CORNELL
Veterinary Medicine
FALL 1996

Veterinary Medical Center Dedicated

A new era in veterinary medicine at Cornell began officially on June 7, 1996, with the formal dedication of the new Veterinary Medical Center.

So stated Dean Franklin M. Loew, noting in his remarks that the ceremony also marked the 100th anniversary of the opening of the first Veterinary College building on the Cornell campus. The dedication, held during the annual alumni reunion, drew more than 400 veterinary alumni, friends, state and local legislators, SUNY officials, and leaders in the horse racing and agricultural industries, as well as faculty members and current students.

Speaking on behalf of the profession, New York State Veterinary Medical Society president Mac Donald Holmes, DVM '61 lauded the contributions of many of the emeritus faculty. He said the new facility would help the current faculty "provide the finest education to the brightest veterinary students in the world."

Representing those students, Dr. Mara DiGrazia, a 1996 DVM graduate and past president of the Cornell Student Chapter of the AVMA, provided a behind-the-scenes comparison of the old and new teaching hospitals. "The hallways in the old clinics were so dark that I couldn't use my solar calculator to work out drug dosages," she recalled, adding that space was so cramped the students often observed they were treating patients in "the intensive care closet." By contrast, the new Companion Animal, Equine, and Farm Animal Hospitals are so spacious she joked, that the students "were given two days off just to learn our way around."

State Assemblyman Martin Luster recalled touring the new Companion Animal Hospital after it opened last fall. He was so impressed, he said "I went home and told my wife if I ever get sick, feed me a dog yummy and take me to Cornell." Luster read from a joint resolution by the state Assembly and Senate, and noting the delay in passing a new state budget, said that the excellence of veterinary education at Cornell was "one of the few things both houses of the Legislature agreed on this year."

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Dean Franklin M. Loew '65 spoke at the June 7 dedication of the new Veterinary Medical Center. Also on stage, L to R: former deans Dr. Robert Phemister '60, Dr. George Poppensiek, and Dr. Edward Melby '54, NYSVMS president Dr. Mac Donald Holmes '61, Dr. Mara DiGrazia '96, Cornell president Hunter Rawlings, NYS Senator James Seward, NYS Assemblyman Martin Luster, and SUNY vice chancellor Irving Freedman.

Inside

Cornell Veterinarian Volunteers at Summer Olympics

When you ask Dr. Michael A. Ball what he did during his summer vacation, be prepared for a long and enthusiastic answer. After spending three weeks at the Summer Olympics as part of the team of veterinarians who monitored the equestrian events, he's got plenty of stories.

Less than a month after completing a two-year residency in internal medicine in the college's Equine and Farm Animal Hospitals, Dr. Ball traveled to Atlanta to join 40 other veterinarians selected from an extensive list of equine experts who volunteered for the Olympics veterinary staff. (Other alumni volunteers were John Jager, DVM '74 from Millbrook, N.Y., and Kenneth Marcella, DVM '83 from Sugarhill, Ga.) He was assigned to the equestrian triathalon, where the athletes he cared for ran three days of races in Georgia's July heat, jumping over logs and ditches, and sweating off as much as 15 liters of body fluid an hour.

Dr. Michael A. Ball '87, DVM '92

Describing his role as akin to "an equine EMT," Ball was stationed miles out in the field for the most grueling part of the triathalon: the cross-country obstacle course. He monitored the jumps, ministered to any horses that got into trouble, and radioed for assistance when needed. Help came from the Olympic Veterinary Clinic (OVC), the on-site horse hospital at the newly built Georgia International Horse Park in Conyers, Ga., some 30 minutes from Atlanta.

The equestian triathalon combines a day each of dressage, jumping, and the cross-country road-and-track trotting, steeplechase, and obstacle course. "Our main concern was heat and dehydration," Ball said, noting that for the first time in the games' history, Olympics officials shortened parts of the equestrian event course because of the steamy Georgia venue.

"But," he pointed out, "many of the veterinary staff thought that despite the extreme weather conditions and a technically difficult cross-country course, there were no more health-related problems — and perhaps fewer — than they'd seen at other three-day events of similar caliber." More than 250 horses from 29 countries, including 15 from the U.S., competed in dressage, jumping, and the three-day event. Of the 64 horses that competed in the three-day event, only four were attended to at the OVC.

"There were plenty of veterinary checks and balances to assure that the horses weren't pushed beyond humane limits," said Ball. "We had standard 10-minute rest periods so we could check the horses' body temperature, heart rate, respiratory rate and muscle fitness. If they weren't recovering properly during those 'pit stops' they were not allowed to continue."

The horses chilled out with specially built outdoor air conditioners, Ball said, describing the "Cool Concepts" evaporative-cooling devices where huge fans blew mists of water droplets to lower ambient temperatures as much as 15 degrees (F). "There were 85 cooling fans and 100 tons of ice used throughout the equestrian events to help keep the horses cool." The thirsty steeds drank water and electrolyte solution but couldn't have a Coke or chocolate bar to boost their energy. Both contain caffeine, which is one of the prohibited drugs in equine blood and urine tests.

A Cornell graduate (BS '87 in animal science; DVM '92), Dr. Ball has had plenty of experience with performance horses. He spent six years exercising show jumpers and Thoroughbred racehorses, managing several show stables, and working extensively in horse transportation in Rhode Island, New Jersey, California, and Florida before enrolling at Cornell. He also took a year off before entering veterinary school to work with an equine transport service, supervising the international shipment of horses as they flew around the world.

Now a graduate student at the college, Ball is working with anatomy professor John F. Cummings in a research study on equine motor neuron disease (EMND), an affliction that parallels amyotrophic lateral sclerosis (ALS), or Lou Gehrig's disease, in humans. Cummings and his colleagues are trying to determine the role of vitamin E deficiency in EMND, which seems to strike horses that eat large amounts of dried hay, rather than fresh grass.

Ball realizes that his expertise gave him a coveted front row seat—or at least a place to stand—at the Olympic equestrian events. "It was one of the most fantastic experiences of my life," he said. "In all, there were over 100 veterinarians working on the grounds, including at least forty team vets from other countries, so it was also a great learning experience." ■

Lecture Hall Named for Dr. John Murray '39

Dr. John D. Murray '39 at the dedication of a Veterinary Education Center lecture hall in his honor

On June 8, the larger of the two lecture halls in the three-year-old Veterinary Education Center was formally dedicated in honor of John D. Murray, DVM '39, one of the college's most generous donors and volunteers.

Dr. Murray has been a leader in supporting and promoting the college's fund raising efforts for more than two decades. As the chairman of the Development Advisory Committee in the late 1970s and early 1980s, he helped institute the Alumni Unrestricted Gifts Fund and set up the process by which a joint committee of faculty and alumni award grants from the fund's proceeds. He is a member of the Cornell University Council and served as vice chair for planned giving in the college's five-year capital campaign which ended last December.

Always a leader by example, Murray was among the first veterinary alumni to establish a charitable remainder trust to benefit the college. His estate plan also includes a pooled life income fund and a will and living trust package that will provide a lasting benefit to both the college and his family. "It makes a lot of sense for older veterinarians to plan their estates around Cornell," Dr. Murray said. "Because of the way estates are taxed, and because there are usually expensive settlement fees, you can arrange a planned gift to Cornell and your children will end up getting more of your estate than they would if you had bequeathed it to them directly. No one I've known who has made a planned gift to Cornell has ever regretted it, including myself."

In 1989 Murray was recognized by the Board of Trustees as a "Foremost Benefactor and Builder of Cornell," a distinction reserved for those who have followed in founder Ezra Cornell's footsteps in making gifts of $500,000 or more. At that time, his name was inscribed among those of fellow Builders on the stone wall that borders the Uris Library terrace.

The reunion weekend ceremony to name the John D. Murray Lecture Hall was attended by close to 100 alumni, faculty, staff, and friends. Speaking at the dedication, Dr. Murray recalled waiting all through the summer of 1935 to hear whether his application for admission to the Veterinary College had been accepted. One day in August his father showed up unexpectedly at the leather factory where he was working.

"He'd never done that in the three years I'd worked there," Murray said. "When I saw him carrying an envelope, I knew this was it, yes or no, as far as vet school went. I remember seeing the logo of the State University of New York in the upper left hand corner, and I remember my hands trembling as I opened that seal."

He also spoke about his admiration for the faculty and his desire to give something back to the institution that has played such an important role in his life. "My reasons for coming to Cornell were quite practical ones," Dr. Murray said. "It was 45 miles from where I grew up, and as a state school, it was affordable. But my connection to the place comes from somewhere deeper."

"The faculty was much smaller then," he said. "Even if you weren't taking classes from a particular professor, you got to know him very well. Literally, they were like family to us. When I walked into James Law Hall that first day as a student, I fell in love with the place. Somehow I felt like I was coming home and I still do, every time I come back to campus." ■

A Select Few:
Record Numbers Apply for DVM Class of 2000

To be accepted for admission to the College of Veterinary Medicine each student in the Class of 2000 was up against the excellence of 733 other applicants. This year, applications were up 20 percent (127 more applicants than last year's pool of 607) for a slot in the 80-member entering class.

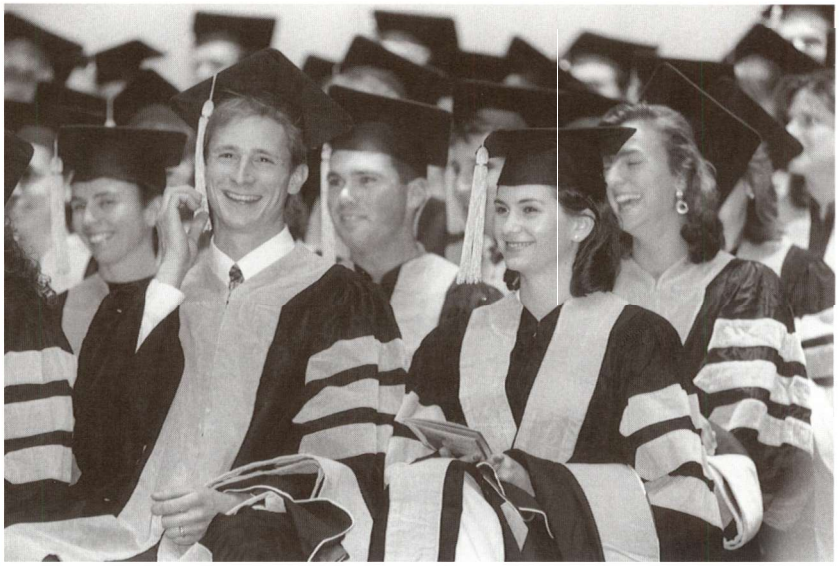
To sift through over 700 applications can be a daunting task, but Joseph Piekunka, director of admissions, says the first cut is made strictly on the basis of cumulative grade point average (GPA) combined with the results of the Graduate Record Examination (GRE). Each of these scores accounts for 30 percent of the applicant's total score for the admission process. This fall, the entering class has the highest GRE scores — an average combined score of 1316 — of any other class on record.

"We have no minimum benchmark, however. We rank all applicants based on these two scores and then thoroughly read the top 270 applications," says Piekunka.

Each application is then evaluated for animal and veterinary experience (worth 20 percent), extracurricular activities (worth 15 percent) and quality of undergraduate program (worth 5 percent). Applicant essays and letters of recommendations are considered in giving these subjective scores.

"To make sure that students can be successful in our rigorous academic program, 65 percent of the admission scoring is based on academics," said Piekunka, referring to the 60 percent from the GPA and GRE and the 5 percent for undergraduate education.

When all the scores are assigned, the applicants are rank ordered and the top 90 or so applicants are considered by the college Admissions Committee, a group of twelve faculty members that is chaired by Dr. Hollis Erb, professor of epidemiology in the Clinical Sciences department. The committee assesses these top candidates and decides if they are satisfied with the number of minority students on the list and whether they have any concerns about the final pool of applicants. Such concerns may include a lukewarm letter of recommendation, for example, or whether any of the applicants near the top are children of alumni and that 60 of the 80 slots available are filled by New York residents. As a statutory unit, the College of Veterinary Medicine is obligated to fill three-fourths of each class with New Yorkers.



Members of the DVM class of 1996 at the hooding ceremony prior to commencement in May. Front and center are Christopher and Darcy Adin, who met at Cornell and married during their fourth year in the DVM program.

The selection process is completely neutral to gender, age, financial status and undergraduate curriculum or major. This year's class, for example, includes a woman who is 48 and has years of experience working with animals in the pharmaceutical industry, as well as business and sociology majors who took plenty of science courses. Every applicant must have taken a full year of biology, chemistry, organic chemistry, and physics, as well as microbiology and biochemistry.

Although the veterinary profession used to be dominated by men, by the early 1980s most veterinary schools had equal numbers of male and female students. Since then, increasing numbers of women both apply and are accepted to veterinary colleges across the nation. In recent years, Cornell has received three times more applications from women than men, and thus about 70 percent of today's DVM classes are female. Piekunka says that some experts in the field predict that in the near future 90 percent of veterinary students will be women.

Getting into veterinary school, and especially Cornell's College of Veterinary Medicine, is considerably more difficult than getting into medical school, Piekunka points out. Although there are three applicants for every seat in both veterinary and medical schools, the U.S. has only 27 veterinary colleges compared with 200 medical schools. "Veterinary students are required to

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Profile of the Class of 2000

80 students

Average age:	24 (youngest 21, oldest 45)
Average GPA:	3.52 (out of 4.00)
Average GRE:	1316 (highest on record; out of 1600 combined verbal and quantitative)
Female to male ratio:	71 percent women/29 percent men
Minority composition:	10 percent
3 African Americans	
4 Hispanics	
1 Pacific Islander	
Legal residence:	
New York State	60
Contract states	
New Hampshire	1
New Jersey	3
Other states	14
Other countries	2 (Mexico and Poland)
Amount of preveterinary education	4.23 years on average
Institution previously attended	
Cornell	31
Other	49
Field of preparatory study	
Animal science (or related)	25
Biological sciences (or related)	41
Other	14

have more previous experience working with animals in veterinary medicine than med students are required to have medically-related experiences," Piekunka said.

Once the Admissions Committee fine tunes the rank-ordered list, Piekunka extends 90 offers and then waits to hear from the selected students. If students decline admission offers, Piekunka issues new offers just a few at a time, careful not to accept more students than the college can accommodate. All told, for this year's entering class, 103 offers were made to fill 80 seats.

Overall, the Class of 2000 has one thing in common with their predecessors. These students are among the best and brightest of all applicants to veterinary colleges in the United States. "As usual, they are at top of the national applicant pool," Piekunka concludes. ■

Class of '96 — Where Are They?

One hundred and twenty years after Cornell University awarded its first DVM degree (to Daniel E. Salmon in 1876), most of the graduates in the Class of 1996 are now working in private practice or in internships. Although they have scattered all over the U.S., 40 percent of those who responded to a survey at graduation said that they will remain in New York State.

Well over half of this year's 78 graduates are working in private practice. Of them, two-thirds have found jobs in companion animal practices, 17 percent are working in mixed practices, and the others are split equally between large animal and equine practices.

Internships are non-degree programs that provide additional training for practice, clinical teaching, and specialty board eligibility. Generally a one-year rotating internship in medicine and surgery is a prerequisite for residency programs and for board certification in a clinical specialty (e.g., dermatology, ophthalmology, internal medicine, or cardiology). Thirty percent of the class of '96 have secured internships at other veterinary schools or in practices with board-certified specialists.

Class of '96 Career Choices*

Private practice	64 %
companion animal	67%
mixed	17%
equine	8%
large animal	8%
Internships	30%
Advanced graduate studies	6%

*Based on responses from 60 of 78 DVM graduates in May, 1996.

Avian Medicine Unit Keeps New York Eggs *Salmonella*-free

Fearful that a little egg nog or Caesar salad dressing might send you to bed with a *Salmonella*-related illness? The chances are slight, but they're even slimmer if your eggs are produced in New York, thanks to the Unit of Avian Medicine in the college's Department of Microbiology and Immunology.

Funded by the Department of Agriculture and Markets, the Avian Disease Control Program works hand in hand with New York State poultry producers to minimize the risk of *Salmonella enteritidis* (*SE*) infection in eggs. Although *SE* has been detected in only two flocks of layer chickens in New York State since the surveillance program began in 1989, it is the most significant source of egg-transmitted salmonellosis in parts of the northeast. Therefore, the Avian Disease Program maintains continual surveillance and testing of chicken flocks throughout the state. Dr. Benjamin Lucio, DVM, PhD, the poultry extension specialist in charge, also provides educational assistance for egg producers to keep their poultry houses free of *Salmonella enteritidis*.

SE is a bacterium that may be present inside normal looking eggs, and can cause illness if the eggs are consumed raw or partially cooked. Symptoms appear 12 to 72 hours after eating a contaminated egg and may last four to seven days. The resulting illness, salmonellosis, can include fever, abdominal cramps and diarrhea, and, in rare cases, may cause death among individuals who are very young or old or whose immune system is already compromised. Of the eggs laid by a flock infected with *SE*, only a very small proportion (two per 10,000) may contain the bacterium. However, when infected eggs, or food containing the eggs, are not handled properly they pose a serious health risk. And any *SE*-infected eggs in the billion-plus produced in the state every year are too many.

The *SE* surveillance program is just one among many active programs in the Unit of Avian Medicine that focus on preventing and controlling diseases of commercial, backyard, and hobby poultry. In New York State, poultry is the second largest animal industry and fourth largest agricultural industry.

Investigations on *Salmonella enteritidis* date back to 1988, when it was discovered that clean, unblemished (Grade A) eggs could be infected with *SE*. Cornell researchers were among the first to demonstrate that *SE* is an ovarian infection in hens that occasionally passes on to the eggs. In 1989, they conducted extensive surveys of commercial chicken flocks throughout New York but found none were infected with *SE*. Since then continuous surveillance has identified only two *SE*-positive flocks. One was destroyed and the other flock's eggs were pasteurized to destroy the bacterium.

Early in their studies, Cornell researchers also found that refrigeration followed by adequate cooking destroys *SE* present in eggs. This research led to egg handling recommendations printed on egg crates, to educate people handling eggs from the farm to the table.

Dr. Lucio maintains close ties with the major egg producers in the state, not only to test laying hens, but also to help keep grower houses free from *SE*. He collects samples for testing from chick boxes, egg belts, and manure pits, and advises on how to prevent introduction of *Salmonella enteritidis* into farms by cleaning and disinfecting chicken houses and properly controlling rodents, which play a major role in spreading the bacterium.

"The goal of the program is to detect any evidence of *SE* in New York State's poultry. Poultry production in the State is worth some $92 million and provides jobs for many people working on the farms or for poultry-allied industries. *SE* has to be detected before any infection can spread to humans," said Lucio. "I hope we never find another positive flock, but to make sure, we must provide constant monitoring. At the moment we are covering 70 percent of the eggs

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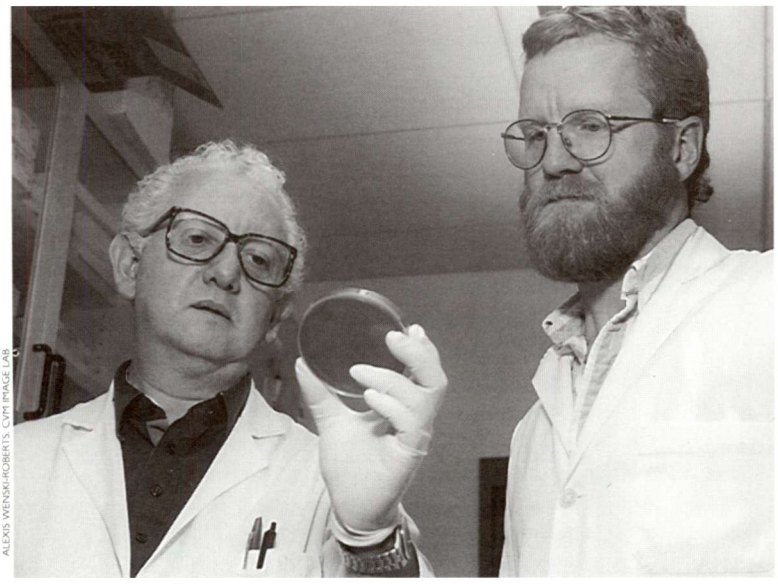
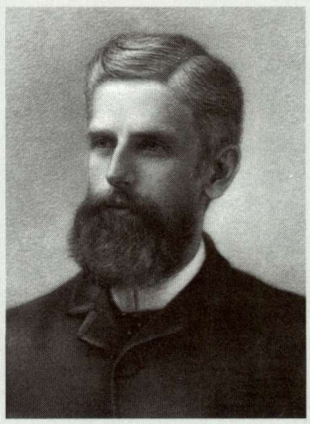


ALEXIS WENSKI-ROBERTS, CVM IMAGE LAB

Dr. Benjamin Lucio (left) and research support specialist Rodman Getchell examine the results of a laboratory trial to see whether *Salmonella* infection can be prevented by introducing non-pathogenic bacteria into chickens' diet.

SOL GOLDBERG

Faculty in the Avian Medicine Unit are currently studying chicken infectious anemia and infectious bursal disease, which are immunosuppressive diseases in chickens, and bronchitis, infectious laryngotracheitis, avian influenza, coccidiosis, and duck plague.



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Salmonella enteritidis is one of many infectious pathogens in the genus *Salmonella,* named in 1913 for its discoverer, Daniel E. Salmon. *Salmonella* are usually motile enterobacteria that can cause food poisoning, gastrointestinal inflammation, typhoid fever, or septicemia in humans and other warm-blooded animals.

Dr. Salmon entered Cornell as a veterinary student when the university opened in 1868. He earned a BVSc in 1872 and a DVM in 1876 — the first DVM degree to be awarded by an American university. Salmon became the first chief of the U.S. Bureau of Animal Industry and was a pioneer in the use of inoculation to prevent infectious diseases.

produced in New York State."

When the Department of Avian and Aquatic Animal Medicine and the Department of Microbiology and Immunology in the College of Veterinary Medicine merged in 1995, the change in organization significantly enhanced the college's avian disease research and control programs. Currently, seven active faculty members in the Unit of Avian Medicine, conduct diagnostic, disease surveillance, extension and research programs to prevent and control diseases that threaten chickens, turkeys and ducks. With its state-of-the-art poultry isolation building and flocks of specific pathogen-free genetically defined lines of chickens, Cornell is recognized as one of the top avian research institutions in the world.

Last year, for example, the Cornell surveillance programs found avian influenza and chicken infectious anemia in two of the largest commercial chicken flocks in the state. This allowed prompt intervention by the N.Y.S. Department of Agriculture and Markets and the USDA, which prevented further outbreaks. Even though avian influenza is not a threat to humans, it is a devastating disease for poultry; a 1983 outbreak in Pennsylvania resulted in losses in excess of $500 million.

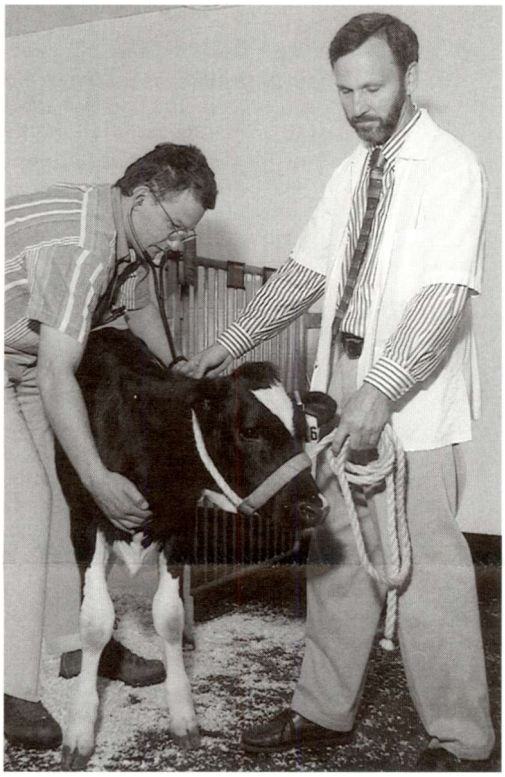
"The crucial nature of these disease control programs cannot be overemphasized," says professor Syed Naqi, BVSc, PhD, Dipl ACVM, director of the Unit of Avian Medicine. "The ability to rapidly detect infection is imperative. Without surveillance and prevention, such diseases could devastate flocks and potentially spread to other commercial poultry farms within and beyond the state."

Faculty in the Avian Medicine Unit are also involved in an array of programs that use the chicken as a research model, including basic research on cancer, immunosuppression, and respiratory diseases. Their studies have resulted in vaccines for chickens, programs to control and eradicate poultry diseases, and techniques that are now being used for preservation of human chicken pox vaccines.

Basic and applied research are essential for the college's long-term preventive medicine approach to disease control, said Naqi, and form the backbone of the Avian Unit's programs to assist the poultry industry in controlling disease outbreaks in the field. "Pathogens are in a continual state of evolution, and we need improved and sometimes entirely new methods for control. There is a constant need to develop and deploy new diagnostic tests and control methods," he said. ■

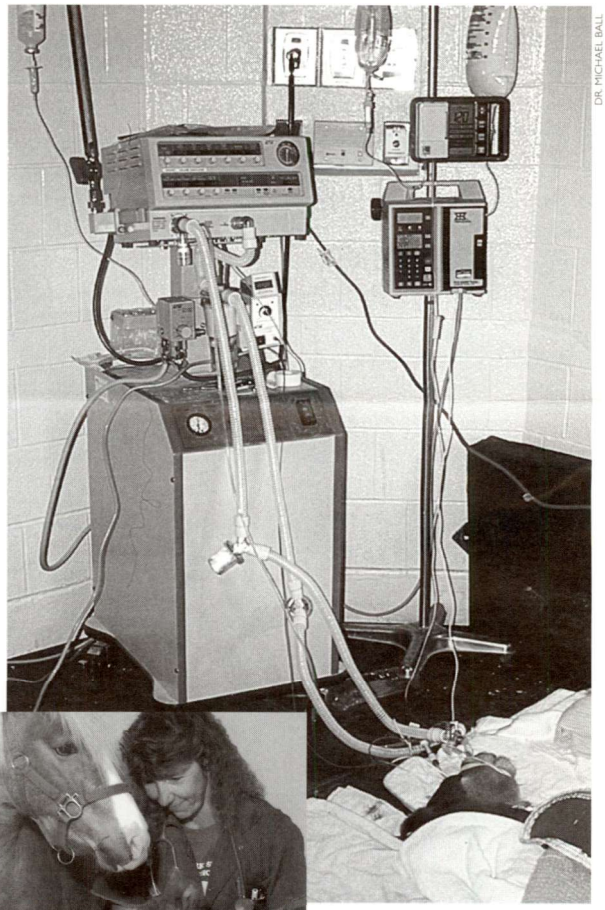
Behind the Scenes in the New Farm Animal and Equine Hospitals

(Photos by Alexis Wenski-Roberts, CVM Image Lab, unless otherwise credited)



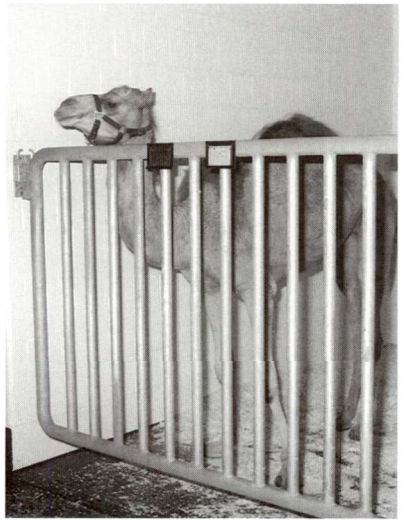
Fourth-year DVM student Scott Sutor (left) and Dr. Thomas Divers examine a young patient in the Farm Animal Hospital.

With five extra-large stalls that can accommodate mares and foals, the Equine Intensive Care Unit also doubles as the neonatal care facility during foaling season. Staffed round-the-clock by clinical residents, veterinary technicians, and third- and fourth-year DVM students, the ICU has six additional stalls and is equipped with ECG, blood pressure and pulse rate monitors, IV infusion pumps, and other life support and emergency resuscitation equipment.

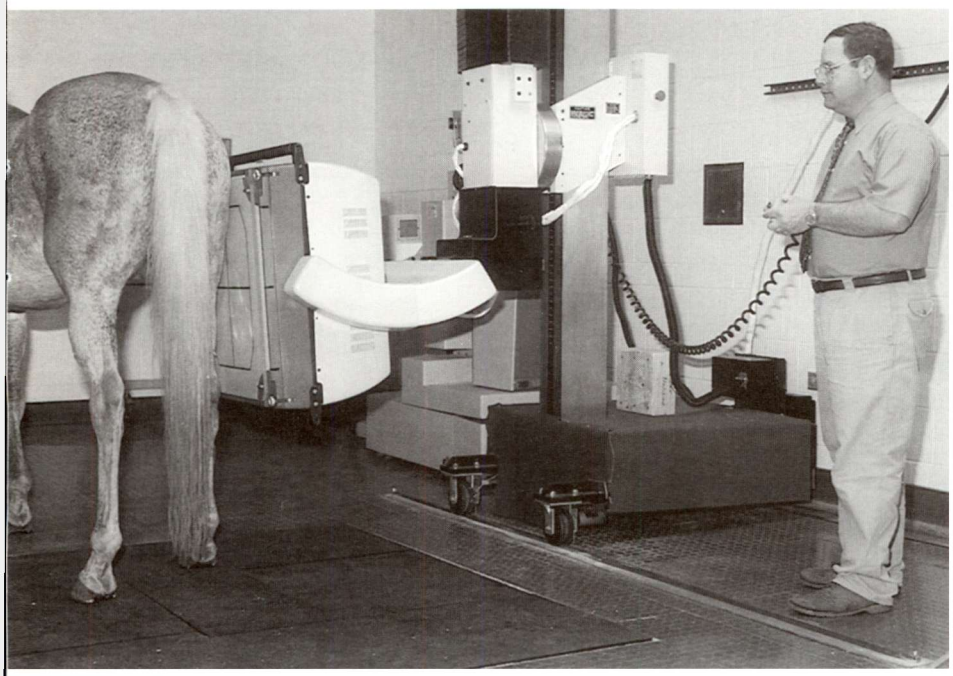


DR. MICHAEL BALL

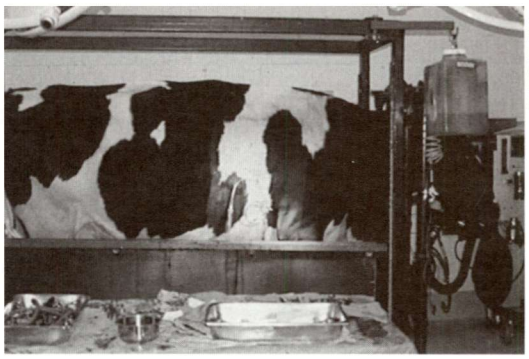
Medicine technician Jean Young gives some extra T.L.C. to a new mom and her baby.



You'll typically find cows, sheep, and goats in the Farm Animal Hospital, but it's also the place where large "exotic" animal patients are housed. This camel came in in July to have a tooth extracted.

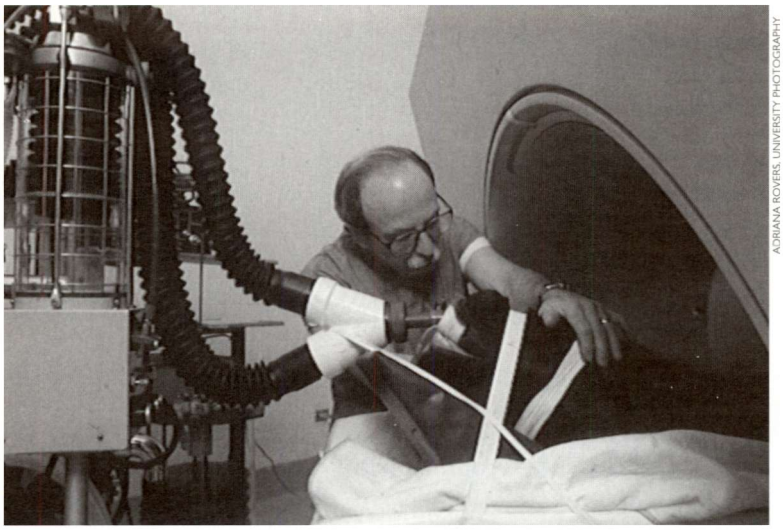


In the large animal radiology suite, Dr. Nathan Dykes uses the nuclear medicine gamma camera to acquire a bone scan on an equine patient. The radiology department provides radiographic, ultrasound, echocardiography, and computerized tomography (CT) services for patients in the Companion Animal Hospital as well.



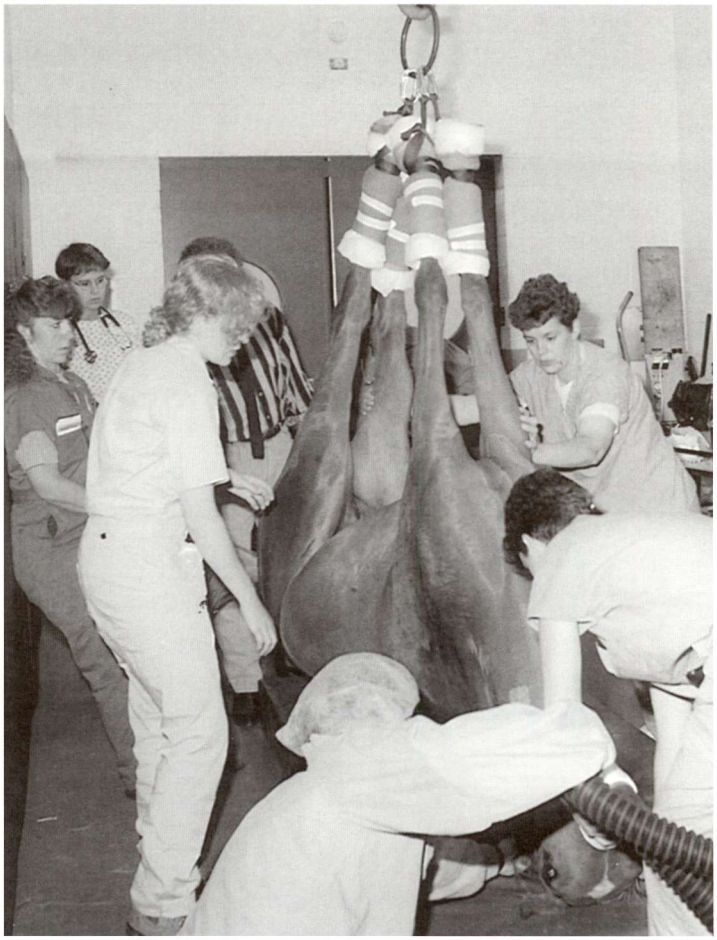
DR. MICHAEL BALL

One of the three surgery suites is used primarily for farm animal surgery, such as cesarean sections in cattle, that frequently do not require general anesthesia.

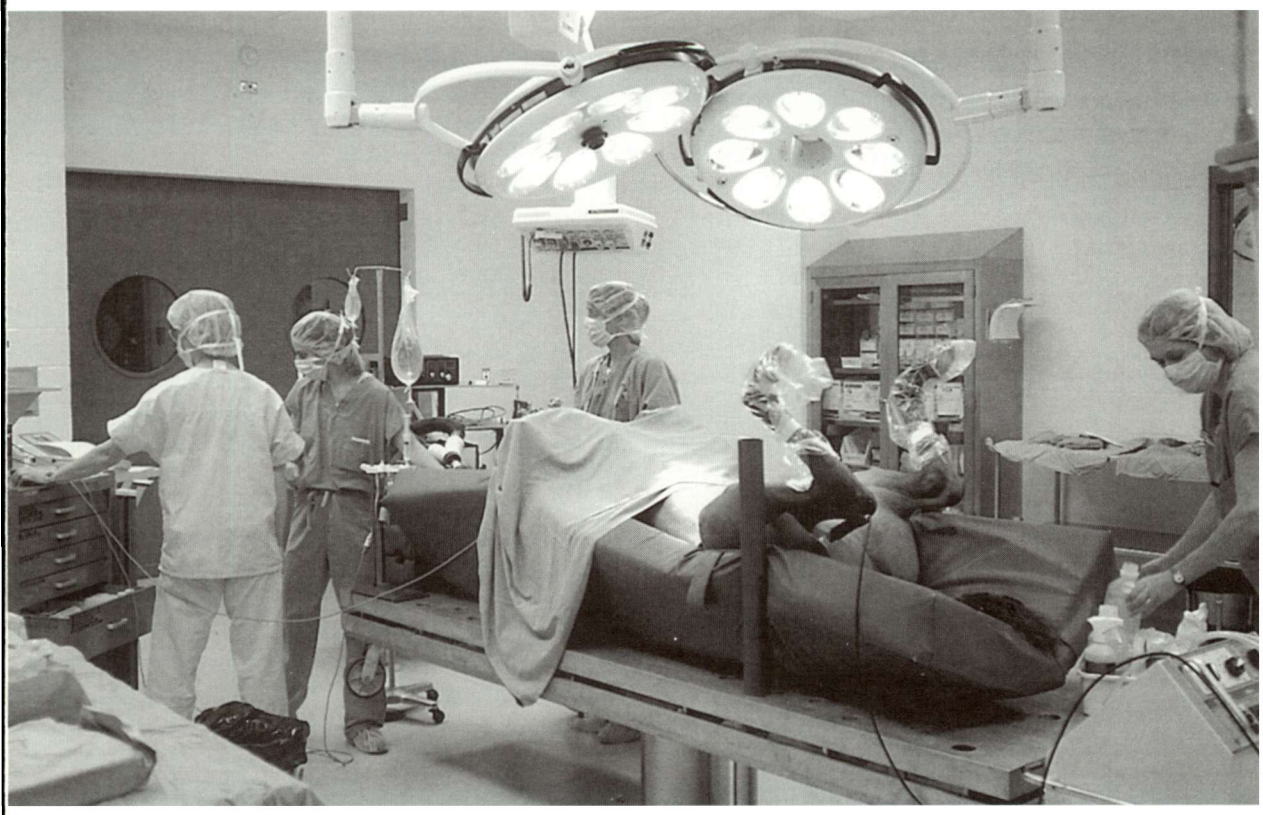


ADRIANA ROVERS, UNIVERSITY PHOTOGRAPHY

With an electric pulley and sling system and an adjacent induction/recovery room for equine patients, the computerized tomography suite is equipped to provide CT scans of both large and small animals. Presently, the scanning table can accommodate patients that weigh up to 350 lbs. The radiology staff are working closely with engineers from Picker International, the company that made the CT scanner, to design a table that can hold a full-grown horse. Above: anesthesiologist Dr. John Ludders monitors a four-month-old foal undergoing a scan to diagnose a cervical vertebral problem.



It typically takes five or six anesthesia and surgery staff to prepare an equine patient for surgery. Above: After being anesthetized, a horse is positioned on a surgical table in one of the induction rooms in the Equine Hospital. Once the patient is secured on the padded table, it will be moved across the corridor into a sterile surgical suite.



There are two aseptic equine surgery suites — the general surgery is used primarily for soft tissue and ophthalmologic procedures and the other is specially equipped for orthopedic surgery. Above: a horse is prepared for abdominal surgery in the general surgery suite.

PHOTO COURTESY OF PERINI BUILDING COMPANY

The addition of the 208,000-square foot Veterinary Medical Center brings the total space occupied by the college on the main Cornell campus to 650,000 square feet. That is roughly equivalent to 15 acres or:

- 13.5 football fields
- 11 lacrosse fields
- 2355 horse-shoe pits
- 138 NCAA basketball courts

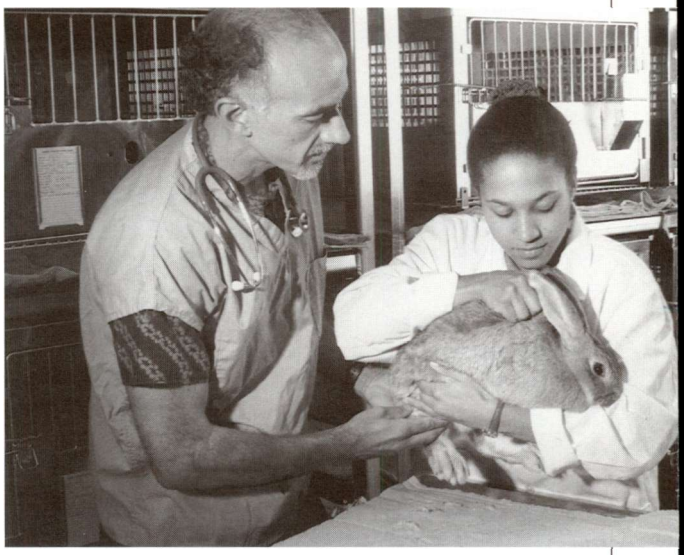
High School Minority Program Expands to Include Teachers

How can a veterinary college get more qualified minority students interested in veterinary science and biomedical research? How about offering high school students a summer to work on laboratory research with a faculty mentor, as well as an opportunity to sample the wide array of activities in the in the College of Veterinary Medicine? And why not invite high school biology teachers to campus to learn about new discovery-oriented teaching strategies they can share with other teachers and use to spark the interests of their students back home?

That's just what the Minority High School Student and Teacher Summer Program did this past summer. Minority high school students have been coming to Cornell since 1981 for the Veterinary College's summer research apprentice program. But now, thanks to funding from the National Institutes of Health and the U.S. Department of Agriculture, the new program includes a component for minority high school teachers or teachers who work with a significant number of minority students.

This past summer, ten high school students, selected from a pool of more than 100 applicants, spent six weeks on campus working on research projects with veterinary faculty members. They came from California, Virginia, Puerto Rico and New York, and included five Hispanics, four African Americans and one Native American. Two biology teachers, who both work in schools with a large proportion of minority students, came from Rochester and New York City to spend a month on campus as part of the program.

"The college is committed to increasing the size and quality of the pool of underrepresented minority students interested in pursuing undergraduate, professional and graduate education in the biomedical sciences," said Clare Fewtrell, associate professor of pharmacology. Dr. Fewtrell, who chairs the faculty committee on Affirmative Action in the Veterinary College, co-directs the high school program with Dr. Janet Scarlett, associate professor of epidemiology and associate dean for student services. She explained that the program is based on the belief that early formative experiences and individual mentoring are important influences on professional career choices. "It is clear from past years that the program has significantly enhanced minority interest in and awareness of veterinary medicine and biomedical research," she said.



Shemika Holder, a 12th-grade student from Elmira, N.Y., worked with Dr. Larry Carbone this summer in the Center for Research Animal Resources (CRAR). Her project was a retrospective review of health records of research rabbits at Cornell. The study is designed to identify subtle indicators of stress (such as reduction in appetite) that will be important in designing social housing for laboratory rabbits.

Program for Students

Each high school student is linked with a faculty member who is actively engaged in a research project involving animals. They spend mornings doing laboratory research under the auspices of their mentor. In addition to Dr. Larry Carbone pictured above, the faculty mentors this year included:

- Dr. Hussni Mohammed, Clinical Sciences, who is analyzing factors associated with the epidemiology of Potomac horse fever and the risk of developing equine motor neuron disease, which is a model for Lou Gehrig's disease in humans;
- Dr. John Bertram, Anatomy, who is using structural engineering techniques to elucidate the relationship between anatomical structure and movement in a variety of animals;
- Dr. Dwight Bowman, Microbiology and Immunology, who is studing nematode and protozoan parasites;
- Dr. Paul Bowser, Microbiology and Immunology, who is investigating tumors in fish that are caused by retroviruses and evaluating therapies for treating diseases in fish;
- Dr. Katherine Houpt, Physiology, who is studying various factors that impact the behavior and psychological well-being of animals;
- Dr. Susan Suarez, Anatomy, who is analyzing the pattern of movement in sperm on their way through the reproductive tract;
- Dr. Sydney Moise, Clinical Sciences, who is investigating a form of sudden death syndrome in German Shepherd dogs;
- Dr. Peter Nathanielsz, Physiology, who is studying fetal development and the role of neurotransmitters in the fetal and maternal brain, placenta and uterine muscle;
- Dr. David Robertshaw, Physiology, who is studying the control of respiration during exercise;

In addition to their research projects, the students attended lec-

tures, laboratory sessions and demonstrations in veterinary medicine for a behind-the-scenes view of many of the exciting projects under way in the college. The topics ranged from zoo animal medicine, embryo transfer technology, and animal behavior to avian anatomy, electron microscopy, and equine motor neuron disease. The students also had advising sessions that focused on how to choose colleges and prepare successful applications, and weekly meetings with professors Fewtrell and Scarlett to discuss the research process, ethical issues, and how their own research may contribute to the body of knowledge in a particular field. They also wrote a scientific paper describing their research and at the end of the summer each student gave a 15-minute presentation about his or her project.

Program for Teachers

The program is designed to offer a first-time participant the opportunity to join the Cornell Institute for Biology Teachers (CIBT) and enables a returning graduate of CIBT to do full-time research. This summer, the program included two teachers, one in each phase of the program. Edwin Klibaner spent three weeks in the CIBT, which included a course on molecular biology, laboratories designed for high schools, and computer workshops.

"We believe that teacher participation in CIBT is the most effective way to help teachers keep pace with the explosive growth of scientific knowledge in health-related areas, and to enable them to develop new teaching approaches for transfering this knowledge to their students," said Fewtrell.

George Wolfe, who had previously attended CIBT, worked in the research laboratory of Dr. Ross MacIntyre, professor of genetics and development, conducting experiments with fruit flies. He also held four spirited laboratory sessions with the minority students in which they conducted genetic experiments using another insect that Mr. Wolfe believes could be a better model than the fruit fly for high school laboratories.

"Since the program began in 1981, we've had more than 100 students participate and at least three-quarters of them have gone on to some form of higher education," says co-director Janet Scarlett. "We think that participation in this program both heightens the students' interest in veterinary medicine and research as well as increases their competitiveness as candidates for higher education down the road." ■

VETERINARY MEDICAL CENTER
CONTINUED FROM PAGE 1

State Senator James Seward echoed Luster's sentiments about his own visit to the teaching hospital, and added that the state's investment in the new facility "will pay dividends for many years to come." He presented a special proclamation from Governor George Pataki to Cornell president Hunter Rawlings.

Noting that the Companion Animal Hospital treats some 13,000 pets each year, President Rawlings informed the audience that his own dog, Hana, "a noble beast," had already had a well-dog checkup there and promised "she will be back."

Obviously enjoying the festivities and barking occasionally in agreement was a current hospital patient, a dog out for an exercise walk behind the large tent. Three other dogs had official roles in the ceremony, providing canine escorts for the speakers and distinguished guests. They included a German Shepherd police dog and two Labrador retriever puppies-in-training for Guiding Eyes for the Blind. ■

Staff Profile: Susan Caring for Animals

For some people, a turning point in their lives occurs through a dramatic turn of events. But for Susan Long, RN, a veterinary technician in the Companion Animal Hospital who just returned from three weeks volunteering for the Audubon Society's Puffin Project in Maine, it occurred during a casual walk in the woods she thought would be 20 minutes long.

"My backyard is Sapsucker Woods and about four years ago, I went on a hike with a friend who is a botanist, biologist and teacher," says Long, a petite grandmother with a stream of waist-long brownish-gray hair pulled back in a ponytail. "He got me so involved in all the nature around us that we walked for hours. Ever since then, I've been an ornithology fanatic and have been learning all I can about birds, habitats, nests, songs, mushrooms, trees, wildflowers, duckweed — anything and everything that's out there!"

Always interested in biology, Long earned a nursing degree years ago and worked as a pediatric nurse for physically impaired children, a private duty nurse, and in a summer camp and college infirmary while raising her three children. Twenty years ago, at the age of 38, she joined the staff of the Cornell's Veterinary Medical Teaching Hospital as a registered nurse working in anesthesiology in the large animal clinic. About thirteen years ago, however, she decided she wanted to work with awake animals as well, so she earned a veterinary technician license and transferred to the small animal clinic.

Today, as a veterinary technical supervisor, Long assists third- and fourth-year veterinary students through their clinical rotations in the Community Practice Service (CPS) in the Companion Animal Hospital. The students' work in the CPS is designed to simulate the job of a working veterinarian. Long helps the students complete medical work-ups on cats, dogs, pet birds, and wildlife, teaching them to draw blood, perform

Long, RN, VT — On and Off the Job

PHOTO COURTESY OF S. LONG

Veterinary technician Susan Long (left) with fellow Audubon Society staff and volunteers on the beach at Stratton Island, Maine

minor surgical procedures, and helping them educate pet owners on animal nutrition and housing, flea control, rabies, and vaccinations. Her job is to play a major role at the beginning of the students' tenure in the CPS and gradually withdraw as they gain confidence and skill.

When her interest in animals took flight several years ago, Long enrolled in Cornell's Field Ornithology Course taught every spring by Steve Kress, a research biologist with the National Audubon Society and Cornell who founded and runs the Puffin Project in Maine. Ever since, Long has taken the course each spring and plans to continue doing so indefinitely.

"You can see 300 species of birds in Ithaca between March and May during spring migration. On field trips throughout the course, we start hiking in the snow with the ducks and end up in the sun. Now I go birding whenever I can and have given up my weekend private duty nursing to do so," says Long, who typically wears binoculars whenever she's outside, except on her daily 5:30 A.M. jog. "I do it because I really love the earth, the flowers, the trees, the plants — all of it. I started with birding but ended up falling in love with the planet."

As soon as Long learned about the Puffin Project, officially known as the Seabird Restoration Program of the National Audubon Society, she signed up to volunteer. The project is dedicated to protecting and fostering the number of nesting birds on the islands of Penobscot Bay, Maine, which used to be one of the largest puffin colonies on the coast of Maine. Hunting in the late 1800s, however, decimated the puffin colonies and those of other birds, such as Roseate terns and Northern Gannets. By the turn of the century, all species of birds had disappeared from the area.

The restoration project involves staffing six islands off the coast of Maine from mid-May through mid-August to translocate puffin chicks and attract back other species, protect nests from seagulls, tourists and other predators, and to learn as much as possible about the birds and their habitats.

For three weeks this past spring, Long camped on Stratton Island with a supervisor and two interns. Their job was to protect the terns, particularly the Roseate terns, which are an endangered species. The only humans on the island, which lies a mile and a half off the coast, the four took turns "doing everything." That included cooking in the shed kitchen, crawling into "blinds" or sheds for one- to three-hour shifts to observe the birds, count nests and birds, log what the birds were doing and eating, and determine what birds were visiting. They also scared away encroaching sea gulls and herons and educated visiting tourists about the restoration project and why it is important.

"We're there to do whatever we can to protect the nests of all the terns because you need large tern colonies to encourage Roseate terns to nest. And it works. In 1985, there were no terns on Stratton Island; three years ago there were 119 tern nests and this year there are 706 including ten Roseate tern nests!" exclaimed Long. She spotted 70 different species during her stay and plans to save enough vacation time to return to the Puffin Project next year for a six-week stay.

This year, Long's commitment to animals is extending to the wild and to the deep. She's taking an exam to get certified as a wildlife rehabilitator this winter so she can care for wild animals and birds at home (where she has two roommates, four cats, and a 100-pound Fila Braseliero dog — a gift from a grateful hospital client — to fill her five bedroom home now that her children have flown the coop). She also plans to work on her scuba certification. In her free time, she hikes, camps, works on renovating her house and helps with construction on a friend's campsite near Syracuse.

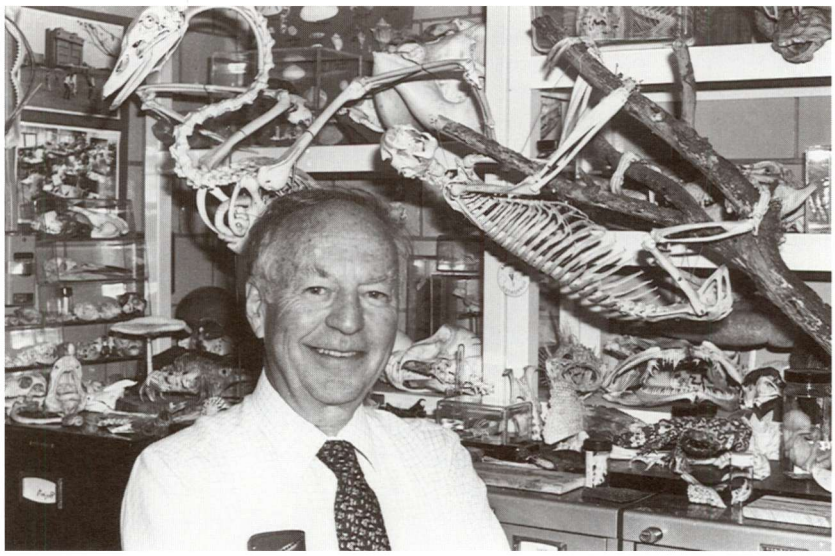
"I really believe that birds and animals have never done anything to harm the planet," she says. "They are in balance with nature and it's up to people to preserve their habitat. It's very simple — if the planet isn't viable for all our critters, it's not viable for us." ■

From Bugs to Bones: Anatomy Professor Still Dedicated to Teaching

When he was a youngster growing up in New York City, he worked at the American Museum of Natural History after school bottling amphibian and reptile specimens, making artificial rocks and plants, and stretching tanned skins over mannequins for dioramas in the Akeley African Hall. He was fascinated by insects and when an exterminator told him, "If you want to learn about bugs, go to Cornell," that's what he did.

You could say that Dr. Howard E. Evans, professor emeritus of veterinary and comparative anatomy, has been part of the backbone of the college for close to half a century and the pun would not be in jest. Evans came to Cornell's College of Agriculture in 1940 as an entomology major, but was called to active duty in the Army in 1943. He received a B.S. in absentia in 1944 and returned to the university as a graduate student and teaching assistant in zoology in 1946. After completing his Ph.D. in comparative anatomy in 1950 he was hired by Professor Malcolm Miller to teach gross anatomy in the Veterinary College. He's been captivating DVM and graduate students in both basic anatomy and special courses on birds, reptiles, fish and marine invertebrates ever since.

This spring, Evans was recognized by Cornell's veterinary students — both present and past — for his devotion to teaching. The Class of 1996 dedicated their yearbook to him and the College Alumni Association named him its first honorary lifetime member. The students' dedication in the yearbook read in part "Wandering into Dr. Evans's office has led many along a thrilling adventure with a man as excited about his specimens as a kid in a candy store. This dedication to the discovery of knowledge, and the teaching of this information to others are his trademarks, as are his wonderful New York City accent and his warm-hearted smile."



DR. JOHN HERMANSON

Behind professor emeritus Howard E. Evans in his Schurman Hall office are just a few of the hundreds of anatomical specimens he's collected over the years.

Evans's love of natural history and his commitment to teaching go hand in hand. Recognizing that people turn to veterinarians for answers to all kinds of questions about animals — "Someone finds a dead snake and of course the first question is, what is it, is it poisonous? But then they often want to know where it lives, what it eats, etc."— he has always woven information about ecology and wildlife into his anatomy classes. These days, Evans offers a distribution course called "Literature of Natural History," to expose students to some of the guide books about animals and habitat that are informative, inexpensive, and readily available to the general public.

Bitten early by the travel bug, Evans's penchant for studying and collecting native flora and fauna has taken him all over the world and provides a wealth of anecdotes for his classes. In the Army, he requested jungle duty and was assigned to Panama as a Malaria Control officer. There he discovered a new frog, *Chiasmocleis panamensis*, in a Panama City park. A young rattlesnake picked up on an Oklahoma highway in 1943 lived in a glass tank in his office for 19 years. Among his favorite specimens are the dried head of a huge sturgeon ("It was about seven feet long; people can't believe it came out of the Hudson River.") and the skeleton of a two-toed sloth from the Buffalo zoo.

Although he's probably best known to veterinary students around the world as the author of three editions of *Miller's Anatomy of the Dog* (conceived and partly written by his mentor, Dr. Malcolm Miller), Evans's interests in research and writing have also concerned birds, fetal development, reptile anatomy, and cyclopia in sheep. One of the original Aquavet faculty, he's taught fish and bird anatomy in the college's program at Woods Hole, Massachusetts, every summer for 20 years. He and his wife, Erica, have led Cornell Adult University natural history tours to Kenya, Tanzania, Papua New Guinea, and South Africa, as well as to Hawaii, the Sonoran desert in Arizona, and Sapelo Island, Georgia. On a trip to Beijing he met a Chinese professor who had discovered extra ducts in the pancreas of Pekin ducks. This led Evans to

CONTINUED ON NEXT PAGE

launch a new research study of Pekin ducks now being farmed in the United States to see if American breeds have the same anomaly. His other current projects include revising the chapter on anatomy for the second edition of James G. Fox's *Biology and Diseases of the Ferret*, and co-authoring a book on the woodchuck with visiting anatomy professor Abraham Bezuidentrout of South Africa.

Although he was promoted to emeritus professor and supposedly retired in 1986, it's impossible to see just where Evans has slowed down. And for all he's given as a teacher over the years, he also believes that Cornell has enriched his own life immeasurably. So much so, in fact, that he and Erica recently gave a gift to the college to endow a student award, to be made by the Anatomy faculty. The purpose is to recognize and encourage students pursuing anatomical endeavors pertaining to the gross structure and function of any animal, but particularly fish, reptiles, or birds. It can be used to fund collection and preparation of research materials, illustration and publication expenses, or travel for research, presentations, or off-campus courses.

"I've been delighted to see an increased focus on fishes, birds, and zoo animals in the curriculum, but there's still little financial support for students who want to do special projects with those species," he says. His primary motivation for making the gift, though, was a love for Cornell and a desire to sustain the spirit of faculty-student interaction he's always enjoyed. "Cornell has done so much for me, and the Veterinary College has been so much a part of my life, that I wanted to give something back." ■

Creative Giving Opportunities

Gifts from alumni and friends are vital to maintain the margin of excellence in programs throughout the college. Below are examples of projects that depend on private support. To make a gift or for more information about gift opportunities at the college, contact Alison Smith in the college Public Affairs office, phone: (607) 253-3744.

Diptych painting for the new Veterinary Medical Teaching Hospital, $5,000—Vermont artist Woody Jackson (best known for the cow murals that grace Ben and Jerry's Ice Cream shops) has agreed to create a large painting to brighten the new facility. The painting will be commissioned in honor of emeritus faculty in large animal medicine and surgery, including Doctors Francis Fox, Robert Hillman, and Stephen Roberts.

Resource Module on "The Morphologic Basis of Vision and Hearing," $4,000—Veterinarians routinely assess vision and hearing during physical exams. A new study station in the college's Modular Resource Center will use the dog as a model to explain the neurological pathways between the external environment and the brain. Support is needed to produce videos of physical examinations, morphologic specimens, illustrations, and radiographs for the interactive learning module.

Cornell Sled Dog Team Travel Fund, $12,000—Dr. Arleigh Reynolds has been conducting research on nutrition in working dogs for nine years, using a group of Alaskan huskies who in recent years have also done double duty as the Cornell Sled Dog Team.

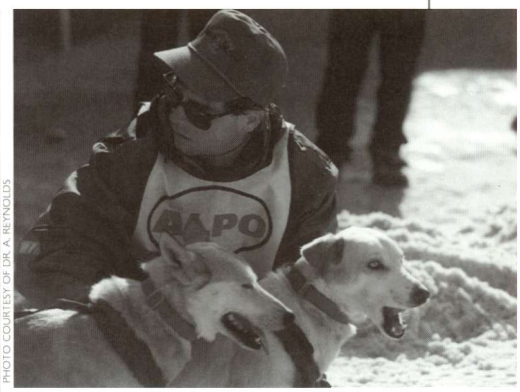


PHOTO COURTESY OF DR. A. REYNOLDS

Dr. Arleigh Reynolds with the Cornell Sled Dog Team lead dogs, Carla and Velcro

In the laboratory, Reynolds and his colleagues have learned a great deal about the type of fuel dogs burn during different kinds of exercise and have found that a high fat diet has a dramatic positive impact on performance. He also has found a means to help dogs recover more quickly after exercise and is currently working on a project that may help prevent dehydration during exercise and aid hospitalized animals suffering from dehydration.

As a field measure of how the laboratory findings apply in real life, Dr. Reynolds and his dogs have competed in some of the most challenging races in North America. The Cornell team won the 1995 World Championship Sled Dog Derby in the 6-dog class and finished second in North America and fourth in the world in the 8-dog class in the 1996 World Cup standings. As a result of these performances, the team will be invited to represent the United States at the 1997 International Sled Dog Sport Federation World Championships in Finland — the sled dog equivalent of the Olympics. Gifts to the travel fund will help defray the expenses of taking the dogs to compete at that event, as well as other races in the U.S. and Canada this winter. ■

In memoriam

Clarence C. "Bud" Combs, Jr., DVM '39 died June 15, 1996, at his home in Colts Neck, N.J. Dr. Combs was active in practice in Shewsbury, N.J., until 1985, with his wife, Margaret (O'Brien) Combs, DVM '40. A member of the Cornell polo team as a student, he continued to play both arena and outdoor polo for many years and was elected to the National Polo Hall of Fame in 1992. Survivors include his wife, two sons, and two grandchildren.

Research and Service Notes

Alumnus Finds Clue to Gulf War Syndrome

Fred Oehme, DVM '58, professor of toxicology at Kansas State University's College of Veterinary Medicine, has had a major role in uncovering a possible cause of the wide array of illnesses—known as Gulf War Syndrome—which have affected an estimated 30,000 veterans of the 1991 Persian Gulf War.

Two years ago, Dr. Oehme teamed with researchers from Duke University Medical Center and University of Texas Southwestern Medical Center to investigate a possible connection between the illnesses and chemicals soldiers had used in combination during the Gulf War. Oehme and his collaborators found that chemicals used simultaneously to protect soldiers from insect-borne diseases and nerve-gas poisoning are highly toxic to the central nervous system in chickens. When used alone, the same chemical agents were harmless.

The research shows that the combination of the anti-nerve gas agent pyridostigmine bromide and the pesticides DEET and permethrin, all three of which were widely used by thousands of Desert Storm soldiers, produced many of the same neurological defects in chickens as those reported by veterans. Chickens exposed to any two chemical combinations showed similar symptoms to Gulf War veterans, including diarrhea, weight loss, shortness of breath, stumbling, and muscle tremors. Chickens exposed to all three chemicals became paralyzed and some died.

"Chickens are much smaller than people, obviously, but their susceptibility to neurotoxic chemicals closely resembles that of humans," Oehme said. His participation in the study confirms once again that veterinarians can play a key role in solving many human health problems.

Grayson-Jockey Club Funds Two Equine Studies

The Grayson-Jockey Club Research Foundation recently awarded grants totaling close to $100,000 to two college faculty members for equine orthopedic research studies.

Last year the Foundation supported a pilot study on inflammatory joint disease by James N. MacLeod, VMD, PhD, assistant professor of molecular genetics in the college's Baker Institute for Animal Health. The present grant extends funding for an additional two years and will support research on the basic mechanisms that link acute joint inflammation (synovitis) to chronic articular cartilage degenertion. Synovitis is common in racehorses and is a major cause of lameness. Synovitis also appears to initiate the degenerative joint changes that are characteristic of osteoarthritis. Understanding the molecular pathogenesis of these changes can help both veterinarians and horse owners improve joint health in all horses that participate in strenuous athletic events. A basic understanding of the disease process will enable treatment plans to be optimized when traumatic joint injuries occur, including the selection, dose, duration, and administration frequency of therapeutic agents.

DEDE HATCH

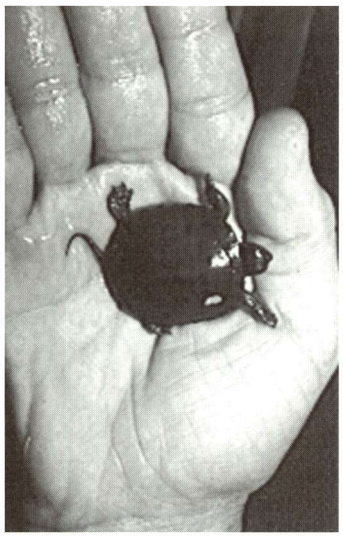
Dr. James N. MacLeod

Alan J. Nixon, BVSc, MS, Dipl ACVS, also received a grant from the Foundation for his continuing research on the use of natural growth factors in healing cartilage defects in horses. An associate professor of surgery in the Clinical Sciences department, Dr. Nixon has developed techniques for growing cartilage cells and then using them to resurface extensive articular cartilage defects in horses. A previous grant from the Foundation provided support for the Comparative Orthopedics Laboratory to develop methods for harvesting stem cells from the bone marrow of horses using standing procedures under local anesthesia and for culturing the stem cells in various systems to promote the growth of cartilage cells. The new study will better define the optimal growth factor combinations that drive stem cells toward their final cartilage cell form and aid development of a paramagnetic cell sorting procedure that will allow retrieval of the most effective cells for later transplantation to cartilage injuries. The long-range goal of the study is to find ways to prevent the development of arthritis in horses and to minimize the potential for catastrophic breakdown.

Update: Head Start for Rare Turtles

Two years ago, wildlife medicine professor George V. Kollias, DVM, PhD, Dipl ACZM, began a joint venture with the Nature Conservancy and the New York Department of Environmental Conservation (DEC) to provide a helping hand to survival for a dwindling population of turtles. In June, a second group of 15 healthy Blanding's turtles were released into the wild after spending the first ten months of their lives at the Veterinary College.

Blanding's turtles (*Emydoidea blandingii*) were declared a "threat-



DR. GEORGE KOLLIAS

A four-week old Blanding's turtle.

ened species" in New York in 1983 after conservationists discovered that their population had fallen to about 600. In the wild, it takes three to four years for the turtles to grow large enough to become unappetizing to predators like snapping turtles, herons, and raccoons. Thus, a captive rearing program was designed to give some baby turtles a chance to grow up in safety.

In the "head start" program, hatchlings are collected in late summer at a Nature Conservancy preserve downstate and are brought to Cornell a few days later. Here they are fed several commercial aquaculture foods and by the time they are released they've grown to about four inches, almost half their adult size.

The conservation project is beginning to provide an opportunity for Kollias to study the relationship between rapid growth and reproduction. In the wild, it typically takes 16 years for Blanding's turtles to reach sexual maturity. If they can reach breeding size in less than five years — which now appears possible given the right environmental conditions and diet — they could make good candidates for a captive breeding program. And, knowledge gained from this species could prove helpful to zoo and other wildlife preservation programs in breeding other species of turtles.

For now, Nature Conservancy and DEC staff are monitoring the progress of the 25 turtles that have been returned to the wild after a head start at Cornell. And, Dr. Kollias is expecting a third group of hatchlings to arrive at the college in September.

Barking Dogs Calmed by Citronella Collars

When it comes to calming "nuisance-barking" dogs, behavior experts at the college have found that a spritz of fragrance is more effective than an electric shock.

In a study by physiology professor Katherine A. Houpt, VMD, PhD, and Soraya V. Juarbe-Díaz, DVM, who recently completed a residency in the teaching hospital's Animal Behavior Clinic, dog owners who tried both types of anti-barking collars preferred citronella spray over shock for their pets.

Nuisance-barking dogs sound off for no particular reason, said Dr. Houpt, who is the director of the behavior clinic. "Certainly there are times when we want a dog to bark to alert us to something we should know about. But nuisance barkers may bark just because they are highly territorial or because barking is a learned, attention-seeking behavior."

Nuisance, inappropriate, or excessive barking make up between 13 and 35 percent of behavior problem complaints by dog owners. "Nuisance barking may be manageable with behavior modification, but some owners are unwilling or unable to provide consistent, appropriate corrections," Houpt said. An anti-barking collar may be the solution in those cases.

The citronella collar releases a spray of the plant-based fragrance when a microphone in the collar senses barking. Houpt and Juarbe-Díaz believe that the dog's keen sense of smell may be the reason that a strange odor was a more effective stimulus to halt barking than an electric shock. All of the dog owners who participated in the study found the citronella collar to be effective in reducing or stopping nuisance barking, while half said that the electric shocks had no effect on their dogs. Once a dog learns that barking results in the citronella spray, the veterinarians advise that a placebo or "dummy" collar may be substituted in some cases and work just as well.

And, although the dogs in the study must have found the citronella spray unpleasant, none of the owners complained about the smell, said Dr. Juarbe-Díaz. "One owner thought the scent was preferable to her dog's body odor." ■

CORNELL
Veterinary Medicine

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http://www.vet.cornell.edu

Correspondence may be addressed to
Bonita S. Voiland
College of Veterinary Medicine
Cornell University
Ithaca, NY 14853-6401

Send e-mail to
bsv@cornell.edu

Writers: Elizabeth Fontana, Susan Lang, Roger Segelken

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College of Veterinary Medicine
Cornell University
Ithaca, New York 14853-6401

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Calendar of Events

(Events are at Cornell unless otherwise noted; call 607-253-3744 for information.)

September

21	Cornell Homecoming, veterinary alumni Tailgate Party at Princeton football game
26–27	Equine Practitioners Seminar*
28–29	Solving Canine Behavior Problems*

November

9–10	Farrier's Conference*

December

9	Alumni Reception, Denver, at the AAEP Conference

January '97

14	Alumni Reception, Orlando, Fla., at the North American Veterinary Conference

*For more information about continuing education programs, call 607-253-3200.

Third-year DVM student Susan Hubbard (left) and Guiding Eyes for the Blind regional coordinator Nancy Trewin with two Labrador retrievers who are puppies-in-training for the Guiding Eyes organization. Along with a police dog, they served as "canine escorts" for the speakers and dignitaries at the dedication of the new Veterinary Medical Center in June.