

College of Veterinary Medicine

Annual Report

July 1991—June 1992



CORNELL
UNIVERSITY



Dr. Barry A. Ball, the 1991–92 co-winner of the SmithKline Beecham Award for Research Excellence

The College of Veterinary Medicine at Cornell University in Ithaca, New York, is the primary health resource for the state's multibillion-dollar animal population.

The college's mission, mandated by the citizens of New York State through their elected representatives, is to advance animal and human health through education, research, and public service.

This report is a summary of the activities during the 1991–92 year of the students, faculty, and staff who worked to accomplish that mission and, by doing so, to justify the public's trust.

1991–1992

College of Veterinary Medicine

Cornell University

A statutory college of the State University of New York

A component college of the State University of New York Health Sciences

Cornell University, Ithaca, New York

Ninety-fifth Annual Report

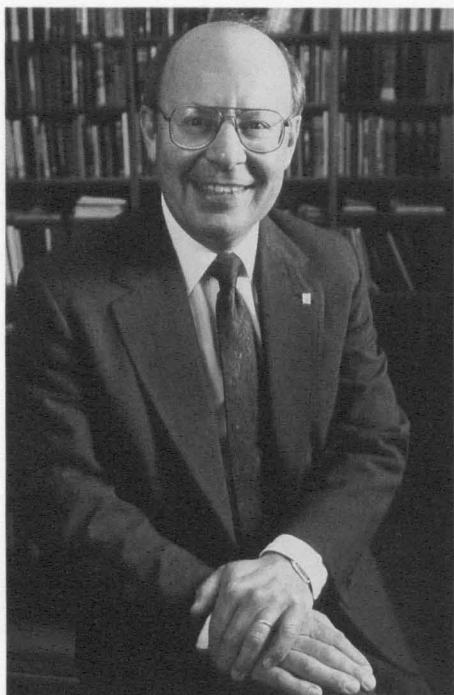
July 1, 1991–June 30, 1992

This document fulfills the reporting requirements of article 115, section 5711 of the New York State Education Law.

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Message from the Dean



Dean Robert D. Phemister

I can best characterize 1991–92 as a year in which we continued to be deeply involved in major endeavors to build, reshape, and strengthen both facilities and programs throughout the college.

The most visible signs of change and improvement are evident in the progress made in constructing our new facilities. In the past year, we watched steel infrastructure rise for two major new buildings that will soon address the long-standing space crunch at the college.

Work on the Veterinary Education Center, begun in July 1991, is proceeding on schedule. We expect to begin moving in by late spring of 1993 and to have full use of the new lecture halls, teaching laboratory, and expanded library space for the 1993–94 academic year.

Construction of the new five-story Veterinary Medical Center began in April 1992. The new small animal, equine, and food animal clinics of the Veterinary Medical Teaching Hospital will be housed on the ground floor, while research laboratories, office space, and technical support facilities will be located on the upper floors and the basement level. Despite the fact that we are currently more constrained for space than ever before, staff, faculty, and students continue to meet the challenges of working and learning around a construction zone with grace, good humor, and eager anticipation.

Building of another sort is taking place indoors as the faculty continues to revise and reshape the veterinary medical curriculum. We have already begun to implement important changes in the way we teach, which are designed to involve students more actively in their education and to offer them enhanced opportunities to develop skills in solving medical problems, accessing information, and communicating.

Clinical rotations are now offered year-round, allowing senior students greater flexibility as well as the chance to

arrange extern experiences at other institutions. Case-based, small group tutorials are being developed for a series of interdisciplinary courses that are slated to begin next year. In anticipation, faculty members are experimenting with the tutorial approach in some preclinical courses during 1992–93. The tutorials will help students learn in a clinical context as they investigate basic science principles by studying actual cases. A more detailed description of the new academic program can be found in the following section, Teaching.

A third major endeavor, the Cornell Campaign for the College of Veterinary Medicine, advanced several steps closer this year to reaching its \$30 million goal. The objective of this fund-raising effort is to strengthen the foundation of support for the college of the future. Our reputation for excellence has been built on an outstanding faculty and student body. The campaign seeks private support for new endowments to fund permanent named professorships, veterinary student scholarships, graduate fellowships, and clinical residencies.

Under the leadership of Campaign Committee co-chairs Robert E. Clark, D.V.M. '52, and Jay W. Geasling, D.V.M. '75, and vice-chair Richard A. Smith, D.V.M. '52, a network of twenty-three regional committees and more than 220 volunteers has been established to contact college alumni in New York, Pennsylvania, New Jersey, Rhode Island, Delaware, Maine, New Hampshire, Vermont, Connecticut, and Massachusetts. We also received a number of major gift commitments from friends and alumni last year, bringing the total raised as of June 30, 1992, to \$16,081,613.

To recognize Dr. and Mrs. Isidor Sprecher, D.V.M. '39, for their many unrestricted gifts to the college, Cornell's Board of Trustees approved changing the name of the veterinary library to the Roswell P. Flower–Isidor I. and Sylvia M. Sprecher Library and Learning Resources Center.

Each year brings the opportunity to welcome a new group of students to the college as well as new faculty and staff members. Dr. George V. Kollias joined the faculty in February as the first Jay Hyman Professor of Wildlife Medicine, a position endowed by Dr. Hyman, D.V.M. '57, who is himself a longtime advocate of wildlife and marine animal medicine. Working with state wildlife agencies and related units on campus, Dr. Kollias will develop and lead a comprehensive program with a special focus on avian species.

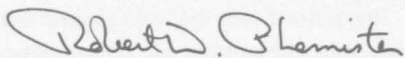
Several years ago the college received a bequest from Mrs. Dorothy McConville to be used by the James A. Baker Institute for Animal Health for research on equine diseases. In May the trustees approved the creation of an endowed professorship for this purpose, and Dr. Douglas Antczak, who heads our Equine Genetics Center, was appointed the Dorothy Havemeyer McConville Professor of Equine Medicine. The trustees also named two new James Law professors: Dr. Alexander de Lahunta, the James Law Professor of Veterinary Anatomy, and Dr. Alexander J. Winter, the James Law Professor of Veterinary Microbiology.

Dr. Leland Carmichael was appointed director of the Baker Institute in September 1991, allowing Dr. Douglas McGregor to devote full time to his position as associate dean for research and graduate education. Dr. Carmichael, one of the college's most distinguished faculty members, will lead the institute's programs until late 1992 when Dr. Gustavo Aguirre arrives from the University of Pennsylvania to assume the directorship. And in March 1992 we bid farewell to assistant dean for public affairs John Semmler, who after more than twenty years at Cornell, was recruited by the University of Sydney, Australia, to become their new director of development. Our new assistant dean, Timothy Redden, arrived in August from the College of Veterinary Medicine at Iowa State University.

Also this year we once again struggled to accommodate substantial cutbacks in state support. All department and unit budgets have been affected, and while most people would agree that the college is leaner and more efficient, we have cut back on a number of activities, such as undergraduate instruction and outreach programs, that we would much prefer to continue. Our budget difficulties have been compounded by a self-imposed restraint on tuition increases and by the national economic recession, which has led to a loss of student support from contract fees from other states in our region.

Through careful management, the Teaching Hospital, the Diagnostic Laboratory, and the Equine Drug Testing and Research Laboratory have been able to augment their net revenues to compensate partially for the reductions in state support. Faculty members have been more successful than ever in competing for national research funding, and this has helped soften the impact of fewer state dollars. Given that other pressures on the state budget are steadily increasing, we must plan for the future knowing that a growing measure of private support will be essential to maintain the college's position as a worldwide leader in veterinary medicine.

The task of preparing this report—to condense and summarize succinctly the year's activities and accomplishments—becomes more challenging each year. The following pages describe only a few of the dedicated individuals and a small portion of the ongoing work in our academic departments and major service units. Nonetheless, I hope this publication will convey some of the excitement and pride all of us feel as we build, reshape, and strengthen the college's future.



Robert D. Phemister
Dean

Message from the Dean

JON CRISPIN



Dr. Linda Mizer, tutor for this small group, looks on as (left to right) Eric Glass '95, Lia Belanger '95, Renee Nail '95, and Michael Geraghty '96 discuss a radiograph, which is one of the supporting materials for a problem-based exercise in the new veterinary curriculum.

Teaching

Development of New Academic Program Accelerates

Work by both faculty and staff members on the new veterinary curriculum was accelerated during 1991–92 in preparation for implementation of the new program in fall 1993. Under active study since 1987 and mandated in broad concept by the faculty of the college in 1989, the proposed curriculum underwent careful review in the fall and winter months of 1991–92. Throughout the winter and spring, extensive discussions were carried on in faculty meetings, at specially organized retreats, and in offices and hallways throughout the college, culminating in April 1992 with a faculty mandate to proceed with detailed development of individual courses.

With a curricular framework established, curriculum design groups further focused their efforts on detailed planning of the seven courses or blocks that will form the principal learning units for the new program. At the same time, faculty members began to attend tutor training workshops at medical schools offering a similar curriculum. Faculty members, along with the staff of the Office of Educational Development, intensified their work preparing educational resources for the curricular program, including case writing and development, computer software development, and laboratory planning.

Goals of the new curriculum include making the educational program flexible for both students and faculty, integrating the clinical sciences with the basic sciences, and facilitating an active learning process in which students assume a greater role in their own learning. While the actual subject matter offered to students entering the college in 1993 will not differ greatly from that offered to their predecessors, the process by which they learn it will.

Case-based and presented for the most part in small tutorial settings of six to eight students led by a facilitator from the faculty, the foundation courses of the new curriculum represent a radical departure from the traditional educational method at Cornell and

A Year of Progress, a Year of Change

July 1991

Construction of the new Veterinary Education Center begins.

August

Eighty-two new students enter the D.V.M. program as the class of 1996.

September

Dr. James Richards is appointed diagnostic consultant and assistant director of the Feline Health Center. A new telephone number (1-800 KITTY DR) lets cat owners and veterinarians speak directly with Dr. Richards to receive the most current scientific information about cats and their health through the Dr. Louis J. Camuti Memorial Feline Consultation and Diagnostic Service.

Dr. George C. Poppensiek, former dean of the college, is named a distinguished life member of the New York State Veterinary Medical Society. This special category of membership recognizes those who have made significant contributions to veterinary medicine and to the society.



Left to right: Rene Nail '95, Karen Antczak '95, Beth Davidow '95, Dr. Katherine M. Edmondson, director of educational development, and Dr. Cornelia E. Farnum, chair of the Department of Anatomy, enjoy a humorous moment while working on course development for the new curriculum to be implemented in fall 1993.

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Dr. Alexander de Lahunta, James Law Professor of Veterinary Anatomy, discusses joint structure with Bill Benner '95 and Dana King '95.

other veterinary schools, by which nearly all material is presented in a lecture or laboratory format. Those studying under Cornell's new problem-based format will be presented with scenarios of actual clinical cases, selected to highlight specific basic science concepts. With other members of their tutorial group, students will be expected to analyze the problems inherent in each case and formulate learning goals. Two-hour tutorial sessions typically will be held three times a week and will be supplemented by laboratories, lectures, and discussion groups appropriate to the learning objectives of each course. Structured presentations will be limited in number and restricted to the mornings. Afternoons will be designated for independent study.

Interactive Visual Learning Units

It is during the afternoons (and, for most, long into the evenings) that students will research the topics they have determined to be essential to understanding the problems presented in the tutorial sessions. They will spend a great deal of time in the newly expanded Roswell P. Flower-Isidor I. and Sylvia M. Sprecher Library and Learning Resources Center, gathering information

from books and other publications and working with the interactive visual learning units.

Arranged thematically in clusters of hands-on stations, each visual learning unit will focus on a specific concept or system, such as the cardiovascular system or the autonomic nervous system. Modules will include plastinated specimens, wet specimens, models, radiographs, slides, and other teaching materials. Some modules will include a computer work station, a radiographic viewer, or other equipment appropriate to the unit's theme. Students will return to the modules again and again, generally with different questions each time, as they progress through their course of study. The modules will also be available to residents, graduate students, faculty members, and visiting practitioners.

Another important source of information for students will be faculty members who agree to serve as experts in given areas. Individual students or groups of students will be able to discuss their questions with these experts outside the tutorial groups at times that are mutually convenient.

Principal Learning Blocks

In their first semester, all students will take Blocks I and II, The Animal Body (covering gross anatomy, histology, developmental anatomy, radiology and imaging, and an introduction to surgical anatomy) and Genetics and Development (cell commitment and movement, morphogenesis and growth, oncogenesis, sex determination, and early development). They also will begin Block VII, Animals, Veterinarians, and Society, a course that will continue through the curriculum, providing opportunities for students to gain experience in conducting physical examinations and interacting with clients early in the curriculum and progressing to topics such as preventive medicine, risk management, ethics, societal responsibility, and practice management.

In the next four semesters students will take Function and Dysfunction (physiology and homeostasis, biochemistry and cell biology, cell injury and repair, histology, hematology, and principles of pharmacology), Host, Agent, and Defense (inflammation and infection, the immune system and immunopathology, histology, bacteriology and mycology, parasitology, virology, antimicrobial therapy, and disease outbreak investigation), and Animal Health and Disease (organized by body system to incorporate systems pathology, clinical pharmacology, medicine, surgery, nutrition, and the related clinical disciplines).

Approximately 30 percent of the veterinary curriculum through all four years will include distribution courses, which will be selected individually by students to fulfill specific requirements in each discipline or across disciplines. Students will spend the second semester of their junior year and all of their senior year in clinical rotations and distribution courses.

Clinical Rotations

A change in the schedule of clinic rotations was implemented in May 1992, and the number of clinical credits required of students for graduation was increased from 32 to 36. Previously, seniors had access to clinical experience only during the academic year. Now they can acquire their clinical credits over the full calendar year.

Within the limits imposed by staffing needs of the clinic, students can choose the times they want to be in the Teaching Hospital and when they want to schedule twelve weeks of free time for employment or other purposes. The new rotation schedule frees students to seek temporary employment with private practices at their own convenience throughout the year, and the year-round staffing by students benefits the hospital by reducing the need for summer and holiday hiring.

Assessment Alternatives

Throughout all four years, each student's progress will be assessed at regular intervals, but alternatives to the usual paper and pencil tests will also be used to measure the students' knowledge of content and the development of their clinical skills. Oral examinations and formal class presentations will be used for assessment as well as computer-linked case-based exercises that measure the efficiency with which students work through information about a case to reach a diagnosis.

The new curriculum is intended to provide students with an excellent, broadly based education with greatly enhanced opportunities for learning to access information efficiently and reliably and to interpret medical information critically. Graduates of the program will be prepared to continue learning throughout their careers, and they will have the advantage of being able to respond readily to the needs and opportunities presented by the veterinary profession in the twenty-first century. Although several medical schools in the United States have adopted similar small group/tutorial, case-based curricula, Cornell will be the first veterinary college in the country to offer such a program.

Summer Leadership Program Attracts Veterinary Students from Abroad

Providing experiences that will increase a person's ability to become a competitive research scientist is the objective of the Leadership Training Program for Veterinary Students. This highly successful program brings twenty or so gifted men and women who have completed at least one year in a D.V.M. program to campus for an intensive ten-week summer session.

Each participant is responsible for conducting an independent research project, thereby gaining insight into the planning and conduct of research, the evaluation and public presentation of data, and the efficient use of the human and physical resources of a research laboratory.

In addition, the veterinary students travel to premier public and private research laboratories, tour the facilities, and meet and discuss career options with scientists working there. Last year the tours included the main campus of the National Institutes of Health and the U.S. Department of Agriculture's Beltsville Laboratory, both in the Washington, D.C., area, and the Merck, Sharp and Dohme Research Institute in Rahway, New Jersey.

Another component of the program is Career Day. Distinguished research scientists and administrators from other colleges of veterinary medicine come to campus to discuss career opportunities in academic settings. Counselors are available to assist participants in their own career decision making.

The program has an increasingly international flavor. More than half of last summer's participants came from veterinary colleges in countries other than the United States. Such cultural diversity exposes this talented group of young people to the challenges and opportunities for veterinary medicine worldwide.

The Leadership Training Program for Veterinary Students is a unique initiative in veterinary education. Applications far exceed enrollment. Now in its fourth year, the program is sponsored by the Merck Foundation, the Richard King Mellon Foundation, and the Robert W. Woodruff Foundation.

October

Dr. Donald F. Smith, associate dean for veterinary medicine, and **Dr. Brian R. H. Farrow**, chair of the Department of Clinical Sciences, are elected distinguished practitioners of veterinary medicine of the National Academies of Practice. Veterinary medicine is one of nine academies, or areas of health practice, recognized by the U.S. government. Only 100 distinguished practitioners may be elected to each academy, and at present, there are 640 in all nine academies. The National Academies of Practice was created to advise the U.S. Congress in matters of health care delivery.

December

Drs. Alexander de Lahunta and **Alexander J. Winter** are named **James Law Professors of Veterinary Anatomy and Veterinary Microbiology**, respectively. Six James Law professorships were created in 1988 to recognize distinguished faculty members who have earned national and international reputations in veterinary medicine and the biomedical sciences. To date, four of the professorships have been filled.

January 1992

The Eighty-fourth Annual Conference for Veterinarians is held at the college and attended by 290 veterinarians from across the Northeast.

February

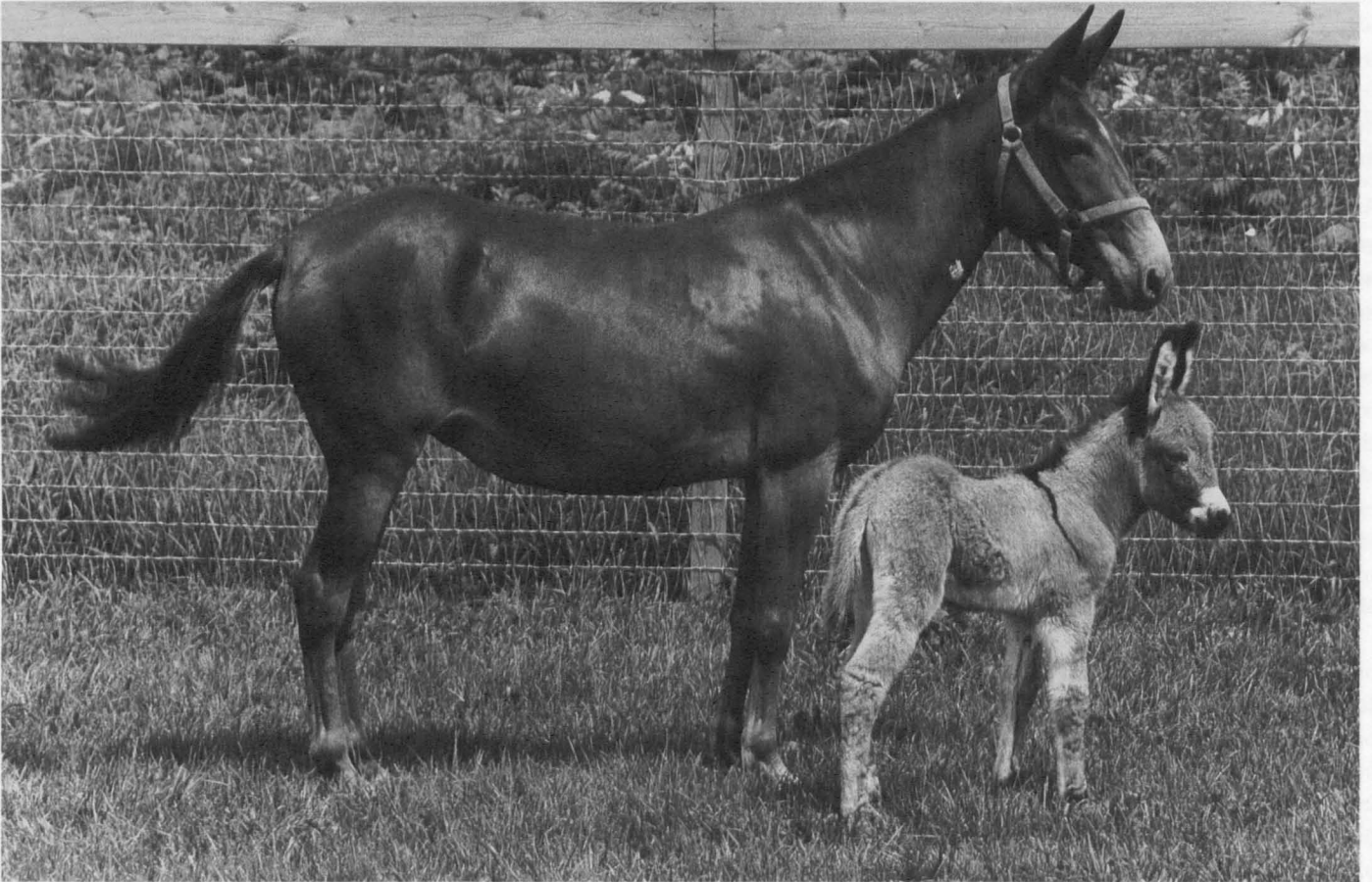
Dr. George V. Kollias joins the faculty as the first **Jay Hyman Professor of Wildlife Medicine**. The distinguished chair was endowed by **Dr. Jay Hyman '57**, a longtime advocate of wildlife and marine animal medicine.

March

Morris Animal Foundation awards a matching grant to Cornell University for a **Companion Animal Behavior Residency Training Program** for a graduate veterinarian. Recipient of the grant is **Dr. Katherine Albright Houpt**, director of the Behavior Residency Training Program. **Dr. Ilanna Reisner** is chosen to fill the residency.



JON CRISPIN



A mother mule with her donkey foal after embryo transfer. Dr. Douglas F. Antczak's research on histocompatibility and reproduction has included the establishment of pregnancy by embryo transfer in the normally sterile interspecies hybrid between a horse and a donkey.

Research

Pioneering Work in Equine Molecular Genetics Could Aid Organ Transplant Recipients

The major problem in clinical organ transplantation in human medicine is rejection of the graft by the recipient's immune system. Grafts between unrelated individuals usually will not succeed unless the donor and the recipient are carefully matched for tissue compatibility (histocompatibility) genes, or the immune system of the recipient is suppressed by drugs.

In pregnancy, however, even though the mother and embryo are not matched for tissue compatibility and the mother shows little sign of general immunosuppression, an embryo containing foreign genetic material from the father is usually not rejected by the mother's immune system. Dr. Douglas F. Antczak, a veterinary immunologist who heads the Equine Genetics Center, is investigating immunogenetic aspects of early placental development in the horse to determine why this is so.

Previous research from Dr. Antczak's laboratory has determined that the trophoblast cells, which make up the outermost layer of the placenta, selectively inhibit the expression of cell surface molecules called histocompatibility antigens. These antigens are the targets in the transplantation reactions that destroy organ grafts, but they also function in normal immune responses by helping cytotoxic lymphocytes identify and destroy virus-infected cells. Thus the fetus's strategy leaves its outer surface largely unrecognizable by the mother's immune system, but also more vulnerable to infection.

Dr. Antczak and his research team are currently investigating the mechanisms by which the fetus "switches off" its histocompatibility genes. The particular anatomy and developmental history of the horse's placenta allows study of this phenomenon in ways that are not possible in other species. Using recombinant DNA techniques, the Equine Genetics Center group has been isolating, cloning, and sequencing histocompatibility genes from the horse.

April

The faculty votes "yes" to proceeding with the detailed development of courses for the new case-based, small group-oriented curriculum.

Following a year of discussions and evaluation by the college executive committee, the dean and department chairs present the faculty with guidelines for tenure and promotion.

Construction of the new Veterinary Medical Center begins.

May

Clinical rotations are made available to students throughout the calendar year. Previously, students could do their rotations only during the academic year.

Drs. Barry A. Ball and Colin R. Parrish win the SmithKline Beecham Award for Research Excellence. Beecham Laboratories presents this award annually to young investigators whose research achievements are likely to have a significant impact on understanding the biology or medical management of animals.

Dr. Alexander de Lahunta is elected by fourth-year students to receive the prestigious Norden Distinguished Teacher Award, which honors continued excellence in teaching. A faculty member for more than thirty years, Dr. de Lahunta is the James Law Professor of Veterinary Anatomy.

Dr. Douglas F. Antczak, professor of microbiology, immunology, and parasitology and director of the Equine Genetics Center at the James A. Baker Institute for Animal Health, is elected the Dorothy Havermeyer McConville Professor of Equine Medicine.

The class of 1992 graduates. Seventy-nine D.V.M. degrees are awarded, five with distinction.

June

Twenty-three participants from ten countries attend the conference "Modern Techniques in the Diagnosis and Control of Poultry Diseases," sponsored by the Department of Avian and Aquatic Animal Medicine and the Office of Continuing Education. Organizers of the conference are Drs. Benjamin Lucio-Martinez and Syed A. Naqi.

These genes are being used to determine both the pattern of expression of equine histocompatibility genes in the placenta and the regulatory pathways that govern this expression in various trophoblast cell populations.

In addition to their implications for understanding the mechanisms underlying organ graft rejection, the results of Dr. Antczak's studies may lead to a better understanding of undesired abortions in horses and perhaps in humans as well.

Dr. Antczak was recently appointed the Dorothy Havermeyer McConville Professor of Equine Medicine.

Epidemiological Study Could Shed Light on Cause of Lou Gehrig's Disease

Since the initial report of equine motor neuron disease (EMND) was published in the *Cornell Veterinarian* by Dr. John F. Cummings in 1990, epidemiologist Hussni O. Mohammed has been actively involved in researching the disease with an interdisciplinary team, including Drs. Cummings,

Alexander de Lahunta, Thomas J. Divers, Beth A. Valentine, and Brian A. Summers. Originally identified in ten horses, both young and old, of various breeds in the northeastern United States, EMND is characterized by slowly evolving weakness and muscle debilitation that brings a sure end to a horse's athletic career.

With the support of a prestigious FIRST award from the National Institutes of Health, Dr. Mohammed, in collaboration with the interdisciplinary team, has launched an intensive, five-year epidemiologic study to determine the extent of EMND in the Northeast and to identify its cause as well as the environmental factors that put horses at risk.

Veterinary hospitals, practicing veterinarians, and horse owners throughout the region are now reporting suspected cases of EMND to Dr. Mohammed. For every horse found to have EMND, data will be collected on more than one hundred potential risk factors, including age, sex, breed, disease history, management practices, and environmental factors. Factors found to be associated with EMND will then be confirmed through further experimental studies.

Because changes in the motor nerve cells in the spinal cord and the brain stem of horses diagnosed with EMND are very similar to those found in sporadic amyotrophic lateral sclerosis, or ALS, the disease that killed Lou Gehrig, medical doctors as well as veterinarians will be interested in Dr. Mohammed's results.



LAURENCE WATERS: UNIVERSITY LABORATORY OF PHYSIOLOGY OXFORD

Dr. Clare Fewtrell

Cell Studies Could Reveal New Ways to Block Allergic Reaction

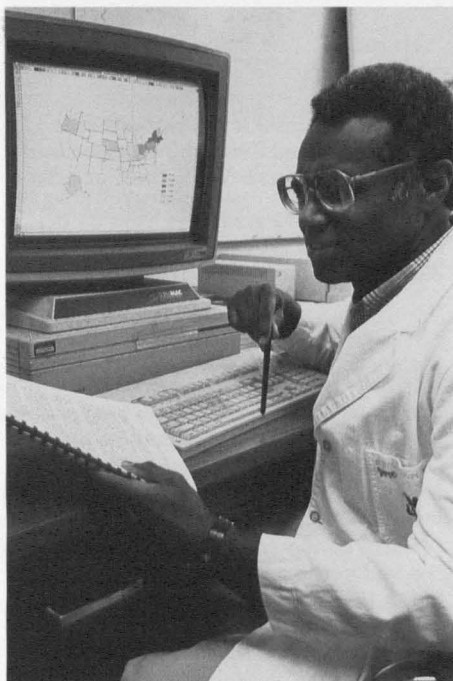
Much of Dr. Clare Fewtrell's time is spent measuring the activity occurring inside single cells involved in allergic reactions. What she learns could one day lead to the development of drugs that prevent allergic reactions in both animals and humans.

One key is understanding the mechanism that, in the presence of an allergen such as pollen, signals mast cells to secrete histamine, which in turn causes inflammation and other allergy symptoms. While a cascade of different factors appears to be involved, one of the most important events is an increase in calcium ions inside the cell.

Dr. Fewtrell, a cell physiologist and associate professor in the Department of Pharmacology, employs an array of techniques, including fluorescence imaging, by which she can determine the concentration of calcium ions inside mast cells, and electrophysiology, which allows her to measure the flow of calcium across the outer membrane and into the cell.

Dr. Fewtrell is looking at two different sources of calcium—that already stored in the cell and that flowing in from the outside. How, she wants to know, are the intracellular stores released? What initiates the operation of the ion channel that allows calcium surrounding the cell to rush into it, and how does that channel, which is but a single protein molecule,

KATHY MORRIS



Dr. Hussni O. Mohammed

work? And more broadly, at what point in the buildup of calcium is the mast cell stimulated to release histamine?

Dr. Fewtrell has found that individual mast cells vary considerably in how quickly, and in how much, intracellular calcium increases in the presence of an allergen. In fact, calcium levels seem to oscillate markedly in some cells, raising questions about how these rapid changes influence histamine release.

In a second study, Dr. Fewtrell is investigating the role of eosinophils, another type of cell in the immune system, in the etiology of asthma in humans and chronic obstructive pulmonary disease in horses. When mast cells are stimulated to secrete histamine, they also release a chemical that attracts eosinophils. When these mobile cells arrive at the site of the allergic reaction, they too release substances that exacerbate respiratory distress. With an understanding of the mechanisms that cause the migration and activation of eosinophils, Dr. Fewtrell may someday be able to identify cell activity that could be modified by drug therapy.

Unique Cell Culture Allows Study of Fetal Lung Development

Respiratory distress syndrome in premature infants is the leading cause of neonatal mortality in developed countries. The syndrome is the result of incomplete maturation of lung epithelial cells in late fetal and early postnatal life. Without mature lung cells, a newborn cannot successfully make the transition in breathing from liquid to air.

In humans, the immature cells in the lung begin to change into what are called type 2 epithelial cells at twenty-two weeks of gestation. The development of type 2 cells is crucial because they are the source of surfactant proteins, which lower surface tension within the lung, allowing expansion and normal respiration. Incomplete maturation of type 2 cells and the resultant lack of surfactant is the major cause of respiratory distress syndrome. During growth and following lung injury, type 2 epithelial cells repopulate the lung with

type 1 epithelial cells, the main cell type that lines the air passages of fully developed lungs.

Both types of lung epithelial cells have been difficult to study because they do not grow in culture. To overcome this obstacle, Dr. Roy Levine, assistant professor in the Department of Pathology, has developed a unique cell culture system for studying lung cells in the developing fetus.

To create the system, epithelial cells taken from the lung of a fetal rat are infected with a virus that carries what is called an immortalizing gene. The immortalizing gene causes the cells to grow continuously, providing a culture in which the researchers can observe the events that cause the immature cells to differentiate. This system could also be used to identify and clone the genes that promote differentiation.

The identification of the factors involved in lung epithelial cell development and the molecular cloning of genes that control it will not only enhance a fundamental understanding of lung maturation but also potentially lead to therapeutic strategies to stimulate lung development in premature infants and in adults with lung injuries.

Cell Adhesion Research Holds Promise for Treating Cancer and Stroke

The ability of cells to stick together is essential to the body's normal functioning. Cell adhesion plays a vital role in growth, in embryonic development, and in healing wounds. In certain disease processes, however, this phenomenon goes awry.

While normal cells cannot survive if detached from each other, cancer cells have the ability to grow independent of their environment. Metastasis, the leading cause of cancer deaths, occurs when malignant cells become detached, move through the bloodstream, and then reattach elsewhere to form secondary tumors.

Determining how oncogenes disrupt normal cell adhesion is one of the most promising areas of cancer research. In

studies of individual cells, Dr. Jun-Lin Guan, assistant professor in the Section of Cancer Cell Biology of the Department of Pathology, is examining cellular proteins and their interactions, which are responsible for keeping cells connected to one another.

For cells to stick together they must secrete a bonding substance, with which they surround themselves, called the extracellular matrix. Three groups of structural proteins and an additional regulatory protein must function properly for the matrix to maintain its adhesive property. In previous research Dr. Guan studied the protein structures bridging the extracellular matrix with the inside of the cell and pinpointed the region that is vulnerable to the influence of oncogenes. When oncogenes modify this particular region, the structural proteins cease to function correctly, allowing the cell to detach.

Dr. Guan is now focusing on another group of proteins inside the cell, which appear to be an even more critical target for oncogenes. Immediately after cells attach to one another, a series of events occur within the cell, causing this group of proteins to become arranged in a specific fashion. Dr. Guan is studying those changes, looking for the signal that causes the proteins to assemble in a way that produces stable cell adhesion.

What he finds could lead to the development of drugs that not only counteract the influence of oncogenes in cancer, but also reduce the reoccurrence of stroke, another disease involving abnormal cell adhesion. In the case of stroke, understanding the mechanisms of cell adhesion could result in therapies to prevent the reattachment of blood cells to those areas of the vessel from which initial clots have been successfully removed.



Drs. Richard P. Hackett (left) and Normand G. Ducharme, surgeons in the Teaching Hospital, and Karen A. Netherton, operating room supervisor, use the neodymium:YAG laser to free an entrapped epiglottis in an equine patient.

Service

Teaching Hospital

Large Animal Clinic Offers Comprehensive Services in Laser Surgery

Just as in human medicine where physicians are minimizing the invasiveness of surgical techniques, so too are veterinary surgeons offering their patients a variety of new procedures that are less costly to the owner and less traumatic to the animal. These new techniques are made possible by surgical lasers. Cornell's Veterinary Medical Teaching Hospital is one of the few facilities in the country now offering a complete laser surgical service.

Surgeons in the Large Animal Clinic, including Drs. Normand G. Ducharme, Richard P. Hackett, Jr., Alan J. Nixon, and Susan Fubini, have at their disposal a neodymium:YAG laser and two carbon dioxide lasers, and research is continuing in the application of other lasers such as holmium:YAG and excimer lasers.

In horses the carbon dioxide laser is primarily a cutting tool, especially useful for the precise removal of tumors of the skin, the viscera, and the airways. Cornell is the only veterinary facility in the world using the carbon dioxide laser in arthroscopic surgery, where it cleanly removes synovial membrane and adhesions inside joints, sealing the ends of nerves and vessels as it cuts. This laser

also has applications in removing abnormal scar or muscle tissue in throat disorders, in cutting and sealing the ends of nerves in neurectomy, in treating infertility disorders in cows and horses, and in removing infected tissue such as granulation and mastitic udders.

Compared with the traditional scalpel blade, the carbon dioxide laser causes less bleeding and can seal lymphatics and nerve endings, resulting in reduced postoperative pain. And because the laser beam sterilizes tissue on contact, control of infection is enhanced and the risk of metastasis is reduced.

The neodymium:YAG laser, in contrast to the precise cutting capability of the carbon dioxide laser, destroys tissue in a slower and more diffuse fashion, making it the ideal instrument for treating tumors occurring deep within an animal's body. Because the YAG laser can be conducted through a 3-meter-long flexible fiber only 1.2 millimeters in diameter, it can be passed through an endoscope to access hollow organs such as the nasal passages, the throat, the esophagus, the vagina, and the uterus.

Removal of tumors, scar tissue, and abnormal folds in the nose, throat, lungs, stomach, and intestines and of cysts in the uterus can be performed with the YAG laser without general anesthesia, allowing the

animal to be returned home the same day. By adding a contact tip to the laser fiber, the YAG laser can more precisely cut membranes, adhesions, and abnormal folds in the throat, airways, and other organs. One of its most frequent uses in large animals is to free an entrapped epiglottis. However, any structure accessible to a fiberoptic endoscope can be surgically incised and in some instances welded using the YAG laser.

New Phacoemulsifier Improves Success Rate in Cataract Surgery

Seventeen years ago the college's Veterinary Medical Teaching Hospital was one of the first facilities in the country to offer the removal of canine cataracts by phacoemulsification—the ultrasonic fragmentation of a cataract—through a small incision in the eye. The hospital's recent acquisition of a more powerful and versatile phacoemulsifier allows ophthalmologists Ronald C. Riis and Thomas J. Kern of the Small Animal Clinic to treat a larger number and broader age range of dogs and cats. Because the new instrument can be used through just a 3-millimeter incision, less irritation and inflammation occur after surgery, resulting in a higher success rate in return of vision.

Reduced trauma to the eye brings an additional benefit: the possibility of intraocular lens implants. Cataract extraction alone improves an animal's distance vision, but a corrective intraocular lens is needed for good acuity up close. Soon the Small Animal Clinic will be able to provide optimum vision correction to dogs and cats of all ages through the combination of cataract removal and lens implantation.

The Small Animal Clinic's neodymium:YAG laser is a second piece of equipment that contributes to successful cataract removal. The device is similar to the YAG laser used for large animal surgery, but the focal point is adjusted for use in eyes. With this laser, treatment of postsurgical complications, including the removal of adhesions and fibrinous obstructions over the pupil, can be done effectively and with a minimum of discomfort to the animal. The laser is also used to treat certain corneal diseases and congenital or developmental eye problems, including iris cysts. As with other noninvasive laser surgical techniques, the hospital stay and trauma to the animal are reduced, as is cost to the owner.

KATHY MORRIS



Laura Eirman '93 discusses a patient with its owner in the waiting room of the Community Practice Service.

Community Practice Service Emphasizes Student-Client Interaction

The case load of the Community Practice Service (CPS) has increased markedly in the past year, coinciding with the expansion of the coordinator position from half time to full time. As a clinical unit of the college's Veterinary Medical Teaching Hospital, the CPS provides routine health care, medical management, emergency treatment, and selected surgical procedures to dogs, cats, and various exotic pets whose owners live in the Ithaca area.

Students in their senior year spend two weeks on the service under the guidance of coordinator Dr. William Hornbuckle, a specialist in internal medicine in the Veterinary Medical Teaching Hospital. In the CPS, students are the primary care providers, while the staff clinicians are their consultants. Being responsible for up to thirty cases a week trains each student to be comfortable interacting independently with clients. Students are also responsible for follow-up telephone calls, which can be as frequent as every twenty-four hours, to owners of seriously ill animals.

This year the Community Practice Service has expanded its training program to include all veterinary students, who are now participating in the CPS on a regular

basis, either as observers or as assistants to a senior student in the weekly vaccination clinics.

The Community Practice Service is designed to teach students how to provide prompt, courteous, and professional care. They learn the importance of treating clients with kindness and to be responsive to worries about a beloved pet. They come to realize that service really means putting the client first.

Diagnostic Laboratory

Mitigating the Economic Effects of Mycotoxins

Every five to six years, New York State's animal producers and corn growers stand to lose millions of dollars due to naturally occurring toxic substances they can neither see nor smell. Molds that are ubiquitous in New York's soils can grow on corn—the primary feed for dairy cows, swine, and poultry—and, when triggered by certain weather conditions, produce mycotoxins, which can cause a variety of animal health problems.

When farm animals ingest mycotoxin-contaminated feed, a dramatic drop in productivity can occur, including feed refusal and reproductive disorders in swine and decreases in milk production in cows and egg production in chickens. With excess mycotoxin ingestion, direct organ damage and subsequent health problems can occur. Yet very few of the more than one hundred different mycotoxins can be detected in the animals themselves. The only way to protect the state's animal industry against the adverse effects of these toxic substances is to monitor feed.

Dr. Larry J. Thompson, director of the Toxicology Laboratory in the college's Diagnostic Laboratory, is in charge of a year-round testing program that assesses mycotoxin levels in corn, both in the field and from storage. Using thin layer chromatography and other analytical techniques, technicians can detect those mycotoxins accounting for 95 percent of the reported adverse clinical effects in production animals. This testing service is provided to farmers through the state's veterinarians

and Cornell Cooperative Extension specialists.

Since mycotoxins can cause animals to exhibit an array of mild to severe health problems, Dr. Thompson works in consultation with Dr. Michael Brunner, the college's extension dairy veterinarian, to assist farmers in pinpointing whether these toxic substances are, indeed, the cause of a specific herd's drop in productivity.

Much of Dr. Thompson's time is also devoted to educating veterinary students, practicing veterinarians, and farmers about mycotoxins. In collaboration with faculty in Cornell's Departments of Plant Pathology and Animal Science, Dr. Thompson produces educational materials and lectures on the amounts of mycotoxins that can be safely tolerated by different animal species and methods to reduce the production of mycotoxins in stored feed.

Due to weather conditions in the summer of 1990, molds in the genus *Fusarium* produced an unusually large amount of the mycotoxin deoxynivalenol (DON), resulting in substantial losses to the state's agricultural industry. Because *Fusarium* is endemic to New York crops, Dr. Thompson is giving animal producers a better understanding of mycotoxins and how to protect their stock from future losses.

Controlling the Spread of Rabies in Urban Areas

Rabies, especially in the raccoon population, has been spreading rapidly throughout New York State and the Northeast. Extending northward approximately twenty-five to thirty miles each year, the disease has spread into thirty-five counties in New York and into parts of Connecticut and Massachusetts.

In an effort to contribute to the containment of this disease, the college's Diagnostic Laboratory has begun an immunization project with the collaboration of the New York State Departments of Public Health, Environmental Conservation, and Agriculture and Markets and the New York State Veterinary Society. The project is led by Dr. Donald H. Lein, director of the

Diagnostic Laboratory, and coordinated by Dr. Susan Stehman, an extension veterinarian, and Laura Bigler, a wildlife biologist, both at the Diagnostic Laboratory.

Begun with a surveillance project to chart the distribution of rabies as it moved northward, the project continued with a ten-week program of trapping and administering vaccine to raccoons in the Ithaca area. More than five hundred raccoons, all unable to resist the marshmallows with which the traps were baited, were inoculated against rabies with a vaccine that has been licensed for use in dogs and cats. While not yet licensed for use with wildlife, the vaccine has been proven in experiments to confer immunity in raccoons for two years. An estimated 60 to 80 percent of the raccoons living within the five-mile radius chosen for the study were immunized.

Once vaccinated, the raccoons were tagged and released in the same place they were trapped. Follow-up surveillance shows that no rabies cases have been reported among the vaccinated raccoons. Since raccoons tend to stay within a defined home range, immunization is expected to control the disease in areas where the vaccine has been extensively administered.

Drs. Lein and Stehman are now seeking approval from appropriate agencies, including the federal government, to use a baited oral vaccine on a trial basis in future immunization sessions. If one or both methods prove to be effective, they could be used to treat endemic areas throughout New York and other northeastern states. The possibility of a coordinated oral bait rabies vaccination program for the northeastern states and Canada, where oral bait has been used effectively for the last four years, has been discussed by various agencies. Oral bait immunization could also be used to protect wildlife against other infectious diseases or to distribute oral contraceptives to control the size of wildlife populations.

Ensuring Safe Drinking Water for New York City's Residents

Eight million people in New York City's five boroughs depend on pure drinking water

that comes from two watersheds covering a total of 1,900 square miles in and around the Catskill Mountains. Much of this area is dairy-farming country as well as home to many species of wild mammals, birds, and fish. Both domestic and wild animals are a potential source of *Giardia* and *Cryptosporidium*—two protozoans that can cause serious, even life-threatening, illness in individuals with suppressed or deficient immune systems, such as the very young, the very old, or those with AIDS.

Dr. Susan Wade, director of the parasitology section of the Diagnostic Laboratory, and Dr. Alice Pell, Cornell Cooperative Extension dairy nutritionist in Cornell's Department of Animal Science, are launching a research project to determine if indeed either domestic or wild animals could compromise the quality of New York City's water.

The first task of Drs. Wade and Pell will be to sample calves and older cattle on more than one hundred farms in the New York City watershed and test those samples at the Diagnostic Laboratory to determine the prevalence of *Giardia* and *Cryptosporidium*. Concurrently, they will conduct a survey of management practices on the farms where samples have been taken. Should the researchers find the protozoans present in a significant number of animals, information from the management survey will be used to develop farming practices to control the pathogens in the animals as well as prevent animal feces from entering the water supply. Samples will also be collected from other domestic animals and wildlife in the watershed to determine the extent to which they may be a source of protozoa.

To comply with the federal Safe Drinking Water Act of 1986, New York City, in collaboration with federal, state, and county agencies, must institute regulations to ensure that its drinking water is 99.9 percent pure. Drs. Wade and Pell, as members of the Cornell Technical Support Group, are contributing expertise essential to meeting the federal water safety standards while maintaining the continued viability of farming in southeastern New York.



Research assistant Sabina Ernst and Dr. George V. Kollias, the Jay Hyman Professor of Wildlife Medicine, examine a red-tailed hawk.

Support and Funding

A Partnership

A unique funding partnership between New York State and private donors has characterized Cornell since it was established as one of the nation's first land-grant universities. In 1894 the College of Veterinary Medicine was chartered as the first state-supported college at Cornell. Public funds were allocated for construction of a facility devoted solely to veterinary education, and annual appropriations have supported academic programs and facilities ever since.

Today the annual legislative appropriation provides approximately one-third of the college's budget. This funding, along with income from tuition and fees, is used to meet expenditures for most faculty and staff salaries, facilities and maintenance, and basic equipment in classrooms, laboratories, and the teaching hospital.

Grants and contracts, awarded on a competitive basis by state and federal agencies, fund research studies aimed at finding new information and solutions to questions about improving the health of food animals and people. In 1991–92 income from these sources made up approximately 30 percent of the college's budget.

In 1897 former New York governor Roswell P. Flower began a long tradition of private support for the college with a gift to found and endow the library. Since then, gifts from friends, alumni, corporations, and foundations have supplemented and enhanced government funding to build and maintain the college's margin of excellence. Important advances in companion animal medicine are made possible largely by gifts from individuals and organizations concerned about improved health for dogs, cats, and other pets. Over the years, college alumni have been among our most loyal and generous donors. In 1991–92, 40 percent of our alumni made gifts to the College of Veterinary Medicine.

Although private support currently makes up a comparatively small percentage of the college's budget, such gifts are often critical as seed monies needed to initiate and develop new programs. Annual state budget allocations continue to provide vital funding for the college, but given that other pressures on the state are steadily increasing, a growing measure of private support will be needed in the future if Cornell is to maintain its position as a worldwide leader in veterinary medicine.

Major Donors and Sponsors in 1991–92

Support from donors and sponsors at every level is vital to our work in creating a healthier future for animals and people. Unfortunately, space in this publication does not permit a complete listing of all who made gifts to the College of Veterinary Medicine in 1991–92. We recognize on the following pages those alumni, friends, corporations, foundations, organizations, and public agencies who have provided support in the past year at a level of \$500 or more.

For more information about gifts to the College of Veterinary Medicine or opportunities for the support of its many programs, please contact the Office of Public Affairs (607-253-3744).



Sylvia M. and Dr. Isidor I. Sprecher '39 (left) were guests of honor at a dinner attended by President Frank Rhodes, Dean Robert Phemister (right), and more than thirty others in June 1992. The Sprechers were recognized for their many generous gifts to the college. The Roswell P. Flower-Isidor I. and Sylvia M. Sprecher Library and Learning Resources Center will be formally dedicated in 1993.

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 The International Cat Association
 Kennel Club of Northern New Jersey
 Lincoln State Cat Club, Inc.
 Long Island Duck Research Cooperation
 Mad Catters
 Merwin Memorial Free Clinic for
 Animals
 Miami Florida Cat Fanciers
 Muscular Dystrophy Association of
 America
 National Association of Animal
 Breeders
 National Birman Fanciers
 National Collegiate Athletic Association
 New York Horsemen's Benevolent and
 Protection Association
 New York Thoroughbred Breeders
 New York State Trappers Association
 New York State Wildlife Rehabilitation
 North Coast Cat Fanciers
 North Shore Animal League
 Oriental Shorthairs of America
 Ox Ridge Kennel Club, Inc.
 Penn Ridge Kennel Club
 Pet Industry Joint Advisory Council
 Pocono Mountain Kennel Club
 Podiatry Association of Germantown
 Potomac Area Cat Enthusiasts
 Rockland County Kennel Club
 Somerset Hills Kennel Club
 Southeastern Egg and Poultry
 Association
 Steel City Kennel Club
 Susque-Nango Kennel Club, Inc.
 Troy Kennel Club, Inc.
 Unicef
 Union Kennel Club, Inc.
 United Professional Horsemen's
 Association
 Veterinary Orthopedic Society
 World Health Organization
 Wyoming Valley Kennel Club

SOL GOLDBERG



The Poultry Diagnostic Services examined more than 4,500 birds this year.

Statistics

Table 1. Roswell P. Flower Library, 1991–92

Bound volumes at beginning of year	80,412
Acquisitions	+3,125
Less withdrawals	-1,030
Total bound volumes	82,507
Audiovisual items	28,240
Periodicals and annuals	1,365
CD-ROM titles	61
Microcomputer software titles	379

Table 2. Qualifications of Entering Students, Class of 1996

	<i>Number of Students</i>
Amount of preveterinary preparation	
Three years of college	8
Four years of college	48
More than four years of college (graduate level)	26
Institution previously attended	
Cornell University	29
Other	53
Field of preparatory study	
Animal science (or related)	29
Biological sciences (or related)	38
Other	5

Table 3. Geographic Distribution of Entering Students, Class of 1996

<i>Legal Residence</i>	<i>Number</i>
New York	61
Contract states	
Maine	1
New Jersey	6
Other states	14
Total	82

Table 4. Admission Summary, Class of 1996

<i>Area</i>	<i>Applicants</i>	<i>Enrolled</i>
New York	196	61
Contract states	57	7
Other	187	14
Total	440	82

Table 5. Degrees Awarded, 1991–92

D.V.M. (with distinction: 5)	79
M.S.	5
Ph.D.	18

Table 6. Student Enrollment, 1991–92

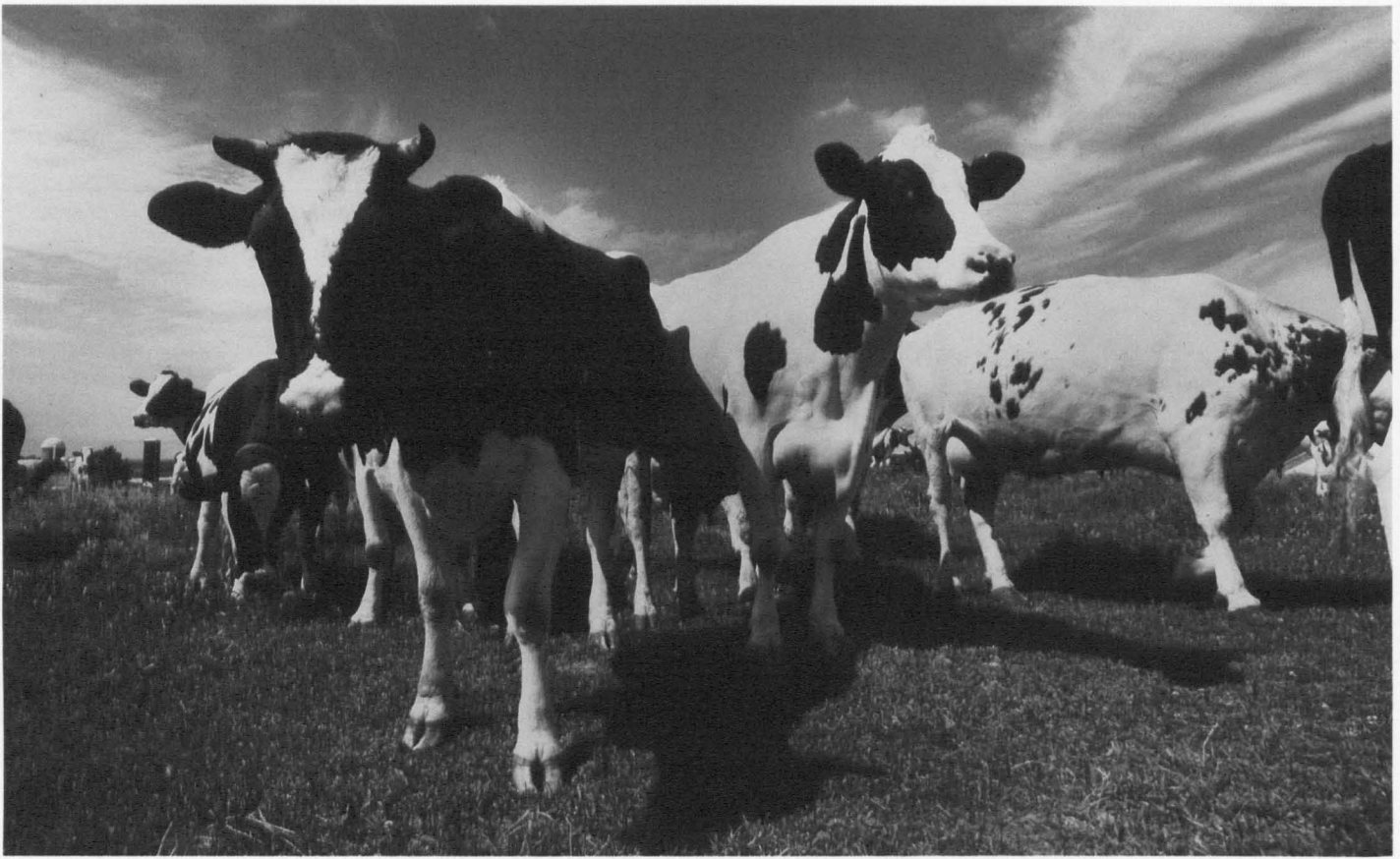
Candidates for the D.V.M. degree	
Class of 1992	79
Class of 1993	78
Class of 1994	81
Class of 1995	81
Total	319

Table 7. Graduate Students at the College of Veterinary Medicine, 1991–92

Candidates for the Ph.D. degree	109
Candidates for the M.S. degree	12

Table 8. Interns and Residents, 1991–92

Teaching Hospital	
Interns	9
Residents	18
Pathology	
Residents	11
Total	38



Some of the 39,139 cows seen by the Ambulatory Clinic this year

Table 9. Clinical Patients and Diagnostic Examinations, 1991–92

	<i>Horses</i>	<i>Cattle</i>	<i>Sheep and Goats</i>	<i>Swine</i>	<i>Dogs</i>	<i>Cats</i>	<i>Birds</i>	<i>Other</i>	<i>Total</i>
Medical and surgical patients	1,534	529	71	25	7,430	2,982	328	460	13,359
Ambulatory Clinic patients	2,775	39,139	2,805	303				55	45,077
Clinical pathology specimens	5,750	2,869	387	22	12,756	3,694	190	2,243	27,911
Diagnostic Laboratory tests	28,655	248,135	6,762	3,592	25,962	12,132	3,505	9,334	338,077
Necropsies	235	389	84	48	288	159	134	384	1,721
Surgical pathology specimens	634	448	79	33	4,224	1,117	45	164	6,744
Laboratory animal examinations			121		446	78	664	2,688	3,997
Fish Diagnostic Laboratory								96	96
Poultry Diagnostic Services									
Ithaca (368 accessions)							3,519		3,519
Eastport (169 accessions)							1,048		1,048
Quality Milk Promotion Services		128,184	687					1,174	130,045

Financial Statements

Table 10. Sources of Funds (in Thousands)

	1991-92	1990-91
State appropriation*	\$15,726	\$16,587
Federal and state: grants and contracts	13,933	13,332
Private support (restricted)	2,595	2,360
College income†	13,665	13,076
Total	\$45,919	\$45,355

* The 1990-91 and 1991-92 expenditures reflect a change in the State University of New York's fiscal year from April through March to July through June. New York State allocated the "fifth quarter" (April 1 through June 30, 1991) based on 1990-91 appropriations before any budget reductions.

† College income includes indirect cost recovery on grants and contracts, tuition, unrestricted gifts from private sources, and other income from college programs.

Table 11. Uses of Funds (in Thousands)

	1991-92	1990-91
Instruction and departmental research	\$8,436	\$5,969
Teaching Hospital	6,105	5,863
Organized research	15,617	17,196
Extension and public service	8,358	8,550
Academic support	608	722
Student services	734	792
Institutional support	4,037	3,864
Plant maintenance and operation	1,096	1,525
Student aid	928	874
Total	\$45,919	\$45,355

Tables 10 and 11 are summaries of the income and expenditures of the College of Veterinary Medicine for fiscal years July 1, 1990, through June 30, 1991, and July 1, 1991, through June 30, 1992. These figures do not include expenditures for fringe benefits, estimated for 1991-92 at \$5.8 million, and general support services provided by the university.

Table 12. Summary of Grant, Contract, and Restricted Gift Expenditures by Source of Funding

Source	1991-92	1990-91
Federal		
Department of Defense		
Cornell Biotechnology Institute	\$ 289,266	\$ 384,649
Department of Navy	14,650	0
National Institutes of Health	5,271,189	5,274,204
National Science Foundation	241,609	168,864
Department of Agriculture		
Grants and contracts	677,359	302,241
Federal appropriations	396,761	312,824
Total, federal grants and contracts	\$ 6,890,834	\$ 6,442,782
State		
Cornell Biotechnology Institute	\$192,283	\$43,994
Department of Environmental Conservation	90,449	142,327
Harry M. Zweig Memorial Fund	414,301	425,125
New York State Agriculture and Markets contracts	3,235,890	3,097,607
New York State Racing and Wagering Board	3,062,958	3,178,291
New York State Sea Grant Institute	41,656	2,412
New York State Department of Education	4,339	0
Total, state grants and contracts	\$7,041,876	\$6,889,756
Total, federal and state grants and contracts	\$13,932,710	\$13,332,538
Private support		
Industry		
Grants and contracts	\$1,173,773	\$1,069,510
Cornell Biotechnology Institute	13,450	4,171
Foundations	263,499	223,775
Alumni, friends, associations, nonprofit organizations	875,450	823,441
Endowments	268,801	239,293
Total, private support (restricted)	\$ 2,594,973	\$ 2,360,190
Total, grants, contracts, and gifts	\$16,527,683	\$15,692,728

Table 12 is a summary of grant, contract, and restricted gift expenditures of the College of Veterinary Medicine for the fiscal years July 1, 1990, through June 30, 1991, and July 1, 1991, through June 30, 1992. The amounts reported exclude expenditures for indirect costs as well as expenditures of unrestricted gifts.

Faculty and Staff Changes

New Appointments

John E. A. Bertram, assistant professor
Karen A. Golemboski, senior research associate
M. Susan Hackett, lecturer
George V. Kollias, Jr., professor
James McLeod, assistant professor
Linda Mizer, lecturer
James R. Richards, senior extension associate
Peter H. Rowland, assistant professor

Promotions and Title Changes

Douglas F. Antczak, professor (from associate professor)
Paul R. Bowser, associate professor (tenure granted)
Leland E. Carmichael, professor and director, James A. Baker Institute for Animal Health
Thomas J. Divers, associate professor (tenure granted)
James A. Flanders, associate professor (from assistant professor)
Susan L. Fubini, associate professor (from assistant professor)
Yrjo T. Grohn, associate professor (from assistant professor)
John W. Ludders, associate professor (tenure granted)
William H. Miller, associate professor (from assistant professor)

Resignations

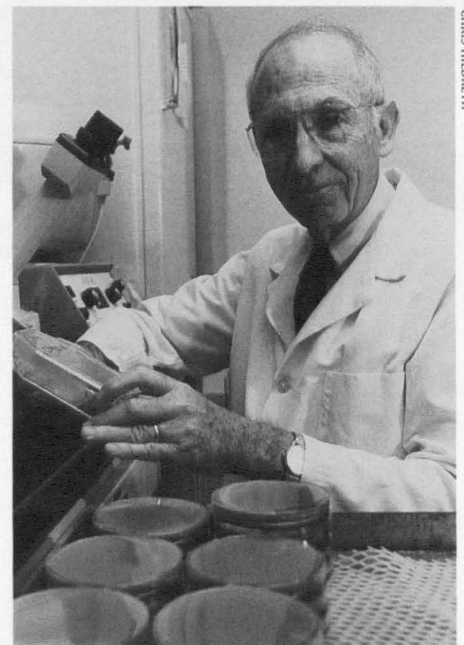
John C. Semmler, assistant dean for public affairs
John F. Timoney, professor

Retirements

Wolfgang Sack, professor

Deaths

Jack C. Geary, professor emeritus



Dr. Alexander J. Winter, James Law Professor of Veterinary Microbiology



Drs. Sydney N. Moise (right) and Robert F. Gilmour discuss their collaborative research on an inherited syndrome in dogs characterized by ventricular arrhythmias and sudden death in young dogs. The study is funded by a grant from the National Institutes of Health.

Administrators and Advisers

Cornell University

Administration

Frank H. T. Rhodes, president
Malden C. Nesheim, provost

State University of New York

Administration

D. Bruce Johnstone, chancellor

College of Veterinary Medicine

Administration

Robert D. Phemister, dean
Donald Smith, associate dean for veterinary education
Douglas D. McGregor, associate dean for research and graduate education
Eugenia G. Kelman, assistant dean for student services
John A. Lambert, assistant dean for administration
John C. Semmler, assistant dean for public affairs
Neil L. Norcross, secretary of the college

William C. Anderson, director, Facilities Administration
Sandra P. Berry, director, Biomedical Communications
S. Gordon Campbell, director, International Programs
Gloria S. Crissey, Registrar and director, Financial Aid
Katherine M. Edmondson, director, Educational Development
Linda F. Emmick, director, Development
Rita W. Harris, director, Personnel
H. Donald Hinman, director, Biomedical Electronics
John M. Lewkowicz, director, Computing Facility

Charles Pearson, director, Financial Services
Fred W. Quimby, director, Center for Research Animal Resources
John E. Saidla, director, Continuing Education
Susanne K. Whitaker, librarian, Flower Veterinary Library

Department Chairs and Directors

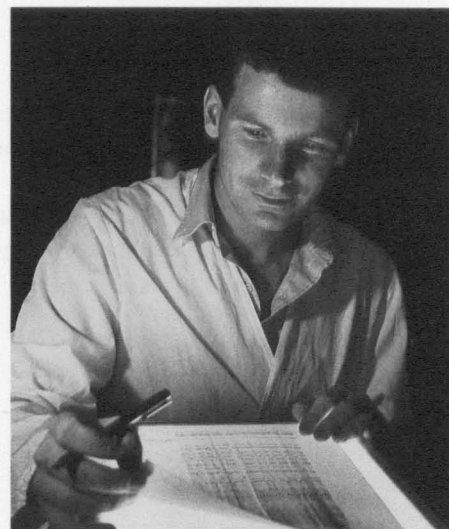
Roger J. Avery, chair, Department of Microbiology, Immunology and Parasitology
Bruce W. Calnek, chair, Department of Avian and Aquatic Animal Medicine
Leland E. Carmichael, director, James A. Baker Institute for Animal Health
Cornelia E. Farnum, chair, Department of Anatomy
Brian R. H. Farrow, chair, Department of Clinical Sciences
Francis A. Kallfelz, director, Veterinary Medical Teaching Hospital
Donald H. Lein, director, Diagnostic Laboratory
Bendicht U. Pauli, chair, Department of Pathology
David Robertshaw, chair, Department of Physiology
Geoffrey W. G. Sharp, chair, Department of Pharmacology

Advisory Council 1991–92

Richard C. Grambow, D.V.M. '57, chair
Donald P. Berens
Robert W. Bitz
Stephen J. Ettinger, D.V.M. '64
Ralph W. F. Hardy
John Patrick Jordan
Stephen J. Kleinschuster
John L. Mara, D.V.M. '51

Mark L. Morris, Jr. D.V.M. '58
Bernard W. Potter
Kenneth J. Rotondo, D.V.M. '75
James L. Seward
Richard J. Sheehan, D.V.M. '63
David Shepherd
Patricia L. Thomson D.V.M. '60
Kent R. Van Kampen
Bruce Widger, D.V.M. '51
Harold M. Zweighaft, D.V.M. '56

Emeritus Advisory Council Member
Stephen H. Weiss



Dr. Colin R. Parrish, the 1991–92 co-winner of the SmithKline Beecham Award for Research Excellence

CHRIS HILDRETH

An unusual patient is treated in the Large Animal Clinic of the Teaching Hospital.



Further Information

All college offices can be reached by dialing directly.

Area code: 607

College information: 253-3000

An operator is on duty from 8:00 a.m. to 5:00 p.m.

Monday through Friday, except holidays.

General Inquiries

Direct general inquiries to

Office of Public Affairs

College of Veterinary Medicine

Cornell University

Ithaca, New York 14853-6401

Telephone: 607-253-3744

Laboratory Locations in New York State

Avian Disease Laboratories:

Ithaca

Eastport

Quality Milk Promotion Program, Regional Laboratories:

Canton (northern region)

Cobleskill (eastern region)

Geneseo (western region)

Ithaca (central region)

Equine Drug Testing and Research Program, Track Locations:

Standardbred Tracks:

Batavia Downs, Batavia

Buffalo Raceway, Hamburg

Midstate Raceway, Vernon Downs, Vernon

Monticello Raceway, Monticello

Saratoga Raceway, Saratoga Springs

Yonkers Raceway, Yonkers

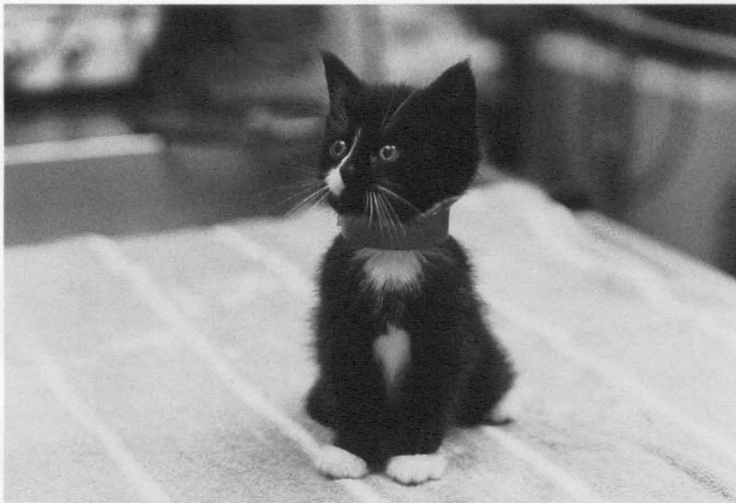
Thoroughbred Tracks:

Aqueduct Racetrack, Ozone Park

Belmont Racetrack, Elmont

Finger Lakes Racetrack, Canandaigua

Saratoga Racecourse, Saratoga Springs



A small patient awaits examination in the Community Practice Service.

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