wrinkled. The incidence of dental disease increases with age. Failing eyesight and reduced hearing ability are common in the old dog.

Veterinarians can provide health care that will minimize problems and maintain health and activity at an acceptable level. The success of such a program depends on the owner's ability to accept and adjust to the additional care needed as the dog grows older.

Send your pet care questions to Josephine Duebler, *Animal Crackers*, U of P School of Veterinary Medicine, 3800 Spruce St., Phila., PA 19104.

## Crackers

although less than 5% of adult dogs affected died.

There is no doubt that this disease causes the loss of many puppies, from the gastrointestinal form in the first two months and the less common heart involvement in older puppies. Continuing research is adding to our knowledge of the disease but there is still much to be learned.

Newer Parvovirus vaccines are available in combination with Distemper, Hepatitis, and other diseases and are being used for the protection of puppies and for "booster" doses for adult dogs. An effective immunization program is the only way to control parvoviral infection. Inactivated and modified live virus vaccines are available. It is necessary to give at least two doses of the killed vaccine several weeks apart to provide protection. A single dose of the modified live product will give protection to 75% of the vaccinates in five days and to 90% of the vaccinates, if a second dose is given in two to three weeks. At this time, it appears that there is no vaccine that is 100% effective. Although the duration of immunity is not definitely understood, "booster" doses every six months are recommended, particularly for show dogs.

Parvovirus infection can be determined by a serological test or by microscopic examination of the intestine post-mortem. The blood test will indicate the antibodies present. If a bitch is blood-tested at the time she is bred, it is possible to predict how long antibodies in the milk will interfere with successful vaccination of the puppies. Usually puppies are susceptible by eight to twelve weeks of age, but vaccine failures may occur if maternal antibodies are present at this age. It seems that even with the most carefully worked-out immunization program, there will be a period when puppies are susceptible. This emphasizes the importance of keeping puppies isolated from infected dogs which might be shedding the virus.

Parvovirus is a resistant virus. It can live in the environment indefinitely, but can be destroyed by a solution of Clorox (1:10). It is spread by fecal material, so watch your footwear...



# Renaissance of a Discipline

In earlier years, the subject of nutrition was often relegated to the status of a poor cousin in the veterinary medicine curriculum. True, students did learn about the composition of oats, corn, timothy hay, and basal rations for various animals, but they were inclined to treat this material as a nuisance to be tolerated. Compared to physiology, medicine, and surgery, nutrition was a rather dead issue. This is no longer true. Nutrition is now a live, vibrant subject that offers many exciting challenges. The teaching of the subject involves numerous other disciplines such as biochemistry, physiology, pathology, and toxicology. Nutritional research extends from basic studies of cellular enzyme systems to applied investigations of the toxic properties of trace elements found as pollutants.

The growing problem of raising larger numbers of food producing animals on smaller parcels of land, intensifies the need for more efficient feeds. The increased availability of commercial foods and supplements for companion animals presents a confusing picture to the owner. There is the tendency to believe that "If a little is good, a lot is better," and as a result, supplements may be used in amounts that prove toxic. All of these matters are of concern to the veterinarian.

In recognition of the growing importance of nutrition, a Section of Nutrition was created at New Bolton Center. This is a part of the Department of Clinical Studies and is headed by a brilliant scientist, Dr. David Kronfeld. Others in the section are Dr. William Chalupa, Dr. Susan Donoghue, Dr. Jonathan Naylor, and Dr. Charles Ramberg. The group conducts a very active and imaginative research and teaching program. Through their efforts, the subject of nutrition has been revived. The following are a few of the current research activities of the Section of Nutrition.

## High Fat Diet for Dairy Cattle.

The Section of Nutrition was recently awarded a three-year grant by the United States-Israel Binational Agricultural Research and Development (BARD) Fund, for a cooperative project with the Hebrew University. The grant will be used to study the role of metabolic disorders in determining the optimum nutrient requirements of dairy cattle. In the first studies, cattle will be fed relatively high levels of fat in forms that bypass fermentation in the rumen. The addition of digestible fat to the diet should increase the efficiency of lactation and decrease the incidence of ketosis. Previous studies have shown that the feeding of 10% tallow, protected by formaldehyde-treated soy-bean meal, depressed blood concentrations of ketones and increased lactational efficiency, up to the predicted theoretical maximum of 87%.

Another recent study showed a 16% improvement in milk production in cows fed 0.8% sodium bicarbonate in their ration. The buffer acted not only in the rumen but also in

body fluids to counteract the endogenous acid load of a high carbohydrate diet.

Ketosis and acidosis both represent metabolic inefficiencies. Diets that minimize these metabolic tendencies should maximize production.

## Research on Calcium Metabolism.

Among the many disorders of calcium metabolism encountered in veterinary medicine, one of the most economically important is a disease known as Parturient Paresis or "Milk Fever." This disease most commonly affects mature, high-producing dairy cows soon after calving, when they begin to secrete milk. The sudden, massive drain of calcium into the milk depletes the blood of calcium, and, if untreated, paralysis, coma, and death occur in about 75% of the cases. Another substantial portion of cows suffering from the disease develop permanent impairment of nerve or muscle function or other complications and eventually die or must be destroyed. The most effective treatment is intravenous calcium injection, but unfortunately, 25% of the treated cows relapse.

It might seem logical to prevent Parturient Paresis by feeding more calcium to the cow before calving, but, paradoxically, this increases her chances of developing the disorder. On the other hand, feeding a low calcium diet prior to calving is effective in preventing the disease, but many feeds fed to dairy cows are naturally high in calcium content, so there are practical difficulties in applying this method. Nevertheless, the "dry" cows in the herd must be separated from the milking cows and fed a specially formulated low calcium diet prior to calving. Furthermore, after the danger of Parturient Paresis has passed, the lactating cow needs a high calcium diet to prevent depletion of skeletal mineral reserves.

In order to develop alternative measures for preventing Parturient Paresis, we need to better understand the mechanisms by which calcium metabolism is controlled in the body and to also explain the paradoxical relationship of calcium intake in the "dry" cow to the development of Parturient Paresis. We currently believe that the low calcium diet causes calcium to be mobilized more rapidly from the bones of the cow at calving, and that this mobilization prevents depletion of blood calcium when milk production begins.

The Section of Nutrition is intensively studying this problem by feeding cows high or low calcium diets. Radioactive isotope tracers are used to study pathways of calcium metabolism and a large computer model of the metabolic transactions involved in the movement of calcium throughout the body is being developed. Using this model, absorption of calcium from the diet, the rates of movement of calcium into and out of bone, and the amount of calcium reserves available to maintain blood calcium can also be measured.

Bone biopsies are also obtained at periodic intervals for microscopic study of the cellular events involved in calcium mobilization. These experiments should explain how low calcium diets prevent Parturient Paresis and suggest other ways in which calcium metabolism of the cow can be altered to prevent the disease.

## Metabolism and Toxicity of Zinc.

Dietary zinc supplements have been used for many years to prevent zinc deficiency diseases, but recently megadoses of zinc have become popular as treatment for a wide variety of problems such as taste and smell dysfunction in humans, infertility in man and animals, liver diseases, skin disorders, and cancer. Furthermore, zinc and its close chemical relative, cadmium, are environmental pollutants in certain areas, such as in the vicinity of zinc smelters. For these reasons, a study is underway on the metabolism of zinc and the mechanisms of zinc toxicity in animals exposed to pollution from a zinc smelter.

Radioactive zinc tracers are being used to study the metabolism of zinc in sheep. With the aid of a mathematical model of zinc metabolism, it is possible to measure zinc distribution in the body and to determine how the body controls zinc metabolism when high doses of zinc are administered. Thus researchers at the Veterinary School can predict how much zinc will be absorbed from the diet, where it accumulates in the body, and how the excess is discharged in animals, which are resistant to zinc toxicosis.

In addition, studies are in progress on interaction of zinc with other trace elements for the purpose of characterizing the mechanisms of chronic zinc poisoning. For example, horses appear to be particularly susceptible to excesses of zinc intake, probably through an interference with copper metabolism. Veterinary School researchers have found extensive lesions in joint cartilage in foals raised near a zinc smelter in Pennsylvania. The cartilage lesions may reflect an interference in the metabolism of copper containing enzymes which are necessary for normal cartilage formation. In addition, there was a loss of bone mineral in these horses, suggesting a link between excessive ingestion of zinc or cadmium and a disorder of calcium metabolism. The horse may be considered the foreteller of a more widespread problem in livestock and humans living in the vicinity of zinc smelters. These studies are being conducted in collaboration with Dr. Dianne Gunson of the Laboratory of Pathology, Dr. David Kowalczyk in the Laboratory of Pharmacology and Toxicology, and Dr. C. Rennie Shoop, a private veterinary practitioner who resides near the zinc smelter. Largely through the efforts of Dr. Shoop, the Environmental Protection Agency and the Pennsylvania Department of Health have become aware of the problem of zinc/cadmium pollution in animals living near the smelter and are now investigating the potential human health hazards.



#### **Canine Nutrition and Exercise Physiology.**

About three years ago, a group of beagles arrived at New Bolton Center. This was the beginning of the Canine Nutrition and Exercise Physiology Group, a part of the Section of Nutrition. Shortly after, a dog treadmill arrived and the training of the dogs began. The beagles spent considerable time acquainting themselves with each other and the treadmill. Eventually they reached a point where they enjoyed running on it and even racing. They ran in groups of four, barking with excitement, their tails wagging happily.

The study involving beagles running a treadmill demonstrated that stamina can be altered by as much as 30%, by varying the amounts of protein, fat, and carbohydrate in the diet. A positive correlation was found between dietary content of fat and stamina, and a negative correlation between carbohydrate and stamina.

The kennel at New Bolton Center has now grown to over thirty dogs, with most of them being Alaskan racing sled dogs. In some current studies, the beagles are being matched against the huskies on the treadmill. This study will provide information about breed differences in regard to nutritional performance. In addition to monitoring dietary effects on stamina, the group is also investigating the dogs' abilities to regulate body temperature, various blood values, and cardiac function. A primary goal of these studies is to generate optimum dietary requirements for dogs under stress—hunting dogs, show dogs, guard dogs, pregnant and lactating bitches, and even house pets that may be subjected to unusual stress.

There is increasing concern over some of the new commercial dog foods. These products, introduced about four years ago, contain acids as preservatives. Analysis of some foods have shown that they contain enough free acid to cause a reduction in mineral content, dangerously high urinary excretion of calcium and acidosis. A pilot study on this problem has just been completed and will now be followed by a more definitive investigation which will establish safe limits for the amount of acid in dog food.

Some experts believe that high protein diets can cause bone abnormalities in growing puppies. The Group on Canine Nutrition and Exercise Physiology, however, has advocated high protein diets during stressful situations to support the responses to stress and to promote the repair of body tissue. Severe stress is known to deplete body proteins, causing a reduction in circulating red blood cells, impaired liver function, and muscle weakness. A study is now underway to determine any possible ill effects of high protein diets.

#### **Hyperlipemia and Hyperlipidemia.**

Hyperlipemia is a well-recognized disease of ponies, characterized by a cloudy plasma due to excess lipids, fatty degeneration of the liver, and a severe clinical syndrome. Some horses,

with a variety of illnesses, may show mildly increased levels of plasma lipids and, in these cases, this factor has been considered as incidental to the particular disease present. These milder increases in plasma lipids have been referred to as hyperlipidemia.

Studies at New Bolton Center have shown that when healthy horses are subjected to short-term deprivation of feed, there are small increases in plasma lipids. This helps to explain the hyperlipidemia observed in horses with various diseases in which there is poor food intake. Recovery from the particular illness, along with a return to normal appetite, is followed by a return to normal blood lipid values.

Decreased food intake cannot account for marked hyperlipemia, since horses with the severe syndrome show much higher blood lipid values than do healthy horses who are simply deprived of food. A striking feature of clinical cases of hyperlipemia observed at New Bolton Center was that all horses were uremic. There was a linear relationship between the severity of uremia and the degree of hyperlipemia. These findings have led to the conclusion that hyperlipemia is due to two factors: decreased excretion of lipids in urine and an increased lipid mobilization from tissues following decreased food intake.

#### **Nutritional Trouble Shooting and Ration Formulation.**

The Section of Nutrition is frequently consulted by veterinary practitioners about nutrition-related problems in large animal practice. Most often, these problems concern metabolic disorders, poor production, or other inefficiencies of animal performance. The Section of Nutrition personnel, along with the staff from the Field Service Unit, will visit farms with herd problems, to examine the feeding and management system, conduct extensive interviews of farm management personnel, examine production and animal records, and obtain samples of feedstuffs for nutritional analysis. This information is analyzed with the aid of a specifically designed computer system to identify and characterize dietary nutrient deficiencies or excesses. The program is also used to formulate nutritionally optimum rations consistent with the economic goals of the farm management. The results of the evaluation and formulation procedures are compiled into a set of feeding and management recommendations for transmittal to the farm and the practicing veterinarian.

From this sampling of the work of the Section of Nutrition, one can see that its activities are not only exciting and pioneering, but vital to the pet owner, farmer, and above all, the animal.

# NUTRITION



# Nostalgia

## The Daring Dean

The first dean of the Department of Veterinary Medicine of the University of Pennsylvania was a rather imposing figure with an equally imposing name. He was Rush Shippen Huidekoper, described as a man of "magnificent physical proportions" and an ancestry tracing back to the first families of the land. His forbearers included the famous physician, Dr. Benjamin Rush; the first mayor of Philadelphia, Edward Shippen; and Dr. William Shippen, a signer of the Declaration of Independence and one of the founders of the Medical School of the University of Pennsylvania. When he became dean, Dr. Huidekoper brought with him an impressive list of titles: Professor of Internal Pathology (*pro tempore* of Anatomy); Dean of the Veterinary Faculty; Doctor of Medicine; Veterinary Surgeon, Alfort, France; Major and Surgeon, First Brigade, N.G. of Philadelphia; Fellow of the College of Physicians, Philadelphia; Member of the U.S. Veterinary Medical Association; Ex-Coroner Physician of Philadelphia, etc., etc., etc.

Dr. Huidekoper was the key in sustaining the Veterinary Department during its early years. Obviously a man of considerable energy, he was well-informed about methods of education, having studied at veterinary schools in France. At times, he dipped into his own pocket to support the struggling school of which he was very proud.

### Huidekoper—The Heady Horseman

Despite the great amount of time devoted to teaching, administration, and providing leadership for the new department, Huidekoper also found time to engage in some rather un-dean-like activities. He was an excellent horseman, a member of the venerable Rose Tree Hunt Club, and the owner of a flea-bitten mare named Pandora, known far and wide as one of the best hunters on the eastern seaboard. Among other accomplishments, Pandora was famous for jumping toll gates, which were then common on many of the main roads. There is no doubt that Dr. Huidekoper was also a daring horseman. At one time, Huidekoper resided and maintained an active veterinary practice in Media, PA. Legend has it that Huidekoper would ride Pandora to make professional calls, step-by-step, over a high open railroad trestle. It is suspected that such feats were not standard equestrian procedures.

When Pandora died, Dean Huidekoper arranged a lavish dinner in her memory at the staid Philadelphia Club, and invited some of the town's most distinguished citizens. Following the sumptu-

### Sheer Poetry In Motion

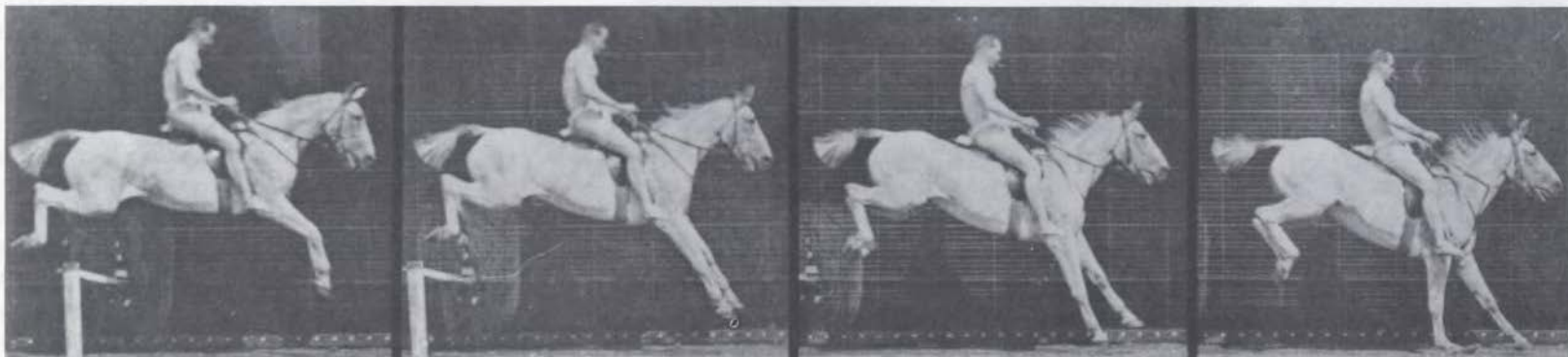
At the time that Dr. Huidekoper was dean, a study was being conducted on motion in animals. This was being carried out by Edward Muybridge and was supported, in part, by the University. For his work, Muybridge had constructed a wooden shack on the site now occupied by the Maloney Building of the University Hospital. A part of Muybridge's studies involved taking a great series of still photographs of animals in motion and projecting them on a machine known as a zoopraxiscope, which gave the illusion of motion. (This machine was a forerunner of the movie projector.) In one of these pictures, Muybridge captured a nude Huidekoper riding Pandora. For many years, two such photographs graced the mantle at the Rose Tree Hunt Club. Dr. Huidekoper resigned as dean in 1890. He died in 1901. In a eulogy he was described as "a physician, surgeon, veterinarian, sportsman, soldier, citizen, author, writer, clubman, journalist, society man" and a "prince of good fellows."

Many graduates of the Veterinary School will associate the name Huidekoper with the once grassy

plot within the quadrangle of the school, often referred to as "Huidekoper Field," or less reverently, "fecal field." Nonetheless, the spiritedness and force of character which Huidekoper possessed, made him a personality in this veterinary school's history that is difficult to disrespect or forget.



Large animal clinic at the University of Pennsylvania in 1885. The man in the white appears to be Rush Shippen Huidekoper. The inset is a portrait of Dean Huidekoper.



ous dinner, Dr. Huidekoper regaled the guests with stories of his famous mare and closed the monologue by informing them that they had just partaken of Pandora! It was reported that numerous guests beat a hasty retreat from the banquet room.

University of Pennsylvania Archives



# The Loyal Red and Blue

In addition to the traditional good feelings that come from renewing old friendships, Alumni Day 1981 offered another exciting attraction—the dedication of the new Veterinary Hospital of the University of Pennsylvania. The formal dedication of this magnificent building had taken place on the previous day, Friday, May 15, but a second ceremony, for alumni, was held on Saturday. Some alumni made it a long weekend by attending both functions and a few arrived on Thursday to attend the Benjamin Franklin Associates dinner. It was a busy weekend and all who were present are certain to remember it as a major milestone in the history of the Veterinary School, which will celebrate its Centennial in 1984.

Over 600 alumni were present and many of them attended the annual business meeting, presided over by President Loy Awkerman (1952) in his own inimitable fashion.

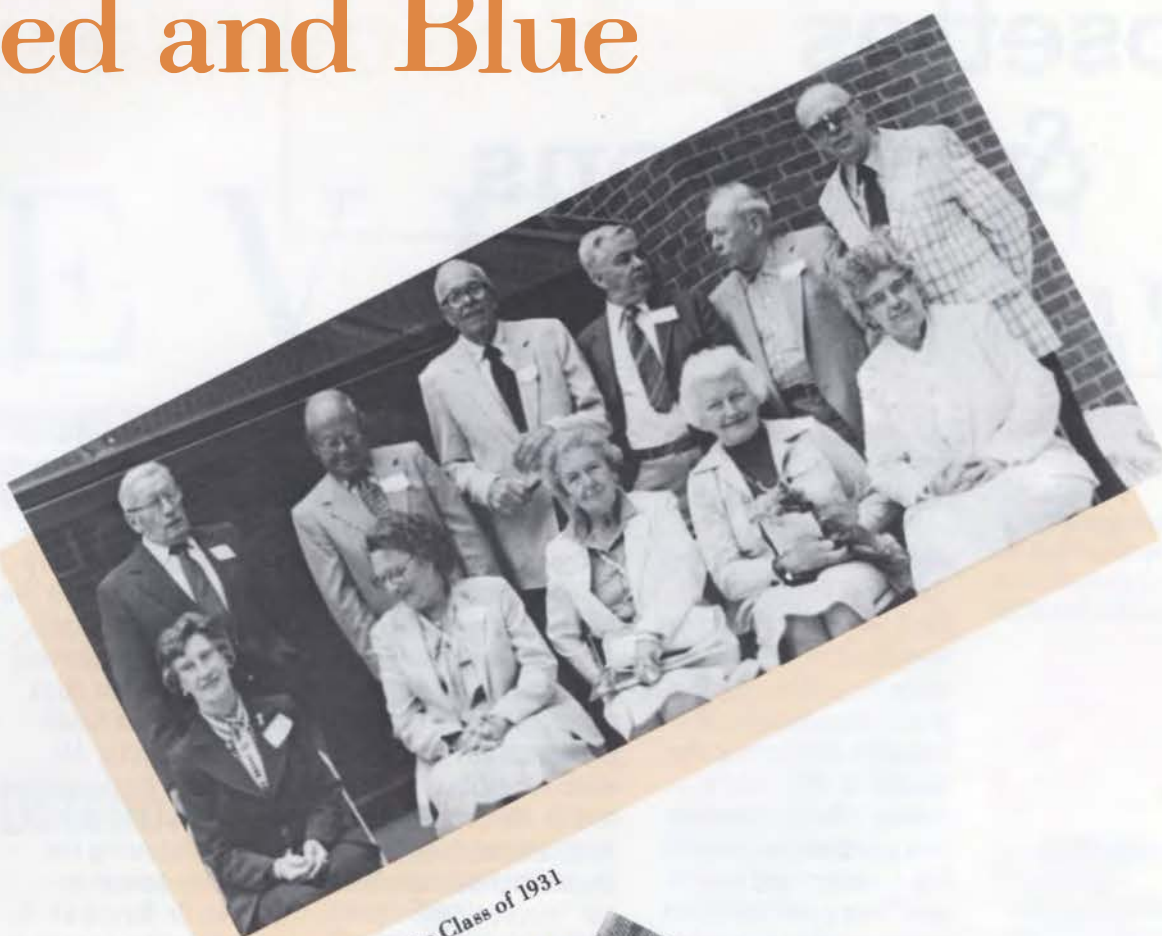
Dr. Josephine Duebler, historian and secretary, presented the history of the past year and this was followed by an introduction of past presidents and recognition of the Old Guard. The oldest member in attendance was Colonel Jesse D. Derrick (1916), followed by Dr. Samuel F. Scheidy (1929), and Dr. Lester D. Barto (1930). Twelve members of the 50th Year Class were also at hand.

Dr. Donald G. Lee (1936), Chairman of Alumni Giving, reported good news—602 alumni had contributed a total of \$122,501.23. Following Dr. Lee, the Reunion Class Chairmen of the following classes presented facsimile checks, representing their class' contributions, to Dean Robert Marshak: 1931, 1936, 1941, 1946, 1951, 1956, 1961, and 1966.

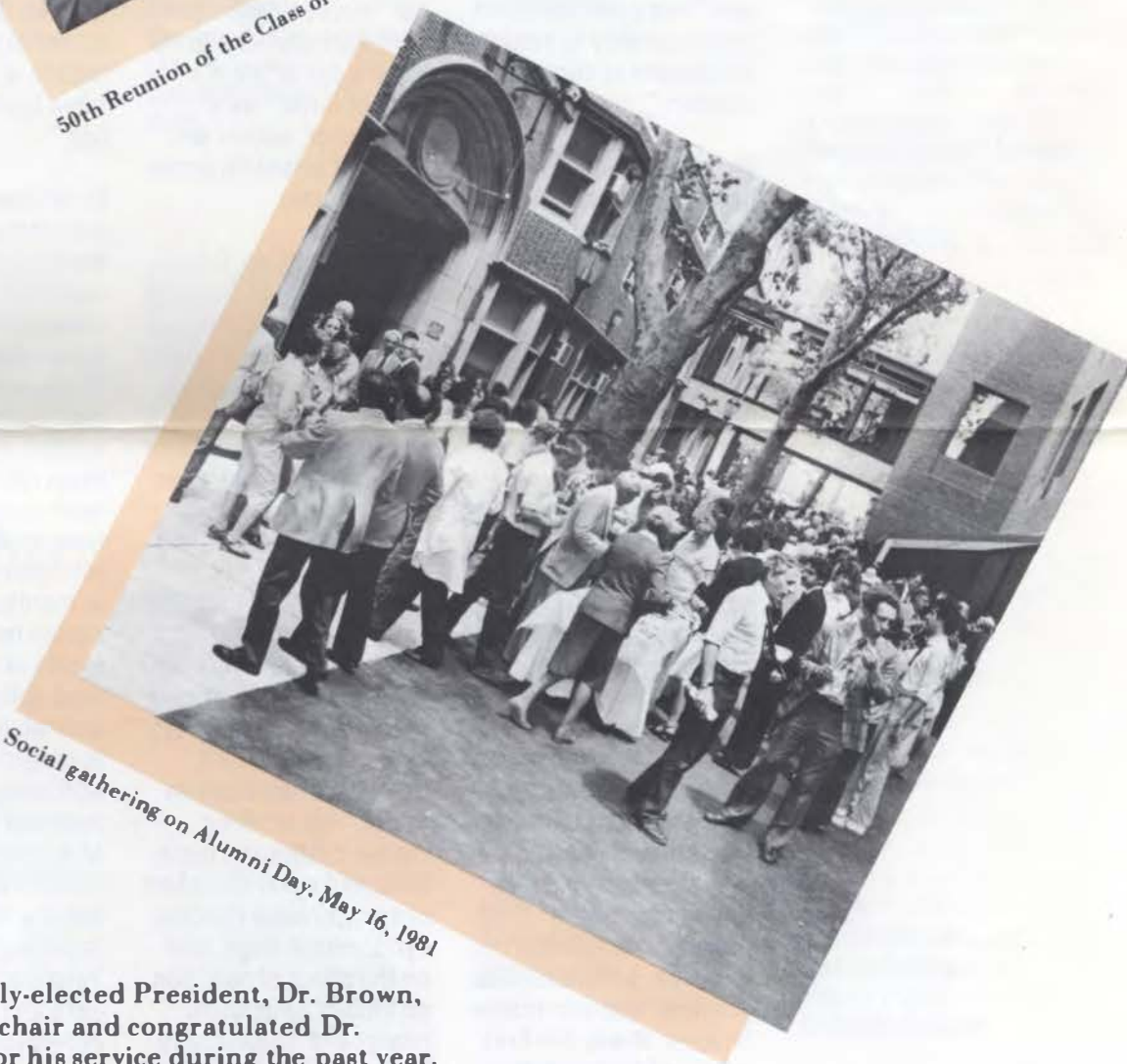
Dean Marshak then addressed the group followed by Dr. Kenton S. Stokes (1968), Chairman of the Alumni Liaison Committee. Both speakers lauded the fine degree of cooperation that exists between the staff of the school and the alumni.

Nominating Committee Chairman, Dr. Stuart Fox (1953) presented the slate of candidates for officers in 1981-82. The following were elected unanimously: President, Dr. A. Cleveland Brown (1959); First Vice President, Dr. Nancy O. Brown (1973); Second Vice President, Dr. Kenton S. Stokes (1968); and Secretary/Treasurer, Dr. M. Josephine Duebler (1938).

A special highlight of the meeting was the presentation of Alumni Citations to Dr. Martin M. Kaplan (1940), Dr. David K. Detweiler (1942), and Dr. Margaret L. Petrak (1952). (See Rosettes and Ribbons, in this issue.)



50th Reunion of the Class of 1931



Social gathering on Alumni Day, May 16, 1981

The newly-elected President, Dr. Brown, assumed the chair and congratulated Dr. Awkerman for his service during the past year. (A great job, Loy, thank you!)

Following the meeting, the group moved to the courtyard of the new building for ceremonies to commemorate the structure. This was followed by a grand tour which was punctuated with many Ooos and Ahs by alumni who obviously liked what they saw.

In the evening, over 300 alumni, family, and friends gathered for an excellent dinner-dance, held in the parking facility of the new building.

The weather cooperated, the speeches were good (and short), and there was an abundance of good fellowship. It was a grand and glorious day! See you next year.

.....

*Dean Robert R. Marshak and the staff offer heartfelt thanks to the loyal alumni who have supported the School of Veterinary Medicine in such generous fashion. We are happy to report that since Alumni Day there have been additional contributions to Alumni Annual Giving. We now have 710 donors with contributions totaling \$148,379.93. Our goal was \$140,000, so we are over the top!*

For information about alumni affairs and continuing education contact Elizabeth Caulk, Director of Veterinary Annual Giving and Continuing Education, 3906 Spruce Street, Philadelphia, PA 19104.



# Rosettes & Ribbons



**Dr. William Boucher**, Professor of Medicine, received the *Christian and Mary Lindback Award for Distinguished Teaching*, in April 1981. Each year, eight teachers from the University at-large are chosen for this prestigious award. Dr. Boucher, who joined the faculty in 1940, immediately after graduation, was cited as "a superlative teacher" and one who "has contributed immeasurably to student attainment of clinical acumen."

On June 4, 1981, New Bolton Center held its annual *Retirement Dinner* at the Red Rose Inn, Jennersville, PA. Those honored on their retirement were **Dr. William Boucher**, **Mrs. Helen Wherry**, and **Mrs. Margaret Thomas**.



This year the **Wharton School** is celebrating its *centennial*. The school opened in 1881 with thirteen students and one-and-a-half professors, following a gift of \$100,000 from Joseph Wharton, a Philadelphia financier and iron manufacturer. It was the first school of business education in the United States and today ranks as one of the outstanding schools in the world.

The following were recipients of citations at the annual meeting of the *Veterinary Medical Alumni Society*, on Saturday, May 16, 1981: **Dr. Martin Kaplan '40**, Chief Veterinarian, Public Health of One World Health Organization, cited as "the premier architect of international veterinary public health," .... **Dr. David K. Detweiler '42**, Professor

of Physiology; Director, Comparative Cardiovascular Studies Unit; Chairman, Graduate Group in Comparative Medical Science, School of Veterinary Medicine, University of Pennsylvania, commended for his work as a "pioneer in the field of comparative cardiovascular studies." .... and **Dr. Margaret L. Petrak**, Staff Internist, Angel Memorial Hospital, for her "increasingly significant contributions to our knowledge of the disease of birds," as a researcher, author and editor of scientific books and manuals.

**Dr. Kenneth Bovee**, D.V.M., M.Med.Sc., was honored in May 1981 with the newly-created *Henry and Corinne R. Bower Chair in Medicine*. In making the announcement, Dean Robert R. Marshak cited Dr. Bovee's achievements in clinical medicine, research, and administration, which have won him world recognition and "literally put the discipline of nephrology on the map in veterinary medicine." Dean Marshak went on to say, "his work on canine cystinuria, metabolic and renal disorders of spontaneous Fanconi syndrome in dogs, and on the effect of nutrition on kidney function in health and disease, has had a profound influence on modern veterinary



medicine." Dr. Bovee graduated from the Ohio State University in 1961 and came to Penn in 1967. He is Chairman of

the Department of Clinical Studies. Mr. Henry Bower and his late wife, Corinne, became interested in the Veterinary School through their lifelong love for animals and the compassionate, expert care their dogs received in the Small Animal Hospital. Mr. Bower is a distinguished alumnus of the University. In endowing the chair, Mr. Bower described Dr. Bovee as "a scientist with a sense of humor, a combination I have found rare in my life."

**Dr. William Chalupa**, Section of Nutrition, New Bolton Center, was the recipient of the 1981 *American Feed Manufacturers Award*. Dr. Chalupa was cited for his research on ruminant nutrition where "his most notable and significant contributions have been in the areas of nitrogen utilization and in manipulating the rumen fermentation to increase the efficiency of feed utilization by the animal. In both areas he is considered a world authority." Dr. Chalupa received his B.S. (1958), M.S. (1959), and Ph.D. (1962) from Rutgers University. He joined the faculty of the School of Veterinary Medicine in 1976 and is presently Professor of Nutrition.

Effective July 1, 1981 Dean Marshak appointed **Dr. Charles Reid** as *Acting Chairman of the Department of Clinical Studies, New Bolton Center*. Dr. Reid is Professor of Radiology, School of Veterinary Medicine, and Professor of Radiological Sciences, School of Medicine. He completed his undergraduate work at the University of Vermont and received his D.V.M. (1956) and M.S. (1960) from Cornell University. In 1971, he was awarded an honorary M.A. by the University of Pennsylvania.

**Dr. Paul F. Landis**, a small animal practitioner in Norfolk, VA was chosen president of the 33,500-member American Veterinary Medical Association (AVMA).

He was elected by the 66-member House of Delegates during the AVMA's 118th annual meeting in St. Louis, MO. Dr. Landis will assume office in July, 1982.

Dr. Landis, who served on AVMA's Executive Board from 1975-81, is a 1939 graduate of the University of Pennsylvania School of Veterinary Medicine. He established his Norfolk practice in 1946.

**Dr. Donald F. Patterson** has been named recipient of the *Ralston Purina Small Animal Research Award*, for 1981. Dr. Patterson is the Charlotte Newton



Sheppard Professor of Medicine, and Chief of the Medical Genetics section. The award was given in recognition of Dr. Patterson's outstanding research in the field of congenital heart disease.

The following appointments and promotions were made for the academic year 1980-81:

**Appointments**  
**Dr. J. Egan Elganmann** Assistant Professor of Medicine, Department of Clinical Studies (Philadelphia).  
**Dr. Lawrence T. Glickman** Associate Professor of Epidemiology, Department of Clinical Studies (Philadelphia).  
**Dr. Robert B. Grieve** Assistant Professor of Parasitology, Department of Pathobiology.  
**Dr. Eberhard Rosin** Associate Professor of

Surgery, Department of Clinical Studies (Philadelphia).  
**Dr. Elizabeth A. Stone** Assistant Professor of Surgery, Department of Clinical Studies (Philadelphia).

**Promotions**  
**Dr. Samuel K. Chacko** to Professor of Pathology in the Department of Pathobiology.  
**Dr. Vincent J. Cristofalo** to Professor of Biochemistry in the Department of Animal Biology.

We welcome the following **Interns** and **Residents** for the year 1981-82 and wish them well during the coming year:

**Philadelphia Interns**  
**Dr. Stephan Bassett**  
**Dr. Jeffrey L. Davidson**  
**Dr. James F. Dougherty**  
**Dr. Christina A. Hutson**  
**Dr. David G. Judson**  
**Dr. Paul A. Lunsman**  
**Dr. Lynna Maria Malatz**  
**Dr. Lynn P. Schmeltzel**  
**Dr. Evan S. Sloan**  
**Dr. Mary C. Walter**

**New Bolton Center Interns**  
**Dr. Kasmin M. Davis**  
**Dr. Gayle S. Donner**  
**Dr. Allan Drusys**  
**Dr. Dennis G. Gentile**  
**Dr. John B. Madson**  
**Dr. Ruth M. Stokes**  
**Dr. Wendy E. Vaala**

**Philadelphia Residents**  
**Dr. Donald J. Brown**  
**Dr. Alexander Coutinas**  
**Dr. Duncan C. Ferguson**  
**Dr. Joan C. Hendricks**  
**Dr. Hamish M. Robertson**  
**Dr. David T. Matthiesen**  
**Dr. Robert J. Orsher**  
**Dr. Daniel J. McGrath**  
**Dr. Ted Anderson**  
**Dr. Albert H. Lewandowski**  
**Dr. Johann Lang**  
**Dr. Nita Irby**

**New Bolton Center Residents**  
**Dr. Gregory A. Beroza**  
**Dr. David Marshall**  
**Dr. Benson Martin**  
**Dr. Elizabeth Wertman**  
**Dr. Lawrence DeGeorge**  
**Dr. Angellina Warner**  
**Dr. Stanley J. Brown**



# Resources

# EVENTS

## The Small Animal Hospital

The Emergency Clinic of the Small Animal Hospital of the University of Pennsylvania is open 24 hours a day. The telephone number is (215) 243-4685. Regular business hours at the Small Animal Hospital are from 9 a.m. to 4 p.m. Appointments can be made by calling (215) 243-4680. The business office, which handles billing, can be reached at (215) 243-8884.

Practitioners who wish to refer a client should call (215) 243-4218 to make an appointment. This number is *only* to be used by veterinarians and their staff. Clients must call 243-4680.

Clinic days are:

**Behavior:** Scheduled by department only.

**Cardiology:** Wednesday, Thursday, Friday

**Dermatology and Clinical Immunology:** Tuesday-Friday

**Exotics:** Tuesday and Wednesday evenings

**Medicine:** Monday-Friday

**Neurology:** Wednesday, and other days by special arrangement with referring veterinarian.

**Oncology:** Monday

**Ophthalmology:** Monday

**Orthopedics:** Monday, Wednesday, Friday

This section only accepts appointments after the referring veterinarian contacts the Small Animal Hospital to explain the specifics of the case.

**Medical Genetics/Pediatrics and Reproduction:** Monday and Tuesday

**Soft Tissue Surgery:** Tuesday-Thursday

Most of the above sections see cases between 9 and 11:30 a.m.

The Section of Veterinary Medical Genetics offers the following clinical services to referring veterinarians, breeders, and owners:

### Genetics Clinic

A genetics/pediatrics clinic is open each Monday and Tuesday for the examination of animals for which genetic counseling or special studies relating to genetic diagnosis are required. Clinical objectives are related primarily to diagnosing the underlying genetic defect in a particular animal or family, and providing genetic counseling to veterinarians and breeders in dealing with hereditary disease problems on a practical level.

**Cytogenetics and Inborn Error Screening Laboratories**  
These laboratories provide tests important in the diagnosis of genetic diseases, including selected biochemical tests for inborn errors of metabolism.

### Genetic Data Bank

A data bank, containing pedigree information on animals with hereditary disease, is being developed for use in investigating the distribution and mode of inheritance of genetic defects and as a guide for genetic counseling.

### Reproduction Clinic

Services include diagnosis and treatment of sterility and other reproductive problems. Laboratory services include hormonal assays, semen analysis, vaginal cytology.

### Pediatrics

Services include evaluating the growth and development of puppies and kittens, nutrition counseling, parasitism treatment, managing routine immunization against common infectious agents, and diagnosing and treating diseases of young animals in general.

(continued on page 16)

## September

12

**Call Management Seminar for the Producer**  
New Bolton Center  
8:30 am-5:00 pm

## October

5-7

**International Conference on the Human/Companion Animal Bond**  
University City Holiday Inn, Philadelphia, PA  
Contact: Phone 215-243-4695

16

**PVMA Annual Meeting**  
Alumni Reception  
Hershey, PA

17

**Second Virginia Canine Symposium**  
"All you wanted to know about Autoimmune Disease but were afraid to ask"  
Reproductive Tysons Corner, Marriott Hotel, Vienna, VA  
(Contact: Dr. J. Deubler 215-243-8862)

20

**Farrler Forging Contest**  
New Bolton Center

24

**Clinical Ophthalmology**  
University of Pennsylvania School of Veterinary Medicine  
9:00 am-5:00 pm

31

**AAHA Region I**  
Alumni Reception  
Canada

## November

18-19

**Clinical Immunology**  
University of Pennsylvania School of Veterinary Medicine  
9:00 am-5:00 pm

21

**Disease of Horses**  
New Bolton Center  
9:00 am-5:00 pm

29

**AAEP**  
Alumni Reception  
New Orleans, LA  
5:00 pm-7:00 pm

## December

8

**AABP**  
Alumni Reception  
Seattle, WA

9

**Cough**  
University of Pennsylvania Faculty Club  
9:00 am-5:00 pm

## January

27-28

**Penn Annual Conference**  
Hilton Hotel of Philadelphia  
34th & Civic Center Boulevard  
Philadelphia, PA

30

**Canine Symposium**  
University Museum Harrison Auditorium  
33rd and South Streets  
Philadelphia, PA  
9:00 am-5:00 pm

## February

10

**Practical Issues Raised by Veterinarians Concerning Owner Reaction to Pet Loss or Bereavement**  
University of Pennsylvania Faculty Club  
9:00 am-5:00 pm

15

**Western States Conference**  
Alumni Reception  
Las Vegas, NV

24

**Surgical Approaches to the Bones and Joints of Dogs**  
University of Pennsylvania School of Veterinary Medicine  
9:00 am-5:00 pm



# More Resources

The laboratories at the Small Animal Hospital offer many services generally not available through commercial laboratories.

The **Laboratory of Microbiology** provides fungus culture; ear culture (bacterial, fungal, sensitivity); fecal culture (screen for Salmonella and Campylobacter); bacterial culture and sensitivity; bacterin preparation; and seriology: Brucella canis, Leptospira, and Toxoplasma.

The laboratory will provide the appropriate transport media for submission of bacteriological samples. Prepaid mailers will be provided for submitting separated serum for serological procedures. For information please contact Ms. Harriet Izenberg, 243-7858.

The **Laboratory of Pathology** also offers a service in diagnostic pathology. The biopsy fee is \$10 and additional tissues are \$2.50 each. The maximum charge for multiple tissues is \$50. Practitioners will be provided with prepaid mailers for submission of specimens. For information please contact Dr. Michael Goldschmidt, 243-8857 or 7871.

The **Clinical Immunology Laboratory** offers the following services:

**Immune Function Tests**

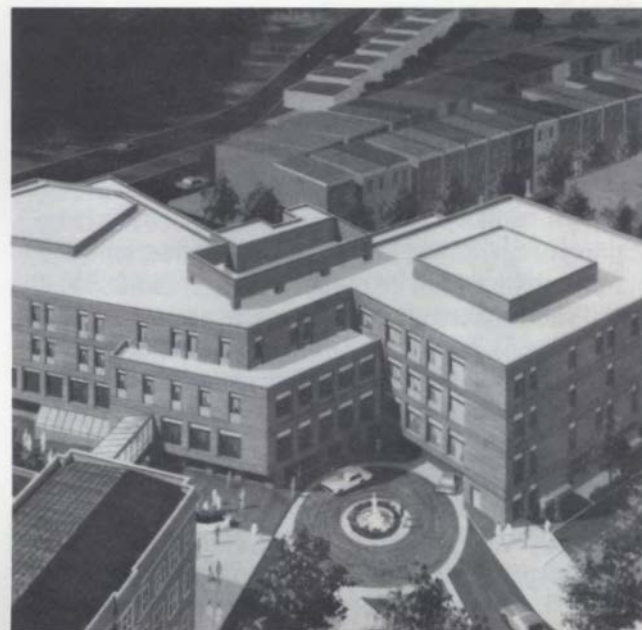
- Serum Protein Electrophoresis
  - Immunoelectrophoresis
  - Quantitation of Immunoglobulins
  - Lymphocyte Transformation
  - Bactericidal Assay
- Autoimmune Disease Tests**
- Coomb's Test
  - Antinuclear Antibody Test

- Rheumatoid Factor Test
  - Immunofluorescence of Biopsies
- Endocrine Tests**
- Thyroid Hormones (T<sub>4</sub> and T<sub>3</sub>)
  - Adrenal Hormones
- Miscellaneous**
- Parvovirus Antibody Titers
  - Fungal Immunodiffusion
  - Feline Leukemia Virus (ELISA)

For additional information and a complete list of services and charges, please contact the Clinical Immunology Laboratory, 243-6882.

The **Parasitology Laboratory** offers services for unusual parasitological problems, especially those involving exotic animals.

Appointments for Radiology and Radiation Therapy are made by calling 243-8887.



Rendering of the New Small Animal Hospital of the University of Pennsylvania

In addition to the resources listed, the basic science laboratories are always available for consultation. For directions to the hospital, call 243-4680.

## Bellwether

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School of Veterinary Medicine  
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Philadelphia, PA  
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