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Annual Report 1990-1991

Cornell University

College of Veterinary Medicine



A routine eye exam at the Small Animal Clinic helps give a puppy a healthy start in life.

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 1990-91 year of the students, faculty, and staff who worked to accomplish that mission and, by doing so, to justify the public's trust.

1990–1991

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-fourth Annual Report

July 1, 1990–June 30, 1991

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

DAVID GRUNFELD



We faced both extraordinary challenges and exceptional opportunities in 1990–91. New York State's well-publicized budget difficulties affected us in two important ways. First, because of the budget reductions, actual state funding was less than we had anticipated. Second, in-year rescissions coupled with the delayed passage of the new state budget added uncertainty to current year operations and to planning for the next fiscal year. As a result, starting as early as August all departments and administrative units worked to find creative ways to increase efficiency and consolidate programs.

For example, by moving the Autotutorial Center into the library, hours of access to the center were increased while the costs of operation were reduced. The recent decision to use the Veterinary Medical Teaching Hospital for professional student instruction year-round will allow more students access to the summer patient load while saving the substantial costs of staffing the hospital during the summer. In addition, the consolidation of college support for animal care, medical illustration, and electron microscopy is expected to lead to improved services while producing operational efficiencies.

Despite these and other accommodations, we will have fewer state dollars and fewer state-supported positions to meet our several missions. During 1990–91 some individuals opted for early retirement under an incentive program made available by the state. Other positions were lost through attrition. Still, it was necessary to terminate several positions, and this was a period of real anxiety for our employees. I am pleased to report, however, that almost all those affected have been successfully reemployed, principally in other parts of the university.

I am most grateful for the extraordinary commitment of our faculty and staff members during these difficult months and am more confident than ever that, with their continuing efforts, our college will

achieve preeminent status internationally among schools of veterinary medicine.

In meeting the budgetary challenges, we have not backed off from our commitment to institute fundamental change and improvement in the veterinary medical curriculum. The new Curriculum Committee has been working for almost two years to achieve an educational program that will involve students more actively in their education and give them greater opportunity and responsibility for learning.

The main feature of the new educational program is its interdisciplinary, tutorial-based approach. Newly appointed curriculum design groups are modeling blocks of study in which students must integrate information from various disciplines through case-based exercises and tutorials. Students will learn basic science principles in the context of clinical applications, and they will have greater flexibility and more opportunity to pursue individual areas of interest. The new program offers enhanced opportunities for students to develop critical thinking and problem-solving skills, to acquire and retrieve information, and to see their studies as a connected curriculum rather than individual courses.

Essential to the planned curriculum changes is an enhanced educational support system for faculty members. During the year, the Office of Educational Development was established and Dr. Katherine M. Edmondson was named director. The office provides faculty development programs and guidance and support for teaching innovations as well as advanced computer and biomedical illustration support services. The college's biomedical communications unit is also a component of the office. Faculty members now have an expanding support system for developing their abilities as teachers, which parallels that for developing research capabilities through the College Research Office.

The college is changing on the outside as well. Work on our \$82-million expansion began in the fall of 1990 with the relocation

of underground utilities. Construction of the two-story Veterinary Education Center has begun, and the projected completion date is mid-1993. The plans for the largest component of the project—the Veterinary Medical Center—have been submitted for bid, and construction will begin in early 1992. The building will include a new teaching hospital on the ground floor and three floors of office and research space.

In October 1990 Cornell University launched a major five-year fund-raising campaign. The College of Veterinary Medicine is a full participant, seeking \$30 million in private support from alumni, friends, corporations, foundations, and organizations concerned with animal health. Since the college was chartered in 1894, a tradition of private philanthropy has enhanced the quality of our programs and distinguished our college from peer institutions throughout the world.

To keep pace with the opportunities and challenges we will face in our second century, we must have the financial resources to compete in the international veterinary and biomedical marketplace to recruit and retain outstanding faculty members. Further, we must ensure that we will continue to attract the very best students, regardless of economic background, and that they will be able to afford a veterinary medical education at Cornell without facing unreasonably large debts upon graduation. In addition, we need ongoing support for research programs that benefit both animal and human health.

The goals of the College of Veterinary Medicine in the Cornell Campaign include establishing endowments for at least five prestigious named professorships; doubling our financial aid endowments for veterinary student scholarships and graduate fellowships; and obtaining funds to support basic and clinical research and to enhance our residency programs.

Guiding the college in this crucial undertaking is our Campaign Committee, led by four alumni who are among our strongest supporters in both their long-

standing generosity and their involvement in college development activities. Co-chairing the group are Dr. Robert E. Clark, D.V.M. '52, and Dr. Jay W. Geasling, D.V.M. '75. Serving as vice chair for annual giving is Dr. Richard A. Smith, D.V.M. '51. Dr. John D. Murray, D.V.M. '39, is vice chair for planned giving. In addition, more than one hundred alumni volunteers are working on regional committees throughout New York State and the Northeast.

Each year brings an opportunity to welcome a new class of students and to congratulate a new group of graduates. We continue to benefit enormously from the quality of the individuals who select our profession and our academic program. Year in and year out, they are the best qualified and most select group of students to enter the veterinary profession in this country.

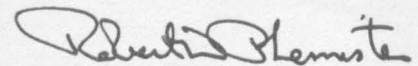
This year we also had the opportunity to welcome several individuals to new leadership positions in the college. During the fall we were joined by Dr. Eugenia G. Kelman, the new assistant dean for student services, and Dr. Brian R. H. Farrow, chair of the Department of Clinical Sciences. Dr. Kelman has held similar positions at the Medical School at the University of Texas, Galveston, and Colorado State University. Dr. Farrow is known internationally for his work as a veterinary neurologist and internist at the University of Sydney, where he spent most of his professional life.

Dr. Farrow's arrival allowed Dr. Donald F. Smith to devote full attention, as associate dean for veterinary education, to implementing the new academic program and Dr. S. Gordon Campbell to resume a professorial role in the Department of Microbiology, Immunology and Parasitology. Dr. Campbell will continue to oversee international activities in the college as director of international programs.

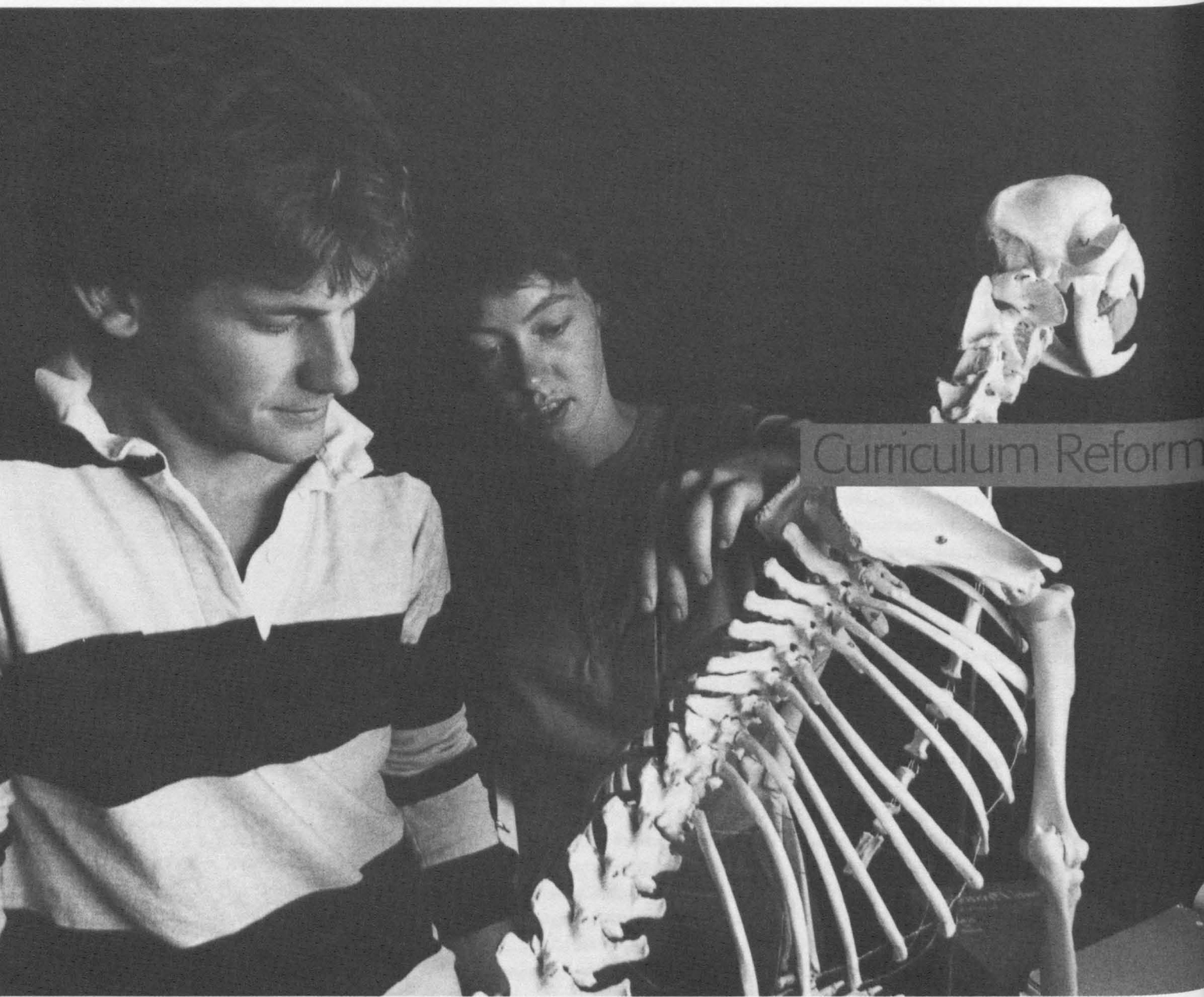
In January, two faculty members were promoted to major leadership positions. Dr. Cornelia E. Farnum was named chair of the Department of Anatomy, and Dr. Francis A. Kallfelz was appointed director of the Veterinary Medical Teaching

Hospital. Dr. Farnum has been a leader in the development of our new veterinary academic program in addition to teaching a major segment of first-year anatomy and conducting fundamental research on the mechanisms of bone growth. Dr. Kallfelz has served the college with distinction for nearly thirty years as a teacher, research scientist, and clinician in an array of disciplines, including nuclear medicine and clinical nutrition and metabolism.

In closing, I express on behalf of the entire college community our deep sense of loss over the passing of one of our most distinguished faculty members and alumni. Professor Emeritus Ellis P. Leonard—surgeon, author, historian, teacher, and colleague—died in Ithaca in February at the age of 86 following a brief illness. He will be sorely missed. A memorial fund to benefit the Roswell P. Flower Library, which he so deeply admired, has been established in his name.



Robert D. Phemister
Dean



Curriculum Reform

The curriculum reform is a comprehensive effort to update and improve the quality of education across all levels. It focuses on integrating modern technology, promoting critical thinking, and ensuring that students are equipped with the skills needed for the 21st-century workforce. The reform also emphasizes the importance of social and emotional learning, aiming to foster well-rounded individuals who are prepared to face the challenges of the future.

Key components of the curriculum reform include:

- Integration of Technology:** Incorporating digital tools and resources into the classroom to enhance learning experiences.
- Critical Thinking and Problem Solving:** Encouraging students to analyze information, evaluate arguments, and solve complex problems.
- 21st-Century Skills:** Focusing on communication, collaboration, and creativity as essential skills for success in the modern world.
- Social and Emotional Learning (SEL):** Promoting the development of self-awareness, self-management, social awareness, and relationship skills.

The curriculum reform is a continuous process that requires ongoing collaboration between educators, policymakers, and the community. By embracing these changes, we can ensure that our education system remains relevant and effective in preparing students for the future.

In Step with a Changing Profession

Preparations are well under way to offer the class entering in 1993 a markedly different veterinary education than that of their predecessors. In the new interdisciplinary block system approach

- First-year students in the D.V.M. degree program will perform physical examinations, with supervision, on patients.
- Clinical rotations are a year-round option for seniors.
- Case-based tutorials, supplemented as appropriate with lectures, laboratories, and discussion sessions, will be the cornerstone for portions of the basic science curriculum.
- Approximately 50 percent of the required courses can be selected from among a range of options.
- Scheduled classes will often be held only in the morning, and the afternoon will be devoted to independent study.
- Examinations may be oral or in the form of small-group presentations.

That's not to say that lecture classes will be no more or that multiple choice exams will disappear. But in moving away from a reliance on traditional educational methods, the revised academic program will offer a broad comparative education while developing a student's skills in accessing information, in critical thinking, and in problem solving. It will require students to assume more responsibility for their own education, to define and then pursue in depth areas of personal interest. The goal is to foster greater independence of thought and action and to motivate and prepare graduates to continue self-directed learning throughout their careers.

A Year of Progress, a Year of Change

July 1990

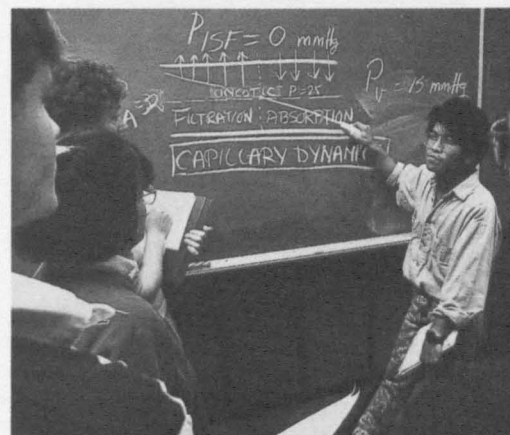
Dr. Howard E. Evans, professor emeritus of veterinary and comparative anatomy, receives the Outstanding Achievement Award from the American Association of Veterinary Anatomists. The award acknowledges outstanding contributions in teaching, research, or service to the discipline of veterinary anatomy.

Dr. Bud Tennant, James Law Professor of Comparative Medicine, is elected to a six-year term as member of the American Veterinary Medical Association's Council on Research. For almost a decade Dr. Tennant has studied the link between the hepatitis B virus group and liver cancer.

Dr. Alan Dobson begins a six-month residence as a Quatercentenary Research Fellow at Emmanuel College, Cambridge. It's one of the first such fellowships awarded to a recipient at a veterinary college.

August

Dr. Fredric Scott D.V.M. '62 is named honorary first fellow of the Academy of Feline Medicine. The honor recognizes Dr. Scott's work in feline medicine, particularly his role in the development of Cornell's Feline Health Center, where he has been director since 1974.





Case-based Exercises at the Core of Interdisciplinary Learning

Meet Harry Shaker's lamb. By the end of a week's tutorial with the sick lamb, students will have learned a lot about parasitology, host specificity, and the nature of the immune response—all while they discover that it has toxoplasmosis. (Along the way they might even get the pun!)

Harry Shaker's Lamb is the title of a case-based exercise in which the student is put in the role of a veterinarian presented with a case. Six to eight students will work on a case together. The group will meet with a faculty member, whose role is to facilitate discussions of the basic scientific principles the case highlights as well as related issues, such as herd management, veterinary medical ethics, and client-practitioner communication. This format, along with lectures and laboratories, is how many of the foundation courses—the backbone of a student's knowledge—will be taught.

In the next one and one-half to two years, weekly case-based exercises will be designed for use in several interdisciplinary blocks. If approved by the faculty, the blocks will replace the core courses, which

have been taught in individual disciplines. Students successfully completing cases in the block called The Animal Body, for example, will have not only learned anatomy, but also developed beginning skills in giving physical examinations, reading radiographs, and handling surgical instruments.

The case-based exercises will teach basic science by capitalizing on students' enthusiasm for the "real stuff" of veterinary practice. The interdisciplinary block format will show them, from the beginning, the importance of integrating information from various disciplines.

Foundation course work will be limited to just more than half of a student's graduation requirements, allowing the students to pursue individual interests and the faculty to introduce new courses that present the latest advances in veterinary science. Students will be given some latitude in choosing the remainder of their courses. Those requirements will be planned to ensure sufficient exposure to both the breadth and the depth of each discipline and to a variety of species.

The development of diagnostic skills prior to actual clinical experience is another feature of the new curriculum.

Clyde, a Rottweiler puppy with multiple sclerosis, is the subject of one of the computerized tutorials students will use to understand the disease process and practice clinical reasoning skills. The computer program provides illustrations of Clyde and all aspects of his disease—from gross specimens to histologic slides. It also includes additional information about the disease from textbooks, journal articles, and other sources. Such computer programs will be available to illustrate a variety of diseases.

Computer-assisted Assessment

With innovations in teaching come innovations in assessment. Unique among these are computer-linked case-based exercises that assess student performance. To determine a diagnosis, students request test results and other information from the computer. They also gather information elsewhere, for example, from slides, smears, or radiographs. The combined information allows them to refine further their list of differential diagnoses. When the students reach a diagnosis, the computer then assesses their efficiency in determining it. Oral examinations and formal class presentations, alternatives to paper and pencil tests, also will become more common.

Beyond the Classroom—Summers Well Spent

Today's veterinary students are among the strongest advocates for curriculum reform. In addition to avidly discussing their ideas and sharing their enthusiasm throughout the year, ten second- and third-year students spent the summer working alongside faculty members developing new teaching materials. Among those are case-based exercises, computer tutorials, and models for teaching horse anatomy. Their efforts, they say, are an investment made in behalf of students to come.

Another summer opportunity, open to students who have completed their first year of study, is the Leadership Training Program for Veterinary Students. Sponsored

by the Mellon Foundation, Merck and Company, Inc., and the Robert F. Woodruff Foundation, the program's goal is to interest students in careers in academic institutions, government, and industry through hands-on experience in a research laboratory. It is the largest such program in the country.

Faculty Members Lead the Way

The faculty voted to endorse fundamental changes in the curriculum in October 1989. A nine-member Curriculum Committee was elected to carry out their mandate. More than forty faculty members visited schools of veterinary and human medicine around the country to survey advances in curriculum, teaching style, and educational technology that could be successfully adopted here.

The Curriculum Committee is helping develop the interdisciplinary block system. Thirty faculty members are participating in six curriculum design groups. The groups are developing the content, teaching methods, and subject and concept interrelationships most appropriate to each block.

Two key administrative appointments were made. Dr. Donald F. Smith, former chair of the college's Department of Clinical Sciences, was appointed associate dean for veterinary education. He is overseeing the implementation of the curricular changes. Dr. Katherine M. Edmondson, a professional educator, was named director of the Office of Educational Development.

The Office of Educational Development supports teaching just as the college's Research Office assists faculty members in their research endeavors. Its staff of specialists in curriculum and instruction, computer technology, and biomedical illustration and communication help faculty members expand their teaching repertoire and ideas and create new teaching materials—whether tailor-made computerized courseware or a revamped lecture—to reflect the diversity of student learning styles.

Twice a month throughout the year, the Office of Educational Development sponsors the faculty seminar "Food for Thought." This series presents demonstra-

tions of innovative teaching techniques—from basic educational concepts and how to structure tutorial assignments to the uses of computer animation. It also gives the faculty a forum for talking together about the fundamentals of education.

At the heart of the sweeping changes occurring in the college is the commitment to prepare students to meet the challenges of veterinary practice in the twenty-first century. In the curriculum design groups, in the "Food for Thought" series, and in the hallways and cafeteria, faculty share, discuss, and at times, passionately debate the most effective way to do that. The steps forward, already taken, are the first of many to come.

September

The class of 1994 enters the D.V.M. program, distinguished by the following statistics:

Males: 25

Females: 55

Minority students: 17

Cornell undergraduates: 31

Average years of education: 4.63

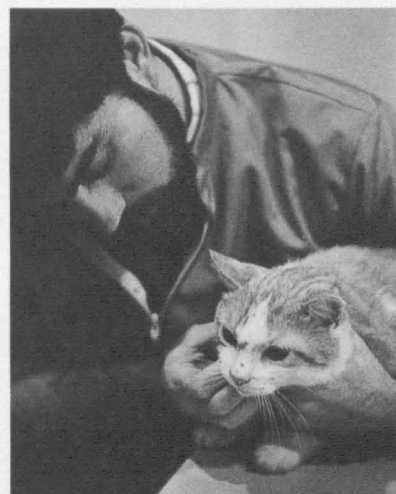
Number of applicants: 447

Percentage accepted: 18

The New York State Veterinary Medical Society celebrates its 100th anniversary at a gala annual meeting. The college joins New York State veterinary practitioners for the weekend festivities, capping off a year of celebration activities.

October

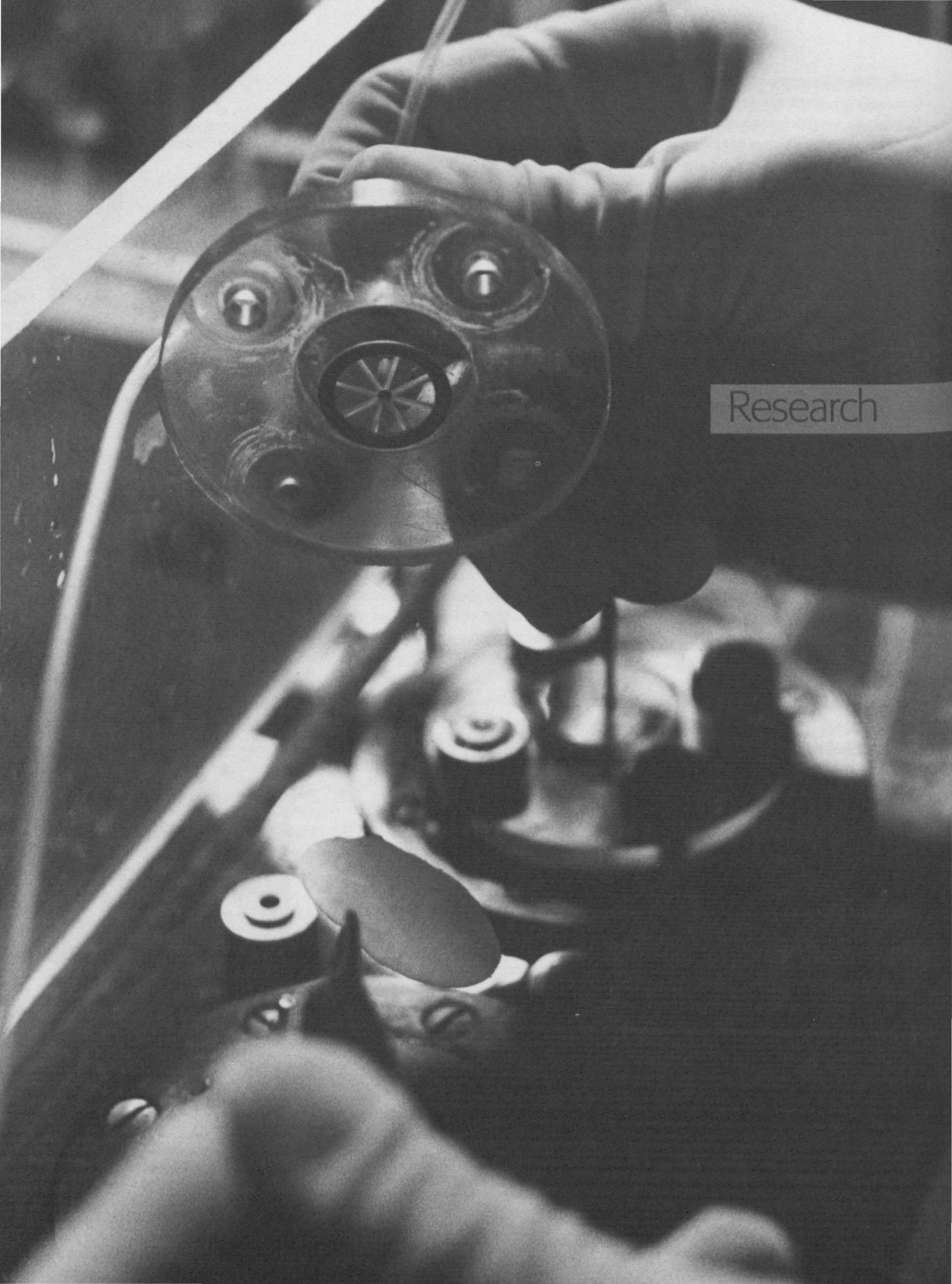
Campaign Kickoff. Cornell University begins a five-year, university-wide campaign to raise \$1.25 billion. The goal of the Cornell Campaign for the College of Veterinary Medicine is \$30 million. The college begins a major fund-raising effort to secure gifts from alumni and friends for student aid, professorships, graduate fellowships, and program enhancement.



SOL GOLDBERG

Dr. Eugenia Kelman is appointed assistant dean for student services. The new position consolidates various student services under a single administrative unit within the college.

Dr. Katherine M. Edmondson is named director of the Office of Educational Development. Dr. Edmondson, who holds master's and doctoral degrees in curriculum and instruction, joins the college as it is expanding curricular and educational initiatives.



Research

It is most remarkable that galanin inhibits the secretion of insulin at four sites, when activity at any one of those alone would have a major inhibiting effect.

—Dr. Geoffrey Sharp

A Quest for Understanding

The Foundation of Caring

Cornell's College of Veterinary Medicine is one of the most successful veterinary colleges in the country in competing for the limited resources that support biomedical research. Major funding for both research and training in the college is provided by the National Institutes of Health, the National Science Foundation, and the U.S. Department of Agriculture. The state of New York, foundations, industry, and individual benefactors also provide substantial support, including support that cannot be readily obtained from federal agencies.

Although the college has traditionally excelled in the areas of infectious diseases and reproductive biology, its research endeavors encompass the full spectrum of veterinary medicine. Interdisciplinary projects constitute an ever-increasing portion of that effort. A recent award from the National Institute of Child Health and Human Development is supporting interdisciplinary research conducted by a clinical cardiologist and an electrophysiologist. Their cooperative studies of ventricular arrhythmia and sudden death in German Shepherd dogs may disclose the cause of at least some cases of sudden infant death syndrome in humans and lead to the development of rational strategies for its prevention.

Diabetes: Insulin-inhibiting Mechanism Discovered

After three years of intense activity in studies related to mature onset (type II) diabetes, researchers in the Department of Pharmacology have made a startling discovery about a mechanism that inhibits the secretion of insulin.

Affecting large numbers of people and animals, diabetes is a disease of the pancreas in which the control of blood sugar goes awry. One cause of the disease is insufficient secretion of insulin by the beta cells in the pancreas. Dr. Geoffrey Sharp and his

Using a perfusion machine to learn more about insulin-secreting cells

November

Construction begins on the college's new facilities. First step: relocate utility lines.

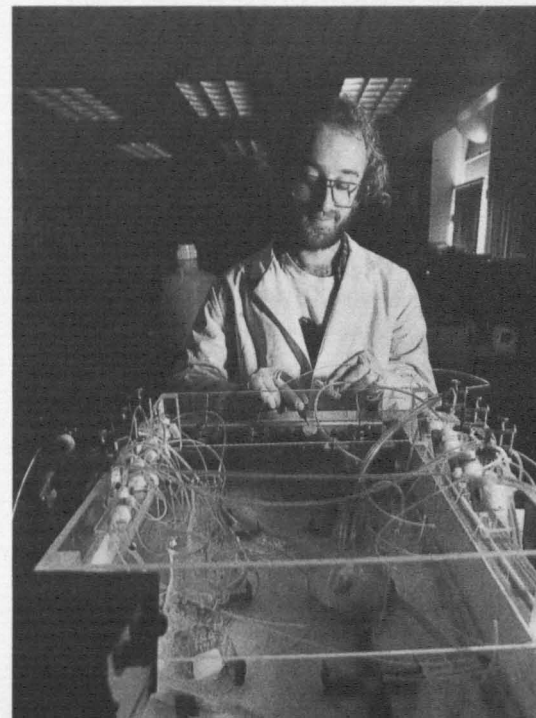
December

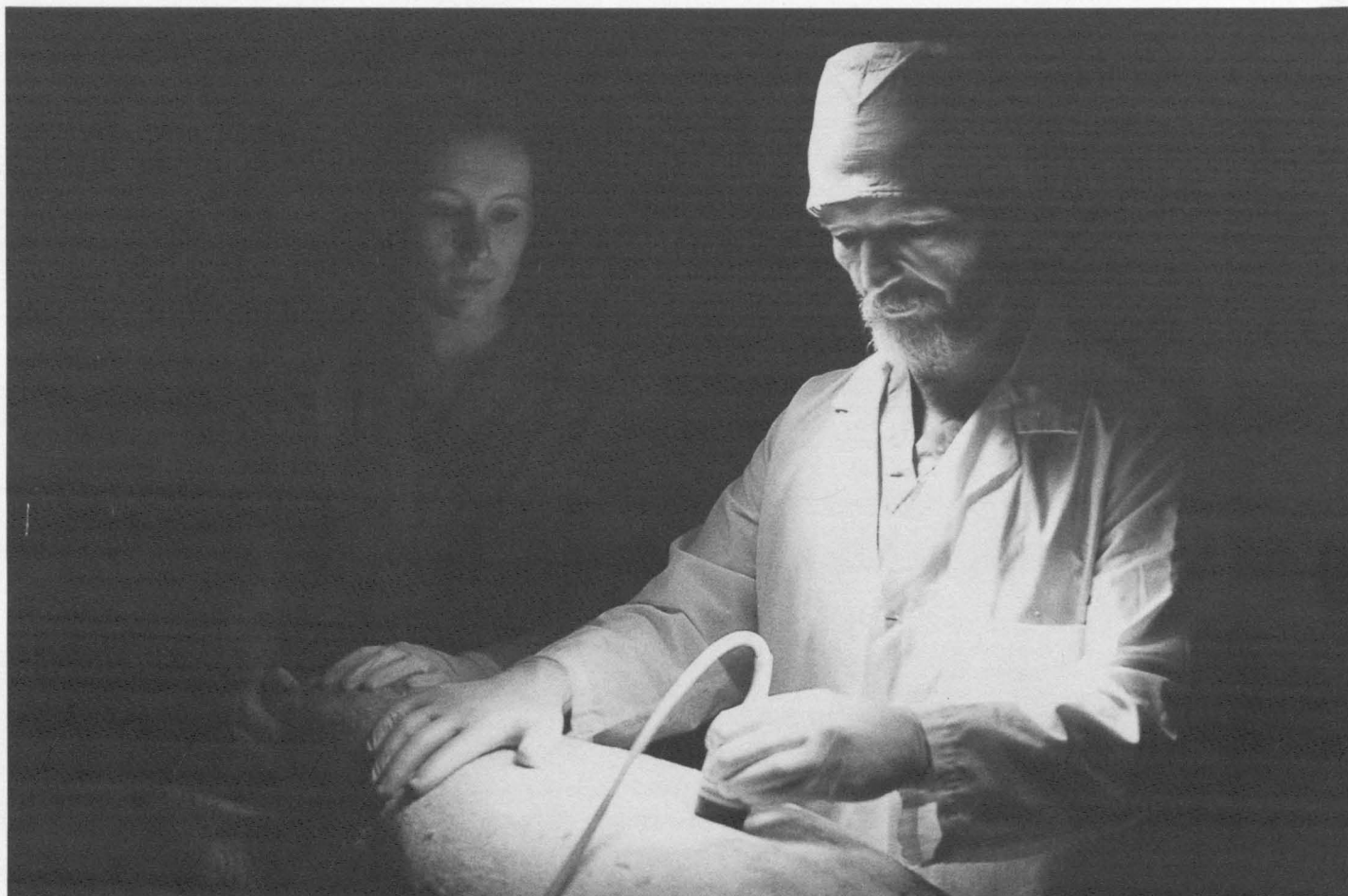
Dr. Harold Hintz, professor of animal nutrition, is one of the first inductees into the Equine Research Hall of Fame, University of Kentucky. This honor recognizes his major influence on the direction of and advancements in equine nutrition.

January 1991

Dr. Robert E. Clark D.V.M. '52 receives the Daniel Elmer Salmon Award for Distinguished Alumni Service at the Eighty-fourth Annual Meeting of the Alumni Association. This award recognizes his exemplary efforts in behalf of the college and the alumni. Dr. Clark has served as president of the Alumni Association, has chaired the College Development Committee, is a member of the University Council, and is co-chair of the Cornell Campaign for the College of Veterinary Medicine.

Dr. Francis Kallfelz D.V.M. '62, professor of clinical nutrition, is appointed director of the Veterinary Medical Teaching Hospital.





colleagues have focused their studies on how a newly discovered peptide called galanin—known to have a strong controlling influence over insulin secretion—does its job. They discovered that this single peptide restricts insulin secretion in not just one but four, and possibly five, different ways.

They found that galanin, produced in the sympathetic nerve endings leading to the pancreas, interacts with a receptor on the outer surface of the beta cells in the pancreas. The receptor transmits signals from galanin to proteins inside the cell called G proteins. The G proteins then carry the signal to at least four different sites within the cell, each of which is responsible for a distinct aspect of the control of insulin secretion: two different ion channels, the site of an enzyme activity, and the site of the insulin release mechanism.

Of the many G proteins inside the beta cell, the researchers have identified two that are responsible for the actions of galanin. Their finding is a major contribution to a full understanding of insulin secretion and its control.

Clues to Prematurity: Fetal Brain Signals Onset of Labor

Premature birth, the leading cause of birth defects and infant mortality in the United States, presents a huge financial burden both to the families affected and to society. In medical care alone, it costs as much to look after four premature babies as it does to provide adequate prenatal care to 150 women.

The key to preventing prematurity is understanding how normal births occur. With support from the National Institute of Child Health and Human Development, the college's Laboratory for Pregnancy and Newborn Research sponsors eleven research programs related to fetal development in the late stages of pregnancy.

Knowing what triggers the onset of birth is fundamental to determining why labor may sometimes begin too soon. Dr. Peter Nathanielsz, professor of veterinary physiology, and his colleagues have shown for the first time that the birth process in a mammal is initiated by the fetus, not the

What triggers labor? The use of ultrasound on a ewe helps researchers uncover the answers.

mother. Working with sheep, they found that after the fetal brain assesses the lamb's readiness for the challenges of the outside world, one tiny section of the fetal brain—the paraventricular nucleus—sends a signal to the ewe. Because the reproductive systems in sheep and humans are very similar, it is likely that the same mechanism is involved in triggering human labor.

Investigating the major problems of prematurity, researchers in the laboratory have known that premature labor is frequently associated with maternal abuse of drugs, particularly cocaine. In fact, cocaine is used by 10 percent of pregnant women in this country. A study conducted by Dr. Nathanielsz and his colleagues showed that cocaine causes the uterine blood supply to the placenta to constrict so severely that the fetus gets less than half of the oxygen and the nutrients it needs.

Unlocking Infertility: The Genetic Key

Dr. Vicki Meyers-Wallen, assistant professor in the Department of Clinical Science, is investigating the genetic basis of two inherited disorders of the reproductive tract with a grant from the National Institutes of Health. Persistent mullerian duct syndrome (PMDS) and XX sex reversal cause abnormalities in the anatomy of the reproductive system that can adversely affect fertility in humans and animals.

The dog is the only animal model available for studying PMDS in humans. Because there are many similarities between genes across species, determining the gene that causes PMDS in dogs would be a major step toward discovering the genetic basis of the disorder in humans. Dr. Meyers-Wallen's work could eventually lead to effective tests to detect carriers in both animals and humans.

XX sex reversal is known to cause infertility in seven breeds of dogs. Several breeds have been identified in the college's Reproduction Clinic for Companion Animals.

Understanding How Viruses Work

In 1978 a virus that had never been seen before in dogs was identified as the cause of a highly contagious, sometimes fatal disease. Since that time the structure of the virus, known as canine parvovirus, has changed twice in the dog population of the United States.

Virologist Dr. Colin Parrish and his colleagues Shwu-Fen Chang, Lisa Strassheim, and Uwe Truyen at the college's James A. Baker Institute for Animal Health are taking advantage of this unusual occurrence to learn about the basic nature of viruses—how they work, how they evolve over time, how they vary in host range, and how changes in molecular structure and sequence can determine their various properties. Their answers will shed light on the emergence and treatment of viral infections in both animals and humans.

As a result of two years of collaboration between researchers from the Baker Institute and Purdue University, the three-

dimensional crystalline structure of canine parvovirus has been identified. The team also is close to identifying the structure of a similar and equally common virus in cats—feline panleukopenia.

Using X-ray crystallography, monoclonal antibody testing, DNA sequence analysis, and other techniques used in molecular biology and biochemistry, Dr. Parrish and his collaborators are comparing the fundamental properties of the two viruses and determining how those properties affect their behavior. Their initial finding is that critical differences between the cat and dog viruses occur on the surface of the coat protein (capsid) of the virus. Now they are investigating how differences at this location affect the ability of the virus to infect a cat or a dog.

The researchers have also found that the two strains of canine parvovirus that have emerged since 1979 differ from the original virus in changes on the surface of the capsid. These surface differences involve antigenic changes, but they may have other functional significance as well—for example, in host range or pathogenicity. Although currently used vaccines, many of which were developed at the Baker Institute, are still effective, the group's work will help determine whether a new vaccine is warranted.

February

Dr. Ellis P. Leonard D.V.M. '34, professor emeritus of veterinary surgery, died February 7 in his Ithaca, New York, home. He was eighty-six years old. An alumnus of the college, Dr. Leonard was a noted historian of veterinary medicine, and in his long and distinguished career he greatly influenced the practice of veterinary medicine in the United States.

March

Construction aided by mild weather. Preparations begin for the next phase of the \$80-million expansion project.

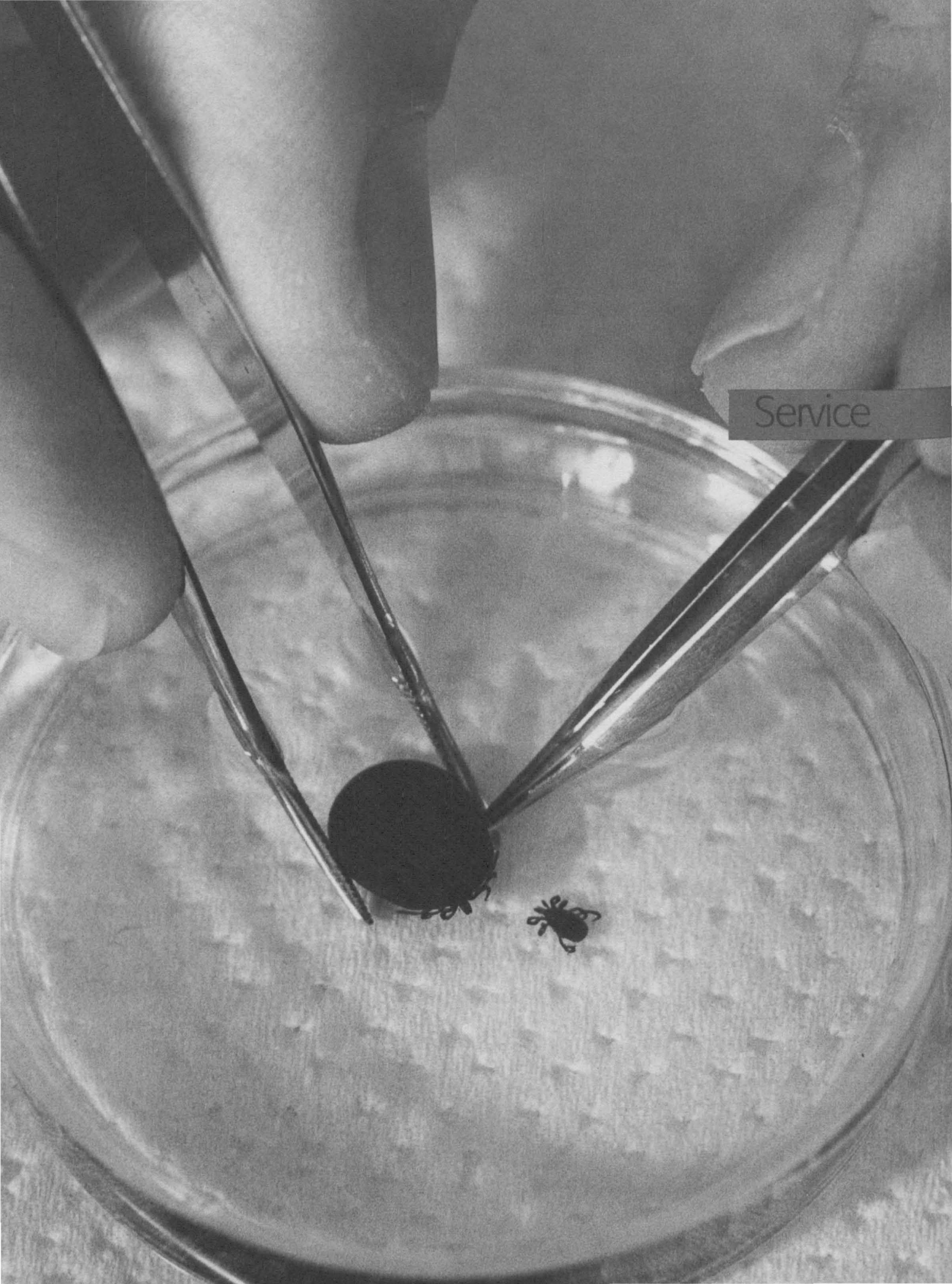
April

Wildlife Symposium. College students host 300 participants from across the country for the Zoo and Wildlife Symposium, which explores zoo, marine, avian, and other exotic animal medicine disciplines.



Dr. Marian J. Truszczynski, the 1991 George C. Poppensiek Visiting Professor in International Veterinary Medicine, discusses the effect of central Europe's changing socioeconomic system on veterinary medicine in a public lecture at the college.

Service



Dogs are the prime sentinel for monitoring the spread and distribution of Lyme disease in the human population.

—Dr. Richard Jacobson

Knowledge at Work

Making a Healthier World for Humans and Animals

The college's Diagnostic Laboratory is dedicated to promoting the health of domestic and wild animals and keeping New York State's agriculture and food industries strong. In addition to diagnostic testing, it provides consultative, extension, and field services to veterinarians working with agricultural, companion, performance, zoological, and exotic animals and with wildlife. The laboratory serves the people of the state through its food quality assurance testing programs and by providing health services to their animals.

The college's Veterinary Medical Teaching Hospital is at the forefront in providing the best possible medical and surgical care for large and small domestic animals and for exotic species. Central to its mission is a commitment to superb communication with clients and veterinarians. The hospital provides veterinary care to the local community through its Community Practice Service, and it is a referral center for veterinarians throughout the Northeast, offering the latest advances in equipment and procedures. Specialty services include cardiology, neurology, internal medicine, orthopedic and soft tissue surgery, dentistry, ophthalmology, dermatology, and theriogenology.

Lyme Disease: Natural Exposure Model Opens Doors to Prevention and Testing

A five-member research team coordinated by the college's Diagnostic Laboratory continues to make significant advances in the study of Lyme disease—a debilitating bacterial infection that, upon reaching the chronic phase, is untreatable in domestic animals and humans. Last year 8,500 people were diagnosed with Lyme disease.

The group, headed by Dr. Richard Jacobson, associate professor of immunoparasitology, has successfully developed a

Lyme disease research: providing answers, allaying fears.

May

Graduation. The 4,000th graduate of the college is one of the 81 students to graduate from the D.V.M. program. Of those graduates, thirty-five enter private practice and twenty-six become interns. The remaining decide among job opportunities.

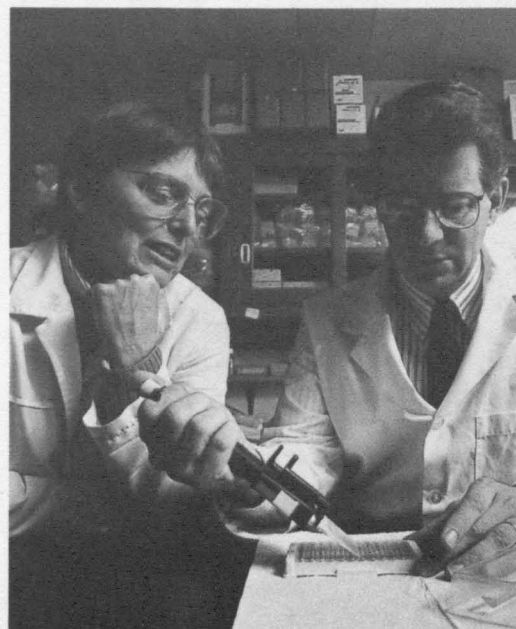
Dr. Judith A. Appleton receives the Beecham Award for Research Excellence. An associate professor in the Department of Microbiology, Immunology and Parasitology, her research focuses on how the immune system interferes with pathogens, particularly the influenza virus in horses and the parasitic nematode *trichinella*, which causes trichinosis.

Dr. William E. Hornbuckle receives the 1991 Norden Distinguished Teacher Award, which honors continued excellence in teaching. Dr. Hornbuckle, an associate professor in the Department of Clinical Sciences, also received the award in 1979.

June

Construction. David Christa Construction, Inc., receives the contract for the Veterinary Education Center.

Horsemen's Benevolent and Protective Association, New York Division, renews its support of the Equine Performance Testing Center. The \$125,000 grant will allow researchers to continue investigating performance factors in horses.



natural exposure model for studying the pathogenesis of the disease in dogs—the only model of naturally induced Lyme disease being used in research in this country. The model is particularly valuable because the progress of the disease in dogs closely mimics the disease in humans. It is especially useful as researchers investigate new vaccines and diagnostic tests for Lyme disease.

Earlier this year Dr. Jacobson's group made available to the veterinary community evaluative data on the first vaccine released for use in dogs. The researchers are now conducting efficacy studies of the vaccine using the natural exposure model.

Because *Borrelia burgdorferi*, the bacteria that causes Lyme disease, is unusually slow growing and may cross-react with other organisms commonly present in the bodies of both humans and domestic animals, developing valid diagnostic tests has been particularly laborious. After extensively evaluating the three most commonly used testing systems, the researchers are increasingly confident that the existing serological diagnostic tests for dogs and horses are reliable. Work is under way to isolate antigens unique to the *Borrelia* organism so more highly sensitive tests, for both animals and humans, can be developed.

Community Practice Service: Caring for Pets—and Owners

The Community Practice Service, a clinical unit of the college's Veterinary Medical Teaching Hospital, provides routine health care, medical management, and selected surgical procedures to small animals and exotic pets whose owners live in the Ithaca area. During a week on the service, senior students conduct interviews and physical examinations, and each student establishes treatment plans for up to thirty cases. It's the ideal setting for students to develop skills in client-practitioner communication.

Coordinated by Dr. William Hornbuckle, a specialist in internal medicine in the Veterinary Medical Teaching Hospital, a team of five faculty members gives students immediate feedback on the effectiveness of their interaction with

clients. Students then talk again with the client during a follow-up telephone call. The new curriculum's expanded rotation schedule will allow students to spend twice as much time benefiting from this on-the-job training.

Stemming the Tide of Rabies in the Northeast

With a history of success in developing eradication programs for infectious diseases, the college's Diagnostic Laboratory is taking a leading role in preventing the rapid spread of rabies, a centuries-old disease that can be fatal to both animals and humans. Collaborating with the New York State Departments of Public Health, Environmental Conservation, and Agriculture and Markets and the New York State Veterinary Medical Society, the laboratory, under the direction of Dr. Donald H. Lein, is studying the most promising method for controlling and eventually eradicating rabies: oral bait vaccines.

This method of vaccinating wildlife involves distributing an oral vaccine in a food that's attractive to the animals. A wax ampule containing a recombinant DNA vaccine virus carrying a noninfectious portion of the rabies virus is placed inside a jacket of dried fish meal polymer. To protect the public and other wildlife species from contact with the vaccine, the bait is put inside a foul-scented resealable plastic storage bag, which raccoons are adept at opening. The pouches are then distributed throughout areas where raccoon populations are large.

In the study, researchers will assess the effectiveness of recombinant DNA modified live vaccines, the different methods of bait dispersal, and the safety of the vaccine to domestic and other wildlife species. The goal is to see if oral bait vaccine will prevent the spread of rabies to new areas. If so, it could then be used to eradicate the disease in endemic areas. Talks are currently under way to study and establish a coordinated oral bait vaccination program involving northeastern states and the eastern provinces of Canada.

Success in using oral bait to vaccinate raccoons against rabies could lead to vaccination programs for wildlife against

other infectious diseases such as distemper. The method might also prove useful for dispersing contraceptives to control the size of wildlife populations.

The Reproduction Clinic for Companion Animals: Overcoming the Barriers to Fertility

The Reproduction Clinic for Companion Animals in the college's Veterinary Medical Teaching Hospital was established a year ago by Dr. Vicki Meyers-Wallen to assist small-animal owners and breeders. The clinic provides diagnosis and treatment of infertility disorders in both male and female animals. Breeding management of female cats and dogs with atypical reproductive cycles, as well as for those requiring specialized insemination techniques, are also available.

Dr. Meyers-Wallen's research and expertise in inherited reproductive disorders allows the clinic to offer genetic counseling, which assists breeders in maintaining their breed line by culling out animals carrying deleterious genes. Her work also enables clinicians to differentiate between genetic and environmental causes of neonatal death.

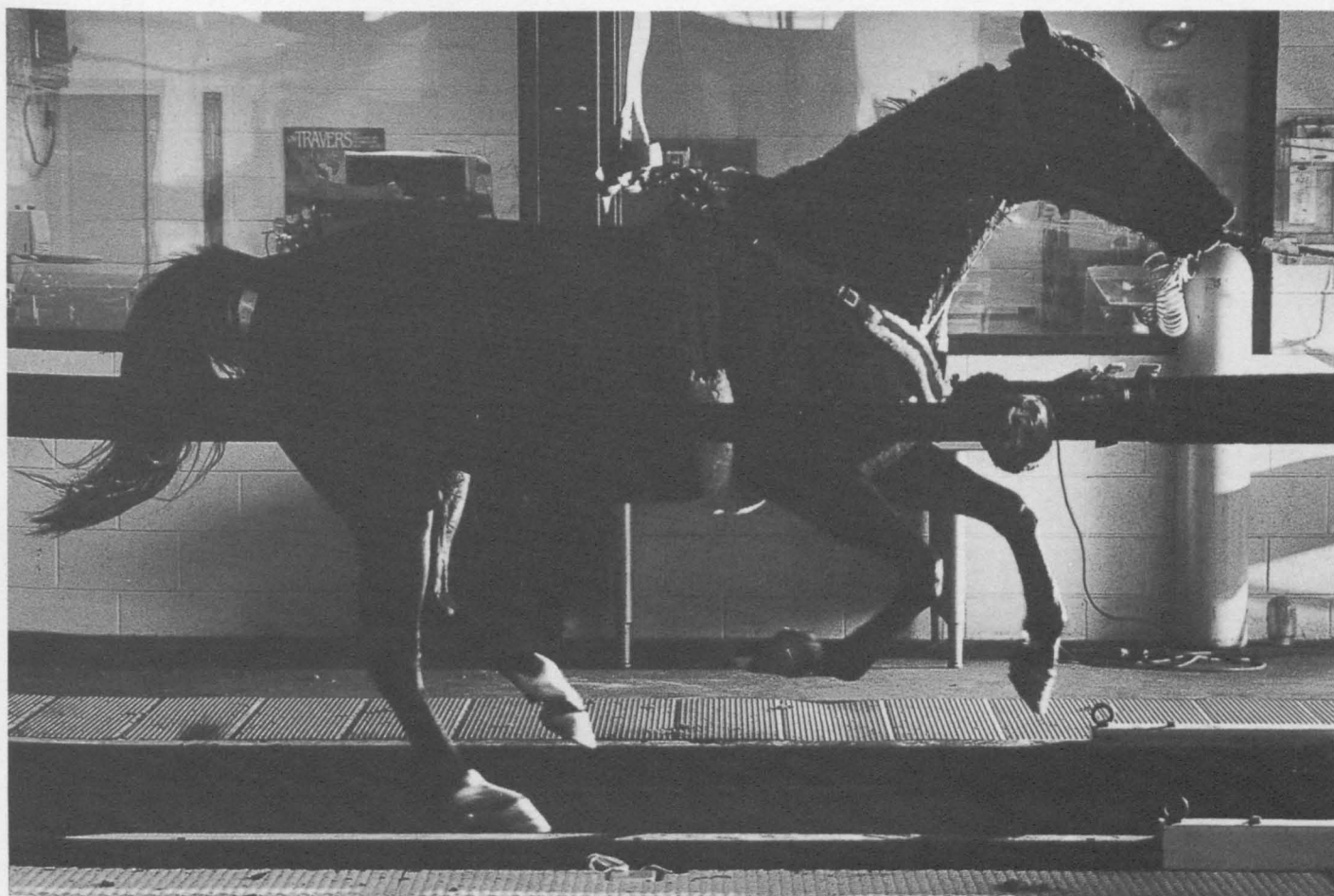
The clinic offers a telephone consulting service to veterinarians on fertility, infertility, and neonatal disorders.

Controlling Food Animal Diseases

The college's Diagnostic Laboratory serves New York State's food animal producers through its Veterinary Field Service Extension Program, which administers the five-year-old Three Disease Program. The Three Disease Program offers diagnostic testing to certify that herds are free of John's disease (paratuberculosis), bovine leukosis virus (BLV), and bluetongue—a requirement for the export of animals and embryos to many foreign markets.

Funding for the Three Disease Program was initially eliminated from the governor's 1991–92 budget. As a result of a comprehensive lobbying effort by the agricultural community, however, the highly regarded program was reinstated.

Researchers in the program have developed a new blood test to screen



quickly and inexpensively for Johne's disease, which is widespread in dairy, sheep, and goat herds. Animals suspected of having the disease are then tested by the more definitive but costly fecal sample culture.

The same blood sample can be used to test for BLV, which is prevalent in cattle, and for bluetongue, which while common in other parts of the country, does not appear to occur in the Northeast. According to senior extension associate Dr. Michael Brunner, the results of testing for bluetongue through the Three Disease Program, along with the results of similar testing programs in neighboring states, should be sufficient eventually to declare the Northeast a bluetongue-free region, increasing the marketability of Northeast cattle.

With the development of a new DNA probe, the Diagnostic Laboratory now offers a service to combat the spread of the pathogenic strains of *Escherichia coli* that cause diarrhea in calves. DNA probes can define an individual *E. coli* isolate in terms

of its virulence factors. This knowledge makes it possible to judge the effectiveness of commercial vaccines that have a limited spectrum of protection. If a vaccine is judged to be ineffective, the Diagnostic Laboratory can take a particular *E. coli* isolate and tailor a vaccine to protect the animal.

Equine Performance Testing Center: Assessing the Role of Lung Disease in Poor Performance

With continued support from the Horsemen's Benevolent and Protective Association, New York Division, Cornell's Equine Performance Testing Center is expanding its services to owners and trainers of athletic horses. Respiratory physiologist Dr. Dorothy Ainsworth, who joined the center's staff this year, is beginning a study on the role of the lower respiratory tract in athletic performance.

Using the center's high-speed treadmill, Dr. Ainsworth is developing techniques for evaluating lung compliance—that is, the flexibility of the lungs and

airway resistance—during exercise. Limited lung compliance as a result of disease requires the horse to work harder just to breathe, thus potentially contributing to poor performance when racing.

In a second study, she is looking at the consequences of lung disease in young horses. By conducting respiratory function tests over time on a group of horses that contracted *Rhodococcus equi* pneumonia within the first three to five months of life, Dr. Ainsworth hopes to determine if those horses will become competitive performance horses as adults. She also expects to learn if they are at greater risk of developing other pulmonary disorders later in life.

Research on the effect of lung damage on the respiratory muscles, particularly the diaphragm, has implications for human athletes as well. Dr. Ainsworth hopes to learn whether lung disease results in diaphragmatic fatigue, and if so, whether that limits a horse's performance. Her conclusions may hold true for human athletes as well, given the similar physiology of both respiratory systems.



Support and Funding

A Partnership for Support

Established in 1894 as the first statutory college at Cornell, the College of Veterinary Medicine has a long history of academic independence and achievements, made possible by a unique combination of support from public and private sources.

An annual appropriation from the New York State legislature provides approximately one-third of the operating budget for the College of Veterinary Medicine. 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 for the teaching hospital, classrooms, and research laboratories.

Grants and contracts, awarded on a competitive basis by state and federal agencies, fund many research studies that have important implications for the health of food animals and people. In 1990–91, income from these sources made up approximately 30 percent of the college budget.

For more than a century, a tradition of gifts from the private sector—from friends, alumni, corporations, foundations, and other organizations—has contributed to the college's margin of excellence in teaching, research, and public service. Although private support makes up a comparatively small percentage of the college budget, such gifts are vital in providing the necessary funds to initiate and develop new programs. 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 1990–91, 40 percent of our alumni made gifts to the College of Veterinary Medicine.

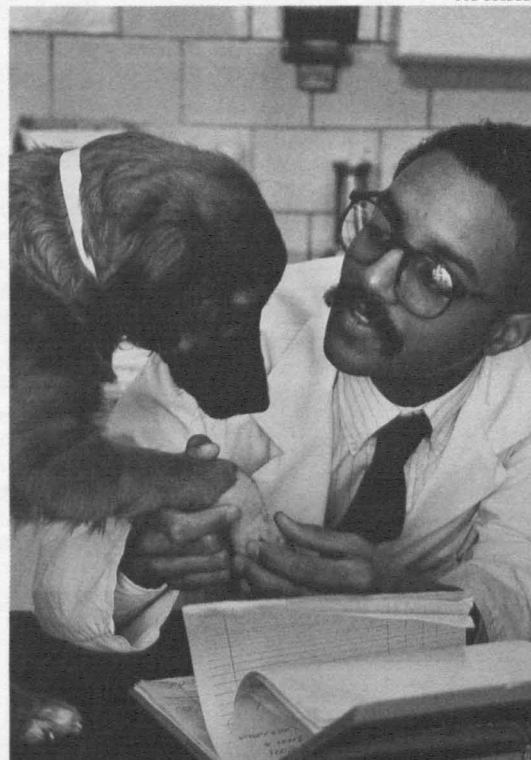
Dr. Colin R. Parrish studies a gel as part of his research on canine parvovirus at the James A. Baker Institute for Animal Health.

Major Donors and Sponsors in 1990–91

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 1990–91. 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 further information regarding gifts to the College of Veterinary Medicine at Cornell and opportunities for the support of its many programs, please contact the Office of Public Affairs (607-253-3744).

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Venture Systems Corporation

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The Dorothy Schiff Foundation
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Thrasher Research Fund
The Vaneck-Bailey Foundation
The Westminster Kennel Foundation
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Robert H. Winn Foundation for Cat Research
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American Diabetes Association
American Heart Association
American Horse Shows Association
American Kennel Club
The Amyotrophic Lateral Sclerosis Association
Auxiliary to New York State Veterinary Medical Society
Binational Agriculture Research and Development Fund
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Capital Cat Fanciers
Carolina Sophisticats
Connecticats
Council for Tobacco Research
Devon Dog Show Association
Eastern New York Thoroughbred Breeders
Finger Lakes Kennel Club

Fort Worth Feline Fanatics

Genesee Valley Breeders Association
Glens Falls Kennel Club
Great Dane Club of America
Great Lakes Fishery Commission
Greater Lowell Kennel Club
Harrisburg Kennel Club
Horsemen's Benevolent and Protective Association, New York Division
Houston Cat Club
The International Cat Association
Junior Collie Club of Central New York
Kanasasaga Kennel Club
Lincoln State Cat Club
Long Island Duck Research Cooperative
The Mad Catters
Monticello (NY) Kennel Club
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Tonawanda Kennel Club
Troy Kennel Club
Unicef
Westchester/Rockland Veterinary Medical Association
World Health Organization



On the farm with the Three Disease Program: a melding of service and research.

Table 1. Roswell P. Flower Library, 1990-91

Bound volumes at beginning of year	78,259
Acquisitions	+2,615
Less withdrawals	- 462
Total bound volumes	80,412
Audiovisual items	29,619
Periodicals and annuals	1,361
CD-ROM titles	48
Microcomputer software titles	346

Table 2. Qualifications of Entering Students, Class of 1995

	<i>Number of Students</i>
Amount of preveterinary preparation	
Three years of college	9
Four years of college	41
More than four years of college (graduate level)	30
Institution previously attended	
Cornell University	37
Other	43
Field of preparatory study	
Animal science (or related)	37
Biological sciences (or related)	40
Other	3

Table 3. Geographic Distribution of Entering Students, Class of 1995

<i>Legal Residence</i>	<i>Number</i>
New York	60
Contract states	
Connecticut	2
Delaware	2
Puerto Rico	1
New Hampshire	1
New Jersey	6
Other states	8
Total	80

Table 4. Admission Summary, Class of 1995

<i>Area</i>	<i>Applicants</i>	<i>Enrolled</i>
New York	188	60
Contract states	90	12
Other	163	8
Total	441	80

Table 5. Degrees Awarded, 1990-91

D.V.M. (with distinction: 4)	82
M.S.	4
Ph.D.	9

Table 6. Student Enrollment, 1990-91

Candidates for the D.V.M. degree	
Class of 1991	81
Class of 1992	80
Class of 1993	79
Class of 1994	81
Total	321

Table 7. Graduate Students at the College of Veterinary Medicine, 1990-91

Candidates for the Ph.D. degree	94
Candidates for the M.S. degree	9

Table 8. Interns and Residents, 1990-91*

Teaching Hospital	
Interns	11
Residents	16
Pathology	
Residents	11
Total	38

* As of August 15, 1991



Table 9. Clinical Patients and Diagnostic Examinations, 1990–91

	<i>Horses</i>	<i>Cattle</i>	<i>Sheep and Goats</i>	<i>Swine</i>	<i>Dogs</i>	<i>Cats</i>	<i>Birds</i>	<i>Others</i>	<i>Total</i>
Medical and surgical patients	1,565	516	29	25	7,416	2,742	474	379	13,146
Ambulatory Clinic patients	2,014	34,581	2,636	288				21	39,540
Clinical pathology specimens	5,784	3,684	278	35	13,522	3,077	244	4,140	30,764
Diagnostic Laboratory tests	30,576	220,948	9,477	2,458	31,268	12,102	4,028	10,360	321,217
Necropsies	308	340	87	63	314	185	107	509	1,913
Surgical pathology specimens	607	483	92	43	4,368	993	66	190	6,842
Laboratory and animal examinations			92		239	82	222	1,329	1,964
Fish Diagnostic Laboratory								107	107
Poultry Diagnostic Services									
Ithaca (410 accessions)							4,611		4,611
Eastport (214 accessions)							985		985
Quality Milk Promotion Services	3	121,362	1,028	1	1			1,073	123,468

Financial Statements

Table 10. Summary of Grant, Contract, and Restricted Gift Expenditures by Source of Funding

Source	1990-91	1989-90
Federal		
Department of Defense		
Cornell Biotechnology Institute	\$384,649	\$391,358
Department of Education	0	15,900
Environmental Protection Agency	0	6,621
National Institutes of Health	5,274,204	5,304,907
National Science Foundation	168,864	253,706
Department of Agriculture		
Grants and contracts	302,241	367,305
Federal appropriations	312,824	386,340
Total, federal grants and contracts	<u>6,442,782</u>	<u>6,726,137</u>
State		
Cornell Biotechnology Institute	\$43,994	\$90,161
Department of Environmental Conservation	142,327	86,155
Harry M. Zweig Memorial Fund	425,125	479,067
New York State Agriculture and Markets contracts	3,097,607	3,976,334
New York State Racing and Wagering Board	3,178,291	3,308,272
New York State Sea Grant Institute	2,412	32,430
Other state agencies	0	641
Total, state grants and contracts	<u>\$ 6,889,756</u>	<u>\$ 7,973,060</u>
Total, federal and state grants and contracts	<u>\$ 13,332,538</u>	<u>\$ 14,699,197</u>
Private support (restricted)		
Industry		
Grants and contracts	1,069,510	1,008,633
Cornell Biotechnology Institute	4,171	9,617
Foundations	223,775	197,395
Alumni, friends, associations, nonprofit organizations	823,441	495,182
Endowments	239,293	228,379
Total, private support (restricted)	<u>2,360,190</u>	<u>1,939,206</u>
Total, grants, contracts, and gifts	<u>\$15,692,728</u>	<u>\$16,638,403</u>

Table 10 is a summary of grant, contract, and restricted gift expenditures of the College of Veterinary Medicine at Cornell for the fiscal years July 1, 1989, through June 30, 1990, and July 1, 1990, through June 30, 1991. The amounts reported exclude expenditures for indirect costs as well as expenditures of unrestricted gifts.

Table 11. Sources of Funds (in Thousands)

	1990-91	1989-90
State appropriation*	\$16,587	\$16,172
Federal and state: grants and contracts	13,332	14,699
Private support (restricted)	2,360	1,939
College income†	13,076	11,006
Total	\$45,355	\$43,816

*The 1990-91 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 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 12. Uses of Funds (in Thousands)

	1990-91	1989-90
Instruction and departmental research	\$5,969	\$6,295
Teaching Hospital	5,863	6,125
Organized research	17,196	17,046
Extension and public service	8,550	8,911
Academic support	722	686
Student services	792	377
Institutional support	3,864	2,854
Plant maintenance and operation	1,525	932
Student aid	874	590
Total	\$45,355	\$43,816

Tables 11 and 12 are summaries of the income and expenditures of the College of Veterinary Medicine for fiscal years July 1, 1989, through June 30, 1990, and July 1, 1990, through June 30, 1991. These figures do not include expenditures for fringe benefits, estimated for 1990-91 at \$6.5 million, and general support services provided by the university. In previous years, private support was included in grants and contracts in table 11.

Faculty and Staff Changes

New Appointments

Dorothy M. Ainsworth, assistant professor
Stephen E. Bloom, professor
Rodney Dietert, professor
Nathan L. Dykes, assistant professor
Geoffrey Eddlestone, senior research associate
Brian R. H. Farrow, professor and chair, Department of Clinical Sciences
Jun-Lin Guan, assistant professor
Thomas H. Kawula, assistant professor
Eugenia G. Kelman, assistant dean for student services
Roy Levine, assistant professor
James Marsh, associate professor
Edward J. Pearce, assistant professor

Promotions and Title Changes

Kathy A. Beck, chief, Section of Radiology, Veterinary Medical Teaching Hospital
Robin G. Bell, professor (from associate professor)
Katherine M. Edmondson, director, Office of Educational Development
Cornelia E. Farnum, chair, Department of Anatomy
Francis A. Kallfelz, director, Veterinary Medical Teaching Hospital (from interim director)
N. Sydney Moise, associate professor (from assistant professor)
Maurice E. White, professor (from associate professor)

Resignations

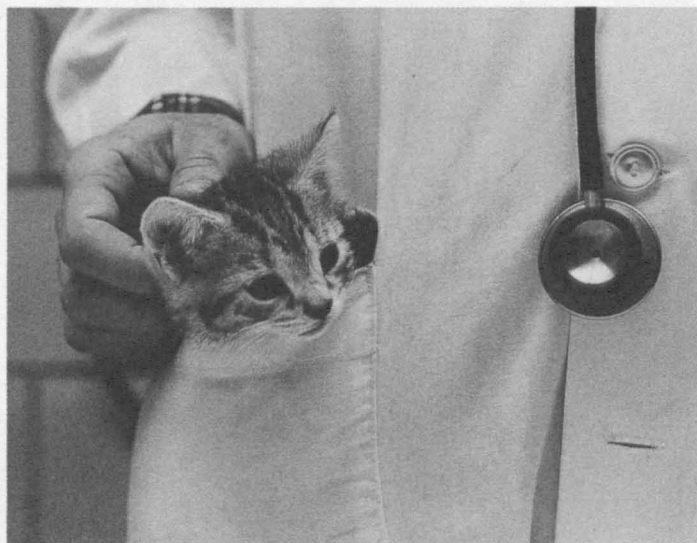
Robert E. Kaderly, associate professor
Robert F. Playter, professor
Roy V. Pollock, assistant professor
Christoph Seeger, assistant professor
Barbara E. Straw, associate professor
Etta M. Wertz, assistant professor

Retirements

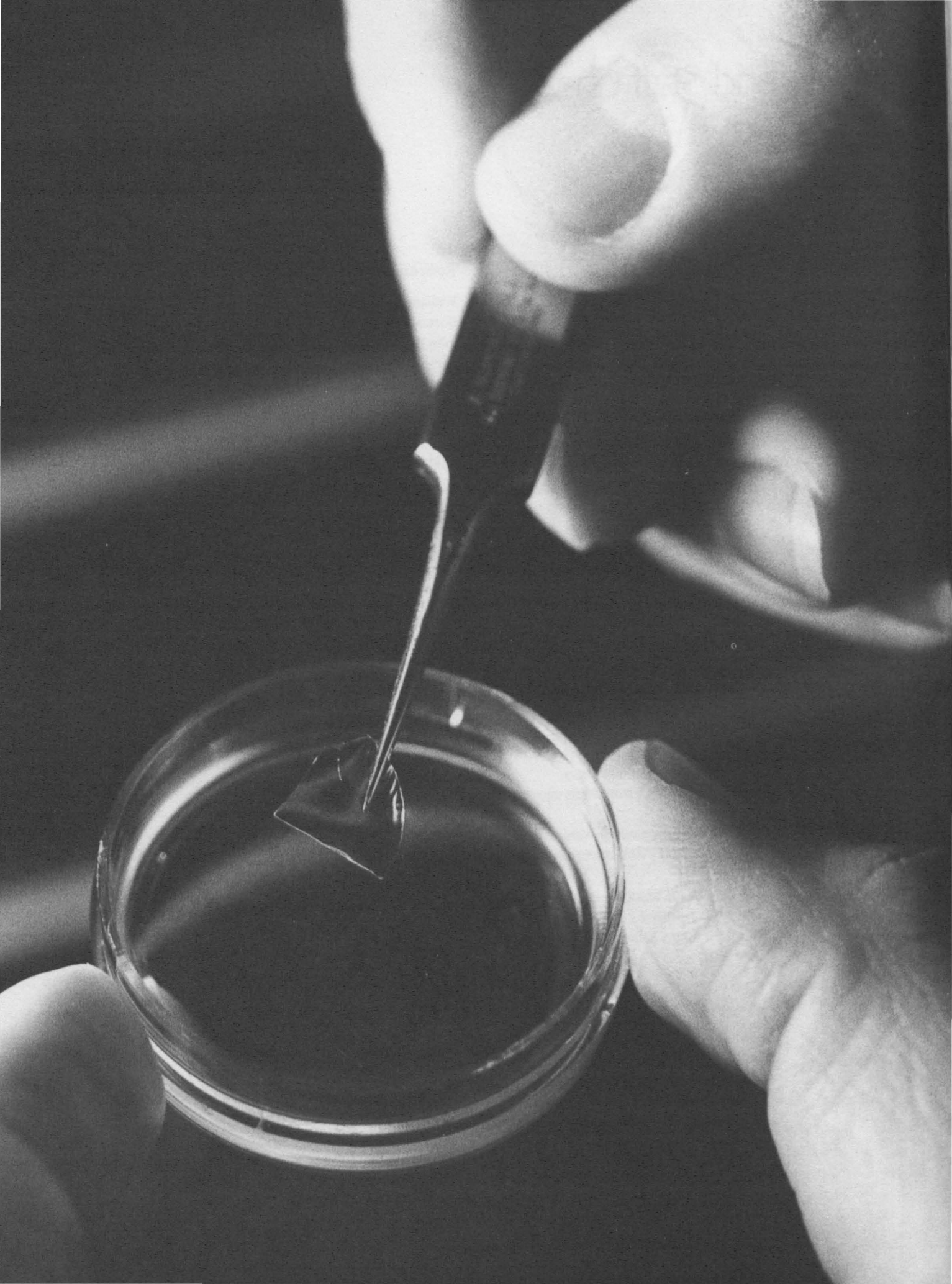
William Hansel, professor
Dorothy F. Holmes, senior lecturer
John E. Lowe, associate professor
Gerald D. Ryan, senior lecturer
Herbert F. Schryver, associate professor

Deaths

Ellis P. Leonard, professor emeritus



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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

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
Elizabeth A. Fontana, 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
Robert Webster, director, Facilities Administration
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
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
Douglas D. McGregor, director, James A. Baker Institute for Animal Health
Bendicht U. Pauli, chair, Department of Pathology
David Robertshaw, chair, Department of Physiology
Geoffrey W. G. Sharp, chair, Department of Pharmacology

Advisory Council 1990-91

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Donald R. Davidsen, D.V.M. '59
Stephen J. Ettinger, D.V.M. '64
Ralph W. F. Hardy
Patricia T. Herr, D.V.M. '60
John Patrick Jordan

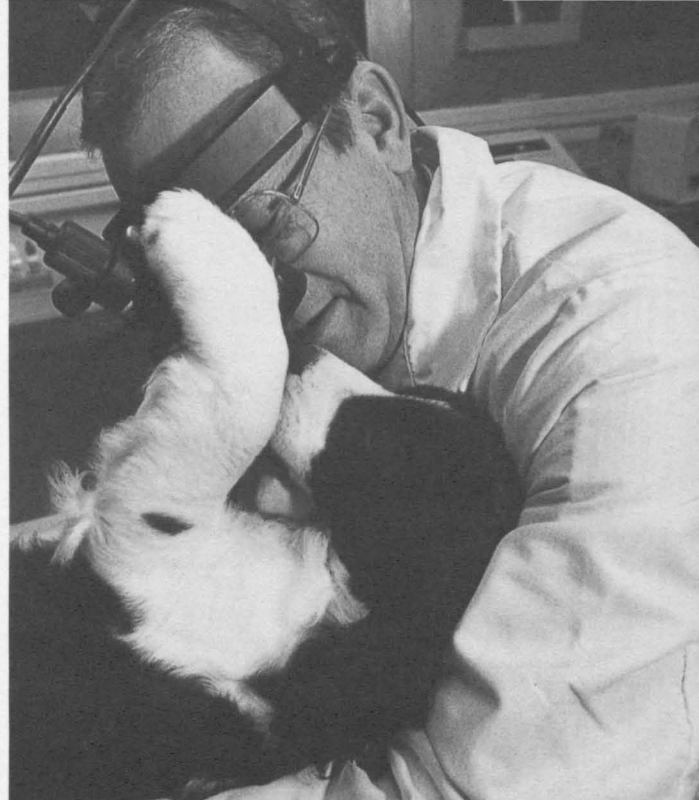
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Bernard W. Potter
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James L. Seward
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Kent R. Van Kampen
Bruce Widger, D.V.M. '51
Harold M. Zweighaft, D.V.M. '56

Emeritus Advisory Council Members

Joseph P. King (deceased)
Stephen H. Weiss



Diabetes research: implications for animals and humans.



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

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