

NEW YORK STATE
COLLEGE OF
VETERINARY MEDICINE
CORNELL UNIVERSITY
ANNUAL REPORT
1986-87



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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

NINETIETH ANNUAL REPORT

July 1, 1986-June 30, 1987

Legislative document number 88

Office of the Dean

New York State College of
Veterinary Medicine
A Statutory College of the State University
at Cornell

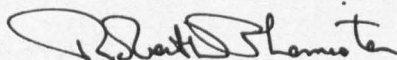
September 1, 1987

Frank H. T. Rhodes
President
Cornell University

Dear President Rhodes:

Pursuant to the requirements of the laws of New York State, I present herewith a report on the activities and the accomplishments of the faculty and staff of the New York State College of Veterinary Medicine for the year ending June 30, 1987, this being the ninetieth annual report of this college.

Respectfully submitted,



Robert D. Phemister
Dean

Office of the President

Cornell University
Ithaca, New York

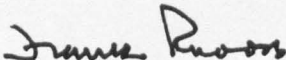
October 6, 1987

The Board of Trustees of Cornell University,
the Chancellor and Board of Trustees of
the State University of New York, and the
Governor of the State of New York

Ladies and Gentlemen:

In accordance with the requirements of Section 5711 of Article 115 of the State Education Law, I am pleased to submit, on behalf of Cornell University, the report of the New York State College of Veterinary Medicine for the year beginning July 1, 1986, and ending June 30, 1987.

Sincerely yours,



Frank H. T. Rhodes
President

Office of the Chancellor

State University of New York
Albany, New York

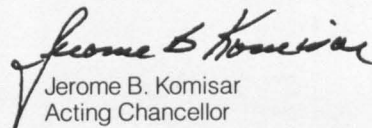
October 16, 1987

The Board of Regents, the Governor, and
the Legislature of the State of New York

Ladies and Gentlemen:

Pursuant to the law, the 1986-87 Annual Report of the New York State College of Veterinary Medicine at Cornell University is herewith submitted.

Very respectfully yours,



Jerome B. Komisar
Acting Chancellor

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Dr. Wolfgang O. Sack
with first-year students,
in an anatomy laboratory



The New York State 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 1986–87 year, of the students, faculty, and staff who worked to accomplish that mission and, by doing so, to justify the public trust.

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Dean Robert D. Phemister on the campus of the New York State College of Veterinary Medicine

MESSAGE FROM THE DEAN

Were our founding father, Dr. James Law, able to conquer time and space to appear on the campus, he might not recognize either us or veterinary medicine. But since he was a man who shared our current concerns with inadequate space for classrooms, laboratories, and offices, perhaps he might feel a sympathetic twinge. From the first week of classes in 1868 Dr. Law fought a battle for usable space, and the too-tight fit is a problem to this very day. Unlike Dr. Law we have not remedied the problem by holding our classes in the open air. Thanks to the commitment of the State University Construction Fund, the governor, and many state legislators, we now have an appropriation of \$5.7 million to complete the planning phase of a greatly expanded and renovated facility. Every corner of the college will see the impact of construction, and it is our hope that today's plans will provide the space necessary to enable us to meet the challenges of a new millennium.

In the meantime we're gaining ground against financial problems that have threatened to overwhelm our students. In 1977 the total cost to a New York State resident of a year's veterinary medical education—including tuition, fees, room, board, books, and personal allowance—was estimated to be \$6,050. Ten years later the total cost had risen to \$15,170. A similar increase in student indebtedness has been the result. In 1978 a new D.V.M. graduate might have expected to carry a debt load of \$10,200. Today when the bills are totaled for four years of undergraduate school, topped by four more years in the professional D.V.M. program, our graduates who borrow money begin their careers owing an average \$31,267. Still, nearly all of them acknowledge it is likely to be the best investment of time and money they will ever make. However, students and prospective students are undoubtedly influenced by the rising costs and growing indebtedness. Nationally those factors have had a negative effect on the size of the applicant pool. New graduates with large debts to repay are inclined to forgo lower-paying residencies, internships, and graduate research positions.



C.U. VET. CLASS '04

When the class of 1904 graduated, they could anticipate gainful employment and an average "generous" salary of \$1,200 per year.

In addition to holding the line on tuition increases—and ours have been by far the smallest increases at Cornell University during the past two years—the college is now experimenting with several alternatives to traditional financial aid. We hope that these efforts will provide at least partial solutions to our students' financial problems.

For example, we've initiated a program called VET SEP, which stands for Veterinary Student Employment Program. Begun in the 1986–87 academic year, the program is designed to create jobs for students and to increase their hourly wage rate. Over \$60,000 in a specially earmarked fund was made available to individual departments on a matching basis, which created a total pool of \$84,000. VET SEP is an incentive for the departments to increase employment opportunities for students while increasing the likelihood that students seeking part-time work during the academic year, or full-time summer work, will find a job that will help to prepare them for their future profession and will broaden their exposure to different aspects of veterinary medicine. Financial projections indicate that a student working over the summer has the potential to earn \$2,200 and to save nearly \$1,000 for fall education costs, thereby reducing the amount of



money that he or she must borrow. So far the program has proved mutually beneficial for the departments, the forty-eight students employed during the 1986–87 academic year, and the thirty-five students who worked last summer. Thanks to VET SEP more of our students than ever before are employed in the college during the academic year.

Members of the class of 1989 may graduate facing a debt load that is greater than their average starting salary.

Another initiative is an ongoing program to make even high-interest loans as affordable as Guaranteed Student Loans. In most cases students must have loans to fill unmet financial needs—needs that are not met by scholarships, Guaranteed Student Loans, or personal income. A major drawback is that students must begin to repay the interest on some of those loans while they are still in school. The college is attempting to increase the loans' affordability by making the interest payments for students while they are in school.

Private support for scholarships has been encouraged, as it represents a form of financial support for students that does not increase their debt load and can be supplemented by employment and other forms of personal support. Since 1976 the scholarship endowment has grown from \$161,000 and three benefactors to

Explorations in Veterinary Medicine brought high school students to the campus for a first-hand experience of veterinary medicine.



nearly \$1,900,000 and thirty-seven benefactors. Those sources provide just over \$100,000 in student scholarships annually and a like amount to assure the future appreciation of the endowment.

The college is also sensitive to the academic pressure undergraduates come under if they wish to enter veterinary college. Because of misconceptions regarding prerequisites and a strong sense of competition for the places available in each entering class, students often feel compelled to concentrate on those science courses they believe will enhance their application. Unfortunately they may neglect courses in the humanities, the social sciences, and the arts and cultural opportunities that will enrich their lives. The phenomenon is particularly distressing because it is evident that the profession and society benefit when our graduates face the world not only as excellent veterinarians but also as individuals with a well-rounded general education. A new, experimental Guaranteed Admission Program could help address the problem. Under this program a small number of students will apply for admission after two years of undergraduate work. Their acceptance or denial will be based upon their academic records at that time and the potential they show for success in the profession. If accepted for admission, students would have the choice of entering the D.V.M. program after their third year of undergraduate work or of waiting until after graduation. We hope the program will alleviate much of the pressure to take only courses that are "safe" or that might enhance an application and that it will encourage successful applicants to use the two years following their acceptance as an opportunity for personal growth—for example, through foreign study or course work in languages, arts, philosophy, or business. Of course, deferred-acceptance students would be required to maintain a certain minimum grade-point average.

High school students are encouraged to consider choosing the profession early in their academic careers with a new Cornell summer program called Explorations in Veterinary Medicine, offered for the first time in 1987. Sponsored by Cornell's summer session, Explorations in Veterinary Medicine is a six-week program for juniors and seniors in high school. The students spend mornings in college preparatory courses, and four afternoons a week, for one and a half hours, they experience veterinary medicine through demonstrations and discussions by college faculty and staff members on such wide-ranging topics as exotic animals, embryo transfer, and equine pediatrics.



What of today's graduates? The majority of the members of the class of 1987 entered practice. According to the latest information, 78 percent of the class went into practice, and 62 percent entered predominantly small-animal practices. Eleven percent joined mixed practices, and 5 percent went to predominantly large-animal practices. Of the remaining graduates 23 percent went on to internships, and 2 percent pursued research opportunities at universities.

Women continue to outnumber men in veterinary classes, reflecting a nationwide trend.

The small numbers of new graduates entering research may appear to express a general disinterest in research as a professional goal, but the truth is otherwise. Today's graduates are better prepared than previous classes to pursue alternatives to veterinary clinical practice. One of those alternatives is research. But even if they never enter a laboratory or publish a scientific paper in their professional lives, our graduates need to have the ability to read critically, to analyze complex problems, and to draw information from several sources. Typically, after spending a few years in practice, several members of each class decide to seek further education and ultimately enter positions in academe, industry, or government. Sometimes their interest is sparked by experiences in practice or by the realization that veterinary medicine does not possess all the answers or all the cures.



Out of the classroom and into the laboratory: in the study of theriogenology, students divide their time almost equally between lectures and the laboratory.

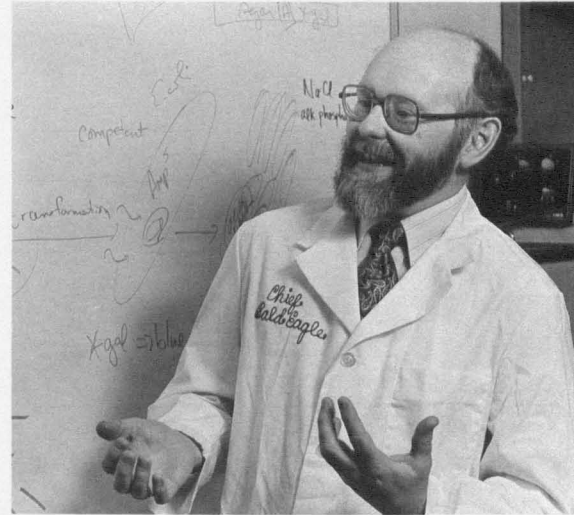
Women continue to outnumber men in veterinary classes throughout the country, including at Cornell. After several years during which women made up slightly over 60 percent of our entering classes, the number of women in this year's first-year class reached 70 percent, the highest percentage of female students ever admitted to a class at the New York State College of Veterinary Medicine. The incoming class of 1991 will be 64 percent female. It is the policy of Cornell University as well as of the state and federal governments to ensure equality of educational opportunity. All applicants are considered equally on their merits.

The lopsided male-female ratio is a sign of the times nationally; fewer men are admitted because the proportion of men applying has grown smaller each year. Certainly it is one area of change that is receiving scrutiny here and elsewhere, and the college is also examining the effect a predominantly female student body has on programs and facilities. For example, we are beginning to assess the need for day-care facilities for our students, faculty members, and staff members with small children. Cornell University has opened an on-campus infant-day-care center for the children of staff and faculty members and students. Already the influx of women has created a problem the architects of the 1950s never anticipated—lack of appropriately positioned locker space. Thirty years ago they built locker facilities to accommodate smaller class sizes and a male

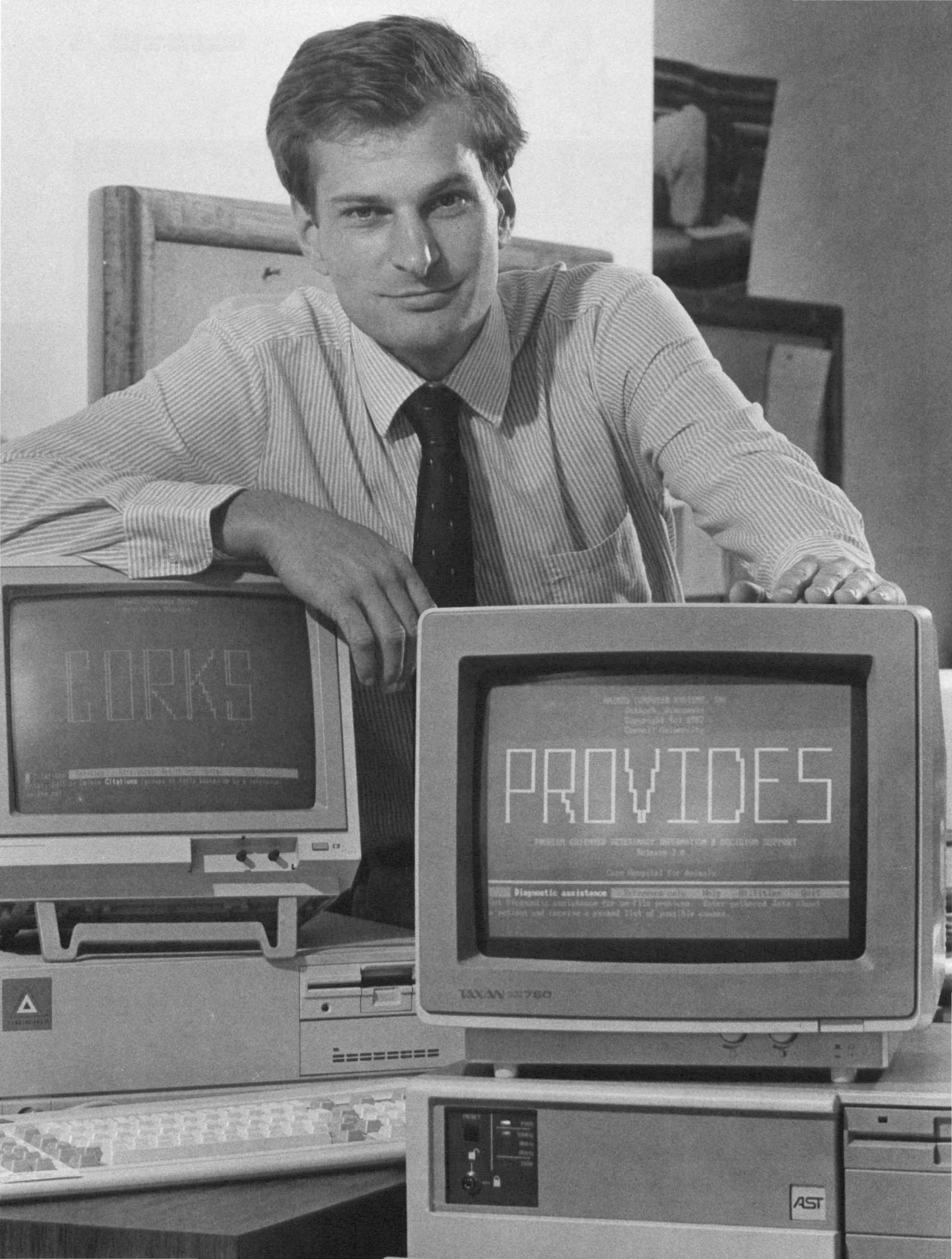
population. Now lockers (and students) are crowded into basements, restrooms, and storage areas. Recognizing that much learning about veterinary medicine goes on among students outside the classroom, we know that providing space to encourage informal interaction among students and faculty members will be part of our planning for new facilities.

Other changes during the past year will have a long-term impact on the college. Those changes include a “changing of the guard,” the appointment of five new department heads in the last year: Dr. Roger J. Avery, in the Department of Microbiology, Immunology, and Parasitology; Dr. David Robertshaw, in the Department of Physiology; Dr. Bendicht U. Pauli, in the Department of Pathology; and Dr. Donald F. Smith, in the Department of Clinical Sciences. Dr. Alexander deLahunta is the fifth new department head, exchanging the chairmanship of the Department of Clinical Sciences for that of the Department of Anatomy. Those individuals, along with the continuing heads, Dr. Bruce W. Calnek, in the Department of Avian and Aquatic Animal Medicine, and Dr. Geoffrey W. G. Sharp, in the Department of Pharmacology, play extremely important roles in the college. Not only do they provide leadership in their respective departments—they also serve as the principal administrative policy-making and leadership group for the College of Veterinary Medicine as a whole. The college is fortunate to have faculty members of their distinction willing to assume the additional responsibilities of leadership.

In this report we look at two areas within the college that have the potential to change the way veterinary medicine is practiced and taught. Our international reputation in one of those areas—research—can be traced back to the foresight and influence of Dr. James Law himself. Through his own commitment to the eradication of disease and to the increased well-being of humans and animals, he set the standards by which we measure our own research contributions to society. The computerization of veterinary medicine, covered in another section of this report, was one development Dr. Law could not have anticipated. In fact, the extent of the computerization of veterinary medicine exceeds what was anticipated even five years ago. Change has been rapid, and if James Law could see us now, he would not recognize the campus, the student body, or the field of veterinary medicine. But I am confident he would quickly respond to the spirit of change and would approve of the progress, innovation, and enthusiasm that pervade the college today.



Dr. Roger J. Avery



CORKS

PROVIDES

ALCOHOL CONSUMPTION SYSTEM, INC.
Pebblebrook, Minnesota
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PROBLEM ORIENTED VETERINARY INFORMATION & DECISION SUPPORT
Release 2.0

Case Hospital For Animals

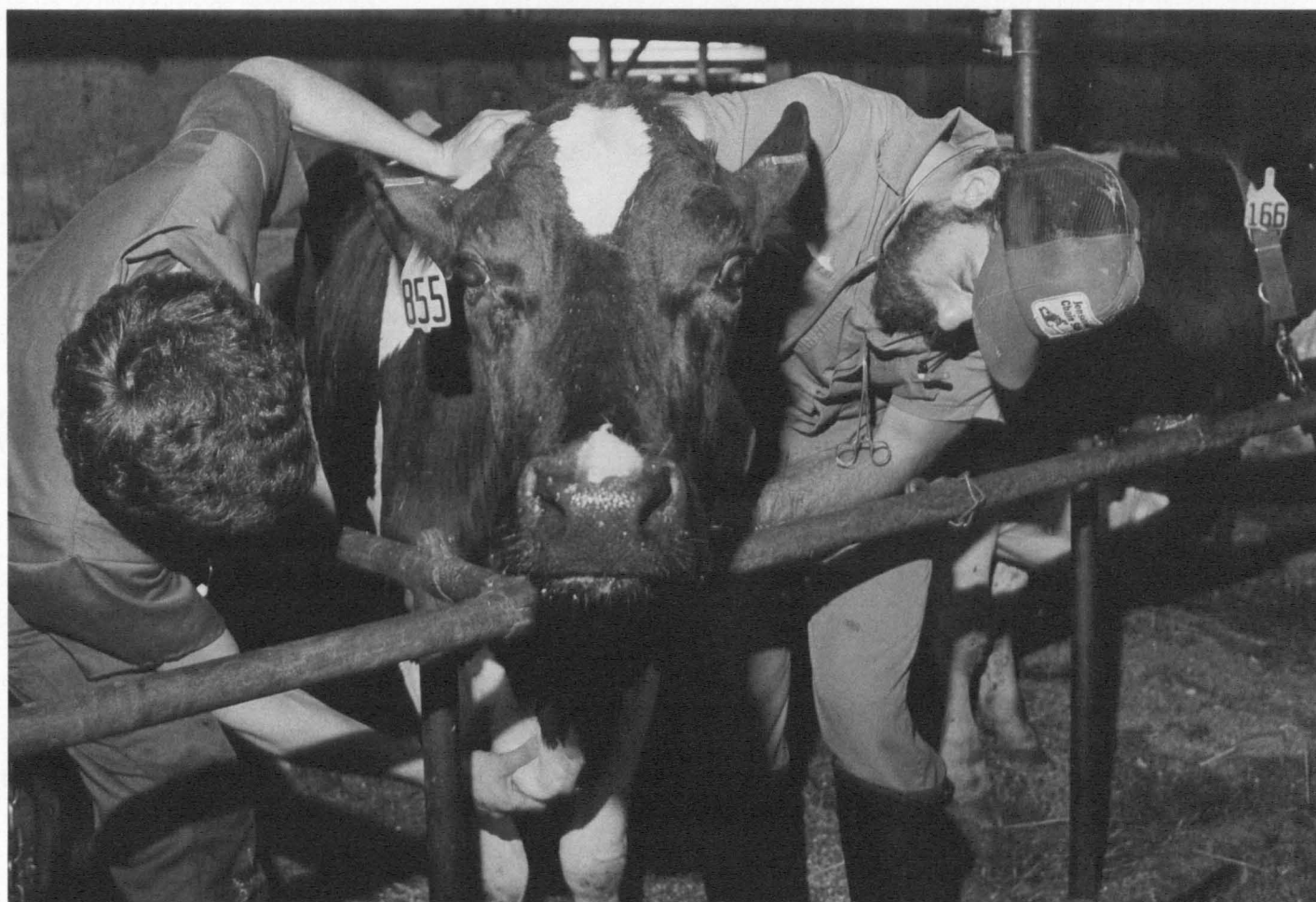
Diagnostic assistance

Get Diagnostic assistance for on file problems. Enter gathered data about a patient and receive a ranked list of possible causes.

TAHAN 2750

AST

THE COMPUTERIZATION OF VETERINARY MEDICINE



▲ In his Ambulatory Clinic work Dr. Charles Guard uses computers to handle data on farm-visit records, dairy-herd performance, and rations.

◀ Dr. Roy V. H. Pollock with the computer programs PROVIDES (Problem-Oriented Veterinary Information and Decision Support) and CORKS (Cornell's Knowledge System)

Recall a patient's record from seven years ago? Find that abstract in the medical literature? Chart the elimination curve of a particular drug? Computers at the New York State College of Veterinary Medicine can do it for you.

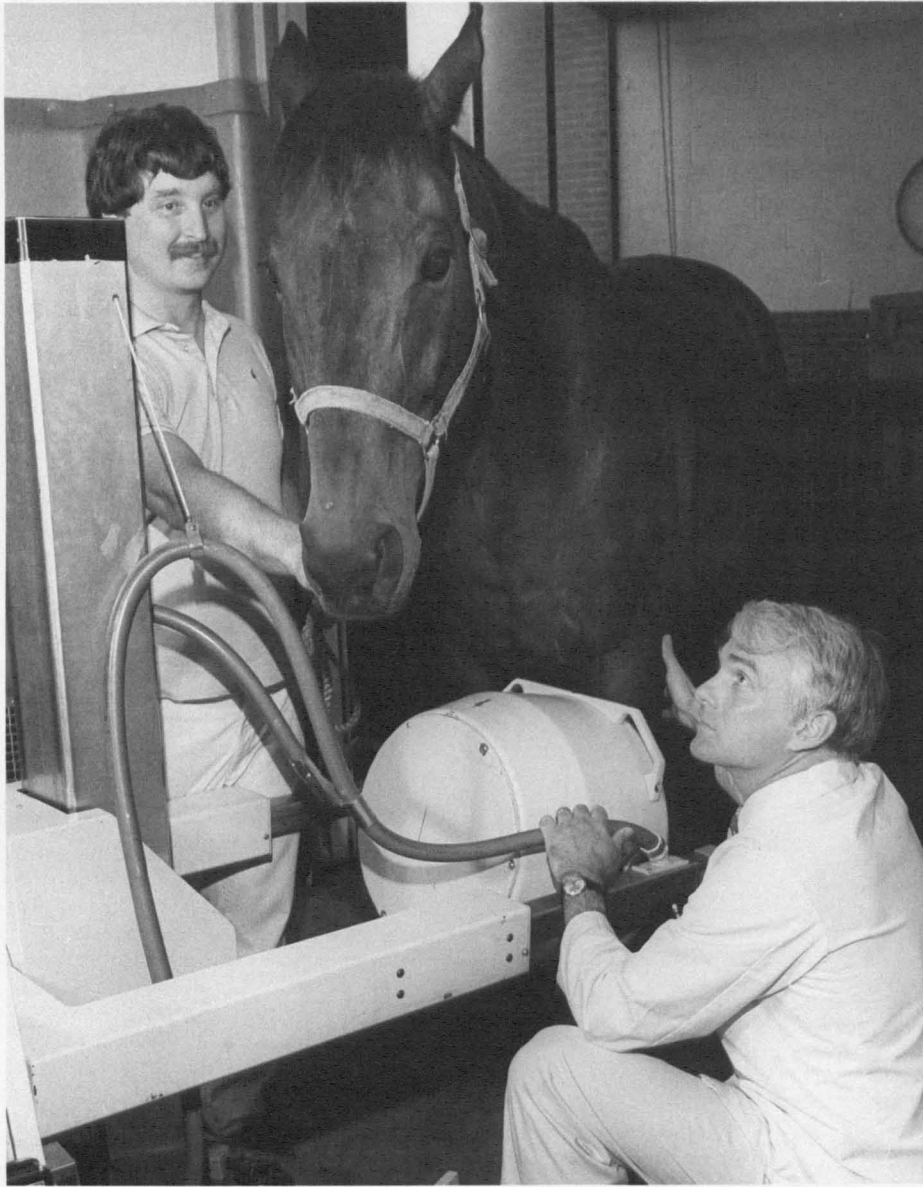
John M. Lewkowicz, the director of the computing facility, has watched the inroads computer technology has made into veterinary medicine. In the last five years, he says, the college has acquired 450 microcomputers. (In 1982 it had only 3 microcomputers.) What is the college doing with computers?

The applications are as varied as the disciplines and individuals. Some programs are meant for the classroom. In the Department of Physiology Dr. Alan Dobson has written an acid-base simulation program for use during lectures and discussion. The program calculates the titration of the buffers when either carbon dioxide or hydrogen ions are added to or subtracted from extracellular fluid. It can thereby simulate the pathways for four major primary acid-base

disturbances and the response of a patient to each disturbance.

Last fall students in pharmacokinetics were introduced to a program that helps them to understand the factor or combination of factors that will slow or speed the elimination of drugs from the body. In the instructional portion of the program students are shown how changes in various external and internal factors may affect drug residues. In the graphics section students can study the effect of any of the physiological factors that influence absorption or elimination and dose and dosage interval. Graphs are created that give a dynamic picture of what happens to a drug. The computer-assisted instruction and utility program was developed by Dr. John G. Babish and Dr. Robert E. Oswald, of the Department of Pharmacology, and Dr. Arthur L. Craigmill, of the University of California.

In a clinical and classroom application Dr. Charles Guard, with members of the faculty of the Ambulatory Clinic, is using microcomputers for data handling. Func-



The gamma camera's computer collects and stores information on imaging studies performed by Dr. Francis A. Kallfelz and a technician, Bob Wallace.

tions include storing, retrieving, and analyzing farm-visit records, monitoring and evaluating dairy-herd performance, and analyzing and formulating rations for dairy herds. The information generated from the analyses is used to identify areas in which herd productivity might be improved. Senior students participate in the analyses and in discussions with farmers and thus gain experience in assessing the influence of management and, especially, feeding practices on milk production.

Faculty and staff members use computers every day, whenever they tap into the medical records program. The program depends on a centralized computer system, called MUMPS, which is accessed from over a hundred terminals throughout the college. The system has served as the

workhorse of the college's mainframe computer since 1975. In addition to containing a basic medical record that supplies an on-line summary for every patient seen since 1975, the program keeps a record of client scheduling and a record of support services. For example, in the pharmacy the computer will record the prescription, sale, and dispensing of drugs and even type the prescription labels. The most recent laboratory results from clinical pathology are entered directly into patients' records, and necropsy reports are also recorded. Sophisticated search packages are available that allow students and teachers to retrieve cases on the basis of diagnosis, procedures, and a variety of other parameters. In an effort to make the programs increasingly fast and user-friendly, continual revamping takes place. Cornell's veterinary college has shared the medical records system with all the veterinary institutions in North America, and four other schools have already adopted all or part of the Cornell system.

The MUMPS system also organizes and communicates information on the college's phone directory, job placement files, diagnostic laboratory programs, personnel files, and financial records. Of course, access to sensitive files is strictly limited, and for even the most routine files users must give their personal passwords. In the Office of Student Affairs and Admissions computers assist in the admissions process, compiling statistical data on applicants. Computer programs are used routinely for determining the sequence of clinical rotations, compiling course grades, and coordinating class schedules. Job opportunities are listed under a computer file called JOBS, and users can learn about available jobs by state and by practice type.

Flower Veterinary Library's Microcomputer Center is available for use by students, faculty, and staff. Assorted software packages are provided for word processing, data analysis, graph production, and other projects. Heavy use of the facility has prompted plans for a new, larger microcomputer teaching library, which will be down the corridor from the library. The college has received a grant, through Cornell's Project Ezra, that is large enough to equip the facility with nearly thirty IBM/ATs with enhanced graphics adapters and monitors, one interactive video-laserdisc PC/AT for rapid searching through texts, and at least two Macintosh microcomputers. The facility will have MUMPS connections and access to other Cornell campus mainframes, and hence to BITNET, an inter-university electronic-mail system. Presently the users of the Flower Veterinary Library have computer access to five-and-a-half

years' worth of citations, with many abstracts from MEDLINE, an on-line data base for the medical literature, which is updated quarterly. This represents a valuable expansion of librarian-assisted on-line search services. They will also find an on-line information service, designed by veterinarians for veterinarians, that offers access to bibliographic data bases of citations.

Computer programs to assist veterinarians in clinical practice are being developed by college faculty members. CONSULTANT, a system for computer-assisted differential diagnosis, went international last year with the licensing of Ontario Veterinary College for in-house use of the program. Developed by Dr. Maurice E. White, of the Department of Clinical Sciences, CONSULTANT is one of the first diagnostic data bases available for widespread use in human or veterinary medicine. The program contains information on hundreds of toxic agents and on nearly six thousand diseases of dogs, cats, horses, cattle, sheep, goats, and swine, including almost two hundred diseases not native to North America. In the United States the data base is accessed through a telephone hook up to the college's MUMPS system.

PROVIDES (Problem-Oriented Veterinary Information and Decision Support System) is a microcomputer-based information system for small-animal medicine designed for use in veterinarians' offices. A sophisticated program, it factors in clinical findings and age, sex, and breed predispositions for various diseases, as well as patient histories. The program also contains up-to-date information on tests, treatments, and prognoses, all backed by on-line abstracts. Animed Computer Systems markets the program to veterinarians under a license from Cornell.

Daily, computers and computer programs prove their worth in diagnostic work. In clinical pathology the newly purchased DACOS chemistry system runs an entire series of tests on each sample, replacing an old system that ran one test at a time. The faster, more efficient system is state-of-the-art, and its software can easily be modified to increase the number of tests DACOS can perform. The computer comes with a menu of routine tests, but its capacity is great enough to accommodate a program for almost any test desired. Right now DACOS has an impressive level of ability to store and retrieve information, plot graphs, and compare quality-control data. A program is being written that will also allow DACOS to interface directly with the college-wide computer system to speed data handling and reporting. In the Department of Clinical Sciences the radiology section has acquired a new gamma cam-

era that performs normal imaging studies of small and large animals and stores the information collected by means of a computer. Manipulations of that information as a function of time and location allow the determination of organ function characteristics, such as cardiac stroke volume, heart-wall motion, blood flow to the kidneys, and filtration of waste products.

It would not be an exaggeration to say computers have revolutionized the running of the modern research laboratory. Use of computers is facilitating a vaccine study, at the Feline Health Center, involving large numbers of test subjects. A new program records data on exposure, agent, dose, route of administration, clinical signs, and other factors that are generated from the dozens of cats in the study group. Then the program automatically analyzes the data and prints out graphs comparing and contrasting the different groups. Researchers in the Department of Avian and Aquatic Animal Medicine are using computers in a similar manner. There the computers are linked directly to equipment for the continuous collection of data. The faculty at the James A. Baker Institute for Animal Health uses computers to operate a fluorescent-activated cell sorter in the college's Flow Cytometry Laboratory. They are also exploring ways to use the capabilities of Cornell University's supercomputer.

The Laboratory for Pregnancy and Newborn Research is using computers in its \$3 million study of the interactions of fetal neuroendocrinology, parturition, and the myometrium, in sheep and monkeys. The laboratory's director, Dr. Peter W. Nathanielsz, and his coresearchers in the Department of Physiology depend on computers for continuous monitoring of fetal development and uterine muscle activity. Those data are then analyzed to determine their interrelationships. With that information the researchers hope to be able to predict abnormal labor or premature labor, either of which has disastrous consequences for a fetus or a newborn. This research has relevance for human pregnancy, where such studies have already led to improvements in the management of pregnancy, perinatal care, and the care of newborns who are at risk.

Of course, computers are the sine qua non of modern epidemiologic research. Multiple logistic regression and other modeling techniques, which allow researchers to tease out the interlocking factors in real-world health problems, are impossible without substantial computer support. Ongoing studies in the Section of Epidemiology, involving everything from bovine reproduction to feline hyperthyroidism, are applying powerful new techniques to a wide range of veterinary problems. In one

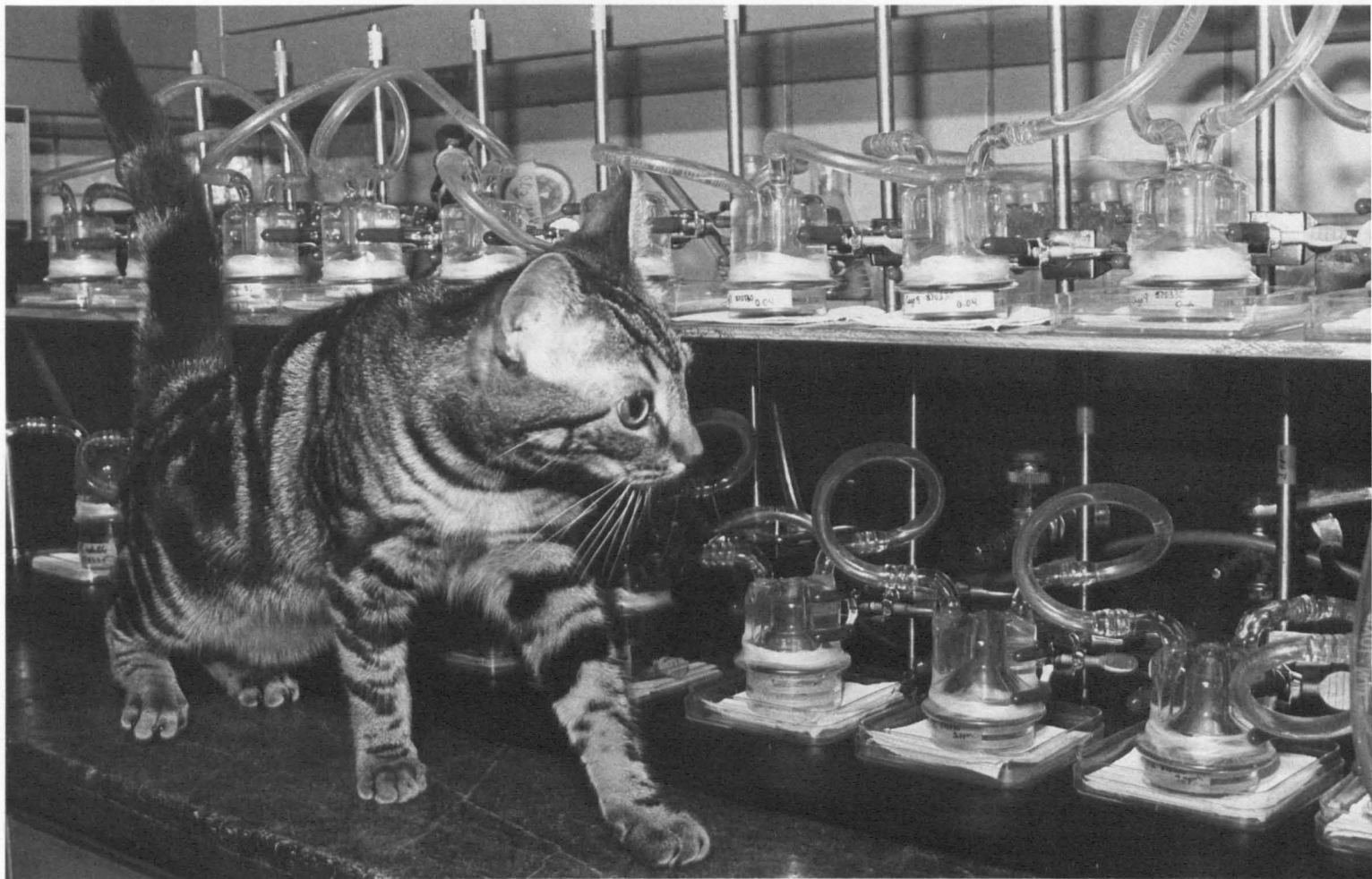
instance that is typical of the rapid progress in this field, Dr. Yrjö T. Grohn, a visiting assistant professor of epidemiology, has a data base so large, he must use Cornell's supercomputer to do analyses.

Have computers increased productivity? Certainly computers in the research laboratory are saving hours of work in recording, compiling, and analyzing information. Likewise, computers are worth their weight in microchips when they "crunch" statistical data or generate graphs and charts in formats that can be changed at the wish of the researcher. The programs available for medical records, student affairs and admissions, department accounts, and personnel ease and expedite handling the work load. For improved coordination of the curriculum, programmers are devising a computerized "curriculum map"—a new project that catalogs the total veterinary medical curriculum, noting what is taught in each course, when and where subjects are covered, and the level of instruction. Instructors will soon be able to check the map for overlaps and gaps in courses.

One of the newer developments in the application of computers to education is the construction of knowledge nets. A knowledge net is an indexing system that indicates not only key words but also what an article says about the relationships among those words. The National Library of Medicine has awarded a three-year grant to Dr. Roy V. H. Pollock, director of the Center for the Study of Medical Informatics, to study computer-based knowledge nets for medical information. The principal goal of research on knowledge nets is to develop and test a method of organizing medical knowledge, using canine medicine as a model, that makes information optimally useful for developing and updating computer-aided diagnostic programs. Efficient methods of updating such programs are critical, since the effort involved in updating will likely be far greater than that required to devise the programs in the first place, and the programs will be useful only so long as they remain current.

Working their way into everything we do, computers are almost impossible to avoid. They augment human skills, serving to collect, store, analyze, and pictorially represent data. Computers will undoubtedly play an increasingly important role in medicine in the future.





▲ Growing fleas in an artificial system in the laboratory eliminates the animal host.

◀ Dr. Beth Valentine examines two dogs from the muscular dystrophy group.

Somewhere in the Florida Everglades a veterinarian and a professional tracker are tagging one of the few remaining Florida panthers. The samples they take are on their way to Cornell within hours.

Tests reveal the big cats have an unusually high incidence of infection with feline panleukopenia. Current research suggests that this virus, in conjunction with external stresses such as inadequate diet and a heavy parasite load, could be the cause of heavy losses among Florida panthers.

A paper by a pharmacologist at the College of Veterinary Medicine on the control of chloride secretion within cells draws the attention of researchers studying cystic fibrosis in people. The pharmacologist is invited to share his findings with an international assembly of cystic fibrosis experts.

In the Veterinary Medical Teaching Hospital two patients are admitted after the sudden onset of an unknown disease on a farm, where some of the breeding stock have gone blind. Microbiologists and virologists

from the college are called in to work closely with clinicians on diagnosis and prognosis.

A virus is isolated as the culprit and a killed vaccine is recommended to check the spread of the disease on the farm.

REAL-WORLD PROBLEMS IN THE LABORATORY

Research at the New York State College of Veterinary Medicine is increasingly focused on the full spectrum of society's health needs and priorities. For example, college scientists are looking at how the body protects itself against parasites, the link between hepatitis and liver cancer, the causes of atherosclerosis, the gene that transmits muscular dystrophy, the gastrointestinal controls of food intake, and the link between obesity and ketosis. "Major advances in the treatment of disease are still going to come out of basic research,"



Dr. Richard A. Cerione works with light receptors in his laboratory.



A graduate student in pharmacology, Cheryl Bliss, helps conduct research on diabetes.

says Dr. Geoffrey W. G. Sharp, chairman of the Department of Pharmacology. In the department's pharmacological research—work that deals on a very basic level with molecular mechanisms and membrane function—information drawn from current research has direct applications to such health problems as seizure activity, diabetes, neuromuscular disorders, antiinflammatory reactions, certain cardiac myopathies, and growth.

Dr. Wayne S. Schwark's work explores the neurochemical and neuropharmacological basis of an experimental seizure model, and Dr. Sharp is developing a physiological approach to the treatment of diarrheal diseases. Dr. Gregory A. Weiland's research centers on the role of receptors and action of ion channels in the nervous system. The properties of acetylcholine receptors are being studied by Dr. Robert E. Oswald. Acetylcholine receptors are proteins that function in all vertebrates as the first point of the muscles' recognition of signals sent from the nerves. After purifying a protein Dr. Oswald studies the structure of the acetylcholine receptor, using biochemical techniques, and studies the function of individual receptors, using single-channel recording. The technique lets him watch as the receptor opens and closes its electrical pathway, allowing ions to flow into the cell

and relaying impulses between nerve and muscle. Dr. Richard A. Cerione, a Pew scholar, concentrates his biochemical research on two major areas, vision systems and cell proliferation. He is interested in how the light receptor rhodopsin activates proteins in the eye to produce sight. This receptor-coupled signal system is actually serving as a model for the second area of Dr. Cerione's work—cell proliferation. By applying what he learns about the interactions within the vision system to similar processes mediated by growth-factor receptors, he hopes to isolate the sequence of events leading to cell proliferation, and the components directly responsible for tumorigenesis.

In the Department of Physiology basic research has shown how to control reproductive cycles in farm animals, developed a successful contraception method in dogs, told us how and where vitamin D and calcium are absorbed, devised a way to predict iron deficiency, demonstrated how intestinal cells change in normal and disease states, and identified the mechanism that may trigger epileptic activity in the brain. We also know more about the peripheral nervous system because of work that led to a model of the neural networks in the spinal cord.

A retinal physiologist, Dr. Ellis Loew, has linked vitamin E deficiency in the diet of dogs to severe changes in vision, including blindness, that may bear directly on the development of senile macular degeneration in humans. Dr. Loew's investigations into vitamin E deficiency began with a nutritional study by Dr. Ben E. Sheffy, of Cornell's James A. Baker Institute for Animal Health, and Dr. Ronald C. Riis, of the Small Animal Clinic. In working with dogs deficient in vitamin E, Dr. Riis noticed the dogs also had eye lesions that produced night blindness and eventually, if the deficiency was long-term, complete blindness. The dogs were referred to Dr. Loew for an assessment of the physiological state of their eyes. Using noninvasive clinical tests, he found that severe changes had indeed occurred in the neurophysiology of their eyes that correlated with ophthalmoscopic and microscopic retinal damage. With a college Biomedical Research Support Grant, awards from the National Eye Institute and the Hoffmann-LaRoche company, and regional Hatch funding they began studying the effects of vitamin E deficiency in young dogs and found that the retina degenerates if the dog does not receive vitamin E in its diet. Fortunately the retinal damage caused by vitamin E deficiency can be halted with early detection and treatment. Dr. Loew's present research concentrates on the interaction of vitamins E and A.

A form of muscular dystrophy found in dogs is being studied by pathologists. Muscular dystrophy is a condition in which there is a progressive degeneration of muscle tissue. The canine disease is carried by an unaffected mother and passed on to her male offspring. That characteristic, says Dr. Barry J. Cooper, indicates that the disease is an X-linked form of muscular dystrophy, because the gene for the disease is carried on the X chromosome. The finding is important to an understanding of the disease in dogs and is of particular interest to Dr. Cooper and his associates because canine X-linked muscular dystrophy also may be a very appropriate animal model for studying a devastating and inheritable form of muscular dystrophy in humans.

Clinical scientists have for the first time experimentally produced liver cancer in woodchucks infected with the woodchuck hepatitis virus. The finding could help speed the effort to develop effective methods for combating viral hepatitis and liver cancer in humans because the woodchuck hepatitis virus is genetically and biologically closely related to human hepatitis-B virus. Scientists have recognized the link between liver cancer in humans and infection with hepatitis-B virus, but their data have been mainly from epidemiological studies. The studies in woodchucks provide direct experimental support for the view that the woodchuck hepatitis virus and, by analogy, the hepatitis-B virus are oncogenic. Worldwide more than 200 million people are chronically infected with hepatitis-B virus, and an estimated 250,000 people die of liver cancer annually. Chronic hepatitis and cirrhosis of the liver often precede development of liver cancer. Human infants appear to be more susceptible to chronic infection with hepatitis-B virus than adults, but the infection may remain clinically silent without producing any overt symptoms for twenty to thirty years. As a result millions of adults around the world are carriers of the virus and ultimately may develop liver cancer. According to Dr. Bud C. Tennant, who directed the woodchuck study at the College of Veterinary Medicine, new types of vaccines and antiviral drugs developed and tested using the woodchuck as a model may be available for the control and treatment of hepatitis-B virus infection in humans.



Dr. Barry J. Cooper dissects tissue samples for enzyme histochemistry.

COMPANION-ANIMAL HEALTH RESEARCH

We're learning more about the diseases of companion animals, partly through new, highly automated research and diagnostic capabilities. Gamma cameras can count pinpoints of radioactivity accumulating at minute lesions and display the results in color. With ultrasound, clinicians can watch heart contractions without invading the body. Automated hematology instrumentation is used to characterize leukemia, and other diagnostic tools detect pancreatitis in dogs asymptomatic for the disease.

But in the midst of technological improvement it is the scientific curiosity and experience of scientists that produce new approaches, discoveries, and interspecies applications. In feline research Dr. Fredric W. Scott and his co-workers at the Feline Health Center may be close to producing a vaccine for feline infectious peritonitis. The researchers who produced the parvovirus vaccine in 1980 continue to study the mechanisms of canine parvovirus infection and have begun work on the development and evaluation of diagnostic tests for *Brucella canis* infection. More is known about hip dysplasia thanks to work by Dr. George Lust and Dr. Nancy I. B. Wurster on the de-



Woodchucks are models for a study of hepatitis-B virus infection and liver cancer in humans.



The ground for James Law Hall, the first of the college's buildings, was broken in 1895. The main building housed offices, a museum, an amphitheater, a library, and laboratories for the study of anatomy, pharmacy, physiology, pathology, bacteriology, and histology.

velopment of hip joint instability and associated osteoarthritis. Their work in osteoarthritis has led to new information on the abnormalities of cartilage metabolism that accompany canine hip dysplasia—findings that should be directly applicable to human osteoarthritis. Applications to human disease are an increasingly important aspect of studies of autoimmune and related disorders of companion animals. The cross-species context is evident in the use of feline leukemia virus (FAIDS) as a model for AIDS in humans. Studies by Dr. Fernando de Noronha on the effects of newly developed drugs for the treatment of FAIDS and their mechanisms of action against that virus could lead to new approaches in the treatment of AIDS.

Clinical research in companion-animal health often follows a faculty member's area of specialization: a dermatologist studies skin allergies in dogs and cats; a cardiologist, cardiopulmonary diseases in

cats. Surgeons are involved in improving gastrointestinal surgical techniques, thyroid-parathyroid surgery in cats, and renal transplantation and approaches to perianal fistulae in dogs. Comparative oncology is a growing research interest. An anesthesiologist, Dr. Charles E. Short, developed Resusci-Dog as an animal substitute in teaching the detection of cardiac arrhythmias and cardiopulmonary resuscitation. Ophthalmologists are investigating the etiology of cataracts, corneal and retinal disorders, and canine keratoconjunctivitis sicca.

Two parasitologists, Dr. Susan E. Wade and Dr. Jay R. Georgi, have found a way to feed adult fleas artificially and estimate with scientific accuracy their normal mortality rate. Why? Well, if a way is ever to be found to rid houses and animals of fleas, scientists need to know how the pests feed and reproduce, produce allergies in their hosts, and react to chemicals designed to stop

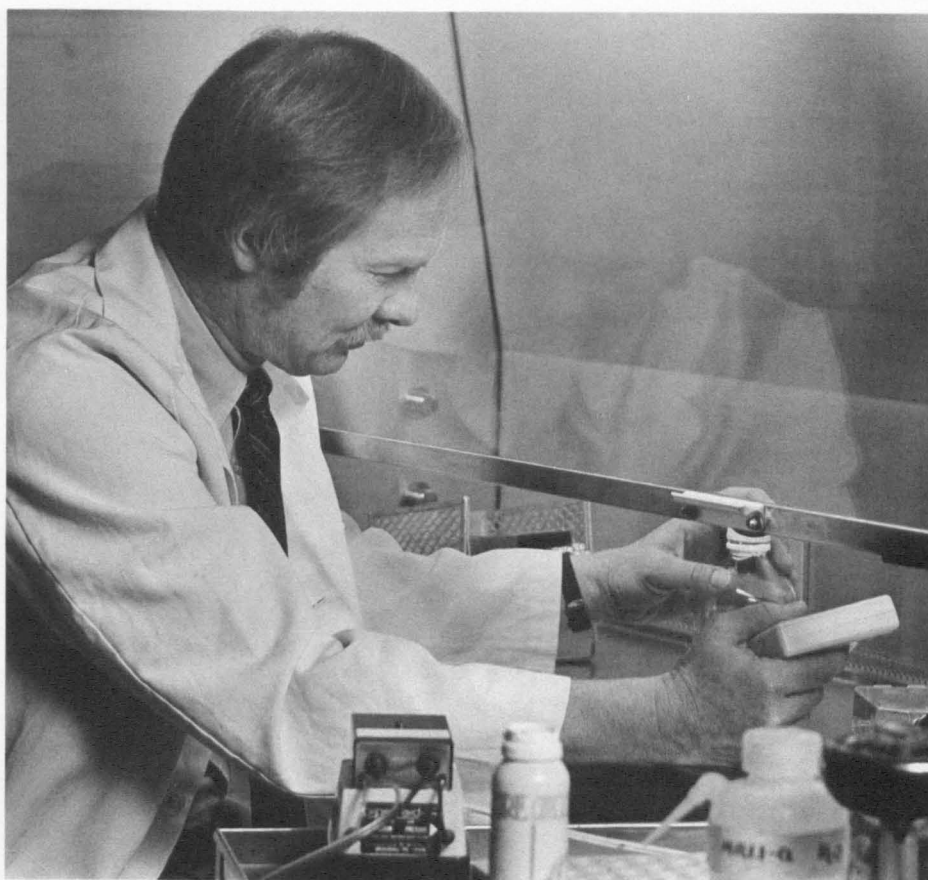
them. For effective study there must be ready access to large numbers of fleas. Future work will include perfecting the feeding system and learning more about the biology of fleas in such areas as nutrition, environmental requirements, genetics, behavior, and reproduction. The artificial system can also be used to study the effects of toxicants and growth regulators on fleas, the transmission of blood-borne disease organisms to fleas, and flea allergies in dogs and cats.

FOOD ANIMAL RESEARCH

Work on the diseases and other problems of food animals is historically one of the strongest areas of research at the college. Ambulatory clinicians and epidemiologists are involved in the development and application of epidemiological and statistical programs for support of animal health. They're also interested in the effect sub-clinical Johne's disease may have on mastitis and reproduction in dairy cows and in the long-term effects calfhood diseases may have on productivity and health. Metabolic and nutritional studies have traced the development, and now aid in the diagnosis of, deficiencies of selenium and vitamin E. Livestock owners will benefit from a continuing study on the effectiveness of certain broad-spectrum drugs in the treatment of specific infectious diseases, including mastitis.

Dr. Neil L. Norcross has completed development of a vaccine against the most common organism that causes mastitis. The mastitis vaccine is now being tested in the field.

In the meantime other important infectious diseases, such as bovine paratuberculosis, bovine viral diarrhea (BVD), and brucellosis, must be prevented. That is a difficult and complicated task. Dr. Edward J. Dubovi is researching easier methods to identify and characterize cattle persistently infected with BVD virus. The diagnosis of Johne's disease, or bovine paratuberculosis, is hampered by a lack of accurate and sensitive tests. Even serological tests fail to identify all infected animals, and the only practical method of laboratory diagnosis relies on culture of the organism from feces, a procedure that is labor-intensive and requires from six to twenty weeks before growth is detectable. Dr. Donald R. Callihan and researchers in the Diagnostic Laboratory are seeking new approaches for a more rapid and accurate test. Dr. Alexander J. Winter continues the search for better diagnostic tools for latent brucellosis in cattle. Dr. Sang J. Shin and his associ-



Dr. David O. Slauson at work under the hood in a tissue culture laboratory

ates have recently completed a project, with several national bovine artificial insemination organizations, designed to combat certain bacteria in processed semen. Their research has enabled the organizations to export an increased volume of semen to other countries.

To improve fertility in cows, Dr. William Hansel and Dr. Joanne Fortune are examining the control of corpus luteum function in nonpregnant cows and cows with cystic ovarian disease. Dr. David O. Slauson and Dr. Donald H. Schlafer are studying bovine fetal and neonatal responses to infection. Dr. Schlafer is also studying placental function as it relates to the pathophysiology of abortion. The early identification of embryos carrying abnormal genes soon may be possible, thanks to a study by Dr. Ronald R. Minor. He is biochemically characterizing the protein abnormalities resulting from new mutations in the germ line cells of clinically normal Holstein bulls.

Combine pregnancy and lactation with undernourishment, and hypoglycemia and disorders of amino acid metabolism may occur. Although studies in this area are of great importance to the animal industry, the work can also be applied to problems of



Dr. Paul R. Bowser inspects trout raised in an experimental aquaculture system.

human health. From measurements of metabolism during obesity, a physiologist, Dr. Emmett N. Bergman, found that blood insulin concentrations are higher in obese than in lean sheep and that obesity definitely increases the sensitivity of the pancreas to secreted insulin. Amino acid production and removal are also affected.

AVIAN AND AQUATIC ANIMAL MEDICINE

Pet and wild birds and domestic poultry benefit from research at the college. Vaccines have been developed to combat a viral hepatitis in psittacines, Pacheco's disease, and pox infections in canaries. The Poultry Diagnostic Laboratory at Cornell maintains surveillance to detect outbreaks of serious poultry diseases, such as avian influenza, that have cost the poultry industry in the mid-Atlantic states over \$59 million in recent years. The study of how poultry diseases affect economical production is a specific research project at the laboratory. Dr. Karel A. Schat participates in a project to determine the genetic basis of resistance to avian diseases, and several researchers, including Dr. Julius Fabricant, Dr. Syed A. Naqi, and Dr. Benjamin Lucio-Martinez, are cooperating to study immune mechanisms in the diagnosis and control of important poultry diseases. The efficacy and safety of the use of *Pasteurella anatipestifer* vaccine on domestic white Pekin ducks are now being assessed, as are drugs to control bacterial and viral diseases, including duck plague. Vaccines have been produced to combat Marek's disease and mycoplasma-related infections. In the study of Marek's disease Dr. Bruce W. Calnek and coresearchers at the college have unraveled much of the mystery about why the Marek's disease herpesvirus causes tumors in some birds but not in others. Collaborative work by Catherine G. Fabricant, of the Department of Microbiology, Immunology, and Parasitology, and Julius Fabricant produced the first evidence that atherosclerosis was caused by a herpesvirus (Marek's disease virus), and research evidence strongly suggests that a vaccine that prevents herpesvirus-induced tumors in chickens will also prevent herpesvirus-induced atherosclerosis. It is possible that a vaccine against human herpesvirus can be formulated to protect against human atherosclerosis.

Aquaculture, a potential cash crop for New York State, is a burgeoning area of interest, both in the laboratory and on New York's lakes, rivers, and streams. At the college a greatly expanded fish diagnostic laboratory, under the direction of Dr. Paul R.

Bowser, offers assistance on how to maintain fish successfully, whether for commercial or laboratory use. Researchers are also looking at fish diseases of economic importance; the diagnosis and the control and prevention without drugs of bacterial kidney disease in fish is one area of concern. The Department of Environmental Conservation is providing funds for a study of the extent, nature, and causes of anomalies observed in fish in New York. Papillomas, or benign tumors, have been found in the mouths and, occasionally, on the bodies of brown bullheads, walleyes, largemouth bass, and lake trout. Although it's too soon to tell what causes fish papillomas, there is concern that their development may be traced to contaminants in the water. Affected fish may be a first alert for pollution problems that could affect human health.

EQUINE RESEARCH

At the College of Veterinary Medicine clinical and laboratory equine research meet to an extraordinary degree. Data from a long-term study by a pathologist, Dr. Lennart P. Krook, and by Dr. George A. Maylin, director of the Equine Drug Testing Program, seem to show that track conditions have no influence on the incidence of fractures or soft-tissue injuries sustained by horses during races. They reached that conclusion after analyzing data on nearly seventy thousand starts at three thoroughbred tracks operated by the New York Racing Association. The ramifications of their study could alter the production of thoroughbred yearlings, race training, and the very nature of the thoroughbred business.

Not all horses race, but nearly all horses are susceptible to strangles and to influenza infection. The development of vaccines for those diseases has made substantial progress. Only the results of field trials are needed before protective vaccines, including Dr. John F. Timoney's intranasal vaccine against strangles, can become available. In the meantime a new avenue of vaccine production is being explored. In the new procedure the piece of genetic material that engenders the immune response is lifted out of the equine influenza virus and inserted into the smallpox-vaccine virus (vaccinia), which is then used to vaccinate against the targeted disease. Vaccinia virus is used because it is unusually large, has many empty spots in its genetic material that can be filled with patched-in material, and has been studied extensively since its identification nearly two hundred years ago. Experimental vaccines for hepatitis B, herpes simplex, and human influenza are already being made



and tested using vaccinia and the patchwork method.

Owners of performance horses are following with interest a study on the effects of training and diet on energy utilization in racehorses. Originally funded in 1986, the research seeks to determine some of the energy demands of race training, including postexercise energy demands. Dr. Harold F. Hintz and his graduate students have devised a system to determine energy expenditure by measuring the oxygen consumption and carbon dioxide production of horses at hard work. There is increased interest in the use of fats as an energy source in horses, so the study will also assess the effects of fats on the performance of racehorses.

Idiopathic laryngeal hemiplegia, or roaring, is probably the most common upper respiratory disorder in performance horses; some authorities feel that up to 95 percent of those horses are affected clinically or subclinically. In this condition half the larynx is paralyzed, resulting in an airway that is markedly smaller than normal. That narrowing leads to respiratory noise and poor performance, such as quitting toward the

end of a race or during a strenuous workout. Dr. Normand G. Ducharme and Dr. Richard P. Hackett, Jr., of the Department of Clinical Sciences, are studying the reliability of endoscopic examination as a diagnostic tool in roaring. The major goal of their project is to develop and refine a grading system to describe laryngeal function in horses accurately. Such a classification system would encourage more thorough and precise evaluation of laryngeal function in horses of all ages.

Dr. Ducharme and Dr. Hackett are also collaborating with a veterinary anatomist, Dr. John F. Cummings, to obtain close-ups of the horse's larynx, a procedure made possible by the purchase, with a grant from the Harry M. Zweig Memorial Fund, of a new operating microscope. This magnified look at the larynx is part of a research project that hopes to shed light on the causes and surgical treatment of laryngeal hemiplegia. Through use of the operating microscope the nerves that supply the equine larynx will be identified and injected with a chemical marker. The marker will be used to track the nerves to the brain and spinal cord. Then electron microscope techniques can

Dr. Pamela Livesay-Wilkins checks the progress of a foal in the Equine Neonate Unit.



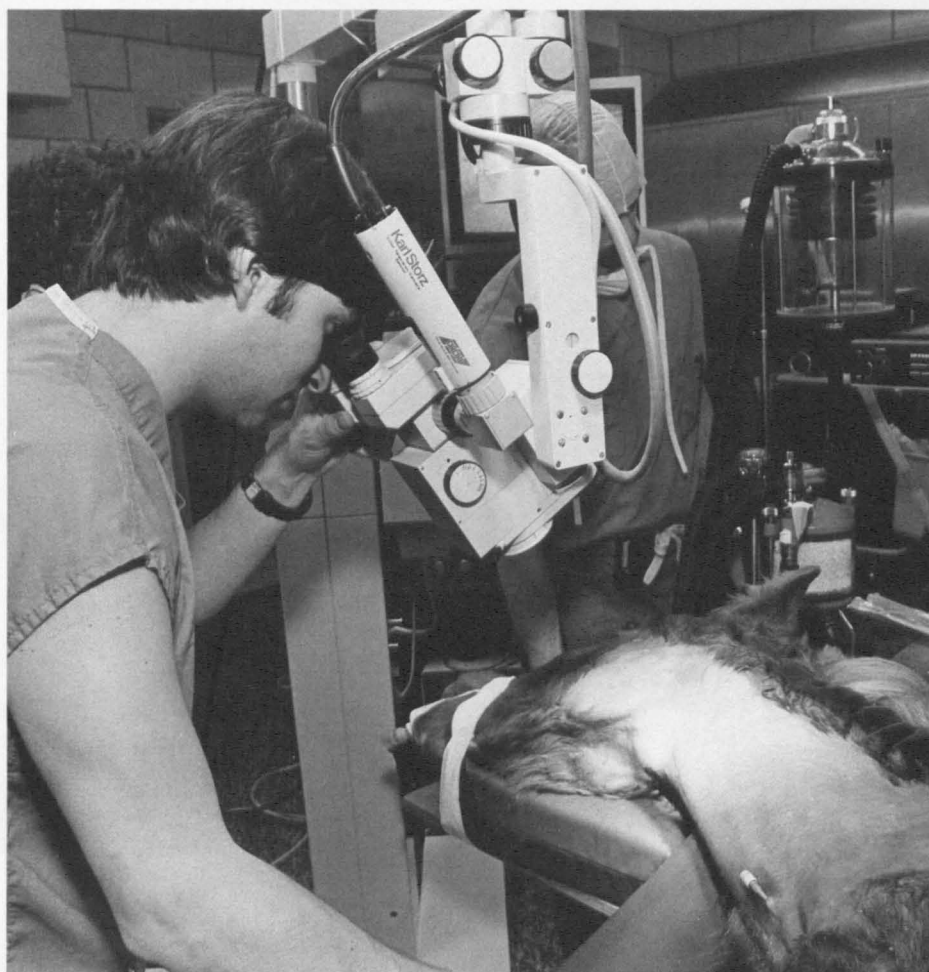
The college's first chief of surgery, Dr. Walter L. Williams, wrote in 1906, "I operated that day on three roarers, one ear tooth, one diseased grinder, one suppurating navicular bursa—six in all. . . ."

be used to examine the nerves of affected and normal horses for a truly comprehensive study of the location and causes of the nerve damage that leads to roaring. The effectiveness of nerve transplant techniques for reinnervation eventually will be assessed.

The study of pulmonary function in anesthetized thoroughbred horses may at first seem peripheral to the more obvious problems of the equine athlete, but whenever surgery on a horse is contemplated, one of the major problems connected with the use of anesthesia is shortage of oxygen in the patient's blood, which can result in severe complications. An anesthesiologist, Dr. Robin D. Gleed, and a physiologist, Dr. Alan Dobson, have identified ways to minimize the problem through changes in the horse's posture, and they are now looking for drugs that will correct low blood oxygen.

Productive research into neonatal maladjustment syndromes and similar disorders and the development of specialized equipment and testing procedures have im-

proved the effectiveness of care for newborns. A direct outgrowth of those advances is the Equine Neonate Unit, in the Large Animal Clinic. The unit is now operating and providing intensive care for critically ill foals. Although the unit was designed to accommodate foals up to two weeks of age, it is an option for any foal whose condition requires round-the-clock care.



Dr. Robin D. Gleed, an anesthesiologist in the Veterinary Medical Teaching Hospital, is investigating pulmonary function in horses, with Dr. Alan Dobson.

Dr. Norman G. Ducharme adjusts the operating microscope in a project that may shed light on the causes and surgical treatment of roaring.

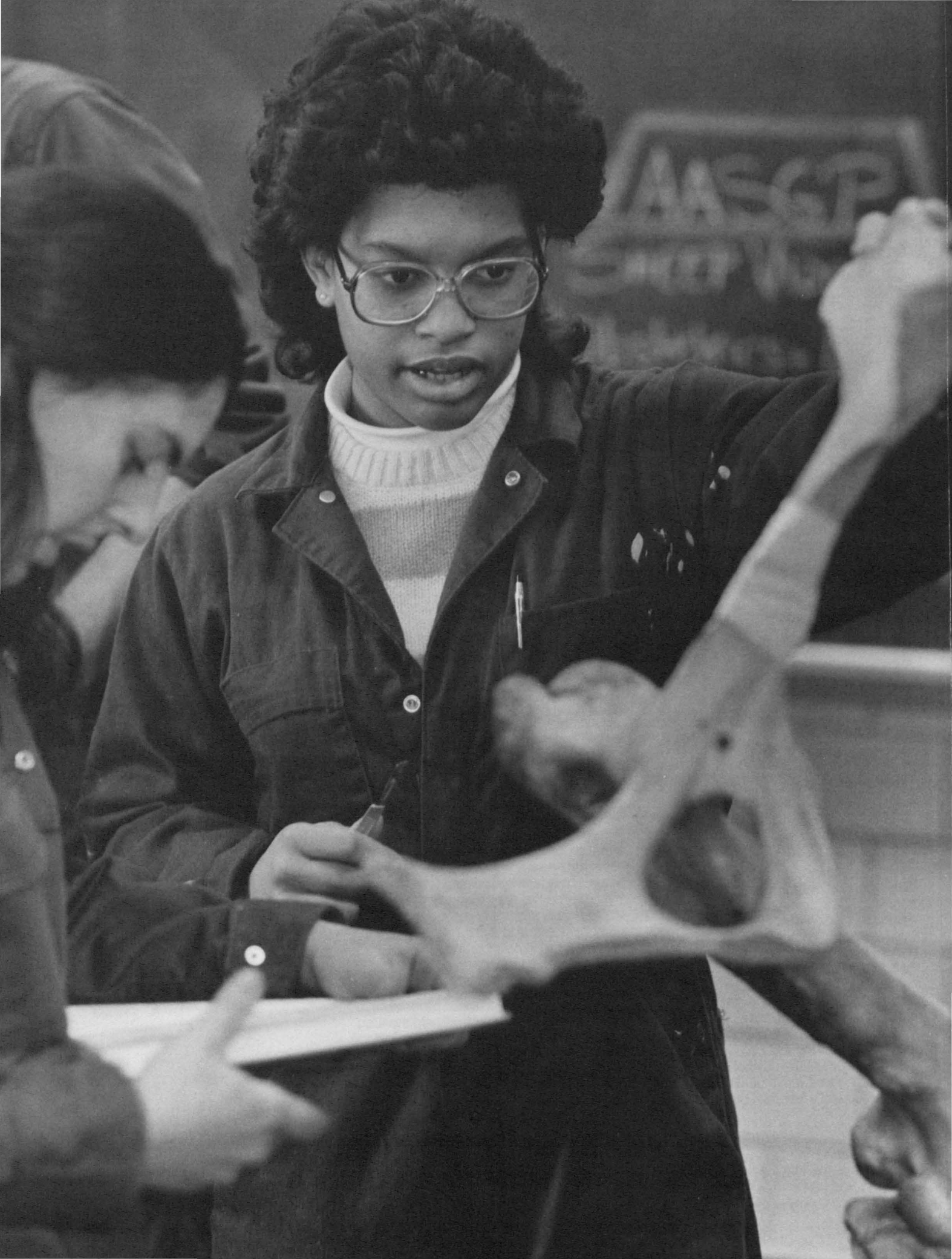
CHANGING EXPECTATIONS

In one way the focus on research at the College of Veterinary Medicine is a sign of changing popular expectations; we live in a world where it is possible to think in terms of the eradication of any number of diseases. There are side effects. The demands that researchers feel at laboratory benches and in clinical settings increase the urgency for funding. The financial reality is that, to perform nearly any type of scientific work, researchers require access to instruments and facilities like microcomputers, electron microscopes, cell lines, monoclonal antibodies, specific-pathogen-free animal models, incubators, and anaerobic laboratories. The days of achieving research objectives with a bunsen burner, a refrigerator, and a few petri dishes are gone forever.

Fortunately, faculty members have been successful in competing for scarce research dollars. In 1986–87 the college received \$17,415,054 in research grants and awards. The diversity of the faculty's re-

search interests, which reflect national health priorities and the depth of expertise available at the college, have combined to expand funding possibilities. Faculty members do not limit themselves to one area of research. In fact, the multi-interest, team approach is fairly typical of our faculty—they may devote the majority of their laboratory time to one line of research, but another percentage to a completely different venture, often in collaboration with colleagues in another department.

Research continues to fulfill society's expectations and also provides students with knowledge and skills that will help them meet professional demands in their practice of veterinary medicine. A research background produces students who can choose alternatives to practice and practitioners who bring specialized skills to veterinary medicine. The research program augments the teaching and service programs, and they in turn augment research. That is the vital measure of research for the real world.



RANDOLPH WINS NORDEN DISTINGUISHED TEACHER AWARD

Dr. John F. Randolph has been selected as the 1987 recipient of the Norden Distinguished Teacher Award, the second time he has been honored with that award since 1982. Dr. Randolph, an assistant professor in the Department of Clinical Sciences, divides his time between working in the medicine service of the Small Animal Clinic and lecturing on small-animal medicine and surgery and general medicine and surgery. A coordinator of the small-animal residency program, he is a member of the American College of Veterinary Internal Medicine, is board-certified in internal medicine, and has served on that organization's committee on credentials. He has also served as the American Animal Hospital Association faculty representative, as a member of the college's Committee on Student Conduct, and as the supervisor of the Small Animal and Intensive Care Unit Summer Crew.

A 1977 recipient of a D.V.M. degree with distinction from Cor-

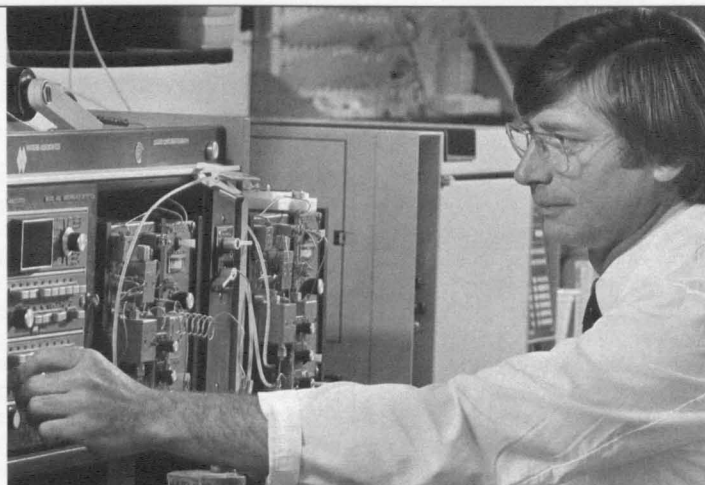
nell University, Dr. Randolph completed an internship and a residency at the Animal Medical Center in New York City. While there he received the President's Award for Outstanding Intern. He is a member of the Cornell chapter of the honor society of Phi Kappa Phi, the National Veterinary Honorary Society of Phi Zeta, the New York State Veterinary Medical Society, the American Animal Hospital Association, and the American Veterinary Medical Association.

The Norden Distinguished Teacher Award is given annually to a full-time member of the veterinary medical faculty who is recognized as an outstanding teacher. The primary qualifications for consideration are preceptorship and teaching ability, as reflected by students' responsiveness, and moral character and leadership. A list of nominees for the award is submitted by the four classes in the D.V.M. program, and the final selection is made by a committee appointed by the dean.



Dr. John F. Randolph (second from left)

◀ As a summer project Pamela E. Blackshear '87 investigated avian rotavirus in Brazil.



Dr. Curtis S. Fullmer

1987 BEECHAM AWARD WON BY FULLMER

A 1987 Beecham Award for Research Excellence was won by Dr. Curtis S. Fullmer, senior research associate in the Department of Physiology and the first scientist at Cornell University to identify the sequence of amino acids in a protein. Beecham awards are given annually to young investigators whose research achievements are likely to have a significant impact on our understanding of the biology or the medical management of animals.

The first protein Dr. Fullmer worked on was 75 amino acids long and took about two years to sequence; the second was 261 amino acids long and took nearly twice as long to complete. The two proteins are involved in calcium regulation and absorption in the body. By identifying the order of amino acids Dr. Fullmer could predict where the calcium-binding regions actually occur and how calcium is bound.

Studies have shown that the amount of calcium absorbed and the amount of calcium-binding protein present are directly related to the degree of stimulation by vitamin D. If an individual's diet is low in calcium, the vitamin D endocrine system provides greater

amounts of the intestinal binding protein for calcium, and absorption of calcium increases as a result. Without vitamin D no intestinal calcium-binding protein is available, and calcium is not well absorbed.

Dr. Fullmer received his undergraduate degree and a master's degree in nutrition from Cornell University. He also earned his Ph.D. degree at Cornell, completing study in physical biology, nutritional pathology, and biochemistry at the College of Veterinary Medicine in 1974. Dr. Fullmer until recently was director of the University Amino Acid Analysis and Protein Sequencing Facility in the Department of Physiology. He joined the faculty as a research associate in 1974, then left in 1976 to take a position as a research associate in the Department of Biochemistry at the University of Kansas Medical Center. He returned to Cornell in 1977. Dr. Fullmer has published nearly eighty scientific papers and abstracts on the chemistry of calcium-binding proteins and intestinal absorption of heavy metals. He lectures on the nutritional and physiological effects of minerals, on biological membranes, and on nutrient transfer.

HUNGER PANGS

A Husband and Wife Look at Hunger

Is your stomach growling? For you that might be a sign to order a pizza. How do other mammals know when to eat, what to eat, and when to stop eating? A husband-and-wife team of physiologists at the New York State College of Veterinary Medicine, Dr. Katherine A. Houpt and Dr. T. Richard Houpt, study the changes that produce feelings of hunger and of appetite satisfaction, or satiety, in domestic animals. During the past decade the Houpts' research has focused on the ingestive behavior of hoofed animals, with an emphasis on gastrointestinal and body-fluid factors. They have found that the gut hormone, cholecystokinin, is responsible for producing the feeling of satiety that makes an animal stop eating and have also identified a second satiety factor. It seems that osmotic pressure in the intestine, rather than in the blood stream, determines when an animal stops eating. Another finding from their previous research is that pigs have a sweet tooth.

In their present research Katherine and Richard Houpt hope to make clear the mechanisms that underlie ingestive behavior in domestic animals. They are primarily interested in exploring changes in brain catecholamines, which are messenger substances, or neurotransmitters, that result when previously identified satiety factors are administered. Eventually it should be possible to explain basic neural control mechanisms and controls for hunger, thirst, and satiety and to quantify the changes that stimulate activation of the responsible neurons.

Throughout 1987 the Houpts will continue work on ingestive behavior, with Dr. B. A. Baldwin, at

the Agriculture and Food Research Council Institute of Animal Physiology, Cambridge, England, thanks to a Senior International Fellowship awarded to Katherine Houpt by the John E. Fogarty International Center. An associate professor of veterinary physiology at the college, she holds a joint appointment in Cornell's Section of Physiology. She is also the director of the Cornell Animal Behavior Clinic in the Veterinary Medical Teaching Hospital.

Dr. Katherine A. Houpt, an animal behaviorist, has investigated such areas as aggression, ingestive and sexual behaviors, taste aversions, and mare and foal behavior.



CORRADINO AWARDED FULBRIGHT GRANT

Robert A. Corradino, Ph.D., was awarded a Fulbright grant for 1986-87 to lecture and to conduct research in the Department of General and Experimental Pathology, University of Vienna Medical School, Austria. He was one of about twenty-five hundred Americans sent abroad for the 1986-87 academic year under the Fulbright exchange program.

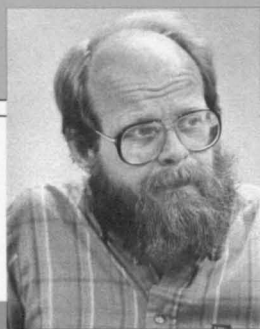
Dr. Corradino received his B.S. degree from Millersville University of Pennsylvania and graduate degrees from Purdue University (M.S., biochemistry) and Cornell University (Ph.D., physiology). He was appointed an associate professor of physiology in the College of Veterinary Medicine at Cornell University in 1980. His research interests include the hormonal regulation of intestinal absorptive mechanisms, particularly the regula-

tion by cholecalciferol (vitamin D₃) and by hormones of calcium, iron, and zinc absorption. The National Institutes of Health (N.I.H.), the National Science Foundation (N.S.F.), and the U.S. Department of Agriculture (U.S.D.A.) have supported that work. More recently he has begun studies funded by the U.S.D.A. on the role of calcium in the progesterone biosynthesis necessary for the maintenance of pregnancy. Dr. Corradino teaches courses on hormone action to graduate students and courses on cellular physiology to veterinary students and conducts an animal physiology laboratory for undergraduates.

He is an elected member of the American Institute of Nutrition, the American Physiological Society, the Society for Experimental Biology and Medicine, the Endocrine Society, and other

professional organizations. From 1975 to 1980 he received an N.I.H. Research Career Development Award. He is the author of over eighty scientific papers and has presented his work at numerous national and international scientific meetings. In Vienna Dr. Corradino worked closely with Dr. Meinrad Peterlik and Dr. Heide Cross on the hormonal regulation of nutrient absorption processes during embryonic development, a study funded by a grant from the N.S.F. As a Fulbright scholar he lectured at the University of Vienna, with his Austrian colleagues, in a course entitled "Hormonal Regulation of Intestinal Absorptive Processes: Significance for Pathogenesis of Metabolic Disorders."

Dr. Karel A. Schat



FOGARTY FELLOWSHIP FOR SCHAT

Dr. Karel A. Schat received a Senior International Fellowship from the John E. Fogarty International Center. He used the award to work with Dr. L. J. N. Ross, of the Houghton Poultry Research Station in England, on the molecular aspects of Marek's disease herpesvirus (MDHV).

A Fogarty Senior International Fellowship provides opportunities for study or research in a foreign institution to biomedical, behavioral, and health scientists who have established themselves in their chosen careers in the United States and whose professional stature is well recognized by their peers and their nominating institution. The fellowship is intended to enhance the exchange of ideas and information about the latest advances in the health sciences, both basic and clinical, to permit United States scientists to participate abroad in ongoing study or research in the health sciences, and to improve the research, educational, and clinical potential of the nominating institution.

Dr. Schat is a leading investigator in the areas of avian immunology and the pathogenesis of avian diseases. He has been working mainly on immune responses to and the pathogenesis of lymphomas induced by Marek's disease herpesvirus, and, more recently, on MDHV-induced atherosclerosis. In addition he has research in progress on rotavirus infections in avian species and on immune responses in trout.

CERIONE RECEIVES NATIONAL AWARD FROM PEW SCHOLARS PROGRAM

Richard A. Cerione, Ph.D., of the Department of Pharmacology, has been selected a scholar and awarded \$200,000 under the prestigious PEW Scholars Program in the biomedical sciences, Pew Memorial Trust. Under the guidelines of the program, recipients may use the funds at their discretion for personnel, equipment, supplies, or travel directly related to their research. Invitations to apply for the Pew Scholars Program were submitted to forty-four major institutions across the United States.

Dr. Cerione's biochemical research concentrates on two major areas, vision systems and cell proliferation. In his vision research he is interested in how different components in the eye interact to produce sight. One component is the light receptor

rhodopsin, which activates other protein components in the signal transduction pathway upon light absorption. That receptor-coupled signal system is actually serving as a model for the second area of Dr. Cerione's work—cell proliferation. In that process growth factors, such as the epidermal growth factor (EGF), bind to specific cell-surface receptors and initiate cellular growth by means of a signal transduction system quite analogous to that operating in vertebrate vision. By applying what he learns about the interactions of the protein components of the vision system to processes mediated by growth-factor receptors, he hopes to isolate the sequence of events leading to cell proliferation, and the components directly responsible for tumorigenesis.

POLLOCK IS GAINES AWARD WINNER

Dr. Roy V. H. Pollock was honored as the Gaines Veterinarian of the Year 1986 in ceremonies at the fifty-fourth annual convention of the American Animal Hospital Association (AAHA). He is the fifth Cornell winner of the honor, which is informally known as the Fido award. Dr. James H. Gillespie, Dr. Leland E. Carmichael, Dr. Robert W. Kirk, and Dr. Alexander deLahunta have been honored in previous years.

Dr. Pollock is an assistant professor of medical informatics and the director of the Center for the Study of Medical Informatics at the college.

A cum laude graduate of Williams College, Dr. Pollock graduated first in his veterinary class at Cornell and also earned a Ph.D. degree at Cornell. As a graduate research assistant at the James A. Baker Institute for

Animal Health from 1975 until 1981 he worked closely with Dr. Leland E. Carmichael to develop the first effective parvovirus vaccine. From 1981 until 1985 he was an assistant professor of microbiology and an assistant dean for curriculum development at the New York State College of Veterinary Medicine. He is the editor of the *Cornell Animal Health Newsletter* and a special consultant to the Standard Nomenclature Committee of the American Veterinary Medical Association and has been active with the AAHA as a member of the education, long-term planning, and computer committees.

His major research interests are computer-based information systems in veterinary medicine, analytical epidemiology, and medical education.

Dr. Douglas D. McGregor



CONSOLIDATED RESEARCH GRANTS PROGRAM ESTABLISHED

Under a new program more than \$280,000 was allocated within the college to support the development of pilot projects by faculty members that will eventually lead to funding from outside sources. The Consolidated Research Grants Program eliminates the need for faculty members to develop research programs throughout the year in response to individual in-house research program funding. Funds for the program come from the National Institutes of Health, the U.S. Department of Agriculture, the state of New York, and private gifts.

Under the direction of Dr. Douglas D. McGregor the single consolidated research competition evaluates projects on the basis of their scientific merit, as judged by a peer review panel. Projects involving meaningful collaboration among faculty members representing different departments within the college and the university are encouraged. Collaborations between clinical and preclinical disciplines receive particular attention. Priority is also given to new faculty members and to those who are changing research direction.

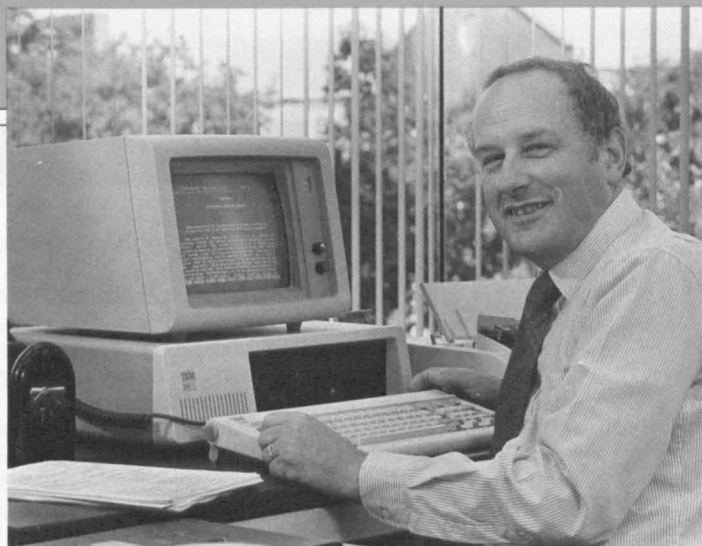
FOUR NEW CHAIRMEN JOIN FACULTY

Pauli to Head Pathology

Bendicht U. Pauli, D.V.M., has been selected as the chairman of the Department of Pathology at the New York State College of Veterinary Medicine. He was formerly the director of research and a professor in the Department of Pathology at Rush Medical College, Rush-Presbyterian-St. Luke's Medical Center, Chicago. Dr. Pauli also held an appointment as an assistant professor in the Department of Biochemistry and General Surgery at Rush Medical College.

The new chairman received his D.V.M. degree in 1967 from the School of Veterinary Medicine, University of Bern, Switzerland, and in 1968 he entered a residency in the university's Department of Veterinary Pathology, where he completed work on his doctoral thesis in veterinary pathology in 1970. From 1970 until 1974 he was an assistant professor in the Department of Veterinary Pathology at the School of Veterinary Medicine, University of Bern. Dr. Pauli received the first Faculty Prize for Scientific Research while at Bern's School of Veterinary Medicine and held a Swiss National Foundation for Scientific Research Fellowship in 1974-75.

Dr. Pauli joined the staff of the Department of Pathology, Rush Medical College, in 1976, after holding a position as an instructor and associate scientist in the Department of Pathology at the Tufts University School of Medicine. At the Rush Medical College he conducted laboratories and lectured on general pathology and histology. His research interests are tumor neovascularization, invasion, and metastasis. Dr. Pauli has authored or coauthored nearly 150 abstracts, articles, books, and book chapters in his area of research.



Dr. Bendicht U. Pauli

A member of the New York Academy of Science, the American Society for Cell Biology, the American Association of Pathologists, and the Electron Microscopy Society of America, Dr. Pauli served as president of the Midwest Society for Electron Microscopists from 1981 to 1982. He is also a member of the International Academy of Pathology, the Tissue Culture Association, the International Society of Stereology, the European Society of Veterinary Pathology, and the Swiss Society of Pathology.

Avery to Head Microbiology, Immunology, and Parasitology

Roger J. Avery, Ph.D., head of the Department of Microbiology at Houghton Poultry Research Station, Houghton, England, joined the college's faculty as the chairman of the Department of Microbiology, Immunology, and Parasitology on November 1, 1986. He is responsible for a historically productive and diverse faculty that includes virologists, immunologists, parasitologists, and bacteriologists. The department has established a national reputation for work in infectious disease research, and further recognition is now expected with the addition and development of Dr. Avery's field of interest, molecular virology.

Dr. Avery completed his undergraduate training in biochemistry at the University of Leeds, England, where he became interested in both nucleic acids and

viruses, interests that earned him a first-class honors degree in biochemistry in 1966. Three years later he earned his Ph.D. degree in biochemistry and microbiology from the University of Newcastle upon Tyne, England. As the recipient of a Carnegie Institution postdoctoral research fellowship he studied the DNA of the T-even bacteriophages and gained experience in the technique of molecular hybridization under the guidance of Dr. R. J. Britten and Dr. D. E. Kohne.

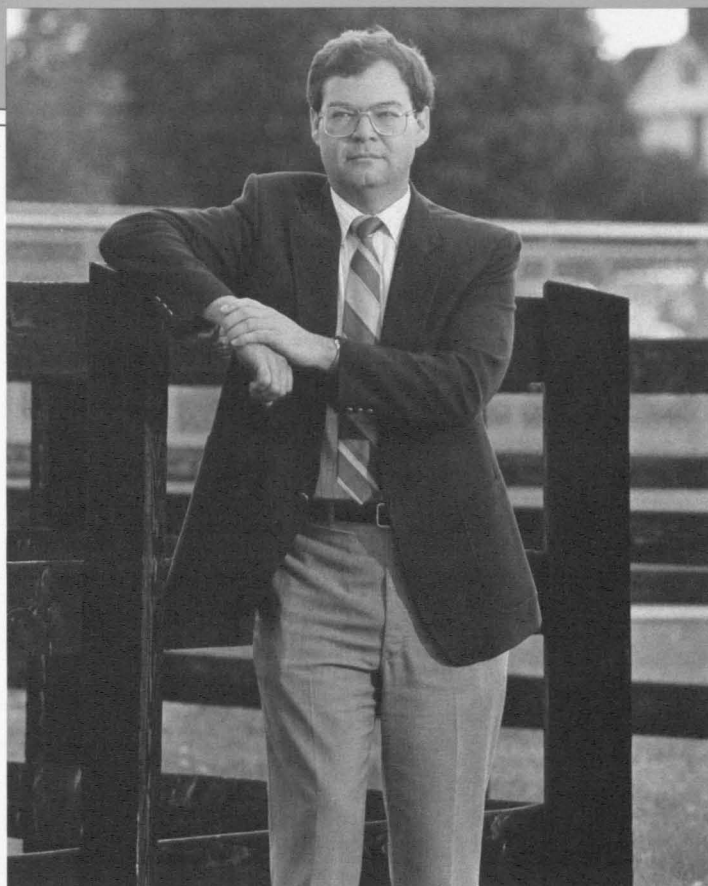
Returning to the United Kingdom in 1971, to the University of Warwick in Coventry, Dr. Avery began work on the replication and transcription of the RNA genome of influenza viruses. In the course of his work he also studied phages, amphibian viruses, insect viruses, fowl pest virus, infectious bronchitis virus, and interferon. In 1975 he was a Visiting Medical Research Council Fellow in cancer studies at the University of California Medical Center, in San Francisco; later, in 1978, he was a visiting fellow at the Amyotrophic Lateral Sclerosis Foundation, Torrey Pines Research Center, San Diego. In 1976 he began working on the Kirsten sarcoma/leukemia virus complex, a model system of virus-induced neoplasia. Dr. Avery and his co-researchers' approach was at a molecular level, and they succeeded in isolating a series of clonally related cells that differed only in their response to viral infection.

In the early 1980s Dr. Avery became interested in viral diseases of food animals. Consequently he accepted the position of professor of virology and director of the virology section in the Veterinary Research Laboratory at Montana State University. His work there involved the use of recombinant DNA techniques to investigate a number of viruses that infect livestock. From October 1984 until his arrival in Ithaca in November 1986 Dr. Avery served as the head of the department of microbiology, Houghton Poultry Research Station. He initiated projects designed to provide diagnostic reagents for infectious laryngotracheitis virus and a novel vaccine against infectious bursal disease virus.

Smith Directs Clinical Sciences

Donald F. Smith, D.V.M., has been named a professor in and the chairman of the Department of Clinical Sciences. He assumed his new duties on March 2, 1987, leaving a position as the chairman of surgical sciences at the School of Veterinary Medicine, University of Wisconsin-Madison. While pursuing his administrative duties, Dr. Smith continues teaching and research in his area of specialization, the anatomic and metabolic changes associated with gastrointestinal obstruction in cattle.

As department chairman Dr. Smith sees his role as providing leadership and assistance to faculty members in the development of their teaching and research responsibilities. Because so many teaching and research activities are based on Veterinary Medical Teaching Hospital activities, he also anticipates working closely with the hospital's personnel. He will emphasize clinically relevant research programs to provide quality research training for post-doctoral and graduate students. Recruitment of faculty and some realignment within the department will occur as a result of the new areas, such as epidemiology, that have recently become



Dr. Donald F. Smith

part of the department. The new chairman is aware of the growing need to provide students with experience in primary care practice in small-animal internal medicine and allied areas. Although vaccination clinics and regular health checkups are part of the current program, instruction will be formalized, and a faculty position will be added to coordinate its direction. The growing field of veterinary medicine for pet birds will also be recognized with the addition of a faculty position in that area of small-animal medicine.

Dr. Smith was born in Picton, Ontario, Canada, and received his D.V.M. degree from the Ontario Veterinary College, University of Guelph. He completed an internship and residency in large-animal medicine and surgery at the University of Pennsylvania. In 1977 he joined the faculty of the New York State College of Veterinary Medicine as an assistant professor of large-animal surgery, leaving in 1983 to become an associate professor of surgical sciences at the School of Veterinary Medicine, University of Wisconsin-

Madison, with a joint appointment in that university's Department of Veterinary Sciences, College of Agricultural and Life Sciences. He also served as the chairman of the Department of Surgical Sciences.

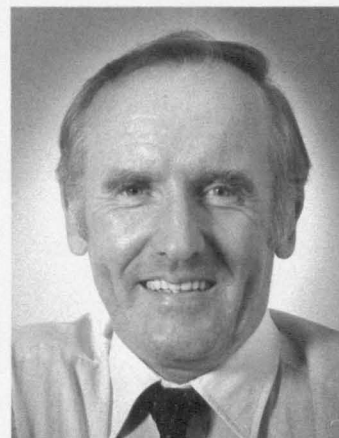
A diplomate of the American College of Veterinary Surgeons, Dr. Smith is a member of the American Veterinary Medical Association, the Wisconsin Veterinary Medical Association, the Comparative Gastroenterology Society, and the American Association of Bovine Practitioners. He has served on many professional and academic committees and has been a member of the editorial board and manuscript review boards of the *Compendium for Continuing Education for the Practicing Veterinarian*, of the manuscript review board of *Veterinary Surgery*, and of the editorial board of *Modern Veterinary Practice*. He is a member of Phi Zeta and was a 1980 winner of the Norden Award for Excellence in Teaching.

Robertshaw to Head Physiology

The new chairman of the Department of Physiology, David Robertshaw, B.V.M.S., Ph.D., joined the faculty in September 1987. He leaves a position at Colorado State University, where he was a professor and the head of the Department of Physiology.

Dr. Robertshaw's research interests concern the regulation of electrolytes, water, and temperature in mammals. He is the author or coauthor of nearly a hundred scientific publications and abstracts, including a three-part series of books on environmental physiology. He is on the editorial board of the *Journal of Applied Physiology*.

Dr. Robertshaw studied at Glasgow University, Scotland, becoming a bachelor of veterinary medicine and surgery in 1957 and receiving a Ph.D. degree in 1963. He stayed on at Glasgow University as an assistant lecturer until 1960, when he left to join Kenya's East African Veterinary Research Organization and to lecture part-time at the University of East Africa, now the University of Nairobi. By 1963 he had returned to Scotland, to the Hannah Research Institute in Ayr, where he was a senior scientific officer. In 1969 he was appointed a professor and the head of the Department of Physiology at the University of East Africa. While still there, Dr. Robertshaw accepted a position as a research associate at Harvard University. He pursued his research at Harvard until 1975, when he was named a professor and the head of the Department of Physiology at Indiana University School of Medicine. In 1979 he joined the faculty of Colorado State University as a professor and the head of the Department of Physiology, taking a leave of absence in 1986 to work as a visiting professor and the program director for the Small Ruminant Collaborative Research Support Program at the University of California, Davis.



Dr. David Robertshaw

While at Glasgow University in 1957, he was the recipient of the Governor's Prize. He was honored with a medal from the University of Wroclaw, Poland, in 1978 for contributions to the physiology of temperature regulation. He has acted as a consultant to the Commonwealth Scientific and Industrial Research Organization in Australia and in 1976 was a Pfizer Traveling Fellow at the Clinical Research Institute in Montreal. Dr. Robertshaw is a member of many scientific societies, including the Physiological Society of Great Britain, the American Society of Veterinary Physiologists and Pharmacologists, the American Physiological Society, the American Veterinary Medical Association, and the American Association for the Advancement of Science.

EQUINE PROJECTS SUPPORTED BY ZWEIG FUND

In December 1986 equine research at the New York State College of Veterinary Medicine received \$385,000 from the Harry M. Zweig Memorial Fund, a fund supported by state moneys for breeding and development derived from betting revenues at New York State tracks. The Zweig Fund was established to honor the late Dr. Harry M. Zweig, a well-known and respected figure in the racing industry.

All projects are submitted to the Harry M. Zweig Memorial Fund committee by faculty members at the New York State College of Veterinary Medicine at Cornell. Need, priority, and potential benefit to the state's equine industries are the major criteria for awards. Thirteen projects were chosen for 1987. They are "Immunogenetic Studies of the Horse," "Clonal Analysis of the Equine Immune Response to Influenza Virus," "Definition of the Enteric Nervous System of the Equine Cecum and Colon," "Equine Arteritis Virus: Characterization of New York State Isolates," "Neuroanatomy of the Equine Larynx," "The Determination of Anabolic Steroids in Racehorses," "Bronchial Artery Flow in the Horse," "Development of Improved Equine Influenza Virus Vaccines," "Vitamin D₃: Metabolism and Intoxication in Horses," "Applying New Technology Developed at Cornell University for Evaluating and Predicting Fertility of Breeding Stallions," "Maintenance of Broodmares and Stallions for the Equine Reproduction Unit," "Development of a Serologic Test for the Diagnosis of Osteoarthritis in Horses," and "Studies of Equine Acute Inflammatory Cell Function."

The incumbents of specified government and equine industry positions and individuals including equine breeders, owners,



The Equine Research Park

trainers, and veterinarians sit on the Harry M. Zweig Memorial Fund Committee. Current committee members and their affiliations are Daniel J. Burke, Longford Farm; Joseph Gerace, commissioner of the New York State Department of Agriculture and Markets; John L. Hardy, Tucker and Hardy Associates; John Hettinger, vice president of New York Thoroughbred Breeders; Charles Knauss, Jr., executive director of the Agriculture and New York State Horse Breeding Development Fund; Albert W. Miller, D.V.M., a practitioner; Richard Corbisiero, Jr., the chairman of the New York State Racing and Wagering Board; William H. Welch, the executive administrator of the New York State Thoroughbred Breeding and Development Fund; Theodore J. Zornow, Avon Farms; Anna Zweig, the widow of Dr. Zweig; and Robert D. Phemister, the dean of the New York State College of Veterinary Medicine, who serves as chairman.

TRAVERS FUNDS TO SUPPORT EQUINE RESEARCH

The 1986 fund-raising activities of the Travers Committee generated \$45,000 in support of equine research at the college. Committee members, who come from the thoroughbred and local communities, devote considerable time and energy each year to the festivities surrounding the annual running of the Travers Stakes in Saratoga, New York. Fund-raising and celebration are well mixed, as demonstrated by a gala party in 1986 at which the auction of a lapis and diamond necklace donated by Van Cleef and Arpels raised \$18,000.

Four equine research projects were selected for funding after consideration of proposals by a special committee appointed by Dean Phemister. The successful proposals were "Differential Diagnosis of Equine Parasite Infections by Computerized Morphometry of Strongylid

Eggs," "Evaluation of Reliability of Endoscopic Examination in Assessment of Laryngeal Function in Racehorses," "Pulmonary Function in Anesthetized Thoroughbred Horses," and "The Effect of Training and Diet on Energy Utilization in Racehorses."

Recommendations for the allocation of Travers monies were made by a committee consisting of Dr. Robert F. Playter, director of the Veterinary Medical Teaching Hospital, Mrs. Penny Chenery, director and past president of the Travers Committee, Dr. Donald F. Smith, chairman of the Department of Clinical Sciences, Mr. E. Barry Ryan, chairman of the college's Equine Advisory Council, and Dr. Charles G. Rickard, professor emeritus of the New York State College of Veterinary Medicine, who served as chairman.

EQUINE NEONATE UNIT OPENS

Thanks to the efforts of Dr. Robert B. Hillman, of reproductive studies, Dr. Pamela Livesay-Wilkins, an intern at the college, and Dr. William C. Rebhun, of the medicine service, the Equine Neonate Unit in the Veterinary Medical Teaching Hospital is operating and providing intensive care for critically ill foals. Although the unit was designed to accommodate foals up to two weeks of age, it is an option for any foal whose condition requires specialized round-the-clock care.

The first stall of the unit contains a heated water bed. Far from being a luxury, the bed helps prevent bedsores in foals that are lying down for long periods of time, and the heated water in the bed helps foals maintain a constant body temperature. The second of two stalls houses the foal crib, a reinforced couch-sized piece of equipment with generous padding down three sides. The fourth side is open so that attendants can have access to a foal. The high sides of the crib maintain the foal in the optimum position for breathing and treatment, while protecting it from injury. The entire crib is raised about two feet off the floor, high enough to protect the foal from drafts and potential infection and low enough for its comfort. Since some critically ill foals have difficulty breathing because of either a poorly developed respiratory tract or pneumonia, oxygen lines are available in each stall. Multipositional radiant heat units adjust air temperature to individual needs.

An impressive array of equipment, nearly all of it purchased with unrestricted funds and private donations, helps clinicians administer therapy and monitor patients. Volumetric fluid pumps deliver a precise amount of fluids intravenously to the foals. Digitalized and computerized,

the machines are more accurate than those employing gravity-flow methods and have alarms that signal when the flow of fluids has diminished. A glucometer, first developed for home use by human diabetics, measures blood glucose levels in the foals. A ventilator for assisted respiration and a blood pressure monitor with electronic memory for instant replay of blood pressures are also in the unit. In addition either room can be completely padded to give added protection to a foal that is standing but unsteady. There is also access to a new plasmapheresis machine that makes protective plasma available to foals that may have received inadequate colostrum. A few steps from the suite of stalls there is a compact satellite laboratory with equipment for quick assessment tests, ideal for the continual monitoring that critically ill foals frequently require. The staff and the sophisticated equipment of clinical pathology serve as a backup for the laboratory.

Dr. William E. Hornbuckle was the corecipient of the SPCA's "humanitarian of the year" award.



A surgeon, Dr. Jay Harvey (center), was honored by the SPCA for his work with homeless animals.

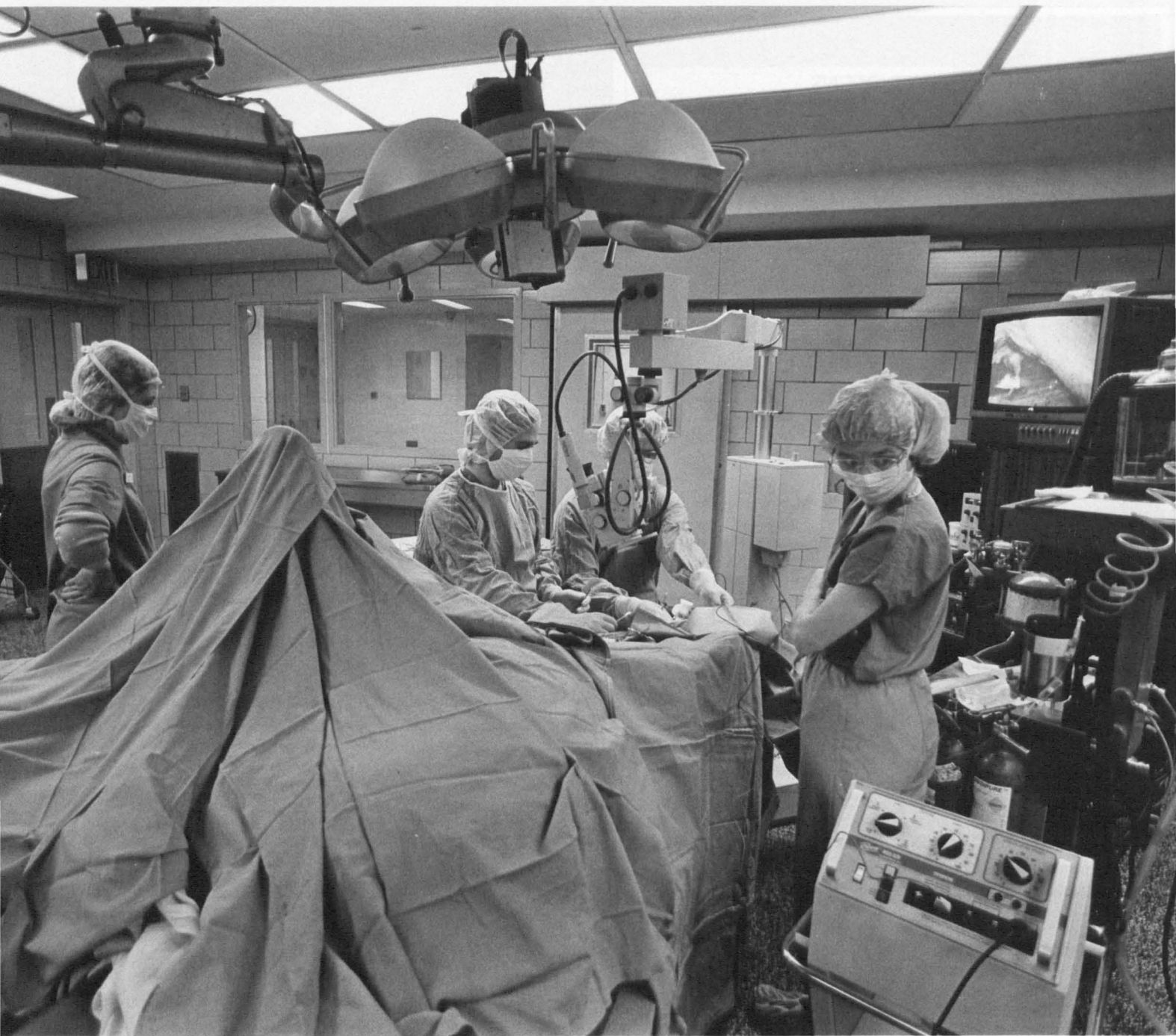
HUMANITARIANS OF THE YEAR

Jay Harvey, D.V.M., and William Hornbuckle, D.V.M., were selected as "humanitarians of the year for 1986" by the Tompkins County Society for the Prevention of Cruelty to Animals (SPCA). Their compassion and sincere interest in the well-being of homeless animals were cited during ceremonies at the SPCA's annual meeting. The 1986 Humanitarian Award is the fifteenth that the Tompkins County SPCA has given. Both Dr. Harvey and Dr. Hornbuckle are veterinarians in the Small Animal Clinic of the New York State College of Veterinary Medicine. The clinic provides emergency care and treatment for adoptable SPCA animals and also conducts a weekly spay and neuter program for adoption-ready animals at the SPCA facilities. Dr. Harvey and Dr. Hornbuckle were nominated for the award by the staff of the Tompkins County SPCA, who have worked closely with both clinicians.

Dr. Hornbuckle earned his D.V.M. degree at Oklahoma State University in 1967, and after some years in private practice and seven years as a staff

clinician at the Angell Memorial Animal Hospital, Boston, he joined the faculty of the New York State College of Veterinary Medicine in 1977. He is an associate professor of Small Animal Medicine in the Department of Clinical Sciences and a diplomate of the American College of Veterinary Internal Medicine. Dr. Hornbuckle was the recipient of the 1979 Norden Distinguished Teacher Award.

Dr. Harvey is an associate professor and section chief of surgery in the Department of Clinical Sciences. He received his D.V.M. degree from Kansas State University in 1971, and after an internship at the Animal Medical Center, New York City, and a residency at the University of California, Davis, he entered private practice. He returned to the Animal Medical Center as an associate staff surgeon in 1975. In 1979 he joined the faculty of the New York State College of Veterinary Medicine. Dr. Harvey is a diplomate in the American College of Veterinary Surgeons and was the 1981 recipient of the Norden Distinguished Teacher Award.



Equine surgery in a sterile surgery suite at the Veterinary Medical Teaching Hospital

FACULTY AND STAFF CHANGES

New Appointments

Roger J. Avery, *professor and chairman, Department of Microbiology, Immunology, and Parasitology*
Paul J. Battista, *postdoctoral fellow*
Kathy A. Beck, *assistant professor*
Dwight D. Bowman, *assistant professor*
Shah N. Buriro, *visiting professor*
Myung-Dae Byun, *visiting associate professor*
Xiu-Ying Ding, *visiting assistant professor*
Normand G. Ducharme, *assistant professor*
Per Olof G. Edlund, *postdoctoral associate*
Pedro A. Figueroa, *visiting fellow*
Carlos M. Gamazo, *postdoctoral fellow*
Willard J. Gould III, *instructor*
Chaobin Hu, *visiting associate professor*
Patricia M. Kane, *postdoctoral associate*
Bernard A. LeBlanc, *visiting fellow*
Benjamin Lucio-Martinez, *visiting professor*
William H. Miller, Jr., *assistant professor*
Hannu M. Mykkanen, *visiting fellow*
Syed A. Naqi, *professor*
Dale D. Olm, *instructor*
Bendicht U. Pauli, *professor and chairman, Department of Pathology*
Carlos G. Santisteban, *visiting assistant professor*
Donald F. Smith, *professor and chairman, Department of Clinical Sciences*
Angelika E. Stock, *postdoctoral associate*
Ana M. Tomasi, *visiting fellow*
John S. Walton, *visiting associate professor*
James R. Williams, *research associate*

Promotion and Title Changes

Judith A. Appleton, *assistant professor* (from senior research associate)
Robert G. Buerger, *instructor* (from veterinary resident)
John S. Chandler, *postdoctoral fellow* (from lecturer)
Raymond H. Cypess, *professor, Department of Microbiology, Immunology, and Parasitology* (from professor and director, Diagnostic Laboratory)
Hollis N. Erb, *associate professor and chief, Section of Epidemiology* (from associate professor)
Robin D. Gleed, *associate professor* (from assistant professor)
Barbara S. Hook, *visiting fellow* (from postdoctoral fellow)

David J. Jasko, *veterinary assistant* (from instructor)
John G. Koland, *research associate* (from temporary research support specialist)
Lennart P. Krook, *professor* (from acting chairman, Department of Pathology)
Donald H. Lein, *associate professor and acting director, Diagnostic Laboratory* (from associate director)
Pamela Luther, *instructor* (from senior resident)
Paul J. Millard, *temporary research support specialist* (from postdoctoral fellow)
William J. Mitchell, Jr., *instructor* (from veterinary assistant)
F. Charles Mohr, *temporary research support specialist* (from instructor)
Robert E. Oswald, *associate professor* (from assistant professor)
Roger L. Papke, *postdoctoral associate* (from assistant)
John A. Perdrizet, *veterinary assistant* (from instructor)
Rama Rajaram, *postdoctoral associate* (from technician)
Emery I. Schiff, *technician* (from research associate)
Wayne S. Schwark, *professor* (from associate professor)
David O. Slauson, *professor* (from associate professor)
Susan E. Wade, *research associate* (from technician)
Ching-Hua Wang, *postdoctoral associate* (from veterinary assistant)
Gregory A. Weiland, *associate professor* (from assistant professor)
Etta M. Wertz, *assistant professor* (from instructor)
Marilyn J. Wolfe, *assistant professor* (from senior research associate)
Jerry M. Wright, *postdoctoral associate* (from postdoctoral fellow)

Completed Appointments

Daniel F. Adene, *visiting fellow*
Philip J. Ahrens, *visiting instructor*
Sami A. Al-Atuja, *visiting fellow*
Sabry M. Aly, *visiting assistant professor*
C. Ben Baker, *instructor*
Larry D. Bowers, *visiting associate professor*
Andries P. Bruins, *visiting assistant professor*
Ma. Teresa C. Cabalum, *visiting associate professor*
Carol A. Carberry, *lecturer*

Francoise E. Dudan, *instructor*
Mohamed I. El-Sherry, *visiting fellow*
Frederick M. Enright, *visiting professor*
Marianne K. Hellsing, *visiting fellow*
Wendy J. Holden-Stauffer, *visiting fellow*
Johnny D. Hoskins, *visiting professor*
Cha Soo Lee, *visiting professor*
Anibal J. Llanos, *visiting fellow*
John W. Parris, Jr., *visiting associate professor*
Carmen V. Schuler Campo, *visiting fellow*
Vijai P. Varshney, *visiting fellow*
Lars O. G. Weidolf, *postdoctoral fellow*

Resignations

William R. Allen, *adjunct professor*
William L. Castleman, *associate professor*
Michael A. Collier, *senior research associate*
Marwan E. El-Sabban, *postdoctoral associate*
Duncan C. Ferguson, *assistant professor*
Dougald R. Gilmore, *assistant professor*
Gerard J. Hickey, *postdoctoral associate*
Margarethe Hoenig, *senior research associate*
John Krupinski, *postdoctoral associate*
George Lesser, *adjunct assistant professor*
Robert A. Milvae, *research associate*
Colin R. Parrish, *assistant professor*
James T. Rothwell, *visiting fellow*
Zuzzer A. Shamsuddin, *director, laboratory operations*
George L. Spitalny, *adjunct professor*
Donna K. Walton, *assistant professor*
Donald L. Wassom, *assistant professor*
Gordon L. Woods, *assistant professor*

Retirements

James H. Gillespie, *professor* (to professor emeritus)

Deaths

Hugh H. Dukes, *professor emeritus*

TABLE 1

Continuing Education, 1986-87

<i>Program</i>	<i>Participants</i>	<i>Hours</i>
Pathology Short Course	41	40
Farriers Conference	105	8
Conference for Veterinarians, 79th Annual	423	15
Conference for Veterinarians, June	104	15

TABLE 2

Laboratory Animals Housed and Cared for by the College, 1986-87

<i>Species</i>	<i>Daily Average</i>	<i>Acquisitions during the Year</i>
Calves/cows	105	150
Cats	230	288
Chicks	1,879	7,609
Dogs	294	544
Ferrets	4	4
Fish	3	1,000
Flying squirrels	1	6
Frogs	9	20
Goats	8	32
Guinea pigs	116	317
Hamsters	8	13
Horses/ponies	309	132
Mice	2,195	10,602
Mules/burros	16	0
Parakeets	0	200
Primates	6	17
Rabbits	284	559
Raccoons	0	141
Rats	1,485	8,110
Sheep	559	539
Swine	2	44
Turtles	0	24
Voles	160	253
Woodchucks	672	475
Total*	8,345	31,079

*Laboratory animals housed and cared for by the Division of Laboratory Animal Services: daily average, 4,157; total acquisitions during the year, 23,526.

TABLE 3

Library Use, 1986-87

On campus	
Reserve books (in-library use)	10,415
Books lent (home use)	18,102
Reference questions answered	8,693
Audiovisuals and software used	7,312
Computer searches performed	1,556
Total, on campus	46,078
Interlibrary	
Books lent	76
Photocopy items provided	464
Books borrowed	76
Photocopy items received	1,053
Total, interlibrary	1,669

TABLE 4

Library Holdings, 1986-87

Bound volumes	
At beginning of year	74,011
Acquisitions	1,686
Less withdrawals	139
Total, bound volumes	75,558
Audiovisual items	24,159
Periodicals and annuals	1,281

TABLE 5

Degrees Awarded, 1986-87

D.V.M. (with distinction: 5)	83
M.S.	6
Ph.D.	14

TABLE 6

Interns and Residents, 1986-87

Interns	12
Residents	16
Senior residents	11

TABLE 7

Graduate Students at the College of Veterinary Medicine, 1986-87

Candidates for the Ph.D. degree	74
Candidates for the M.S. degree	19

TABLE 8
Clinical Patients and Diagnostic Examinations, 1986–87

	Horses	Cattle	Sheep & Goats	Swine	Dogs	Cats	Birds	Others	Total
Medical and surgical patients	1,773	500	97	11	8,051	3,400	296	190	14,318
Ambulatory Clinic patients	1,671	35,312	497	272					37,752
Clinical pathology specimens	7,700	3,339	405	311	13,809	4,561		1,944	32,069*
Diagnostic Laboratory tests	24,104	430,118	4,826	1,269	21,307	8,034	1,280	9,186	500,124
Necropsies	387	403	106	46	451	243	28	203	1,867
Surgical pathology specimens	661	444	83	17	5,726	1,240	47	253	8,471
Laboratory animal examinations			26		145	62	206	590	1,029
Aquatic animal accessions									
Marine Biological Laboratory								15,781†	
Fish Diagnostic Laboratory								79	
Total									15,860
Poultry Disease Laboratories									
Ithaca							1,833		
Eastport							2,642		
Kingston							1,188		
Total									5,663
Pet, Exotic, Wild Bird Diagnostic Service							1,167		1,167
Quality Milk Promotion Services (Mastitis Control Program)	2	164,113	15					1	164,131
Total	36,298	634,229	6,055	1,926	49,489	17,540	8,687	28,227	782,451

*The Clinical Pathology Laboratory performed 42,681 tests on the 32,069 specimens.

†The Marine Biological Laboratory had 975 accessions for 15,781 specimens.

TABLE 9
**Geographic Distribution of
Accepted Applicants, Class
of 1991**

Legal Residence	Number
New York	59
Connecticut	2
Florida	1
Illinois	1
Maine	1
Maryland	5
Massachusetts	1
New Jersey	7
Puerto Rico	1
Vermont	2

TABLE 10
Qualifications of Accepted Applicants, Class of 1991

	Number of Students	Percentage of Class
Amount of preveterinary preparation		
Less than four years of college	7	9
Four years of college	55	69
More than four years of college (graduate level)	18	22
Institution previously attended		
Cornell University	35	44
Other	45	56
Field of preparatory study		
Animal science (or related)	29	36
Biological sciences (or related)	32	40
Other	19	24

TABLE 11

Summary of Grants and Contracts Awarded, 1986-87

<i>Department</i>	<i>For 1986-87</i>	<i>For Subsequent Years</i>	<i>Total</i>
Administration	\$ 692,424	\$ 12,000	\$ 704,424
Anatomy	222,088	357,704	579,792
Avian and Aquatic Animal Medicine			
Agriculture and markets contract	262,154	0	262,154
Other	668,363	1,167,285	1,835,648
Total, Avian and Aquatic Animal Medicine	930,517	1,167,285	2,097,802
Clinical Sciences	1,927,129	87,033	2,014,162
Diagnostic Laboratory			
Agriculture and markets contracts	1,976,315	0	1,976,315
Other	171,554	23,500	195,054
Quality Milk Promotion Services	781,546	0	781,546
Equine Drug Testing and Research Program			
New York State Racing and Wagering Board	3,182,136	0	3,182,136
Other	493,834	298,404	792,238
Total, Diagnostic Laboratory	6,605,385	321,904	6,927,289
Microbiology, Immunology, and Parasitology	1,015,409	1,071,071	2,086,480
James A. Baker Institute for Animal Health	1,333,057	1,456,933	2,789,990
Total, Microbiology, Immunology, and Parasitology	2,348,466	2,528,004	4,876,470
Pathology	302,314	140,269	442,583
Pharmacology	1,278,917	2,104,250	3,383,167
Physiology	3,107,814	6,900,402	10,008,216
Grand total	\$17,415,054	\$13,618,851	\$31,033,905

TABLE 12

Admission Summary, Class of 1991

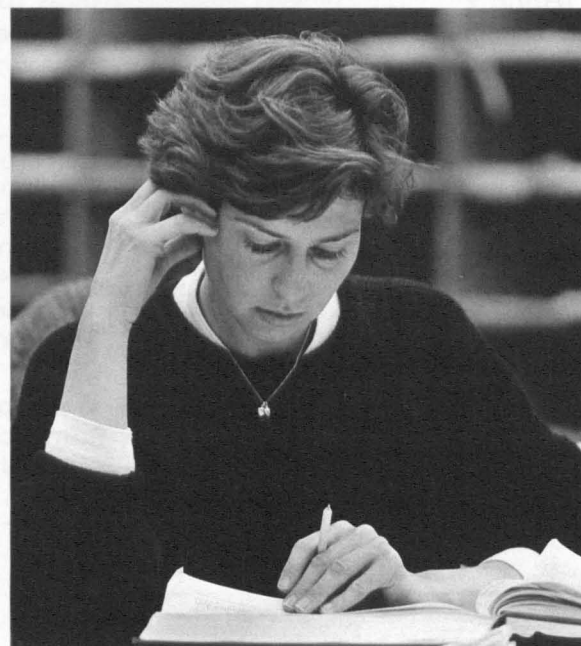
<i>Area</i>	<i>Applicants</i>	<i>Interviewed</i>	<i>Accepted</i>
New York	225	101	59
Contract states	122	52	17
Other	151	14	4
Total	498	167	80

TABLE 13

Predoctoral Student Enrollment, 1986-87

Candidates for the D.V.M. degree	
Class of 1987	78
Class of 1988	80
Class of 1989	79
Class of 1990	80
Total	317
Cornell undergraduates taking courses in the college (full-time equivalents)	99

Dayna E. Wiedenkiller '88



FINANCIAL STATEMENTS

TABLE 14

Source of Funds (in Thousands)

	1986-87	1985-86
State appropriation	\$13,250	\$12,439
Federal appropriation	227	274
Grants and contracts	14,775	13,451
College income	7,631	8,862
Total	\$35,883	\$35,026

TABLE 15

Use of Funds (in Thousands)

	1986-87	1985-86
Instruction and departmental research	\$ 4,910	\$ 4,778
Teaching hospital	5,231	5,245
Organized research	13,527	13,926
Extension and public service	7,711	6,656
Academic support	594	611
Student services	342	264
Institutional support	2,465	2,635
Plant maintenance and operation	722	569
Student aid	381	342
Total	\$35,883	\$35,026

Tables 14 and 15 are summaries of the income and expenditures of the New York State College of Veterinary Medicine for the fiscal years July 1, 1985, through June 30, 1986, and July 1, 1986, through June 30, 1987. These figures do not include expenditures for salary fringe benefits, estimated for 1986-87 at \$5,167,504, or for general support services.

Soraya V. Juarbe-Diaz '87 and Amy L. Glaser '87



Dr. Stephen G. Dill, of the Department of Clinical Sciences







Shenetta J. Selden, an admissions officer, also advises students in the college's Veterinary Intercultural Association.

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All college offices may be reached by dialing directly. The area code is 607. The college information number is 253-3000. An operator is on duty from 8:00 a.m. to 5:00 p.m. Monday through Friday.

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General inquiries should be directed to
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New York State College of Veterinary
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Cornell University
Ithaca, New York 14853-6401
Telephone: 253-3729

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The following supplements, containing detailed statistical material, are available:

Report of Necropsies
Report of Parasitological Examinations
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Requests for any of the above should include the name of the document desired and should be addressed to

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Telephone: 253-3700

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Dr. Douglas D. McGregor
James A. Baker Institute for Animal Health
Telephone: 277-3044

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L21
Telephone: 253-3234

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Mr. H. Donald Hinman
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Bovine Research Center
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Telephone: 253-3770

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624 Research Tower
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Dr. Donald H. Lein
206 Diagnostic Laboratory
Telephone: 253-3900

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G2 Research Tower
Telephone: 253-3744

Diagnostic Laboratory
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206 Diagnostic Laboratory
Telephone: 253-3900

Equine Drug Testing and Research
Dr. George A. Maylin
Telephone: 255-6555

Equine Infectious Diseases, Laboratory for
Dr. Dorothy F. Holmes
216 Research Tower
Telephone: 253-3402

Equine Research Park
Dr. John E. Lowe
517 Research Tower
Telephone: 255-7753 or 253-3100

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Dr. Michael A. Brunner
204 Diagnostic Laboratory
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618 Research Tower
Telephone: 253-3414

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James A. Baker Institute for Animal Health
Telephone: 277-3044

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W201 Seeley Mudd Hall
Telephone: 255-4716



Dr. William H. Miller and Maritza M. Perez '87 treat a patient on the dermatology service.

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Dr. John F. Timoney
Graduate Field Office
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Telephone: 253-3391

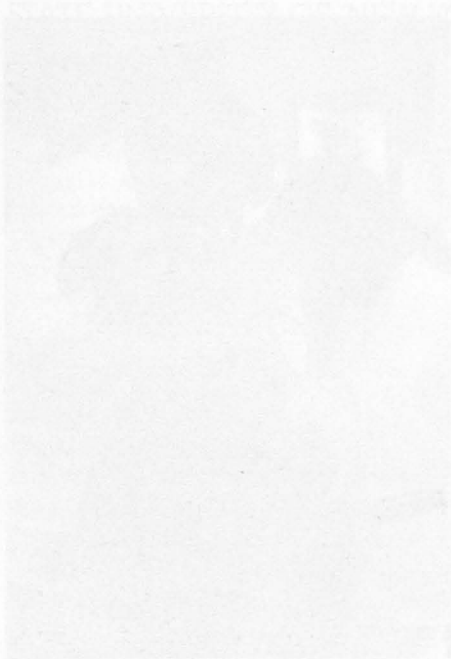
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Published by the New York State College of
Veterinary Medicine, Cornell University, 1987

Written by Karen E. Redmond

Edited by Persephone J. Doliner

Designed by Sally Dutko

Produced by the Office of Publications
Services, Cornell University

Photographs by Biomedical
Communications, Sol Goldberg, David
Grunfeld, Jean Gwaltney, and Claude Levet

Cover: A present-day surgery in the
Veterinary Medical Teaching Hospital is
superimposed on a lecture in the 1900s
presided over by the college's founder, Dr.
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Title page: Dr. Thomas V. Little, Dr. Francoise
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