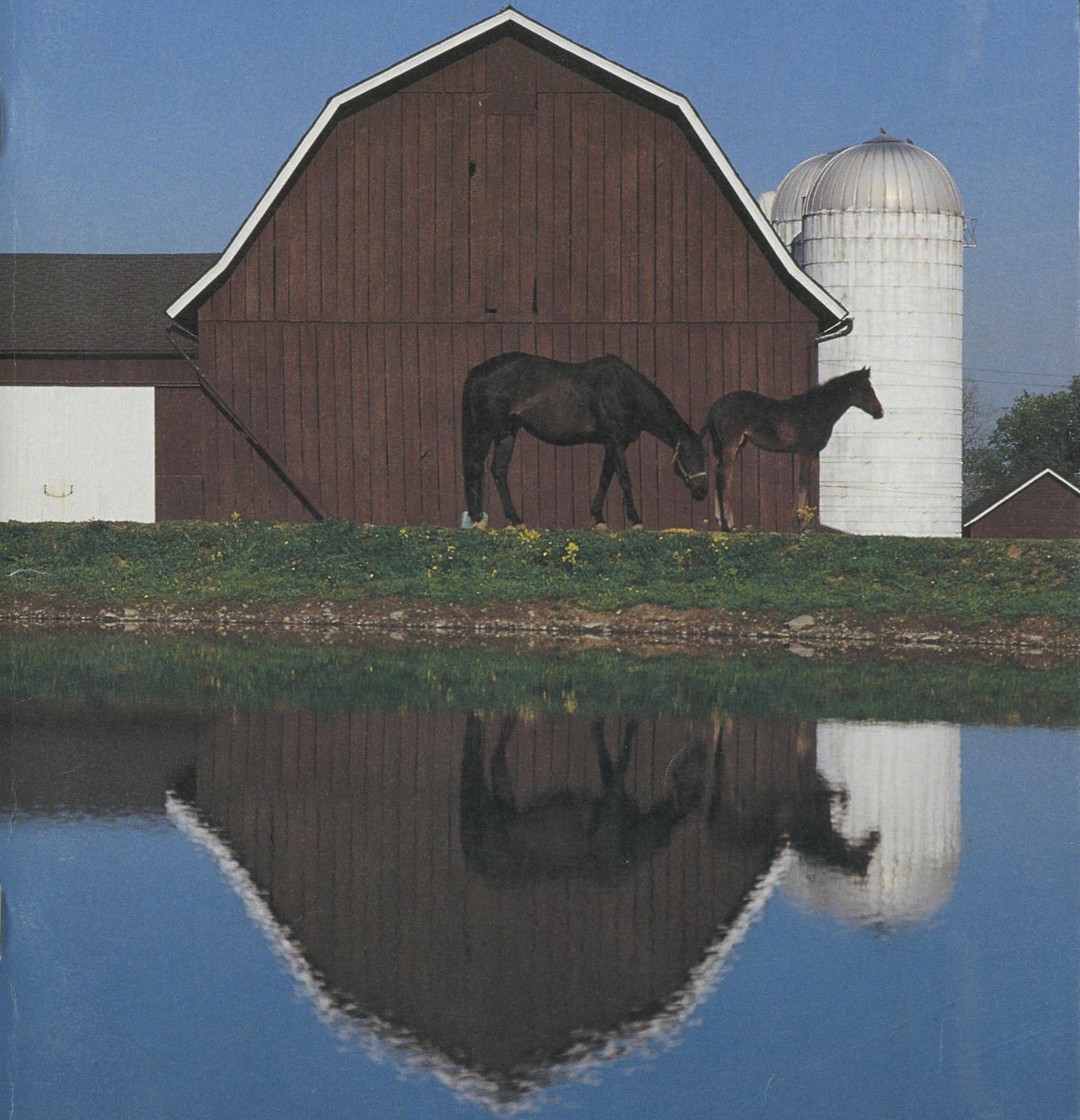


THE COLLEGE
OF
VETERINARY MEDICINE

Lms Desk Copy



CORNELL
UNIVERSITY

Cover: The college's Equine Research Park is home to stallions, brood mares, and their offspring.

Opposite: Dr. Sydney Moise is a board certified veterinary cardiologist on staff in the Teaching Hospital.

Cornell University
(USPS 132-860)

Volume 80 of the series Cornell University consists of six catalogs, of which this is number six, dated August 15, 1988. Issued once in February, once in June, twice in July, and twice in August. Published by the Office of Publications Services, East Hill Plaza, Ithaca, New York 14850-2805. Second-class postage paid at Ithaca, New York.

Postmaster: Send address changes to "Cornell University," New York State College of Veterinary Medicine, C-117 Schurman Hall, Ithaca, New York 14853-6401.



COLLEGE OF
VETERINARY MEDICINE
CORNELL UNIVERSITY

A Statutory College of the State of New York

1988-89

Cornell Academic Calendar 1988–89

Fall Semester

Registration begins	Tuesday, August 23
Registration ends	Wednesday, August 24
Instruction begins	Thursday, August 25
Fall recess begins	Sunday, October 23
Instruction resumes	Wednesday, October 26
Thanksgiving recess begins	Wednesday, November 23, 1:10 p.m.
Instruction resumes	Monday, November 28
Last day of instruction	Saturday, December 3
Study period begins	Sunday, December 4
Study period ends	Wednesday, December 7
Final examinations begin	Thursday, December 8
Final examinations end	Saturday, December 17

Spring Semester

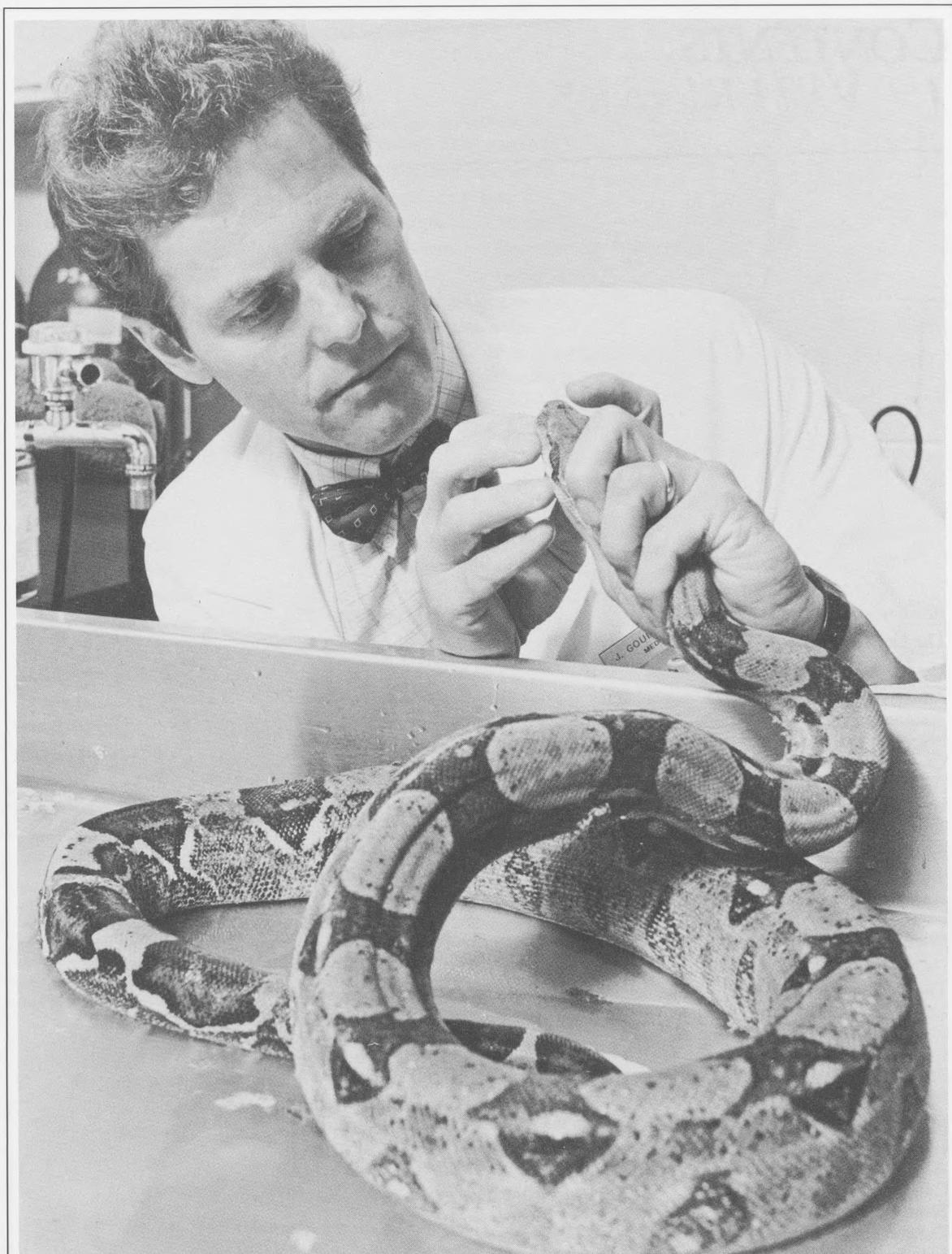
Registration begins	Thursday, January 19
Registration ends	Friday, January 20
Instruction begins	Monday, January 23
Spring recess begins	Sunday, March 19
Instruction resumes	Monday, March 27
Last day of instruction	Saturday, May 6
Study period begins	Sunday, May 7
Study period ends	Wednesday, May 10
Final examinations begin	Thursday, May 11
Final examinations end	Saturday, May 20
Commencement	Sunday, May 28

This calendar is subject to modification and is not legally binding.

In enacting this calendar, the university has scheduled classes, laboratories, and examinations on religious holidays. It is the intent of the university that students who miss those activities because of religious observances be given adequate opportunity to make up the missed work.

CONTENTS

- Academic Calendar 1988–89 2
- The College of Veterinary Medicine** 5
- High School Programs** 9
- Admission to the D.V.M. Program** 11
- Admission Policy 11
- Selection Criteria 11
- Guaranteed Admission 13
- Application Procedures 13
- University Requirements 15
- Combined Courses 15
- Finances** 17
- Tuition and Fees 17
- Refund Policies 17
- Financial Aid 18
- Pre-D.V.M. Advanced Pharmacology Training Program 18
- The Curriculum** 27
- Use of Animals in Teaching 27
- Requirements for Graduation 27
- Core Curriculum 28
- Special Veterinary Interests 28
- Teaching Hospital Rounds 31
- Student Life** 33
- Housing and Dining 33
- Activities and Organizations 34
- Counseling 36
- Health Services 36
- Conduct of Students 36
- Placement 36
- Services for the Disabled 37
- Legal Requirements to Practice 37
- D.V.M. Students** 39
- The Graduate School** 43
- Graduate Education 43
- Admission 43
- Financial Support 44
- Graduate Record Examinations 44
- Graduate Students 1988–89 44
- Internships and Residencies** 47
- Veterinary Medical Teaching Hospital 47
- Postdoctoral Training in Veterinary Pathology 48
- Resources and Facilities** 51
- Service Programs 51
- Species-oriented Programs 52
- Academic Support Services 54
- Computer Facility 55
- Faculty and Administration** 57
- Description of Courses** 65
- Anatomy 65
- Avian and Aquatic Animal Medicine 66
- Clinical Sciences 68
- Microbiology, Immunology, and Parasitology 74
- Pathology 76
- Pharmacology 79
- Physiology 81
- Index** 86
- Ithaca-Area Map** 87
- Tentative Academic Calendar 1989–90 88



Dr. Jay Gould, who specializes in avian and exotic animal medicine, examines a patient with a respiratory infection.

THE COLLEGE OF VETERINARY MEDICINE

From the very beginning of the university, with the issuance of a charter in 1865, the founder, Ezra Cornell, insisted that a chair of veterinary medicine be established. His experience as an owner of purebred livestock had taught him the importance of animal health, and he instructed Andrew D. White, the first president, to seek out the best-qualified person to teach courses in veterinary medicine and surgery. It was the first time that veterinary science had been granted equal rank with other sciences in an American university.

President White secured the services of James Law, and the appointment was confirmed on August 4, 1868, by the Board of Trustees. A young, well-educated Scotsman, Law had graduated from the Edinburgh Veterinary College, studied under the great teachers of the day (William Turner in human anatomy and Joseph Lister in the principles and practices of surgery), and attended veterinary schools on the Continent. He had also taught at the New Veterinary College in Edinburgh and the Albert Veterinary College in London.

When classes began on October 7, 1868, Dr. Law's office was on the second floor of Morrill Hall, the first university building to be completed. During the academic year 1869-70 a fairly complete course in veterinary medicine was taught by Professor Law to a class of about twenty. Of this group, four

graduated after four years of study with the Cornell degree of Bachelor of Veterinary Science. Three of these continued in the profession and became nationally distinguished through their accomplishments in disease control.

It was not until March 21, 1894, that the New York State Veterinary College was established at Cornell. It was the first contract college (later to be known as a statutory college) at Cornell, thereby setting the stage for a long and effective arrangement between the state and the university. A veterinary building (named James Law Hall some years later) was provided by the state, and the doors were opened for classes in the autumn of 1896. The school was composed of six faculty members of professorial rank, two instructors, and eleven students. The scholastic requirement for entrance was a high school diploma or its equivalent, a rather high standard for those days.

The early faculty recognized the importance of a good library and set this goal as one of their priorities. Governor Roswell P. Flower made a personal donation in 1897 to the library that now bears his name and houses an impressive collection of veterinary resource materials.



Dean Robert D. Phemister



The Veterinary Research Tower on the college campus houses laboratories and offices.

The college remained at the original site (at the southeast corner of East Avenue and Tower Road) until the summer of 1957. The present site was occupied in July 1957. The main group of buildings occupy about twenty acres, with ancillary facilities on Snyder Hill and elsewhere. The latest additions are the ten-story Veterinary Research Tower, dedicated June 27, 1974, and the Diagnostic Laboratory, dedicated October 17, 1978.

The teaching, research, and service programs of the college are recognized as among the best in the world. Each supports the others and contributes to the vitality of the program as a whole. A staff of almost 900 now supports the college's programs. The college's instructional activities include the professional degree (D.V.M.) program for 320 men and women; graduate programs leading to a master's or Ph.D. degree in the graduate fields of

Veterinary Medicine, Immunology, Physiology, Environmental Toxicology, and others for another 101 students; and intern and residency programs in the Department of Pathology and the Department of Clinical Sciences that educate about 30 D.V.M.'s for advanced work in the clinical services.



Hand-feeding a kid is just one of the unexpected jobs a student may do.

HIGH SCHOOL PROGRAMS

Explorations in Veterinary Medicine

Cornell University Summer College offers Explorations in Veterinary Medicine, a six-week program for high school students interested in gaining realistic insights into modern veterinary medicine. Through lectures, laboratories, visits, and demonstrations students become acquainted with daily veterinary practice, modern biotechnology—including monoclonal antibody production and recombinant DNA techniques—computers in veterinary medicine, modern large animal surgery, animal behavior problems, equine genetics, veterinary ophthalmology, and other current research topics. Students meet professors, practitioners, and students of veterinary medicine and have a chance to talk with people involved in teaching and practice.

In addition, participating students take a freshman writing course and choose one or more courses from those offered by Summer College.

Students successfully completing the program receive a certificate from Cornell University Summer College.

For more information, write to Cornell University Summer College, Box 725, B12 Ives Hall, Ithaca, New York 14853-3901, or call 607/255-6203.

Minority High School Student Research Apprentice Program

The Minority High School Student Research Apprentice Program is a six-week program designed to provide meaningful experience in health-related research. Assignments are made with investigators who are involved in such research, and participants are given the opportunity to assist the investigators in veterinary research laboratories. Certain assignments also allow for veterinary medical animal-related experiences. In addition, participants will be given opportunities to become familiar with the many facets of the College of Veterinary Medicine, including knowledge of the requirements and procedures for admission and an overview of career opportunities available in veterinary medicine.

The program starts in June and ends in August. Each participant receives financial support for the duration of the program. Room and board are subsidized by the College of Veterinary Medicine and are available through Cornell University.

Any minority student who is enrolled in high school during the academic year prior to the start of the program in June is eligible to apply for this program. Apprentices are selected on a competitive basis. Applications are available in January.

For additional information, contact Shenetta Selden, Admissions Officer, C-117 Schurman Hall, New York State College of Veterinary Medicine, Cornell University, Ithaca, New York 14853-6401.



First-year students learn the anatomy of the dog, horse, cow, small ruminants, pig, bird, and fish.

ADMISSION TO THE D.V.M. PROGRAM

Director

Marcia James Sawyer
Director of student affairs and admissions
607/253-3700

Admission Policy

The Faculty Committee on Admissions endeavors to select the best-qualified applicants, who, in its judgment, will be most able to successfully complete the veterinary medical curriculum and become competent, responsible veterinarians.

Approximately 70 percent of the eighty students admitted to each class are from New York State. The college also contracts with a number of states that do not have a veterinary school and subsidize a limited number of positions for their qualified residents. Applicants from these states (currently Connecticut, Delaware, Maine, Maryland, New Hampshire, New Jersey, and Vermont) and from Puerto Rico are encouraged to apply. A very limited number of nonresident, noncontract positions are also available, and those students with superior qualifications, regardless of residency, are encouraged to apply.

It is the policy of Cornell University actively to support equality of educational and employment opportunity. No person shall be denied admission to any educational program or activity or be denied employment on the basis of any legally prohibited discrimination involving, but not limited to, such

factors as race, color, creed, religion, national or ethnic origin, sex, age, or handicap. The university is committed to the maintenance of affirmative action programs that assure the continuation of such equality of opportunity.

Selection Criteria

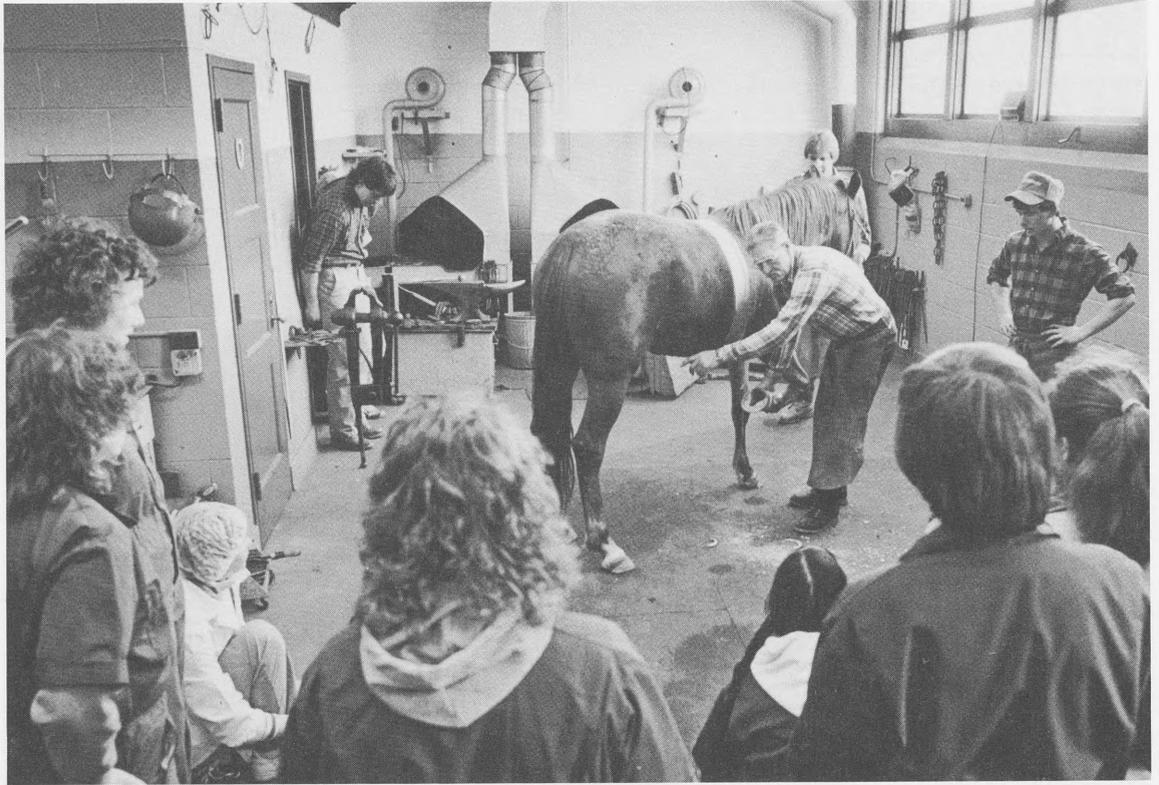
In conducting its evaluation, the committee is guided by the following criteria for determining the best-qualified applicants.

Academic Achievement and Aptitude

The need for learning large amounts of factual material means that successful applicants must have demonstrated achievement and potential for comprehension of scientific materials and an ability to solve complex problems. This ability is evaluated by examination of the applicant's grades in prerequisite courses, by examination of all college-level courses taken, and by consideration of the Graduate Record Examination scores.

Quality of the Preparatory Program

Since the curriculum leading to the Doctor of Veterinary Medicine (D.V.M.) degree is academically rigorous, the committee takes into consideration the quality of the academic program presented by the applicant for admission. Such factors as the variety and balance of courses taken, the difficulty of courses selected, and the ability to



Students gather in the farriery to learn about shoeing.

carry a heavy academic course load at a demanding institution are taken into account. As no preference is given to applicants majoring in any particular field, the choice of a major is left to the individual. Experience in teaching or research in basic sciences or areas indirectly related to human or veterinary medicine is considered in the evaluation.

Experience, Knowledge, and Achievement in Matters Relating to Animals and the Veterinary Profession

Veterinary medicine is an animal-oriented profession. Therefore an applicant's experience in working with animals and an understanding of the veterinary profession are viewed by the admissions committee as important considerations in the selection process. Such experience could involve breeding, rearing, feeding, and showing various kinds of animals, including companion animals, livestock, laboratory animals, zoo animals, or wildlife.

The applicant should be prepared to present evidence of hands-on experience with animals and sufficient contact with the veterinary profession to enable the admissions committee to determine that the applicant has some understanding of the duties and responsibilities of a practitioner and the scope of veterinary medicine.

Experience, Knowledge, and Achievement in Activities Unrelated to Veterinary Medicine

The well-rounded applicant demonstrates significant achievements outside of academic and veterinary-oriented activities. Therefore the committee evaluates the depth and breadth of accomplishment in extracurricular activities, community services, hobbies, and nonacademic interests of all kinds.

Personal Characteristics

The committee endeavors to select applicants of integrity, reliability, maturity, and determination. It is important that professionals possess excellent oral and written communication skills, poise, leadership ability, and a talent for getting along with others.

Academic Preparation

Admission to the New York State College of Veterinary Medicine requires a minimum of three years' preparation in an accredited college or university. An application may therefore be submitted at the beginning of the junior year if the applicant has fulfilled the requirements. This preparation does not have to be completed in a specialized college or in a designated preveterinary program. Potential applicants should enroll in an undergraduate institution with a reputation for

academic excellence that offers the prerequisite courses as part of an accredited baccalaureate program. The ideal candidate will have a broad education from a rigorous program that includes an introduction to the primary areas of human knowledge: the arts, humanities, social sciences, natural sciences, and mathematics. In addition to the specific prerequisite courses listed below, the admissions committee will consider evidence that candidates have sought to develop the general skills, attitudes, and values of an educated person. These include (a) the ability to read with comprehension and to write and speak with clarity and precision; (b) a sense of the physical, biological, social, and historical context in which we live our lives; (c) some insight into a time and culture other than our own; and (d) the ability to work with precision, rigor, and understanding in a chosen discipline.

The following course requirements are prerequisites for admission to the professional degree program in veterinary medicine:

	Semester Credits	Quarter Credits
English composition*	6	9
Biology or zoology (with laboratory)	6	9
Inorganic chemistry (with laboratory)	6	9
Organic chemistry (with laboratory)	6	9
Biochemistry	4	6
Physics (with laboratory)	6	9
General microbiology (with laboratory)	3	4.5

*Half of this requirement may be satisfied with an oral communication course.

All prerequisite courses should be completed and documented with a letter grade of C- or better at the time of application. It is possible to apply with up to seven credits in progress at the time of application, provided that at least one semester of any two-semester series has been completed. For example, three outstanding credits of physics could be allowed, but not all six. Applicants without complete prerequisite course work may be at a disadvantage when compared to applicants who have satisfied all course requirements. All requirements must be completed prior to matriculation.

Guaranteed Admission

A new program recently developed at the college allows highly qualified college sophomores to apply for admission and be guaranteed a position in the class following their third year of school (or, at their option, fourth). It is hoped that if students are notified of their acceptance into the program before their junior year, they will be freer to broaden their undergraduate education by choosing classes that they want to take rather than courses they feel they need to take to please the admissions committee or preserve their grade point averages. More information on this program may be obtained by calling the Office of Student Affairs and Admissions or by sending in the postcard at the back of this catalog.

Application Procedures

Application forms and detailed information can be obtained by writing to the Office of Student Affairs and Admissions. Application materials will be ready for distribution in August of the year preceding possible matriculation. The complete application material, application fee, and supporting documents must be submitted to the Office of Student Affairs and Admissions by November 1.

Graduate Record Examinations

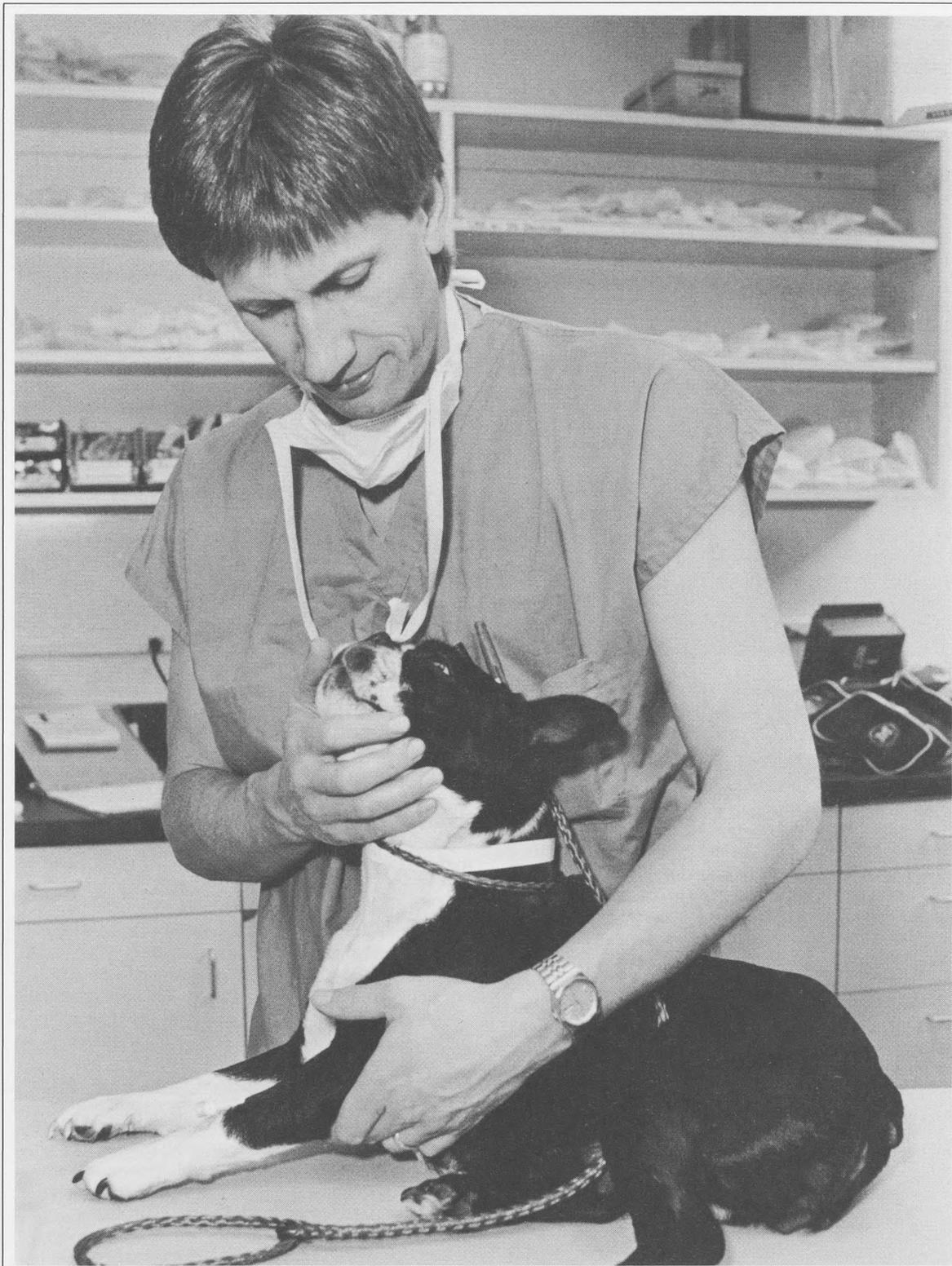
The Graduate Record Examination (GRE) general test is required of all applicants. The test must be taken no later than October of the year before desired matriculation. Scores from examinations taken more than five years before the application deadline will not be considered.

The GREs are administered by the Educational Testing Service, Box 955, Princeton, New Jersey 08540. Results of the examinations will be reported to the college if the institution code R 2549-4, New York State College of Veterinary Medicine, is properly entered on the test forms.

The desirable minimum score for the aptitude portion (verbal and quantitative) is 1,200. The advanced biology test or other advanced tests are not required but may be included. The college does not as yet use the results of the analytical portion of the GRE.

Deferments

Successful (accepted) applicants may apply for deferred admission because of exceptional medical or personal circumstances or to avail themselves of exceptional cultural or educational opportunities. Requests for deferred admission will be considered and granted or denied by the Basic Admissions Committee. Any applicant who wants to apply for a deferment should send a typewritten letter of explanation to the Office of Student Affairs and Admissions at the time of notification of acceptance. Further information is available from the director of admissions and student affairs.



Dr. Robin Gleed, an anesthesiologist, examines a sedated patient before induction of general anesthesia.

Advanced Standing

Applicants for admission with advanced standing as members of the second- or third-year class must present educational qualifications and professional accomplishments similar to those expected of students who have completed the previous year's courses here. Unless attending one of the schools or colleges of veterinary medicine accredited by the American Veterinary Medical Association, applicants must satisfactorily pass examinations in all of the work for which they desire advanced credit. No one will be admitted to any advanced class except at the beginning of the college year in September. The applicant must file a formal application and must be interviewed by the admissions committee and possibly by other faculty members. Places for admission with advanced standing are limited and depend on vacancies occurring in that particular class.

It is imperative that the admissions committee have detailed and translated summaries of veterinary medical academic programs and accomplishments for those seeking advanced placement from schools in foreign countries. Advanced standing applications are normally considered during the summer months before desired matriculation, but applications should be on file and completed as early as possible and not later than April 15.

Further Information

Additional questions about admissions can be directed to the Office of Student Affairs and Admissions, C-117 Schurman Hall, Cornell University, Ithaca, New York 14853-6401 (telephone: 607/253-3700).

University Requirements

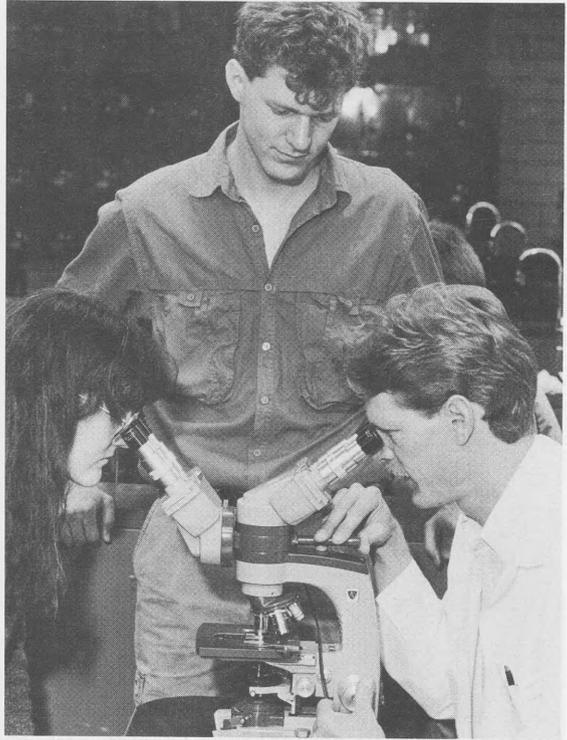
Applicants accepted for admission are required to pay a registration fee and will be notified of the amount and the due date at the time of acceptance. No refunds will be made to applicants who withdraw after the due date of the fee.

Entering students must also fulfill the health requirements adopted by the Board of Trustees of Cornell University before being allowed to register.

Combined Courses

Double Registration

Through a program of double registration it is possible for D.V.M. students who did their preveterinary work in the College of Agriculture and Life Sciences at Cornell University, and who were accepted after their third year of undergraduate study, to complete their B.S. degree while working on the D.V.M. degree. Students interested in this program should consult their undergraduate faculty advisers.



Dr. Tracy French (seated on the right) teaches students in a clinical pathology laboratory.

D.V.M./Ph.D. Programs

Interested students may begin work on a graduate program (Ph.D.) during their studies for the D.V.M. degree. Vacations are devoted to investigations and research toward the graduate degree, while the academic year is devoted to work toward the D.V.M. degree. The remainder and bulk of graduate work is completed after the D.V.M. degree is granted. Vacation stipends are available for work done during the D.V.M. studies, and a limited number of fellowships are available on a competitive basis to students when they are working on the Ph.D. program. For more information, contact the Office of Admissions, College of Veterinary Medicine, Cornell University, C-117 Schurman Hall, Ithaca, New York 14853 (telephone: 607/253-3700).



In a microbiology laboratory course a student plates bacteria onto a petri dish.

FINANCES

Director

Dr. Donald Postle
Director of financial aid
607/253-3765

Tuition and Fees

Tuition and fees for Doctor of Veterinary Medicine degree candidates are \$8,450 a year for New York State residents and \$10,200 a year for nonresidents. Most students in the college do not live in university housing. The cost of room and board in Ithaca for 1988-89 is estimated at \$4,788. Books, instruments, and supplies cost approximately \$600 a year. An additional allowance of \$2,772 should be made for clothing, laundry, local transportation, entertainment, telephone, and incidentals. These estimates are based on standard budget figures provided by the university's Office of Financial Aid and Student Employment for the purpose of allocating funds and budgeting for financial aid. Individual expenditures may exceed these figures, depending on personal preferences in housing, transportation, dining, and so on. The amount, time, and manner of payment of tuition, fees, or other charges may be changed at any time without notice.

Students who want to pay tuition in monthly installments should contact the Office of the Bursar.

Information about this plan is mailed to parents of continuing students in April of each year and to parents of incoming freshmen and transfers in May of each year.

Courses of Study describes university policies, student services, fee schedules, and payment procedures.

Refund Policies

Part of the amount personally paid for tuition will be refunded if the student obtains an official certificate of leave of absence or withdrawal at the office of the dean or director of the academic division involved. Students who terminate their registration in the university in this manner during a regular term will be charged tuition from the official university registration day to the effective date of the certificate as follows: first week, 10 percent; second week, 20 percent; third week, 30 percent; fourth week, 40 percent; fifth week, 60 percent; sixth week, 80 percent; seventh week, 100 percent, except that no charge will be made if the effective date is within the first six days of the semester, including registration day.

The university makes available tuition insurance, which provides refunds in event of leave of absence or withdrawal for medical or emotional reasons. Complete details regarding this coverage and applications accompany the August tuition bill.

The \$40 application fee for university residence halls is nonrefundable except when lack of space prevents the offer of a room assignment and a full refund will be made on request. The \$100 security deposit, which guarantees a contract for a room in the residence halls, is refundable, less damage charges, upon fulfillment of the contract.

Students participating in a prepaid dining plan who withdraw from the plan during a semester are eligible for a prorated refund based on the number of days the contract was in effect.

Financial Aid

Information and guidance regarding financial aid for veterinary students is available from the college Office of Financial Aid. A description of the methods, procedures, calendar, resources, and policies can be found in the college publication *Financial Aid*. This brochure is updated annually. Approximately 85 percent of the financial aid available for the coming year will be through self-help loan programs. The college's policy of support is based on the assumption that parents and spouses are willing to help finance the education of their family members to the extent possible.

To standardize procedures and provide uniform criteria for estimating family financial strength, the college uses the Graduate and Professional School Financial Aid Service (GAPSFAS) and federal income tax information. The college Office of Financial Aid conducts individual need analyses, and available aid is recommended accordingly. Financial aid packages prepared by the college Office of Financial Aid may combine loans, employment, and gifts or grants.

A veterinary student who desires financial aid should request a GAPSFAS application form from the college and should complete it by March 1 for aid beginning the following autumn. Application for financial aid does not affect the admissions evaluation process. Residents of New York State who qualify for Tuition Assistance Program (TAP) awards should apply each year to the New York State Higher Educational Services Corporation, 99 Washington Avenue, Albany, New York 12255. Applications should be submitted in early summer; the deadline is March 31 of the academic year for which aid is requested.

Loan Funds

Sources for loans to veterinary students are as follows: the Cornell Veterinary Alumni Association, the New York State Veterinary Medical Society, the family of David E. Wright '12, the Dean W. A. Hagan Fund, the National Association of Federal Veterinarians Emergency Loan Fund, the Student Emergency Loan Fund of the Auxiliary to the New York State Veterinary Medical Society, the Charles H. Webster Veterinary Fund, the Guaranteed Student Loan Program, the Health Professions Student Loan Program, Perkins Loans (formerly National Direct Student Loans), and certain other

loan funds administered by Cornell University. Most guaranteed loans defer interest or principal payments until the student has left school. Interest rates vary according to the source of the loan, and certain short-term loans are interest free.

Other guaranteed student loans available provide partial or no interest subsidy: Supplemental Loans for Students (SLS) and the Health Education Assistance Loan (HEAL).

Pre-D.V.M. Advanced Pharmacology Training Program

The Department of Pharmacology is making funds available for a summer program in basic or clinical pharmacology. Students will be selected for the program on the basis of academic qualifications and potential interest in a career in pharmacology. Training, which will be for two or three successive summers, will be in basic or clinical pharmacology, pharmacokinetics, or toxicology. Students may work in a different area each summer. The work will be structured to provide formal reading, study, and research under the personal supervision of a faculty member.

The major goal of this program, which we hope to expand as we raise additional funds, is to encourage highly talented individuals to enter a career of veterinary pharmacology. The current summer stipend is \$2,500.

Interested students should contact Dr. Geoffrey W. G. Sharp, chairman, Department of Pharmacology, College of Veterinary Medicine.

Scholarships for Veterinary Students

Veterinary students may receive help from various scholarship funds throughout the four-year course of study. The nature and extent of such assistance depends on scholastic achievements, specific criteria established by each benefactor, and recommendations of the appropriate college committees. Scholarship Committee evaluations and recommendations are completed at the end of spring semester. Scholarship stipends are credited by the university bursar for the award year. Students interested in securing other forms of financial assistance should contact the college director of financial aid.

Numerous prizes are also available for veterinary students and are subject to conditions listed under each award. Many of the prizes, awards, and scholarships were established with endowments, so the income distributed and number of awards may vary from year to year.

Amlan Foundation Scholarship. An award established by the Amlan Foundation in recognition of the special attributes, pleasures, and rewards from associations in the equine area. The scholarship is awarded to a third-year student who demonstrates special interest in standardbred horses and who has shown creditable academic

performance and leadership in addition to financial need.

Auxiliary to the New York State Veterinary Medical Society Scholarship. Two scholarships are awarded each year—one to a student at the end of the sophomore year and the other available to any student. The award of these scholarships will be based on the applicants' financial need and ability to do creditable academic work. Additional awards may be made as funds are available.

Jack Edward Baker Memorial Loan-Scholarship Fund. An endowed fund established in 1981 by Frances Baker in honor of her "horse doctor" husband, Jack Edward Baker, D.V.M. '37. The fund is dedicated to the faculty and the high quality of veterinary training received by Jack Baker at Cornell University. Proceeds from the endowment are to be used for veterinary students in need of financial assistance.

Mr. and Mrs. R. H. Baukhage Book Scholarship Fund. Elizabeth Glover Jenks '48 provided funds in the name of Mr. and Mrs. R. H. Baukhage for a permanent book scholarship for a deserving student.

Harriet G. Bird Memorial Scholarship. Established by the Merwin Memorial Free Clinic for Animals for Massachusetts residents. The award is based primarily on the financial need of applicants who maintain satisfactory academic performance.

The Joseph Brender Student Aid Fund. Established by friends of Joseph Brender, this memorial loan-scholarship fund provides income for an annual scholarship award to veterinary students, with preference given to ethnic minority students.

Charlie and Chico Memorial Scholarship. An award dedicated to the memory of two faithful companion dogs, established by Mr. and Mrs. Alfred Morra in 1979. The scholarship is designated for a veterinary student who is from Connecticut or the New England area. It is to be given to a student who exhibits special care and concern for small animals, who has definite financial need, and who maintains creditable academic performance.

The Dorothy R. Clay Scholarship Fund. This fund was established in 1981 from the Dorothy R. Clay estate and is designed to provide scholarship aid for veterinary students.

The Marjorie Dean Cornell Scholarship in Feline Medicine. This scholarship was established in 1986 by Marjorie Dean Cornell '39 to encourage women studying veterinary medicine who show special interest in feline medicine.

The Ben B. and Elizabeth Cox Scholarship. An endowment established in 1986, this scholarship is to be awarded to students of high character, strong academic record, and demonstrated financial need.

The William A. Dennis Memorial Scholarship Fund. In 1982 the will of Theresa A. Dennis Hart, widow of William A. Dennis, D.V.M. '26, established the William A. Dennis Scholarship Fund, with the income to be used to provide scholarships for worthy students to be selected by the faculty of the college.

The William A. and Walter R. Dennis Memorial Loan-Scholarship Fund. In 1981 Walter R. Dennis, D.V.M. '38, endowed a fund in memory of his brother, William A. Dennis, D.V.M. '26, to benefit second-, third-, or fourth-year students interested in the practice of farm animal medicine, with preference for students from Cattaraugus, Chautauqua, Chenango, and Madison counties. Following the death of Walter R. Dennis, the college honored a request from his family that the fund be known as the William A. and Walter R. Dennis Memorial Loan-Scholarship Fund.

The Dr. John W. and Elsa J. Earl Scholarship. An endowed scholarship for veterinary students who have demonstrated their worthiness through their academic achievements.

Priscilla Maxwell Endicott Scholarship. This endowed scholarship was established in 1977 in honor of Niel W. Pieper, D.V.M. '32. The income is to be used primarily for support of Connecticut students in the college. It is awarded on the basis of creditable academic performance, personal attributes, and financial need. If the scholarship is not needed for Connecticut students, it may be used for students from other New England states.

Equine Summer Experience Scholarship. Established to offer increased experience to students interested in equine medical practice, this scholarship is supported by organizations in the equine industry and by equine veterinary practitioners.

Myron G. Fincher Memorial Scholarship Fund. Funds from this scholarship will be used to provide scholarship assistance to outstanding juniors or seniors enrolled in the New York State College of Veterinary Medicine. Preference will be given to students who are interested in careers in the practice of large animal medicine or in academic large animal medicine.

Irene Heinz Given and John LaPorte Given Veterinary Scholarship. The award is administered by the Committee on Admissions, in accordance with the intent of the trustees of the Given Foundation, to help qualified students applying for admission who might otherwise be financially unable to attend this college.

Arthur G. Hall Scholarship. Established in 1975 as an endowed scholarship for needy and worthy students who maintain the moral standards required by the rules and regulations of the college.

Richard M. Hartenstein Scholarship. This scholarship is awarded to an outstanding veterinary student from Long Island, by the Auxiliary to the Long Island Veterinary Medical Association, in memory of Richard M. Hartenstein.

Hill's Pet Products Scholarships. A program developed by Hill's Pet Products to provide a scholarship for each veterinary class. The awards are based on financial need and special interest in small animal clinical nutrition.

David Kennedy Johnston Scholarships. Under the will of Nettie J. Huey, funds were set aside to provide scholarships to students in the College of Agriculture and Life Sciences and the College of Veterinary Medicine.

Valentine Mott Knapp Scholarship. This annual scholarship was established through the will of David V. Knapp as a memorial to his brother, Valentine Mott Knapp, D.V.M. '04. The award is made at the end of the third year. In awarding the scholarship the faculty will take into consideration the ability of the applicant to do creditable academic work, the personal characteristics of the applicant with respect to professional attitude, and financial need.

Madelyn C. Kreisler Scholarship. Established in 1977 from the Madelyn C. Kreisler estate to provide scholarships in veterinary medicine.

The Joseph and Edith Kyser Scholarship. A scholarship designed to lighten the financial burden of a student specializing in small animal medicine.

Le Schin-Wieler Empire Cat Club Scholarship. This endowment was established in 1986 by the Le Schin-Wieler Cattery for scholarships in veterinary medicine in honor of Eberhardt E. Le Schin and John W. Wieler. Recipients are selected from the entering class who show academic worthiness and financial need and who have an interest in small animals, preferably cats. Preference is given to sons and daughters of members of the Empire Cat Club or similar cat clubs in the New York City area.

Joel Rosenman Leventhal Memorial Scholarship. The Joel Rosenman Leventhal Scholarship was established in 1983 as a gift from Miriam R. Leventhal in memory of her son, Joel Rosenman Leventhal, whose greatest aim in life was to be a veterinarian and who was a student at Cornell University when he met with a fatal accident. This scholarship is to be awarded with the expectation that the student who receives it during the first year in the New York State College of Veterinary Medicine will continue to be supported. It is for a veterinary student who completed undergraduate work at Cornell University.

Germaine B. Little Student Loan Fund. This loan-scholarship fund was established by the will of Germaine B. Little. Income from this fund is

awarded annually to selected veterinary students who have demonstrated financial need.

Miles C. Markham Scholarship. This endowed scholarship was established in 1976 in honor of Miles C. Markham, D.V.M. '18, by his wife, Hedwig, for worthy, needy students in the college. It is awarded on the basis of general worthiness of applicants, taking into consideration their overall character, academic ability, and financial needs.

Dr. John G. Marvin Scholarships. Sponsored by the Western New York Veterinary Association in honor of John G. Marvin, D.V.M. '30, of Fillmore, New York. The scholarships are awarded to students who have completed their third year of study and are residents of western New York counties. Selection is based on financial need, and the awards are presented at the Erie County Fair.

Merck Company Foundation Veterinary Student Aid Program. A special program established in 1981 by the Merck Company Foundation to provide funds for student aid in schools of veterinary medicine. Recipients are selected on the basis of financial need by the Committee on Scholarships.

Dr. Lykergus W. and Alma Fay Messer Memorial Scholarship. A bequest from the estate of Alma Fay Messer established this scholarship in 1981 in honor of her husband, Lykergus W. Messer, D.V.M. '28. The income from the fund is to be used for scholarships for veterinary students in need of financial assistance.

Mohawk Valley Kennel Club. This is a scholarship to provide financial help for a student from the New York State capital district attending the College of Veterinary Medicine.

The Ray and Charles Newman Memorial. This grant aids those students who are physically or financially handicapped. Instrumental in obtaining this grant was Leona N. Kurzrok, the daughter of Ray and Charles Newman, who, with her late husband, Harry B. Kurzrok, bred and showed English setters.

New York State College of Veterinary Medicine Grant. Awarded on the basis of financial need, NYSCVM Grant funds are allocated to the college by Cornell University.

New York State College of Veterinary Medicine Loan-Scholarship Fund. This loan-scholarship fund was established from contributions to the college by alumni and friends. Income from the fund is offered annually as scholarship support for students with financial need.

North Shore Animal League Scholarship-Loan Fund. An endowment provided by the North Shore Animal League in 1983. Earnings are to be used for scholarship support of veterinary students, with preference for those having small-animal interests.



An echocardiogram reveals abnormalities in a puppy's heart structure.

Pfizer Scholarship. This scholarship is awarded to a student at the end of the third year whose academic achievement is adequate, whose need for the award is clear, and who shows good potential.

Plainfield Kennel Club Scholarship. This is an award for a veterinary student from New Jersey who is in need of financial assistance.

Mrs. Cheever Porter Foundation, Inc., Student Loan-Scholarship Fund Scholarship. Supportive of organizations working with animals, the Mrs. Cheever Porter Foundation endowed this scholarship in 1982.

Ryman and Katherine Powell Student Fund. This loan-scholarship fund was established by two veterinarians, Frank Powell, D.V.M. '63, and Joseph Powell, D.V.M. '67, in honor of their parents. Earned income from this endowment is awarded annually in the form of a scholarship, with preference given to students from western New York State.

Putnam Kennel Club Scholarship. The club provides scholarship support for a deserving veterinary student from New York State whose major interests are in the small animal area.

Reeb Memorial Scholarship. A scholarship provided by the board of Out-Trail and dedicated to the efforts of Clara Reeb and her daughter, Virginia Reeb Roberts, who recognized the importance of dogs in our lives. The scholarship is intended to provide financial aid to students with a demonstrated need, preferably those interested in canine research.

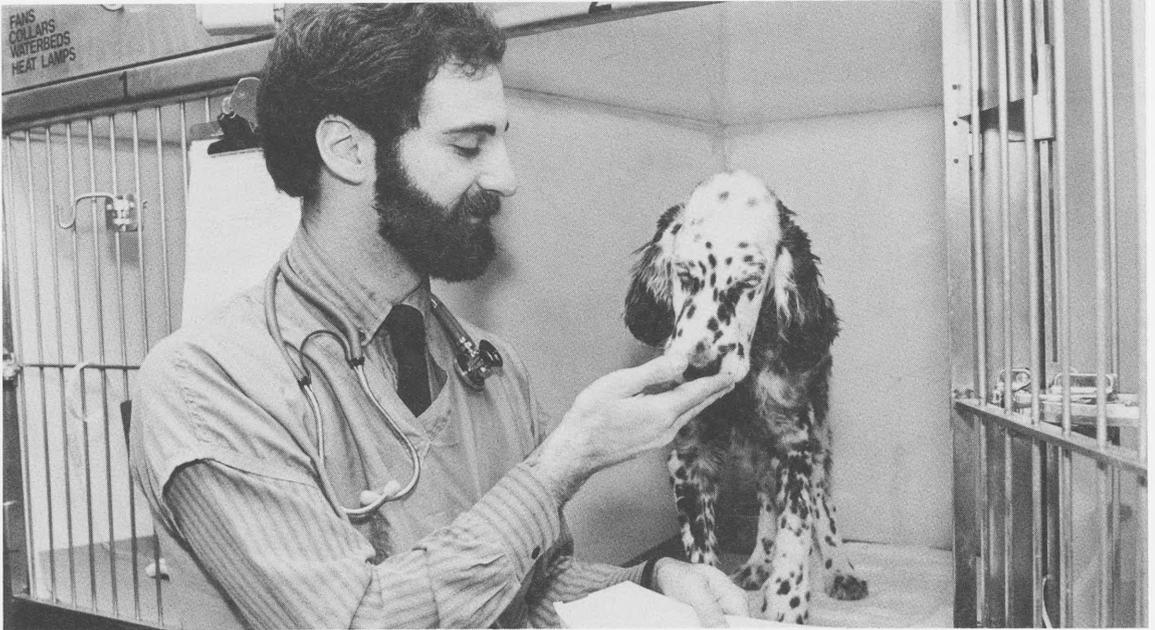
Dorothy S. Rex Student Aid Fund Scholarship. This endowment fund, established in 1979 by the Dorothy S. Rex estate, is designed to help educate worthy young men and women in veterinary science.

Salsbury Scholarships. An endowment from the Dr. J. E. Salsbury Foundation to provide funds for senior veterinary students. The awards are based on scholarship, initiative, perseverance, leadership potential, and financial need.

Sewell-Metzger Memorial Scholarship. An endowment provided in 1980 by the will of Dorothy Metzger is to be used for scholarship support of veterinary students who have completed three years of academic training and have demonstrated interest in small animal research, especially for the canine species.

Silver Spurs Riding Club Scholarship. This scholarship is provided by the Great Lakes Equine Practice of Orchard Park, New York, and is intended for the benefit of New York State residents with an interest in horses.

Thomas F. Tanneberger Memorial Scholarship-Loan Fund. A fund established by the veterinary class of 1975 in honor of Thomas F. Tanneberger, D.V.M. '75, who was killed in an auto accident in 1979. Earnings are to be used to support scholarships for veterinary students who have made outstanding athletic contributions during their lifetimes, with preference for those coming from the northern New York area.



Dr. Paul Bookbinder checks the progress of a surgery patient in the intensive care unit.

The Jim Dale Thomas Memorial Scholarship. This award was established as a prize in 1965 and became a scholarship in 1969. The scholarship is awarded, for use in the fourth year, to a third-year veterinary student who has shown an interest in dairy cattle practice and has a high level of capability in this field. The award is made on the judgment of the faculty of the Department of Clinical Sciences.

Union County Kennel Club Scholarship. A scholarship for a third- or fourth-year veterinary student from New Jersey.

Dr. Donald B. Wade Memorial Fund Scholarship. An endowment established in honor of Donald B. Wade, D.V.M. '70. The award is for a veterinary student who displays academic excellence and needs financial assistance. Preference is given to students from Vermont or those who plan to practice in Vermont.

Hilda G. and Walter D. Way Scholarship. A scholarship established in 1984 to help a needy and deserving veterinary student.

Colonel and Mrs. Louis G. Weisman Fund. This endowed fund can be used for either loan or scholarship purposes at the discretion of the college. Scholarships are granted from fund earnings to students on the basis of academic performance and financial need.

Westminster Kennel Foundation Scholarship. The Westminster Kennel Foundation established this annual scholarship in 1987 to assist a worthy veterinary student who expresses an interest in the welfare of the dog. The recipient is invited, at the

expense of the foundation, to attend the Westminster Kennel Club show.

Hulda Ann White Scholarship. This endowment was provided in 1984 by the will of Hulda Ann White, who was a lover of animals and wanted to benefit the College of Veterinary Medicine. Hulda White bequeathed a scholarship "to be used for the education of veterinarians for the health and welfare of all animals."

Virginia B. Wuori Memorial Scholarship. This scholarship was established by Virginia Wuori in appreciation of the meaningful and rewarding relationships she had with many veterinary students and the profession for a great number of years.

Wyoming Valley Kennel Club Scholarship. A scholarship for veterinary students in the upper two classes who need financial assistance and who come from the western New York counties of Allegany, Cattaraugus, Chautauqua, Erie, Genesee, Niagara, Orleans, and Wyoming.

Yonkers Raceway Foundation Scholarship. By action of the executive committee of the Yonkers Raceway Foundation, an endowed scholarship was established at the College of Veterinary Medicine to be awarded to a needy student who is a resident of New York State.

Dr. Irving Zimmerman '35 Memorial Scholarship. This scholarship was established in 1986 by Dr. Irving Zimmerman's family. It is to be awarded to a student who demonstrates a special interest in, and aptitude for, veterinary pathology as determined by the faculty of that department.

Prizes for Veterinary Students

These are among the prizes awarded at the college annual Honor Day Banquet held each year in the spring.

The American Animal Hospital Association Student Award. An engraved plaque, a letter of commendation, a one-year membership, and a cash award is given to a senior in recognition of outstanding proficiency in small animal medicine and surgery. The nominations are made by faculty of the Medicine and Surgery Sections of the Department of Clinical Sciences who are responsible for teaching in the Small Animal Clinic.

The American Association of Feline Practitioners Award. This award of a recognition plaque and two years' free membership in the American Association of Feline Practitioners is given to a senior student for special interest and accomplishment in feline medicine and surgery. Selection of the recipient is made by the faculty of the Small Animal Clinic.

The Prize of the Auxiliary of the American Veterinary Medical Association. This prize is presented to the member of the fourth-year class who is deemed to have best advanced the standing of the College of Veterinary Medicine on the campus by special contributions of an extracurricular nature.

The Beecham Award for Research Excellence. Beecham Laboratories presents this award annually to a young investigator whose research achievements are likely to have a significant impact on our understanding of the biology or medical management of animals. Nominees must be permanent faculty or senior research associates of the New York State College of Veterinary Medicine and must have completed their formal training not more than eight years prior to being nominated. Most of the research must have been conducted at Cornell within three years of the time of nomination.

The James Gordon Bennett Prize. In 1916 James Gordon Bennett of New York City endowed this prize for the students who show the greatest humaneness in handling animals, with special reference to the use of anesthesia. Bennett was the editor of the *New York Herald* (forerunner of the *Herald Tribune*) a century ago. A man of diverse abilities and interests, he is the person who dispatched Henry M. Stanley in 1870 to find Dr. David Livingstone in Africa. Nominations are made by the faculty of the Section of Anesthesiology in the Department of Clinical Sciences.

The Anne Besse Prizes. A. B. Jennings of New York City endowed this prize in 1925 for the best work in large animal medicine. Nominations are made by the Medicine Section faculty of the Department of Clinical Sciences who are concerned with teaching large animal medicine.

The Frank Bloom Pathology Award. This prize was established in 1978 with an endowment by Dr. Frank Bloom. Frank Bloom, a 1930 Cornell graduate, is a charter diplomate of the American College of Veterinary Pathologists as well as a diplomate of the American College of Laboratory Animal Medicine. He has practiced in Flushing, New York; taught at Downstate Medical Center; and published quite extensively. The nomination of a senior who has demonstrated special excellence in pathology is made by the Department of Pathology.

The Gary Bolton Memorial Cardiology Award. Funds for the endowment of this award were donated by friends and colleagues of Dr. Gary R. Bolton in memory of his outstanding contributions to the field of small animal cardiology. Gary Bolton was a member of the faculty and taught cardiology for a decade. He was also known and respected as a compassionate veterinarian who exhibited empathy for his patients and their owners. A fourth-year student who has demonstrated understanding and expertise in cardiology and an empathy for patients compatible with the philosophy of Gary Bolton is nominated by the faculty of the Small Animal Clinic for this award.

The Charles Gross Bondy Prize. Richard Bondy of New York City endowed this prize in 1929, as a memorial to his son, for the best work in the courses in practical medicine and surgery of small animals. Nominations are made by the faculty of the Medicine and Surgery Sections of the Department of Clinical Sciences responsible for teaching in the Small Animal Clinic.

The A. Gordon Danks Large Animal Surgery Award. An award initiated in 1978 by the faculty of the Surgical Section of the Department of Clinical Sciences with responsibility for teaching in the Large Animal Clinic. It is in recognition of the outstanding contributions of professor emeritus A. Gordon Danks, the first director of student administration and admissions and at one time the chairman of the former Department of Large Animal Medicine and Surgery. It is presented to a senior student demonstrating outstanding knowledge and talent in the diagnosis and treatment of surgical problems of large animals. Basic and applied knowledge, diagnostic abilities, general surgical skills, and patient care exhibited during the clinical rotations are considered in the presentation of this award.

The Donald D. Delahanty Memorial Prize. This prize was established as a special memorial to Dr. Donald Delahanty, a member of the Department of Large Animal Medicine, Obstetrics, and Surgery from 1952 to 1975. The prize is given to a fourth-year student who has shown an interest in equine practice and a high level of proficiency in the field. The candidate is nominated by the faculty of the Department of Clinical Sciences concerned with the equine patient.

The Hugh Dukes Prize in Experimental Physiology.

This prize was established by former students and friends of Dr. H. Hugh Dukes, who was a pioneer in the education of students in physiology and who served the university and college for twenty-eight years as a professor and chairman of the Department of Physiology. With a view to encouraging veterinary graduates to undertake research and teaching in physiology, the prize is awarded on the judgment of the veterinary physiology teaching faculty to a veterinary student who has done excellent work in physiology laboratory courses and shows potential for teaching and contributing new knowledge to physiology. Nominations may be made by any faculty member in the College of Veterinary Medicine.

The Myron G. Fincher Prize. An award initiated in 1980 through an endowment from Dr. Niel W. Pieper '32, given in honor of professor emeritus Myron G. Fincher '20. It is in recognition of the many contributions to the college by Myron Fincher.

Always a gentleman, he firmly demanded the best from his students and played a leading role in the instruction of large animal medicine and obstetrics for forty-five years. The award is presented to a senior student who has demonstrated the best work in courses dealing with large animal obstetrics and reproductive diseases. Both academic and practical performance are considered. Nominations are made by the Section of Theriogenology in consultation with other clinical faculty responsible for fall-semester teaching.

The Gentle Doctor Award. Sponsored by the Class of 1979, this award was made possible by Dr. William E. Hornbuckle's contribution to the Class of 1979 of the money received from the Norden Distinguished Teacher Award. This award, a bronzed statue of the Gentle Doctor, is given to the senior student who, in the opinion of the faculty of the Department of Clinical Sciences, exemplifies enthusiasm, motivation, and dedication to the delivery of excellent veterinary patient care. In addition, Dr. and Mrs. Robert Kirk have established a permanent endowment fund for this award, the income from which will provide an annual cash award.

The Hill's Award for Excellence in Clinical Nutrition. Hill's Pet Products provides bronzed plaques and cash prizes to be awarded to the three fourth-year students submitting the best essays or case reports describing the role dietary management played in the care of a patient. The essay chosen as first-place winner will also be submitted to Hill's for entry in its National Nutrition Scholar's Award competition, where matching cash awards are made to the student and to his or her college. Determination of the three best entries is made by the faculty responsible for teaching nutrition and clinical sciences.

The Grant Sherman Hopkins Prize. The endowment for this prize was given by Mrs. Ann Ottaway Hopkins in 1955 in memory of her husband, who had served the university and the college for forty-five years as a professor of veterinary anatomy. It is awarded on the recommendation of the faculty in the Department of Anatomy on the basis of interest, ability, perseverance, and performance in the work in that department.

The P. Philip Levine Prize in Avian Medicine. This prize was established from donations made by friends and colleagues of Dr. P. Philip Levine in memory of his many contributions to the field of avian medicine, both nationally and internationally. Philip Levine was a longtime member of the Cornell faculty and was the first chairman of the Department of Avian Diseases. Much of his life was dedicated to the training of young people and to encouraging them to aspire to excellence. In the spirit of encouraging excellence, this prize is awarded to the third-year veterinary student who has attained the highest grade in the course on avian medicine.

The Merck Manual Awards. Two copies of the *Merck Veterinary Manual*, embossed with the names of the recipients, are presented by Merck and Company to members of the graduating class. The basis of the award may vary from year to year and is determined by the director of student affairs and admissions.

The Jane Miller Prize. Funds for the endowment of this prize were given by Dr. Frank H. Miller, a graduate of McGill University and a trustee of Cornell University for twenty consecutive years. As a memorial to his wife, the prize is awarded to members of the second-year class who have done the best work in veterinary physiology. Candidates are nominated by the faculty in the Department of Physiology.

The Malcolm E. Miller Award. In 1965 Mary Wells Miller Ewing established this award in memory of her husband, Dr. Malcolm E. Miller '34, a former professor of anatomy and the head of that department from 1947 to 1960. The recipient is to be a fourth-year student who, in the judgment of the dean, has demonstrated perseverance, scholastic diligence, and other personal characteristics that will bring credit and distinction to the veterinary profession.

The Mary Louise Moore Prize. Dr. Veranus A. Moore established this endowed prize as a memorial to his wife for the best work in bacteriology. Veranus Moore served as head of the Pathology and Bacteriology Department and as dean of the College of Veterinary Medicine from 1908 to 1930. Nominations are made by the Department of Veterinary Microbiology.

The Neuroanatomy–Clinical Neurology Prize. This prize, in memory of Dr. William B. Forsythe, is to be awarded to the fourth-year student who has demonstrated the most outstanding expertise and interest in neuroanatomy and clinical neurology. The award will be made by the faculty who have primary responsibility for instruction in neuroanatomy and in clinical neurology.

The New York State Veterinary Medical Society Prize. This prize, which consists of an engraved plaque and a cash award, is provided annually by the society for the best senior seminar. Members of the fourth-year class are eligible to compete. Nominations are made by the Senior Seminar Committee, which judges the quality of the seminars.

The Norden Distinguished Teacher Award. This award goes to a full-time member of the veterinary medical faculty who has demonstrated continued excellence in teaching. Each of the current veterinary classes submits two nominations, and a committee appointed by the dean then chooses one of those eight nominees to receive the award.

The Pharmacology Faculty Prize. This prize is awarded to a graduating student for outstanding performance in pharmacology.

The Phi Zeta Award. The Alpha Chapter of Phi Zeta, the honor society of veterinary medicine, acknowledges the second-year student with the best academic record on completion of the first three semesters of study. The recipient of the award receives Ettinger's *Textbook of Veterinary Internal Medicine*, volumes one and two.

The Philotharian Photographic Prizes. Dr. and Mrs. Hadley C. Stephenson established this endowment. Photographs of animals submitted by students or their spouses are judged by a committee appointed by the college. The two prizes are awarded on the basis of individuality of the animal, its enjoyment of its surroundings, and the effect it has on the feelings of the judges.

Purina Mills Award for Proficiency in Swine Medicine. This prize is presented annually to a senior student for proficiency in swine medicine and consists of a cash award and a plaque. The outstanding student is selected by faculty members responsible for teaching swine medicine.

The Colonel Floyd C. Sager Equine Obstetrics and Pediatrics Award. This award, created in 1984 on the occasion of Dr. Sager's ninetieth birthday by another Cornellian who trained under him, recognizes a Cornell veterinarian whose name is synonymous with excellence in equine obstetrics and pediatrics. Following his graduation in 1917, Floyd Sager served in the Army Remount Service until after World War II. He then became the veterinarian for the world-famous Claiborne Farm in Kentucky, where he remained until his death. The senior receiving this

award, in the opinion of the faculty of the Department of Clinical Sciences, has displayed outstanding aptitude in equine obstetrics and pediatrics.

The E. L. Stubbs Award. This prize, contributed by the Mid-Atlantic States Association of Avian Veterinarians, is to be awarded to the fourth-year student who has demonstrated the most outstanding competence and motivation in various areas of avian medicine, including poultry, wildlife, research, and cage and aviary medicine. The award will be made by the faculty who have primary responsibility for instruction in avian diseases and clinical avian medicine, including the adviser of the Avian Clinic.

The Anna Olafson Sussex Pathology Award. This award was endowed in 1974 by Peter and Harriette Olafson in memory of Dr. Olafson's sister. The award is given at the end of the third year and is made on the recommendation of the people actively engaged in teaching pathology.

The Jacob Traum Award. Through an endowment established by friends of Jacob Traum '05, professor of bacteriology emeritus, University of California, and formerly the chief scientist at the federal Plum Island Animal Disease Laboratory, this prize is awarded to the fourth-year student who is judged by the Department of Veterinary Microbiology as having exhibited in his or her scholastic career superior interest and accomplishment in bacteriology, epizootiology, pathology, and virology, including aptitude for, and expressed interest in, research on infectious diseases.

The Upjohn Clinical Awards. The Upjohn Pharmaceutical Company offers a prize of \$500 each to the student considered to be the most proficient in the practice of large animal medicine and the student considered to be the most proficient in the practice of small animal medicine. Recipients of these awards are chosen by the faculty members of the respective departments.

The Horace K. White Prizes. An endowment for these prizes was originally given by Horace K. White (and later by his sons, of Syracuse, New York) for the students whose academic records for the entire veterinary course are the highest. This award, originally called the President's Prize, dates back to 1873 and is probably the longest-standing prize at Cornell. The original donor was a brother of Andrew Dickson White, the first president of the university.

The Wild Bird Research and Rehabilitation Award. This award, from a university endowment by the same name, is to be given to a senior veterinary student who has demonstrated concern for the rehabilitation of wild birds or who has been involved in research related to wild bird treatment and rehabilitation. Nomination is made by the director of the teaching hospital on the basis of recommendations of concerned faculty.



A student in Large Animal Gross Anatomy talks with Dr. John Hermanson, assistant professor of anatomy (right).

THE CURRICULUM

Use of Animals in Teaching

The college Committee on the Use of Live Animals in Teaching believes that applicants should know and understand the following before accepting a position at the college:

1. Live animals will be used for teaching in certain obligatory core courses.
2. Some of these animals will require humane euthanasia after they have been used for teaching.
3. The college conforms to the rules for the care of such animals as outlined in *Guiding Principles in the Care and Use of Animals*, as approved by the Council of the American Physiological Society, and the *Guide for the Care and Use of Laboratory Animals*, DHEW publication number 86-23 (revised 1985).
4. Each course in which animals are used receives a formal review annually by the college Committee on the Use of Live Animals in Teaching.
5. Any concerns regarding live animal use in teaching should be addressed first to the faculty member responsible for that course. Alternatively students may choose to address their concerns to the chairman of the Committee on the Use of Live Animals in Teaching, whose name may be obtained from the student administration or dean's offices. The chairman may initiate discussion between the said committee and the faculty member responsible for a particular course without involving the student if he or she would prefer to remain anonymous.

The faculty of the college voted in favor of this legislation in March 1988. Applicants must acknowledge having read the above information by signing the application form in the designated place.

Requirements for Graduation

The prescribed four-year curriculum leading to the degree of Doctor of Veterinary Medicine (D.V.M.) is summarized in the section below. To receive this degree, candidates must successfully complete the courses named in the curriculum below, have paid all fees due, and be recommended for graduation by the college faculty.

The academic year, divided into two terms, begins in August and ends in May. At the conclusion of each term the college faculty reviews the records and conduct of students. Students whose grades are not satisfactory may be denied permission to register or graduate or may be assigned varying degrees of academic warning or probation.

Core Curriculum

The college has a core-elective curriculum. A summary of the core curriculum is shown below.

The abbreviation "Req." indicates that a course, or its equivalent, is required for graduation but that no formal credit is given for the course.

First Year

<i>Fall Term</i>	<i>Credits</i>
500 Gross Anatomy: Small Animal	4
502 Microscopic Anatomy*	
504 Neuroanatomy and Clinical Neurology*	
507 Animal Development	3
525 Cell Physiology	3
526 Systems Physiology I	4
568 Foundations of Clinical Science I	2
581 Animal Nutrition	2
	<hr/>
	18

*Begins in the fall term and continues through spring term.

Spring Term

501 Gross Anatomy: Large Animal	5
502 Microscopic Anatomy (continued)	3.5
504 Neuroanatomy and Clinical Neurology (continued)	2.5
508 Anatomy of the Fish and Bird	0.5
515 Veterinary Immunology	2
527 Systems Physiology II	5
569 Foundations of Clinical Science II	2
	<hr/>
	20.5

Selectives (to be taken either fall or spring) 2†

†Those who are not exempted from the nutrition course are excused from taking selectives in the first year.

Second Year

<i>Fall Term</i>	<i>Credits</i>
510 Veterinary Parasitology	4
516 Infectious Diseases I	4
517 Infectious Diseases II	2
528 Pharmacology I	4
535 Veterinary Pathology I	4
545 Epidemiology	2
	<hr/>
	20

Spring Term

518 Infectious Diseases III	2
529 Pharmacology II	2
536 Veterinary Pathology II	4.5
561 Theriogenology I	3
571 Clinical Pathology	3
579 General Medicine and Surgery	4
	<hr/>
	18.5

Selectives (to be taken either fall or spring) 4

Third Year

<i>Fall Term</i>	<i>Credits</i>
505 Applied Anatomy	1
548 Anesthesiology	1
555 Avian Diseases	2
562 Theriogenology II	3
563 Large Animal Medicine and Surgery	5
566 Radiographic Techniques	1
567 Clinical Nutrition	2
583 Small Animal Medicine and Surgery	5
	<hr/>
	20

Spring Term

506 Applied Anatomy	1
520 Preventive Medicine in Animal Health Management	1
531 Regulatory Medicine	Req.
539 Laboratory Animal Medicine	1
564 Large Animal Medicine and Surgery	6
582 Large Animal Surgical Exercises	2
584 Small Animal Medicine and Surgery	7
586 Small Animal Surgical Exercises	2
	<hr/>
	20

Selectives (to be taken either fall or spring) 4

Fourth Year

<i>Required</i>	<i>Credits</i>
540 Pathology Service	2
572 Senior Seminar	1
574 Large Animal Surgery Service	4
575 Ambulatory Medicine Service	4
578 Clinical Anesthesia Service	2
580 Radiology Service	2
589 Small Animal Medicine Service	4
591 Small Animal Surgery Service	4
593 Ophthalmology Service	2
594 Large Animal Medicine Service	2
598 Dermatology Service	2
	<hr/>
	29

Elective

547 Practice Management	2
570 Theriogenology	4
596 Opportunities in Veterinary Medicine	V4

Special Veterinary Interests

Every veterinary student is required to complete the core veterinary curriculum and a certain number of selective courses before graduation. Students with special species or career interests have available to them courses, selectives, and clubs centered around those interests.

Special Veterinary Interests

<i>Interest</i>	<i>Selective Courses</i>	<i>Clubs</i>	<i>Fellowships</i>	<i>Other</i>
Horses	Equine Lameness Advanced Equine Surgical Techniques Theriogenology Equine Foot Care Shoeing Equine Herd Health Problems in Equine Behavior Veterinary Dermatology Bottom Line Postmortem Pathology	AAEP ISVP Equine Neonatal ICU	Danks Award Delahanty Award Equine Summer Experience Colonel Floyd C. Sager Yonkers Raceway Foundation Silver Spurs Riding Club	Equine Metabolism Unit Equine Research Park New York State CEM Quarantine Station Equitation Center
Cattle	Advanced Large Animal Internal Medicine Mastitis Dairy Herd Health and Management Infectious Diseases of Cattle Bottom Line Poisonous Plants Pathology of Nutritional Diseases Postmortem Pathology	AABP		Large animal morning rounds Show and tell R-barn palpation herd
Cats and dogs	Small Animal Infectious Diseases Problems in Dog and Cat Behavior Poisonous Plants Veterinary Dermatology Special Problems in Small Animal Medicine Special Problems in Small Animal Surgery Autotutorial courses in feline disease and breeds of cats	AAHA	American Association of Feline Practitioners Award for Outstanding Work in Feline Medicine and Surgery	Cornell Research Laboratory for Diseases of Dogs, James A. Baker Institute for Animal Health Cornell Feline Health Center
Sheep and goats	Goats: Management and Diseases Health Program for Sheep Postmortem Pathology Bottom Line Externship Senior Year	AASGP		A fair number of college work-study or non- college work-study positions in animal science and physiology
Exotic animals	Diseases of Common Exotic Pets Diseases of Aquarium Fishes Wildlife Pathology AquaVet I and II	AAZV Association of Avian Veterinarians	National AAZV scholarships for zoological research	Weekly rounds at Ross Zoo Externships at zoos AAZV conference
Overseas	Veterinary Medicine in Developing Nations	VIDA	Expanding Horizons International Committee	Many offerings on campus
Fish	Diseases of Aquarium Fishes Fish Health Management Diseases of Aquatic Animals AquaVet I and II			
Caged birds	Diseases of Common Exotic Pets Parasites of Avian Species	Avian Clinic AAV AAZV	P. Philip Levine Prize Avian Rehabilitation Award	Avian Clinic Ornithology Laboratory Peregrine falcon barns
Wildlife	Diseases of Common Exotic Pets Wildlife Pathology	AAZV VIDA	Expanding Horizons	Wildlife rehabilitation for new building



An ambulatory clinician, Dr. Mary Smith prepares for field surgery on one of her farm calls.

Teaching Hospital Rounds

Fall term: August 25–December 3, 1988

Spring term: January 23–May 6, 1989

Time	Monday	Tuesday	Wednesday	Thursday	Friday
7:30	SAC Surgery Patient Rounds: D-215	SAC Medicine Patient Rounds: D-215	LAC Medicine Patient Rounds: LAC	LAC Surgery Patient Rounds: LAC	
8:00	Special Topics in Pathology: E-215 (fall term) Pathology State of the Art: E-215 (spring term)	Surgical Pathology Seminar: E-215	Surgery Rounds: 530-VRT	Necropsy Pathology Seminar: E-215	Anesthesia Resident Rounds: Hospital Annex Conference Room
	SAC Medicine Rounds: G-131 Conference Room	Sit-Down Rounds Large Animal Med/Surg: 530-VRT	Anesthesia Resident Rounds: Hosp Annex Conf Room	Medical Conference: 530-VRT	
	Anesthesia Resident Rounds: Hospital Annex Conference Room				
9:00				Infectious Disease Rounds: G3-VRT (spring term)	
12:00					Cardio- pulmonary Rounds: D-215 (biweekly)
12:15			Pathology Bottom Line: C-207		
12:30		Radiology Rounds: D-215			Neuro/Ophtho Rounds: LAC
3:30					Show and Tell: Necropsy Laboratory
4:30		Show and Tell: Necropsy Laboratory	Senior Seminar: Auditorium		Show and Tell: Necropsy Laboratory



Dr. Pat Tamke (left), with student Jeff Rubin '88 and animal health technician Char Barnard, examines a patient on the newly established Community Practice Service.

STUDENT LIFE

Housing and Dining

Off-Campus Housing

The majority of D.V.M. students live off campus. Information on housing that is currently available is posted on a board at the Off-Campus Housing Office, 103 Barnes Hall. Because changes of available accommodations occur daily, it is not practical to prepare lists. If possible, a student should plan to visit Ithaca well in advance of residence in order to obtain suitable quarters off campus.

The Office of Student Affairs and Admissions at the veterinary college also keeps a notebook of housing opportunities to which students are welcome to refer.

On-Campus Housing

Limited on-campus housing is available for single graduate students. Information and applications can be requested from the Housing Assignment Office, 1142 North Balch Hall, Ithaca, New York 14853-1401.

The graduate residences are conveniently situated and provide a comfortable multinational atmosphere for study, recreation, and socializing. Schuyler House, located in a residential area within walking distance of campus and downtown shopping areas, accommodates 150 graduate men and women. Two coeducational small residences, 112 Edgemoor and The Oaks, situated along the west side of campus, together house approximately

70 graduate students. Thurston Court, a small apartment building situated on the north side of Fall Creek Gorge, accommodates 21 students.

Family Housing

The university maintains apartment accommodations for approximately 340 students and their families in the Pleasant Grove and Hasbrouck apartment complexes. All accommodations are unfurnished. Requests for further information and applications should be directed to the Family Housing Office, Building 40, Hasbrouck Apartments, Ithaca, New York 14850.

Dining Services

Breakfast and lunch are available in the cafeteria on the first floor of the Veterinary Research Tower. Vending machines are also located at various places throughout the college.

Those students who plan to live on campus may want to participate in the Co-op Dining program. Additional information on the various plans available may be obtained from Cornell Dining, 233 Day Hall.



During the annual Open House visitors can view—and touch—the exhibits.

Activities and Organizations

SCAVMA

Most of the students attending the New York State College of Veterinary Medicine belong to the student chapter of the American Veterinary Medical Association. Membership benefits include a subscription to *JAVMA* (*Journal of the American Veterinary Medical Association*); a voice in the national organization, SAVMA (Student American Veterinary Medical Association); and participation in many activities throughout the year. To begin the year, SCAVMA sponsors a picnic to welcome first-year students and, to end the year, holds a farewell picnic for graduates. In between, SCAVMA sponsors lectures, wet labs, and social events. Fund-raising includes an annual auction, dog washes, and the selling of veterinary school T-shirts and hats. A yearly service project is helping the county with its rabies clinic. In the spring several students attend the national SCAVMA symposium, which is held at a different school of veterinary medicine each year.

Cornell Chapter of SCAVMA, 1988–89

President: Celeste Boatwright, Class of 1990

Vice president: Peggy McCann, Class of 1991

Secretary: Heidi Gemperle, Class of 1991

Treasurer: Larry Cangro, Class of 1990

Advisers: Dr. William Hornbuckle; Marcia Sawyer, director of student affairs and admissions

Students with interest in specific areas can also join one of the many organizations active in the college. Each of these groups meets to discuss its particular interests and sponsors lectures, trips, and workshops. Currently, the groups represented at the college are:

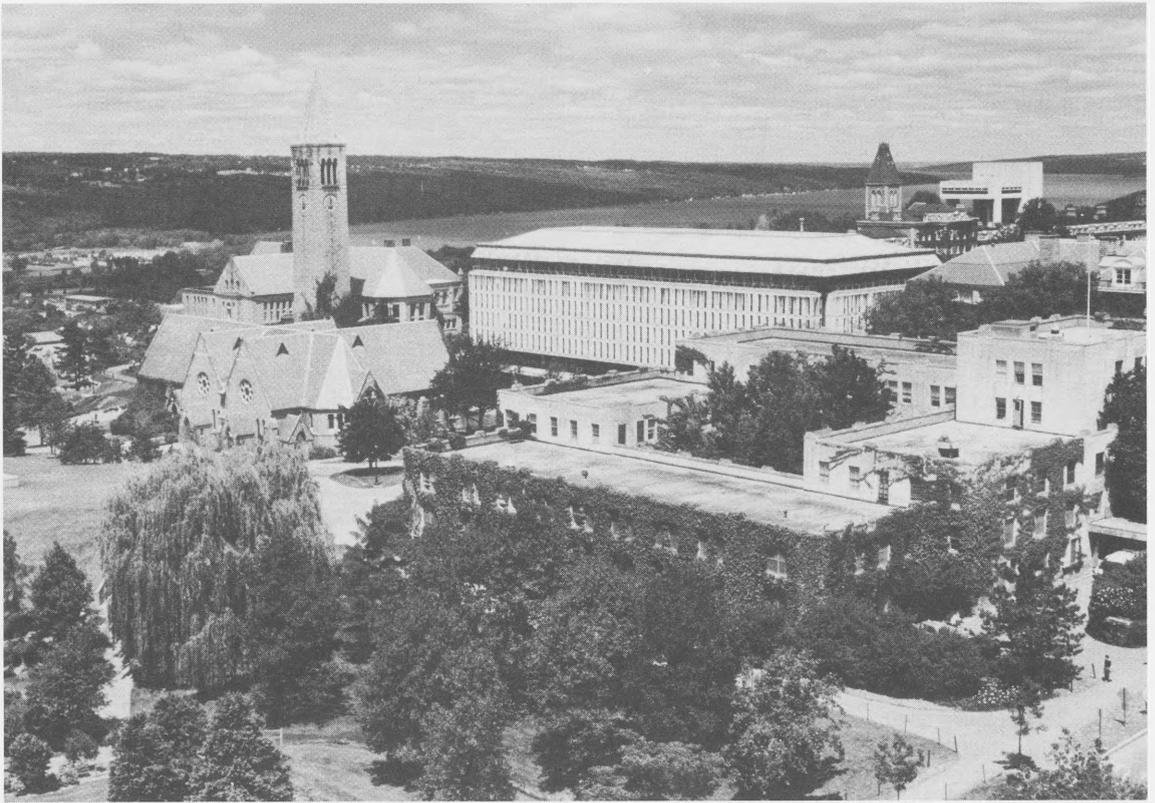
AAEP, American Association of Equine Practitioners
 AABP, American Association of Bovine Practitioners
 AAZV, American Association of Zoo Veterinarians
 AAHA, American Animal Hospital Association
 VIDA, Veterinarians Interested in Developing Areas
 AAWV, American Association of Women
 Veterinarians

VICA, Veterinary Inter-cultural Association

College Committees

Students are also members of the following college committees:

Faculty-Student Liaison Committee
 Honor Board
 Financial Aid Advisory Board
 Student Curriculum Committee



Cornell University offers students an enriched academic, cultural, and recreational environment.

Honor Societies

There are three honor societies for which students of the College of Veterinary Medicine are eligible.

Phi Zeta. Founded in 1925 by the students of the New York State Veterinary College at Cornell University, Phi Zeta strives for the constant advancement of the veterinary profession, higher educational requirements, and superior scholarship. The object of the society is to recognize and promote scholarship and research pertaining to the welfare and diseases of animals.

Sigma Xi. Any student or research staff member is eligible for membership in Sigma Xi, the Scientific Research Society of North America. It is the responsibility of the Admissions Committee of Sigma Xi to select for membership those individuals whose research aptitude or achievement deserves special recognition.

Phi Kappa Phi. The society of Phi Kappa Phi was founded in 1897 and soon became a national organization. Its primary objective is to recognize and encourage superior scholarship in all fields of study. Good character is essential for those elected to membership.

Fraternities

Two veterinary fraternities have houses in Ithaca. They are Alpha Psi and Omega Tau Sigma. The fraternities are coeducational and encourage all students to join whether or not they live at the house. They offer many social activities, and all students are welcome at any fraternity event.

Open House

Each year students at the college participate in the planning and presentation of Open House. On a Saturday in April the college is opened to the public and offers displays and exhibits, tours, films, and instruction on many aspects of veterinary medicine geared to various age groups. Several thousand people take advantage of this opportunity.

Counseling

Academic

Each student has an academic adviser who is a member of the faculty and can advise on matters related to the student's academic career. The relationship is an informal one but can be very important in cases where students are experiencing academic difficulty.

Personal

The director of student affairs is available to counsel students in matters of a personal or crisis nature. The director may at times refer the student for more in-depth therapy to the university Psychological Service or to any number of other offices depending on the problem. There are many support services available at the university to help students deal with problems. For example, among the workshops offered each term are those dealing with time management, assertiveness training, stress management, and study skills.

Health Services

University Health Services provides comprehensive medical care for all full-time undergraduate and graduate students enrolled at Cornell University in Ithaca. Gannett Health Center, located at 10 Central Avenue, adjacent to Willard Straight Hall, is open twenty-four hours a day during the school year and is available for overnight care and emergency outpatient services outside of normal working hours. Normal hours are Monday through Friday from 8:30 a.m. to 11:30 a.m. and from 1:00 p.m. to 4:30 p.m. and Saturday from 8:30 a.m. to 12:30 p.m.

The center's medical staff, under the supervision of the medical director, consists of attending physicians and health associates from the university staff and consulting physicians and surgeons from the Ithaca area. All medical records are strictly confidential.

For a medical appointment, a student should call 255-4082 or go to the center. For an appointment at the Psychological Service, a student should call 255-5208 or go to the offices at the center. A doctor is available for emergencies twenty-four hours a day (telephone: 255-5155).

General medical care, psychological services, gynecological care, and overnight and after-hours or emergency care are provided at Gannett Health Center without additional cost. Laboratory service, X rays, physical therapy, limited consultations, allergy shots, drugs, and other services provided on-site may be charged for. There is a fee for all services off-site. Students may call 255-4082 for additional information.

Student Accident and Sickness Insurance Plan

Cornell sponsors a health insurance plan underwritten by a private insurance company to supplement the services outlined above. This plan may be waived if the student has other health insurance or is willing to accept the financial risk of no insurance. *The university plan does not cover preexisting conditions.* Students are urged to carefully consider the comprehensive benefits available for a relatively modest fee before waiving the plan. The plan covers services not available on campus, such as hospital care and consultations. Further, it provides for expenses relating to illness or accidents outside Ithaca during the academic year and vacation periods. Families of students are eligible for coverage and must enroll annually. Information about this insurance may be obtained by calling 607/255-6363 or by visiting Gannett Health Center, where a representative of the insurance company has an office.

Health Care Plan for Student Spouses

The University Health Services provides health care for student spouses on a prepaid or fee-for-service basis. The fee schedule and other information about this service is available at the front desk and in the Student Insurance Office.

Emergency Health Service

Students requiring after-hours or emergency care should call the health center at 255-5155 to receive instructions on the proper course of action to follow.

Conduct of Students

The standards of conduct expected of a Cornell veterinary student are defined by various university regulations and the College of Veterinary Medicine Student Honor Code. The code was established in recognition of the importance of ethics, honor, and integrity in an individual's training for the profession. It places the responsibility for ethical and professional conduct upon the students and is implemented by the Student Administrative Board, which is granted initial jurisdiction by the faculty. It is each student's responsibility to become familiar with the contents of the code and to abide by it throughout his or her involvement with the college.

Placement

The placement service, a part of the Office of Student Affairs and Admissions, offers valuable information to students attending the New York State College of Veterinary Medicine. Alumni and other practitioners seeking associates also benefit from this service.

Employment opportunities for permanent positions, summer jobs, and externships are solicited from all over the country and stored on the



Dr. John Randolph provides restraint while students examine a patient.

central veterinary college computer. Students gain access to this information by using terminals available to them. The student may select employment type, practice type (small, large, or mixed), and location desired to be viewed on the screen or printed on a remote printer in the Office of Student Affairs and Admissions.

A résumé service; workshops on such topics as job seeking, salary negotiation, and the purchase of insurance; compilation of national and state board information; and the collection and distribution of employment statistics are additional services provided by the office.

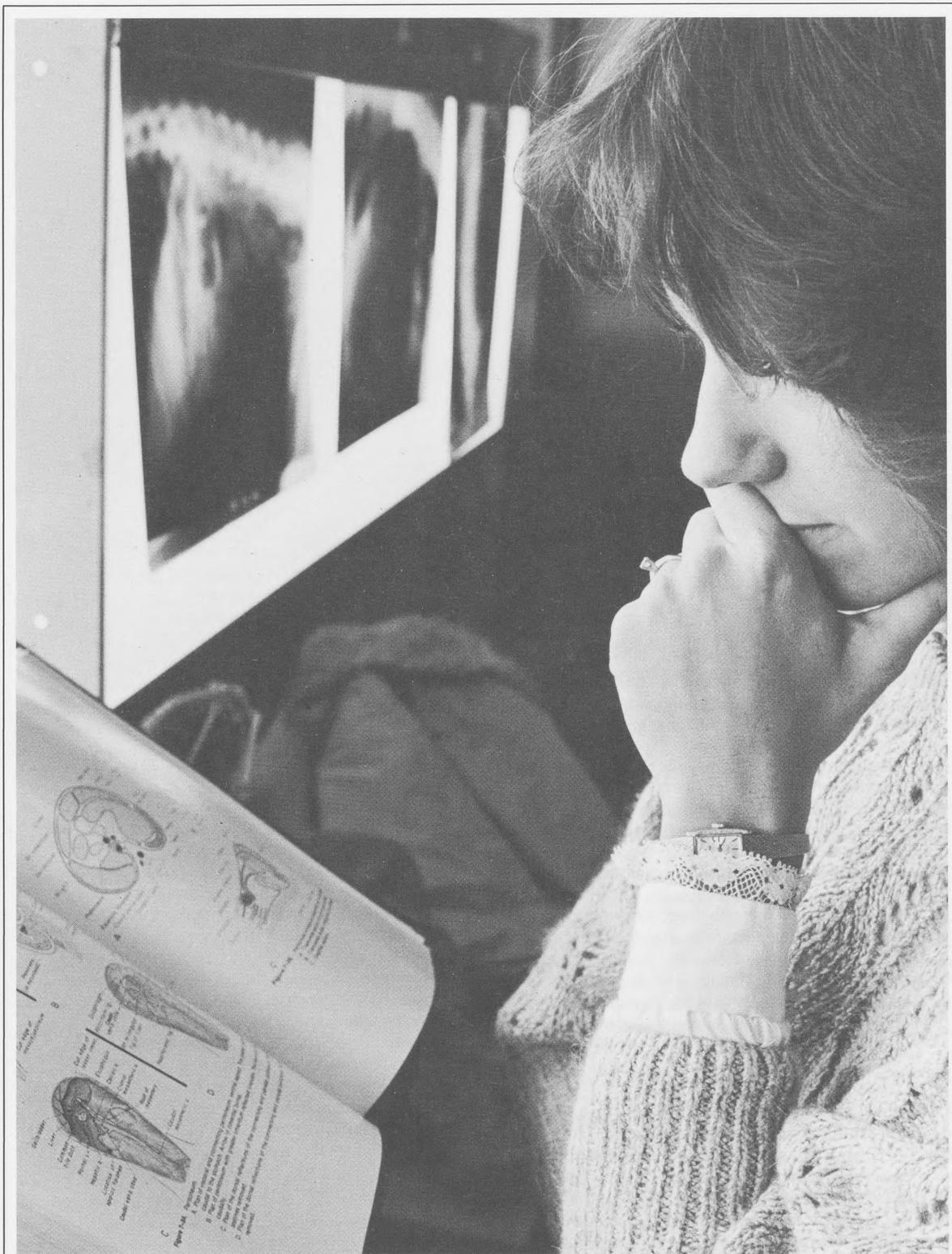
Services for the Disabled

Cornell University is committed to assisting those disabled students who have special needs. A brochure describing services for the disabled student may be obtained by writing to the Office of Equal Opportunity, Cornell University, 234 Day Hall, Ithaca, New York 14853-2801. Questions or requests for special assistance may also be directed to that office.

Legal Requirements to Practice

Before graduates can practice veterinary medicine in the United States, they must obtain a license from the state or states in which they locate their practices. This license is generally issued by the department of education or the department of agriculture of the state on the basis of an examination by a veterinary licensing board. Some states issue licenses without examination, based upon reciprocity, when the applicant has been licensed in other states.

In New York the licensing agency is the State Education Department. All inquiries should be addressed to the Executive Secretary of the State Board for Veterinary Medicine, Room 3041, Cultural Education Center, Albany, New York 12230. Application for the examination must be filed at least sixty days before the scheduled date and must be accompanied by a fee. Other details are available from the State Board of Examiners.



Throughout the four-year D.V.M. program students put in long hours of study and work. They graduate uniquely prepared to pursue many career options in veterinary medicine.

D.V.M. STUDENTS

Fourth Year Class of 1989

Adams, Patricia
Aromando, Michael
Ashley, Patricia
Babbott, Anne
Back, Sean
Balsamo, Vincent
Basak-Smith, David
Battista, Mary
Belman, Matthew
Berl, Erica
Brodsky, Michael
Burbank, Kyle
Burgos, Linda
Byman, Kenneth
Byrd, Marye
Cairns, Patricia
Capella, Frank
Casavecchia, Claudia
Castiglione, Maria
Claps, Megan
Clement, Keith
Cook, Laura
Daly, Patricia
Dattner, Gary
de la Varre, Byron
Dewey, Curtis

Duhaime, Roberta
Durso, Janet
Erickson, Nancy
Farber, Michael
Farewell, Corine
Fisher, Deborah
Frazier, Laura
Gaynor, Alison
Golden, Michael
Gong, Christina
Gorman, P. Douglas
Gruber, Ronald
Hecht, Nancy
Herr, Wayne
Hirsch, Karen
Hlaing, Teresa
Hoskins, Bruce
Isaman, Linda
Jones, Laura
Justin, Robert
Keller, Angela
Kokulis, Kimberley
Kondek, Franczesca
Kraft, Jennifer
Lafer, Diana
Laste, Nancy
Laurita, James
Lee, Joan
Looney, Andrea
Meittinis, Nicholas
Michel, Lillian
Murnan, Kathleen
Neth, Steven

Osofsky, Steven
Parente, Eric
Perry, Pamela
Popolow, Carol
Reyes-Pena, Elvin
Reynolds, John
Rivera, Warren
Schulz, Kurt
Stewart, Ruth
Toole, Robert
Ulrich, Barbara
Van Der Eems, Karen
Van Metre, David
Verhave, Marya
Waldron, Cynthia
Westerman, Stephanie
Wirth, Randal
Wollney, Gwendolyn
Yasuda, Cheryl
Zahn, Amy

Third Year Class of 1990

Amioka, Mari
 Bacmeister, Cynthia
 Barry, Bridget
 Blinn, Beverly
 Boatwright, Celeste
 Brennen, Michael
 Cangro, Laurence
 Carmichael, Daniel
 Carmichael, James
 Carnevale, Joyce
 Chavkin, Matthew
 Chrest, Renee
 Cousineau, Glen
 Cronin, Kim
 Crum, Alberta
 Dallessandro, Marianne
 Diana, Stephen
 Ehram, Beatrice
 Eschner, Andrew
 Feely, Elaine
 Fitchett, Miriam
 Fitzpatrick, Doreen
 Fullam, Lisa
 Gilbraith, Gayanna
 Giles, Stefan
 Goldstein, Richard
 Gordon, Keith
 Grossi, Catherine
 Hoover, Mary
 Hutchinson, Pamela
 Jagne, Jarra
 Johnston, Karen
 Kearney, John
 Kellerman, Dana
 Koprowski, Kimberly Doyle
 Koster, Sophia
 Lamothe, Michele
 Leahy, David
 Licciardi, Janiene
 Loeven, Koen
 Lowenthal, Anne
 McFee, Cheryl
 MacMackin, Thomas
 Macri, Nicholas
 Marke, Lorna
 Marky, Sandra
 Messinger, Linda
 Miller, Timothy
 Nersesian, Pamela
 Nicholson, Brigid
 Ohlinger, Margaret
 Oppenheim, Yvonne
 Oros, Karen
 Pinkham, George
 Ralston, Catherine
 Relyea, Janette
 Rodriguez, Amy
 Savini, Charles
 Schweizer, Christine
 Scott, David
 Sevala, Katherine
 Shewokis, Laurie
 Singer, Michelle

Smith, James
 Topchy, Olivia
 Torrisi, Sharon
 Tyczka, Lawrence
 Ullmann, Margaret
 Wadsworth, Kimberly
 Ward, Tracy
 Welch, Janet
 Wilder, Joseph
 Wilentz, Eileen
 Willis, Frances
 Wohlfahrt, Barbara

Second Year Class of 1991

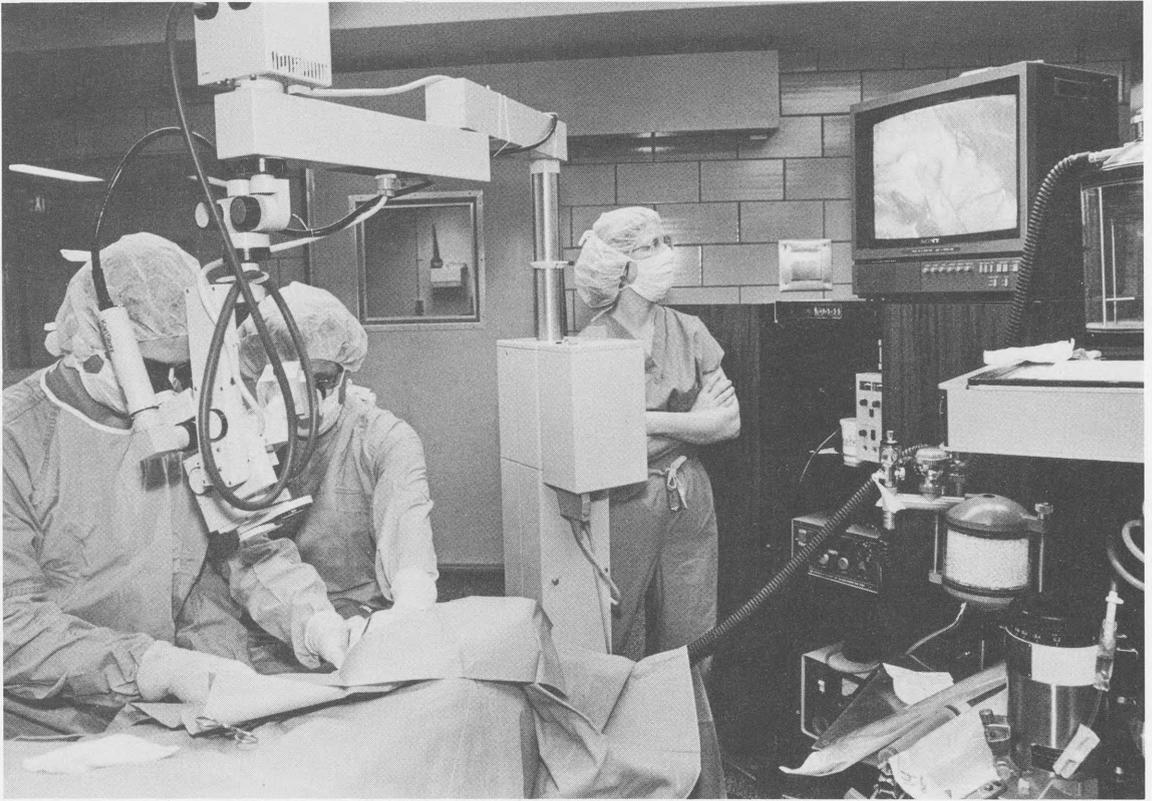
Abdella, Michael
 Angelos, Stephen
 Baum, Frederick III
 Baxendell, Kathryn
 Block, Gary
 Brown, Sharon
 Cammarata, Ronald
 Caputo, Richard
 Carpenter, Jean
 Cesaratto, Dorie
 Chang, Laura
 Cogger, Laurie
 DeFrancesco, Teresa
 Diaz, Hector
 Duddy, Pamela
 Dugan, James
 Durham, Tracy
 Essick, Linda
 Falsarella, Mary Louise
 Fennell, Allison
 Fischer, Karen
 Floetenmeyer, Rosemarie
 Fogelson, Melissa
 Gagliardi, John
 Gamez-Citron, Carol
 Gemperle, Heidi
 Giovengo, Susan
 Glaser, Bari-Sue
 Graves, Thomas
 Guazzo, Andrea
 Hines, Brooke
 Hurley, Karyl
 Johnson, Justine
 Jones, Kathleen
 Kane, Suzanne
 Kaplan, Bruce
 Kendall, Anne
 Kopp, Kaye
 Kuzmickas, Patricia
 Lang, Andrew
 Langdon, Cynthia
 Lee, Robert
 Leroux, Annette
 Lisciandro, Gregory
 Luddy, Paul
 Luke, Carol
 Lulkin, Erik

McCann, Margaret
 McLaughlin, Steven
 McNeill, Robert
 Malloy, Kelly
 Mammato, Barbara
 Manyin, Eileen Cutting
 Marx, James
 Meddleton, Mark
 Miller, Rebecca
 Nachbar, Scott
 Neno, Susan
 Newman, Alexandra
 O'Brien, Karen
 Orzeck, Richard
 Pantano, Dana
 Rasweiler, William
 Redfield, Jon
 Ribarich, Cynthia
 Rosenfeld, Andrew
 Rotmistrovsky, Richard
 Saint Leger, Judy
 Schaedler, Jean
 Shane, Randie
 Sorrell-Griffin, Laurie
 Staehr, Richard
 Stanz, Kimberly
 Tanneberger, Anthony
 Thorndyke, Julie
 Vitulli, Michelle
 Voell, Andrew
 Volel, Laurence
 Walker, David
 Welsch, Susan
 Yousey, Steven
 Zimits, Elizabeth

First Year Class of 1992

This list represents those expected to comprise the class of 1992 at the time of publication of this catalog but could change before the class matriculates.

Adler, Amy J.
 Amaro, Maria
 Angelos, John A.
 Ball, Michael A.
 Barcala, Roberto P.
 Berian, Claire A.
 Bogart, Silke
 Bregman, Susan L.
 Bukowski, Michael P.
 Bull, Jennifer K.
 Chary, Dorothy N.
 Cilli, Janet M.
 Cobb, Matthew A.
 Colon, Elia
 Conner, Deborah L.



A surgical operating microscope and video unit transmit pictures of an equine larynx to a monitor in one of the Teaching Hospital's surgery suites.

Cook, Gabriel D.
 Couret, Karmen I.
 Darrigrand, Ruth A.
 Davis, Valerie L.
 Delaney, Mari A.
 De Muynch, Gary M.
 Denver, Mary C.
 Deyhim, Carol J.
 Di Stephan, Janine M.
 Evans, Eric R.
 Fernandez, Miguelina
 Galvis, Pilar
 Glick, Lauren S.
 Gold, Richard C.
 Graham, Mary E.
 Greenberger, Leah J.
 Hazel, Alison M.
 Hegemann, Margaret T.
 Heinzlering, Heidi M.
 Hillman, Jeanne M.
 Huang, Eric W.
 Hunter, Linda S.
 Kantrowitz, Lawrence B.
 Kelly, Michael P.
 Kleps, Nora A.
 Klohnen, Andreas
 Kornreich, Bruce G.

Leverenz, Nancy E.
 Licari, Louis G.
 McKenna, Antigone M.
 Maher, Valerie E.
 Marsico, Lisa A.
 Morrisey, James K.
 Muffoletto, Bonnie L.
 Nezezon, Joel M.
 Nowak, Mark S.
 Peck, Penny M.
 Pini, Maria T.
 Polehinke, Thomas A.
 Posner, Lysa P.
 Purcell, Karen A.
 Radlinsky, Maryann G.
 Ramos, Lillian
 Rodgers, Robinson R.
 Schanbacher, Barbara J.
 Schottman, Kate
 Seagren, Mary Ann
 Shearn, Valerie I.
 Silbiger, Mark H.
 Spaulding, Barry W.
 Steiner, Robyn S.
 Stummer, Margaret R.
 Sullivan, Thomas C.
 Surman, Vivien
 Tapley, Kathleen

Trachtenberg, David K.
 Triana, Maria S.
 Vannerson, Lesley A.
 Vrba, Janine
 Waldow, Dorraine
 Weston, Hayley S.
 Willmann, Reinemarie T.
 Wilson, Christine S.
 Wohl, Deborah D.
 Young, Sandra E.



Dr. W. G. Geoffrey Sharp works with graduate students in his pharmacology laboratory.

THE GRADUATE SCHOOL

Graduate Education

Graduate education at the College of Veterinary Medicine is administered by the Graduate School at Sage Graduate Center. Applicants of superior academic accomplishment who hold a baccalaureate or equivalent degree may enter the Graduate School of Cornell University and pursue study for the degree of M.S. and Ph.D. in the College of Veterinary Medicine.

Graduate student programs are individualized and frequently fall within the graduate Fields of Veterinary Medicine, Physiology, or Immunology. To a lesser extent graduate students at the college have pursued studies in other graduate fields: Animal Science, Biochemistry, Molecular and Cell Biology, Environmental Toxicology, Microbiology, Neurobiology and Behavior, Nutrition, and Zoology. Each graduate field contains several areas of concentration. Some of the major areas within the Field of Veterinary Medicine also require graduate students to have completed the D.V.M. degree. A description of each field, complete with any special requirements and areas of concentration, is contained in the current Graduate School catalog and in *Peterson's Graduate Programs in the Biological, Agricultural, and Health Sciences*.

Combined D.V.M./Ph.D. program. Up to two graduate assistantships are reserved each year for students aspiring to the combined D.V.M./Ph.D. degree. Candidates may apply for these

assistantships before admission to the college, but an award is conditional on the individual's acceptance into the D.V.M. program. At the end of the first semester of the junior year the candidate must (1) produce evidence of sustained interest in an academic career; (2) identify a college faculty member willing to serve as the student's special committee chairman; and (3) provide evidence of acceptance by the Graduate School.

Information on graduate education at the New York State College of Veterinary Medicine can be obtained from Nanette Blakely, Graduate Field Office, Cornell University, 226 Veterinary Research Tower, Ithaca, New York 14853-6401 (telephone: 607/253-3276).

Admission

Applicants are encouraged to communicate with one or more faculty members in whose graduate field or subject area the student is interested. Appropriate faculty members may be identified by referring to the Graduate School catalog or communicating with the graduate faculty representative of the selected field. Personal interviews with faculty members are especially encouraged before application.

Applicants from countries outside the United States must submit a TOEFL score of 550 or greater if their native language is not English. This applies to all fields.

Application for admission must be made to the Graduate School, Cornell University, Sage Graduate Center, Ithaca, New York 14853-6201, where appropriate forms are available. Information and forms may also be obtained from the college's Graduate Field Office. Although applications for admission to the Graduate School may be submitted any time throughout the year, most students matriculate in the fall and should have their applications submitted by March 1. Spring-term applications should be submitted by October 1.

Financial Support

Most graduate students receive financial support from various sources in the form of fellowships and graduate research or teaching assistantships. Seldom is a student admitted to the graduate fields without clarification and identification of funding for the duration of the graduate program.

Research assistantships and teaching assistantships are available within the different departments of the college with the exception of approximately twenty competitive assistantships that are awarded by the college. Applications for these may be made by candidates with D.V.M. degrees who have a clearly defined research program in mind with an identified faculty sponsor. These fellowships are funded at a level that is comparable to that of other schools and will support a Ph.D. student for three years and an M.S. student for two years.

The exact number of rotating assistantships varies each year. Two of these are reserved for the combined D.V.M./Ph.D. degree program. During their D.V.M. studies successful candidates for the combined program will receive financial support at current work-study rates when they conduct relevant research during vacations. They will not receive tuition support. Once students have been awarded the D.V.M. degree and are enrolled as full-

time students in the Graduate School, they will receive free tuition (currently worth \$8,000 a year) and an initial salary of \$16,000 a year with yearly increments. Decisions on the awards are made in early spring of the year prior to fall matriculation.

Financial needs of prospective graduate students are frequently discussed early, when applicants communicate with graduate faculty, and indication of financial need is part of the application for admission to the Graduate School. Students should complete the appropriate section of the form and should note that eligibility for Graduate School fellowships requires completion of the application by January 15. These are awarded in university-wide competition, and only the strongest of candidates may be nominated by each field.

Graduate Record Examinations

The requirement that applicants take the Graduate Record Examination (GRE) general test is variable among the graduate fields, and the importance of this requirement should be confirmed with the appropriate field. For applicants to the Field of Veterinary Medicine, the requirement for GRE scores may be waived for those from countries outside the United States if evidence of superior academic performance (e.g., high class rank) as an undergraduate is provided with the application. GRE scores are, however, always helpful in the determination of eligibility. Scores on the general test (verbal and quantitative) are expected to be in the 1,200 or higher range, and some fields (e.g., physiology) also require that the advanced subject test be taken.

Applicants for graduate training should arrange to have GRE scores sent directly to the Graduate School, correctly coded (at registration for the test) with Cornell Graduate School number 2098.

Graduate Students 1988-89

Field of Veterinary Medicine

Field representative: Professor

John F. Timoney
C-324 Schurman Hall
607/253-3391

Ahmad, Ali (Pakistan), D.V.M.,
M.Sc.

Angelos, John, B.S.

Araya-Sanchez, Luis (Costa Rica),
D.V.M., M.S.

Baines, Joel D., B.S., V.D.M.

Barr, Margaret, B.S., D.V.M.

Binienda, Zbigniew (Poland),
D.V.M.

Bochsler, Philip, B.S., D.V.M.

Brentano, Liana (Brazil), D.V.M.

Burns, Gilbert, B.A., D.V.M.

Car, Bruce (Australia), B.V.Sc.,
M.V.S.

Carberry-Goh, Karen, B.S., D.V.M.,
M.V.P.M.

Carter, Alison, B.S.

Chandratilleke, Dhammapali (Sri
Lanka), B.V.Sc., M.S.

Coleman, Barbara, B.S., M.S.

Corapi, Wayne, B.A., D.V.M.

Corbellini, Carlos (Argentina),
D.M.V.

Correa, Maria (Uruguay), D.V.M.,
M.S.

Donaldson, William (Australia),
B.V.Sc.

Dore, Monique (Canada), D.V.M.,
M.Sc.

Dzani, David, D.V.M.

Eltom, Sakina (Sudan), B.V.Sc.,
M.S.

Fernandez-Maillo, Maria (Spain),
D.V.M.

Feveriero, Miguel (Portugal), D.V.M.

Foley, George, B.S., D.V.M.

Glaser, Amy L., B.A., D.V.M.

Guldur, Tayfun (Turkey), D.V.M.

Hackett, Susan, B.S., D.V.M.

Hofmeister, Erik, B.A., D.V.M.

Horne, William, D.V.M.

Hsu, Hui-Min (Taiwan), D.V.M.

Jasko, David, D.V.M., M.S.

Jure, Maria (Uruguay), B.S., D.V.M.
 Kenny, Kevin (Ireland), M.V.D.
 King, Alan, B.S., D.V.M.
 Levine, Susan, B.S., D.V.M., M.S.
 Linder, Catherine (France), D.V.M.
 Lopez, Noel, D.V.M.
 McAllister, Raymond A. (Canada),
 D.V.M.
 McGroddy, Kathleen, B.S.
 Martineau, Daniel (Canada),
 D.V.M., M.Sc.
 Mukhtar, Maowia (Sudan), B.V.Sc.,
 M.S.
 Myers, Thomas J., B.S., V.M.D.
 Ngichabe, Christopher (Kenya),
 B.V.M., M.Sc.
 Olsen, Christopher, B.S., D.V.M.
 Oriol, Julio (Argentina), D.V.M.
 Peirce, Susan K., B.S., M.S.
 Perdrizet, John, B.A., D.V.M.
 Platko, Joseph, B.S., M.S.
 Reiser, Raoul, B.S.
 Reynolds, Arleigh, B.S., D.V.M.
 Schultz, Bruce, B.S., M.S.
 Sirois, Jean (Canada), D.V.M., M.Sc.
 Slater, Margaret, B.A., D.V.M.
 Smith, Glenna (Canada), B.S.,
 D.V.M.
 Stafford, Grace, A.B.
 Tavares, Luis M. (Portugal), D.V.M.,
 M.S.
 Thompson, Donald (Australia),
 B.V.Sc.
 Todhunter, Rory (Australia), B.V.Sc.,
 M.S.
 Valentine, Beth A., B.S., D.V.M.
 Volpini, Lucy, B.A., D.V.M.
 Weiser, Irene B., B.S., D.V.M.
 Willard, James M., B.A., B.S., M.S.
 Winand, Nena, B.S., M.S., D.V.M.
 Xu, Yuhong (People's Republic of
 China), M.D.
 Ziegra, Cynthia, V.M.D.

Field of Physiology

Field representative: Professor
 Howard C. Howland
 W-201 Seeley Mudd Hall
 607/255-4716

Aladin, Yasmin (Pakistan), A.B.
 Anderson, Cynthia, B.S., M.S., D.V.M.
 Cai, Qiang (People's Republic of
 China), M.D., M.S.
 Calnek, David, B.A.
 Carney, Edward, B.S., M.S.
 Dobrov, Tamara, B.A.
 Figuero, Pedro (Chile), D.V.M.
 Kelling, Steven, B.A.
 Kogan, Philip, B.S.
 Leipold, Harry, B.S.
 Lu, Shanhong (People's Republic of
 China), M.D.
 Matamoros, Roberto (Honduras),
 D.V.M., M.S.
 Negm, Christine, B.S.
 Raman, Indira, B.S.

Rhodes, Linda, B.A., V.M.D.
 Sadowsky, Drew, B.A.
 Su, Kui (People's Republic of China),
 B.S.
 Tian, Xiuchun (People's Republic of
 China), B.S., M.S.
 Tomasi, Ana (Argentina), M.D.
 Turzillo, Adele, B.A.
 van de Lavoir, Marie-Cecile
 (Netherlands), D.V.M.
 Wahl, Christina, B.S., M.S.
 Wilcox, Brian, B.S.
 Wimsatt, Jeffrey, B.S., D.V.M.
 Zhang, Bing (People's Republic of
 China), B.S.

Field of Immunology

Field representative: Professor
 Robin G. Bell
 Baker Institute for Animal Health
 607/277-3044
 Bastiani, Carol, B.A.
 Carlisle, Melissa S. (Australia),
 B.V.Sc.
 Elzer, Philip, B.S.
 Karaca, Kemal (Turkey), D.V.M.,
 M.Sc.
 Kneissl, Ursula A., B.A.
 McCallus, Daniel, B.S., M.S.
 Neef, Natasha A. (United Kingdom),
 B.A., V.M.B.
 Olmsted, Stephen, B.S.
 Pratt, William, B.S., M.S., D.V.M.
 Rankin, Bruce, B.A.
 Rivas, Ariel (Uruguay), D.V.M.,
 M.S.
 Zhang, Chonghui (People's Republic
 of China), B.S., M.S.
 Zhu, Duzhang (People's Republic of
 China), M.D.

Field of Microbiology

Field representative: Professor
 William C. Ghiorse
 415 Stocking Hall
 607/255-2418
 Chung, Jungwon Woo (Korea), B.S.
 Kao, Sue-Mei (Taiwan), B.S.
 Morin, Mary Beth, B.S.
 Torres, Olga (Guatemala), B.S.
 Trotter, Karen, B.S., M.S.

Field of Toxicology

Field representative: Professor
 June Fessenden-Raden
 630 Clark Hall
 607/255-5045
 Chichala, Tina, B.S.
 Gillons, Jackie, B.S., M.S.
 Lee, Edgar, B.A.
 McLaughlin, Lee, A.B.

Field of Animal Science

Field representative: Professor
 Richard L. Quaas
 114 Morrison Hall
 607/255-3252
 Dunn, Lynn, B.S., M.S.
 Leonard, Catherine (United
 Kingdom), B.Sc.

Field of Zoology

Field representative: Professor
 F. Harvey Pough
 E211 Corson Hall
 607/255-6582
 Reiss, Karen, B.A.

Field of Biochemistry

Field representative: Professor
 Gerald W. Feigenson
 254 Clark Hall
 607/255-4744
 Carraway, Kermit, B.S.
 Hart, Matthew, B.S.



Dr. Sharon Center was the recipient of the 1988 Beecham Award for Research Excellence. Her work pioneered the use of the serum bile acid assay to assess hepatic function.

INTERNSHIPS AND RESIDENCIES

Veterinary Medical Teaching Hospital

Dr. Robert F. Playter, director
Veterinary Medical Teaching Hospital
607/253-3030

Intern Program

Intern programs of the Veterinary Medical Teaching Hospital are available in the Ambulatory Clinic and Small Animal Clinic (medicine and surgery).

Objectives

The intern program is a non-degree program that provides training for practice, clinical teaching, and specialty board eligibility. A one-year intern program with rotation in medicine and surgery is a prerequisite for most residency programs and for board certification. The intern program provides postgraduate education toward a high level of academic and clinical proficiency.

Program

The intern in the Small Animal Clinic is assigned on a rotating basis to the various medical and surgical services and the anesthesiology service. Each service consists of one faculty member, a resident, and an intern. Fourth-year students are assigned to these services during the academic program. Interns in the Ambulatory Clinic are assigned to one of four services, each of which is the responsibility of one

faculty member. Schedules are arranged so that the intern has the opportunity to work with most of the faculty in the area of the program selected.

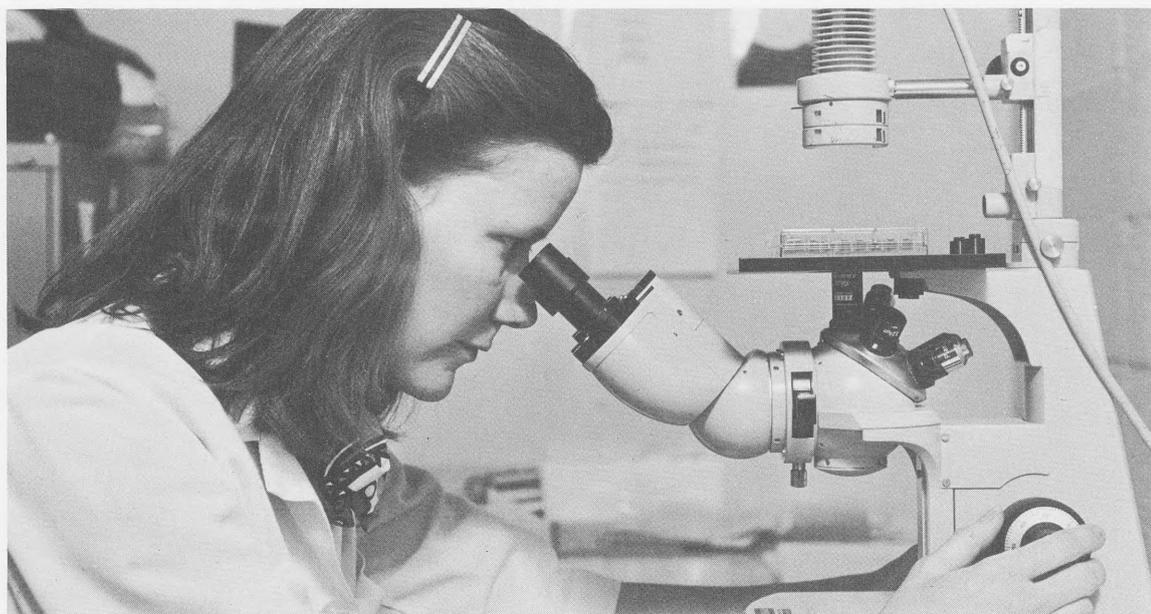
Interns share weekend duty and the responsibility for emergency service on a rotating basis with faculty available for consultation. The resident assigned to the service is responsible for the direct supervision of the intern and, along with the faculty member, evaluates the performance of the intern at the end of the rotation.

Interns are expected to attend and participate in hospital rounds and seminars. With permission of the director of interns, an intern may attend a limited number of elective courses. The intern is required to prepare a clinical paper suitable for publication under the supervision of a faculty member of the intern's choice.

The intern program extends from approximately June 15 of the year of acceptance to June 30 of the next year.

Residency Program

Residencies are offered in anesthesiology, clinical pathology, dermatology, large animal medicine, large animal surgery, ophthalmology, small animal medicine, small animal surgery, and the ambulatory clinic. The training programs are directed toward specialty board certification.



Dr. Judith Appleton, at the James A. Baker Institute for Animal Health, works with monoclonal antibodies.

Objectives

- To educate the resident to a high level of academic and clinical proficiency in a specific clinical discipline
- To fulfill the postgraduate education requirements of the various specialty boards
- To provide the resident experience in the methodology of professional veterinary medical education and experience in clinical teaching
- To assist in providing a high level of specialized veterinary service to the public and the profession

Program

Each resident is supervised by the section chief of the specialty and designated faculty in the section.

The residency program consists of advanced training in a specific clinical discipline. Progression through the program leads to increased responsibility. Descriptions of each of the specific residency programs are available from the director of the Teaching Hospital.

Each clinical service consists of one faculty member, and a resident and/or an intern. Fourth-year students are assigned to the service during the academic program. The resident is responsible for the direct supervision of the intern on the service and participates in the clinical teaching of the fourth-year students. Residents have the opportunity to work with all the faculty in the discipline of the residency.

A minimum of two calendar years is required for successful completion of the program (three years in clinical pathology, small animal surgery, large animal surgery, and ophthalmology).

Postdoctoral Training in Veterinary Pathology

Dr. Bendicht U. Pauli, director
Chairman, Department of Pathology

General Training Objectives

The major objective of the training program in the Department of Pathology is to provide contemporary graduate research training in experimental pathology to prepare students for an independent and successful career in biomedical research. In addition, residency-type training that meets the requirements for specialty board certification by the ACVP is available in anatomic and clinical pathology.

Programs

Graduate Research Training

The graduate program in experimental pathology extends over a three- or four-year period and leads to the Ph.D. degree. During the first year emphasis is on theoretical and practical courses in cellular and molecular biology, biochemistry, genetics, immunology, and biometrics. After successfully completing these courses, students begin research training by working in the laboratory of a faculty member. Current areas of research in the department include cancer cell biology, inflammation, connective tissue disorders, neuromuscular diseases, immunopathology, reproductive diseases, and diseases of bone. Laboratory work is supplemented by informal discussions and seminars. Variable exposure to diagnostic anatomic and clinical pathology is available to meet individual needs.

Residency Training

A well-balanced residency training in anatomic and clinical pathology seeks to prepare students for careers in diagnostic veterinary pathology and involves rotating exposure to the extensive case material available through the necropsy, surgical pathology, and clinical pathology laboratories. The time spent in the program is determined by the entry-level skills of the applicant, and disciplinary competence is the primary training goal. Learning via responsibility for diagnostic casework is supplemented by slide seminars, lectures, and rotation through specialty laboratories devoted to histochemistry and electron microscopy.

Qualifications

The graduate research training program is designed to appeal to candidates who seek a career in biomedical research. The D.V.M. degree is desirable, but other graduate students will also be considered. A strong academic background is essential for admission to the Ph.D. program. The Graduate School of Cornell University and the graduate Field of Veterinary Medicine use the guidelines of a combined 1,200 GRE score, a 3.0 grade point average (in a system based on 4.0), and high class rank as selection criteria. Foreign graduates must provide evidence of scholastic excellence and competence in English (a minimum TOEFL score of 550). Candidates may compete for various sources of financial support.

Applicants for residency training must hold the D.V.M. degree, have a solid academic record, and exhibit evidence of motivation and enthusiasm for advanced diagnostic training.

Programmatic Strengths

The strengths of the training programs at Cornell University lie in an internationally acclaimed faculty dedicated to academic excellence and in a strong historical base in quality education in comparative pathology. The flexibility of the bidirectional training available in the Department of Pathology is structured to offer students the freedom to pursue individual interests and professional goals in either biomedical research or diagnostic pathology. The unique combination of departmental, college, and campuswide resources allows ready access to specialty research laboratories as well as a variety of conferences, lectures, seminars, and formal courses. Research programs are supported by a variety of funding agencies and are carried out in modern and well-equipped laboratories featuring state-of-the-art instrumentation and research approaches. Departmental research facilities dedicated to tissue culture, electron microscopy, cell biology, biochemical investigation, and recombinant DNA research are supplemented by extensive campuswide facilities and resources in the Division of Biological Sciences that focus on biological and biomedical research in a variety of programs.

Specialized campus facilities include FACS laboratories, hybridoma laboratories for monoclonal antibody production, electron microscopy laboratories, and the Cornell Biotechnology Institute. Modern, sophisticated animal facilities in the College of Veterinary Medicine include areas committed to work with infectious and carcinogenic agents.

The diagnostic facilities of the college and the adjacent New York State Diagnostic Laboratory provide a wealth of material and form the foundation for residency training in pathology. Supporting services in diagnostic virology, bacteriology, serology, parasitology, and toxicology allow unsurpassed excellence in diagnostic pursuits.

Special Programs

San Diego Zoo Residency Program

Veterinarians who have completed a minimum of one year of pathology residency at Cornell University are eligible for a special one-year period of residency training in the pathology of exotic animal species. Trainees may return to complete their training at Cornell University following the zoo residency.

Senior Residencies, Necropsy Pathology, and Surgical Pathology Services

Two senior residency positions are available each year with six months' responsibility in each of the two services noted above. Senior residents work closely with pathologists, supervise first- and second-year residents, maintain liaison with clinical staff and faculty, aid in the daily administration of both services, and exploit the publication potential of material on pathology. Ample time is available for final preparation for board certification by the American College of Veterinary Pathologists. Eligibility is determined by completion of at least two years of supervised residency training in veterinary pathology. Stipends depend on background and experience and the current college salary schedule.

Off-Campus Training in the Biomedical Community

Effort is made to tailor the period of research training to the interests and career goals of the applicant, with ample opportunity provided for off-campus training in the biomedical community. Individuals interested in developing a career in comparative pathology may receive training in the pathology departments of the State University of New York medical schools and in the Cornell Medical Center, New York City.



A first-year student checks the corrective shoeing of a horse under the direction of farrier Buster Conklin.

RESOURCES AND FACILITIES

Service Programs

Veterinary Medical Teaching Hospital

Each year more than fifteen thousand cases are treated at the Veterinary Medical Teaching Hospital. An outreach of the hospital, the ambulatory service, has ten field units (consisting of a specially equipped vehicle, a clinician, and three or four students) that travel throughout the area, serving over four hundred farms and thirty-six thousand animals. The teaching hospital's highly trained specialists, sophisticated equipment, and capable support staff provide an invaluable resource for the state when health problems occur in the agricultural or equine industries, in the wildlife population, or among companion animals.

In addition to training for third- and fourth-year students, the teaching mission of the hospital encompasses the postgraduate education of interns and residents.

The teaching hospital is the proving ground for ideas and technologies developed in basic research. The clinical faculty provide the essential blend of medical, surgical, and investigative skills necessary to bring technology's promise to fruition. The rewards of clinical veterinary research extend far beyond animal health. Pacemakers, prosthetic hips, artificial heart valves, and new surgical procedures that now benefit man were all developed first in animals.

Clinical Pathology

Clinical Pathology offers routine diagnostic tests in hematology, clinical chemistry, microbiology, immunology, and cytology, providing these services to clients in New York State and throughout the country. A section of the Veterinary Medical Teaching Hospital and associated with the New York State Diagnostic Laboratory, Clinical Pathology also works with researchers at the college and in industry on drug-related projects and performs most of the laboratory tests required for patients in the Teaching Hospital.

The Diagnostic Laboratory

The Diagnostic Laboratory, located on the campus of the College of Veterinary Medicine, provides laboratory analyses and consultation on diagnostic and field problems and assists practicing veterinarians and the animal industry they serve. The laboratory consists of the Divisions of Bacteriology, Brucellosis, Virology, Toxicology, Automated Serology, Endocrinology, Parasitology, and Field Services/Extension for testing, consultation, and field outbreak investigations as well as preventive and disease surveillance programs. Pathology and clinical pathology services are offered through the Diagnostic Laboratory but provided by the Departments of Pathology and Clinical Sciences in the veterinary college. The laboratory conducts approximately seven hundred

thousand tests a year. Research is conducted on new test development, pathogenesis, epidemiology, and preventive health programs.

The laboratory also provides testing for disease surveillance and control programs for such diseases as bovine brucellosis and equine infectious anemia for the New York State Department of Agriculture and Markets. The laboratory has cooperated with the state animal industry and the New York State Department of Agriculture and Markets to provide a disease-eradication and certified-free herd program for the bovine, sheep, and goat industries; for paratuberculosis (Johne's disease); for bluetongue disease and bovine leukosis disease; for the New York State Thoroughbred Breeding Industries' control program for equine viral arteritis; and for the New York State horse industry surveillance program for Potomac horse fever.

Quality Milk Promotion Services

The New York State Quality Milk Promotion Services and Mastitis Control Program is a special program developed in 1946 to control mastitis outbreaks by culturing milk for bacterial causes, recommending specific treatments, providing milk equipment inspections, and examining milking procedures and hygiene. Over the years it has provided education and service to the dairy industry to reduce the losses due to mastitis. It is estimated that this service saves the New York dairy industry \$48,000,000 annually in the control of just one infectious agent—*Streptococcus agalactiae*.

The program has recently been placed under the Diagnostic Laboratory, combining its personnel and, with the aid of other agriculture specialists in the College of Agriculture and Life Sciences at Cornell, supplying a range of support services to the dairy industry. The Quality Milk Promotion Services also provides a preventive mastitis herd program striving for higher production and increased income for the dairyman. Approximately five thousand visits to farms are made each year, and the milk samples of approximately 250,000 to 300,000 cows are examined by bacteriological culture. Five New York regional laboratories, in Canton, Earlville, Kingston, Ithaca, and western New York, provide the field and laboratory services for this program and also conduct applied and basic research in bovine mastitis.

Equine Drug Testing and Research Program

Horse racing is the largest spectator sport, and the industry is one of the major sources of tax revenue for state and local governments. The Equine Drug Testing and Research Program was formed in 1971, at the request of the racing industry, to prevent drug abuse in horses. Laboratories for testing are now located at all New York State pari-mutuel tracks. The central laboratory is located in Ithaca, New York, and is nationally and internationally recognized as a

reference and research center. Over six hundred thousand samples are tested each year. The proven resources and capabilities of this very sophisticated program guarantee the integrity of racing statewide.

New York State CEM Quarantine Facility

The Diagnostic Laboratory, with the veterinary college, operates a contagious equine metritis (CEM) quarantine station for the state and federal government. This is the only New York State quarantine facility for CEM. All culturing for CEM is performed at the Diagnostic Laboratory, where research has also concentrated on the development of a practical and reliable culture test.

Species-oriented Programs

The James A. Baker Institute for Animal Health

Established in 1950 as the Veterinary Virus Research Institute, the institute changed its name in 1975 to honor the founding director's contributions to veterinary medicine and to reflect the broad scope of the institute's activities.

The institute's primary mission is to prevent loss from infectious diseases in animals. To this end, basic research is conducted on disease-causing organisms to increase knowledge of their nature, means of spread, and methods whereby their spread can be controlled. The Cornell Research Laboratory for Diseases of Dogs and the Cornell Equine Genetics Center are also included in the institute.

Another objective of the institute is to provide advanced training of personnel in immunology, infectious diseases, and arthritis. A limited number of graduate students, postdoctoral fellows, and visiting investigators are accepted.

Facilities have recently been renovated and expanded to accommodate current programs. Among the new facilities are buildings for the breeding and rearing of specific-pathogen-free dogs and laboratory rodents, and two new service laboratories. One of these units is dedicated to the production of monoclonal antibodies using cell hybridization techniques. In the other laboratory unit researchers analyze particles and cells by flow cytometry. Projects conducted here also involve recombinant DNA techniques, cell hybridization, and embryo manipulation.

Avian and Aquatic Animal Medicine

A vigorous multidisciplinary research program is carried out that encourages collaboration among faculty, staff, and graduate students. Major emphasis has traditionally been in the fields of virology and immunology, but bacterial and parasitic diseases are also investigated. Laboratory space is located at the P. Philip Levine Laboratory on Snyder Hill, about three miles from the campus, and in Schurman Hall on the campus proper. A forty-one-



A newborn foal gets some encouragement from his mother.

unit isolation building for studies on infectious diseases is located on the campus, and flocks of several genetically defined specific-pathogen-free chickens are maintained in highly secure buildings near the Levine Laboratory. These flocks provide chicks and embryos free of all diseases and antibodies for use in experimental studies.

Poultry diagnostic laboratories serving the chicken, duck, and turkey producers of the state are located in Kingston, Ithaca, and Eastport, Long Island. Research on economically important diseases of chickens, turkeys, and ducks and various aquatic animal species is conducted at the Ithaca and Eastport laboratories. Vaccines for chicken and duck industries are produced at Kingston and Eastport.

A diagnostic and investigative program has been established at the Marine Biological Laboratory, Woods Hole, Massachusetts, to study the health of marine animals. Supported by the National Institutes of Health, its goals are to investigate disease outbreaks and develop diagnostic methods for recognizing infectious, parasitic, and toxicologic diseases. Colonies of aquatic animals, especially invertebrates, are being developed as defined laboratory animals for research.

At the college the Department of Avian and Aquatic Animal Medicine operates the Fish Diagnostic Laboratory, a facility designed to provide assistance to aquaculturists and others experiencing problems with fish health.

Bovine Research Center

The Bovine Research Center at Cornell fosters research to improve the productivity, health, and well-being of cattle. It serves scientists at Cornell University with expertise and interest in a broad spectrum of scientific disciplines related to the dairy and beef cattle industries. It encourages cooperative research programs in health, metabolism, reproduction, breeding, and management for improved production in dairy and beef cattle. The center also disseminates current information to the cattle industry, identifies areas for additional study, and seeks funding to support its research programs.

The first building of the center, the Bovine Specific Pathogen Free Facility, was completed in 1983 and is used for the production and maintenance of calves completely free of known pathogens. A second facility, the Reed Farm Multipurpose Research Unit, is being developed by the New York State College of Veterinary Medicine and the College of Agriculture and Life Sciences to provide specialized animal housing and research laboratory space. Building plans include the construction of a new research wing.

Equine Research Park

The Equine Research Park, located on 165 acres of land about one mile from the college, includes stall facilities for ninety horses and ponies and shed facilities for sixty horses. The park also has a farrier shop, a stallion barn, and a separate brood mare barn, where box stalls are provided for foaling mares. In the brood mare barn there is a laboratory for reproductive studies and a center-court breeding arena with a dummy mount. A half-mile track is used for both diagnosis of lamenesses in hospital patients and research into the complexities of the equine athlete. Research at the park centers on reproduction, nutrition, behavior, bone and joint disease, pharmacology, infectious disease, and the special problems of the equine athlete.

Equine Annex and Laboratory for Equine Embryo Biology

The Equine Annex, which includes the Contagious Equine Metritis Quarantine Facility, is a separate complex of buildings on Snyder Hill, barely a mile south of the college. Adjacent to the annex is the Laboratory for Equine Embryo Biology. Here, special facilities contain a laboratory, examination and palpation areas, and a transfer arena in support of an embryo transfer service available to horse owners and breeders.

Cornell Feline Health Center

In 1974 the Board of Trustees of Cornell University approved the formation of the Cornell Feline Research Laboratory, changing the name in 1980 to the Cornell Feline Health Center. This formalized a program, started in 1964 by Dr. James H. Gillespie,

to study feline infectious diseases. The center currently receives worldwide recognition for its work on feline infectious peritonitis, feline lentivirus (feline AIDS), feline leukemia, and respiratory diseases and for the development of the ELISA test for detection of coronaviral antibodies in feline serum.

Educational outreach is primarily accomplished through publications. Two newsletters, *Feline Health Topics* (for practitioners) and *Perspectives on Cats* (for cat owners and breeders), are published quarterly and distributed to over thirty thousand people. Also, an animal information bulletin provides scientific data on a major feline health concern. Client information brochures are available on a cost basis to practitioners for distribution to their clients.

The Feline Health Center is funded primarily through contributions from cat fanciers, bequests, the memorial program, memberships, and grants from government, industries, and foundations. Some of the noteworthy funds that have been established are the Camuti Fund in support of the feline diagnostic and consultation service and the Buzz-Fuzz Harder Fund for cardiomyopathy studies.

Academic Support Services

Roswell P. Flower Library

The library, endowed by a gift from Roswell P. Flower, governor of New York when the college was founded, is named the Flower Veterinary Library in his honor. It is maintained partly by endowment funds and partly by appropriations from the state. The library is on the second floor of Schurman Hall. The large reading room, seating seventy, has display shelves for current journals, and areas of indexes, abstracts, and other reference books. The three levels of adjoining stacks include journals and monographs and are open for use. Individual study carrels are also available.

The library contains over seventy-five thousand volumes and regularly receives about thirteen hundred periodicals and series titles. This represents a worldwide selection of veterinary titles plus publications in the biomedical sciences, designed to support undergraduate, graduate, and research programs. Through the various libraries on the campus, nearly five million volumes and more than fifty thousand journals and serials are available to students. These collections, interlibrary loans, and photoduplicated materials supplement the research potential of the veterinary library, which is rich in historical and basic research resources as well as recent monographs and selected government publications. A bimonthly newsletter is issued listing recent acquisitions.

Information on policies and suggestions for the use of the library are provided to new students and faculty. A printed guide is also available. Additional instruction in bibliographic research is available for advanced problems.

A wide range of information services, including reference assistance, online literature searching, interlibrary loan, photoduplication, and current awareness, are offered. In particular, the computer-assisted literature search service, called COMPASS at Cornell, provides rapid access to numerous bibliographic databases, including MEDLINE, CAB ABSTRACTS, and BIOSIS. Bibliographies can also be generated automatically each month through these online systems.

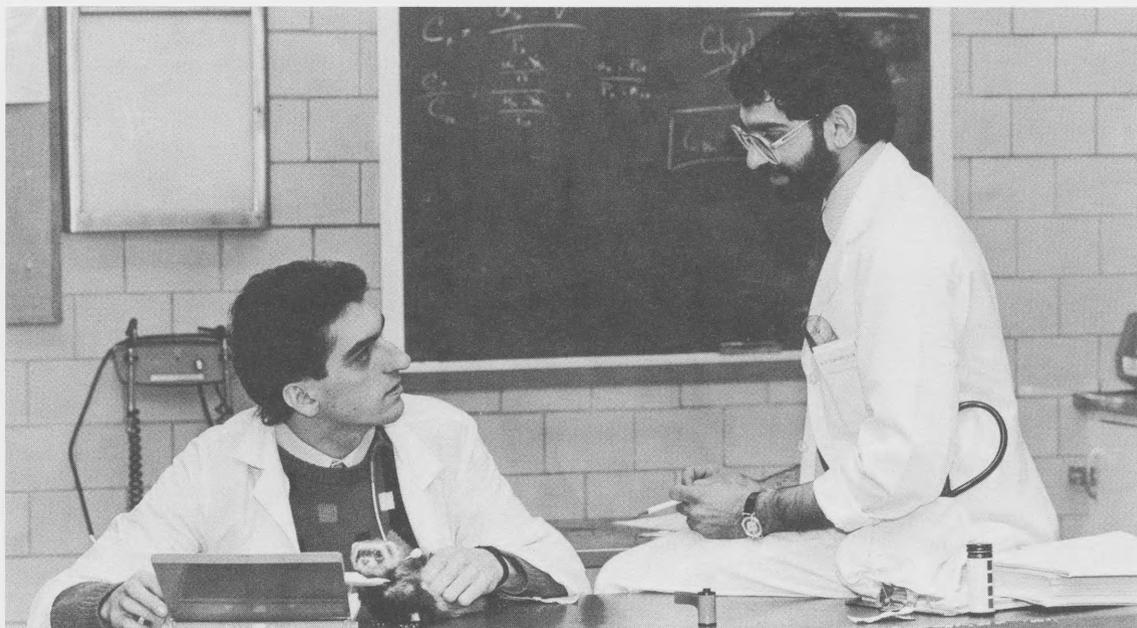
The college's Autotutorial Center contains a collection of over seven hundred titles in slide, audiotape, and videotape format. These media resources enhance academic programs as well as provide opportunities for self study. A collection of audiovisual materials is also available for loan to practicing veterinarians for continuing education purposes.

A microcomputer facility was established in the library in early 1985 and expanded significantly in 1988 to enhance the college's educational programs. The microcomputers are available for use primarily by students and feature a variety of software, including word processing, an electronic spreadsheet, and database management as well as computer-based tutorials. The classroom area, which features twenty microcomputers, supports course-related and other group-instruction uses.

Center for Research Animal Resources

In October 1980 Cornell University established the Center for Research Animal Resources (CRAR) under the jurisdiction of the vice president for research. Currently the center falls under the jurisdiction of the associate vice president for research, to whom Dr. Fred W. Quimby, the director, reports. This center is charged with the responsibility of implementing animal care programs throughout the university to assure compliance with all state and federal laws regarding the use of animals for teaching, research, and testing. It is also responsible for providing the associate vice president for research and advanced studies, the University Animal Welfare Committee (UAWC), and the Institutional Animal Care and Use Committee (IACUC) with information on developments in the field of animal welfare legislation and methods of compliance with new regulations.

Because sound animal care and use practices arise from proper awareness and education, CRAR offers instructional sessions to faculty, students, research technicians, and animal care technicians. These sessions introduce the participants to the ethics of using animals for research, the occupational health program for animal handlers, relevant federal and state regulations, and proper handling and restraint of common laboratory animals, as well as approved methods of euthanasia, available veterinary services, and the proper channels for reporting discrepancies in animal care.



Mike Bonda '88 (left) and intern Hanif Sukhiani discuss a ferret's condition.

The CRAR staff is also available to counsel and advise investigators, technicians, and others on procedures for proper housing, maintenance, care, and sanitation and disease control of animals and animal facilities. The center maintains information on the suitability of various animal models for research purposes and available alternatives to the use of living animals and regularly updates a listing of sources of disease-free animals.

The center also assembles data required by state and federal legislation relative to animal care and use within the university, as well as maintains files and records all animal protocols for active research, teaching, and extension projects at Cornell.

Biomedical Communications

Biomedical Communications offers in-house services in photography, video production, and both photomacrography and photomicrography. Film processing, printing, copy photography for teaching slides, slide duplication, and clinical, surgical, and gross specimen photography are some of the services provided. Biomedical Communications is also equipped with a Zeiss microscope and macrophotography unit to photograph small biological specimens and microscope slides. Studio facilities are available for portraits and passport photos. Video cameras, the services of an experienced videographer, and a three-quarter-inch video editing system make possible the production of educational videotapes. In addition, Biomedical Communications schedules, supplies, and maintains the audiovisual equipment needed in classrooms and for lectures or special events.

Biomedical Electronics Service

The Biomedical Electronics Service provides on-site, economical repair and maintenance of college equipment as well as design and construction of specialized equipment. The service performs scheduled preventive maintenance checks on a variety of centrifuges, microscopes, and other equipment and offers consultation services on new equipment acquisition and use, as well as training in instrumentation concepts and techniques.

Computer Facility

The New York State College of Veterinary Medicine has developed an integrated hospital computer system designed to meet the operational, administrative, and research needs of a veterinary teaching hospital. The interactive online system was developed using the MUMPS language and currently supports over one hundred user terminals throughout the college. Functional areas within the hospital that have been computerized include medical records, admissions desks, clinical laboratory, pharmacy, radiology, ambulatory clinic, and pathology. In addition, the State Diagnostic Laboratory has been automated and a number of administrative functions such as college personnel records, student admissions and records, college and departmental accounting, student job placement, word processing, and electronic mail have been implemented on the computer.



Dr. Hollis Erb, chief of the Section of Epidemiology, sits with her Doberman pinscher, Charlie.

FACULTY AND ADMINISTRATION

University Administration

Frank H. T. Rhodes, *president*

Robert Barker, *provost*

G. Tom Shires, *provost for medical affairs*

James E. Morley, Jr., *senior vice president*

Joseph M. Ballantyne, *vice president for research and advanced studies*

John F. Burness, *vice president for university relations*

William D. Gurowitz, *vice president for campus affairs*

George H. Huxel, *vice president for finance and treasurer*

M. Stuart Lynn, *vice president, information technologies*

Malden C. Nesheim, *vice president for planning and budgeting*

Larry I. Palmer, *vice president for academic programs*

Richard M. Ramin, *vice president for public affairs*

Walter J. Relihan, Jr., *university counsel and secretary of the corporation*

James A. Sanderson, *chief investment officer*

Joycelyn R. Hart, *associate vice president for human relations*

Walter Lynn, *dean of the University Faculty*

College Administration

Robert D. Phemister, *dean of the college*

S. Gordon Campbell, *associate dean*

John A. Lambert, *assistant dean for administration*

John C. Semmler, *assistant dean for public affairs*

Neil L. Norcross, *secretary*

Marcia J. Sawyer, *director of student affairs and admissions*

Donald S. Postle, *director of financial aid*

Rita W. Harris, *director of personnel*

Susanne K. Whitaker, *librarian*

Gloria Crissey, *registrar*

John Lewkowicz, *director, computing facility*

Donald Hinman, *director, biomedical electronics*

Sandra Berry, *director, biomedical communications*

New York State College of Veterinary Medicine Advisory Council 1988-89

Arnold N. Weinberg, M.D.,
chairman
Medical Department
Massachusetts Institute of
Technology
Building E-23
Cambridge, Massachusetts 02139

Donald P. Berens
22 Countryside Road
Fairport, New York 14450

Holly Cheever, D.V.M.
R.D. #1, Box 286
Voorheesville, New York 12186

Richard C. Grambow, D.V.M.
3705 West Genesee Street
Syracuse, New York 13219

Barbara W. Hunter
President
Dudley-Anderson-Yutzy
40 West Fifty-seventh Street
New York, New York 10019

J. Patrick Jordan
Office of the Administrator
Cooperative State Research Service
U.S. Department of Agriculture
Washington, D.C. 20205

Joseph P. King
53 Country Club Drive
Rochester, New York 14618

Stephen J. Kleinschuster
Dean, Cook College
Director, New Jersey Agricultural
Experiment Station
Rutgers University
New Brunswick, New Jersey 08901

John W. McCann, D.V.M.
The Assembly
State of New York
919 Legislative Office Building
Albany, New York 12248

John L. Mara, D.V.M.
Director of Professional Affairs
Hill's Pet Products
P.O. Box 148
Topeka, Kansas 66601

Gerald P. Murphy, M.D.
School of Medicine
SUNY at Buffalo
139 Parker Hall
Buffalo, New York 14214

James L. Seward
State Senate
809 Legislative Office Building
Albany, New York 12247

Richard J. Sheehan, D.V.M.
600 South Main Street
Mansfield, Massachusetts 02048

John V. Steiner, D.V.M.
Bullet Hole Road
Mahopac, New York 10541

Stephen H. Weiss
Managing Partner
Weiss, Peck & Greer
One New York Plaza
New York, New York 10004

John R. Welser, D.V.M.
Vice President, Agricultural
Research
The Upjohn Company
Kalamazoo, Michigan 49001

Harold M. Zweighaft, D.V.M.
8 West Eighty-sixth Street
New York, New York 10024

Standing Committees of the College Faculty

General Committee

Elected by the faculty

H. N. Erb (1988-91)
D. H. Schlafer (1988-91)
W. S. Schwark (1986-89)

Graduate Field of Veterinary Medicine Executive Committee

Elected by the graduate field faculty

J. F. Timoney (1989),
graduate faculty representative
F. A. Kallfelz (1988)
D. M. Noden (1990)
R. E. Oswald (1989)
D. O. Slauson (1989)

University Appeals Panel

Elected by the faculty

L. E. Carmichael (1988-93)
A. Dobson (1987-92)
J. M. King (1985-90)
N. L. Norcross (1984-89)
W. O. Sack (1986-91)

Faculty Council of Representatives

Elected by the faculty

K. A. Beck (1987-90)
A. E. Dietze (1986-89)
A. Dobson (1987-92)
C. M. Fewtrell (1986-89)
R. D. Gleed (1986-89)
T. R. Houpt (1988-91)
R. F. Playter (1988-91)

Committee on Curriculum

Elected by the faculty

C. Guard (1986-89), chairman
J. T. Blue (1987-90)
S. A. Center (1986-89)
C. E. Farnum (1987-90)
R. R. Minor (1986-89)
S. G. Campbell, ex officio

SUNY Senate

Elected by the faculty

H. F. Schryver, senator
G. Lust, alternate

Class Advisory Committees

Class of 1989

P. R. Bowser
R. B. Hillman
W. E. Hornbuckle
F. A. Kallfelz
J. M. King
R. M. Lewis
J. F. Randolph
D. O. Slauson

Class of 1990

K. A. Beck
J. T. Blue
S. G. Dill
T. W. French
J. R. Georgi
C. E. Hall
T. J. Kern
E. M. Wertz

Class of 1991

H. N. Erb
R. D. Gleed
H. J. Harvey
K. A. Houpt
D. F. Holmes
R. H. Jacobson
D. H. Lein
J. M. Scarlett

Class of 1992

E. N. Bergman
J. F. Cummings
A. deLahunta
C. E. Farnum
D. M. Noden
W. O. Sack
D. N. Tapper
J. F. Wootton

Admissions Committee

H. F. Schryver, chairman
C. E. Farnum
H. J. Harvey
D. F. Holmes
F. A. Kallfelz
G. Lust
F. W. Scott
M. J. Sawyer, ex officio

Committee on Scholarships

J. C. Thompson, Jr., chairman
S. A. Center
J. R. Georgi
T. J. Kern
R. M. Lewis
D. W. Scott
D. S. Postle, ex officio

Committee on Deficient Students

R. C. Riis, chairman
A. Dobson
C. M. Fewtrell

Committee on Student Conduct

F. H. Fox, chairman
D. F. Holmes
K. A. Houpt
J. F. Randolph
M. C. Smith

Committee on International Programs

K. A. Schat, chairman
M. J. Appel
D. Robertshaw
D. H. Schlafer

Committee on Animal Use and Care

R. M. Lewis, chairman
B. W. Calnek
C. E. Hall
D. D. McGregor
P. W. Nathanielsz
F. W. Scott
J. E. Gilmartin, ex officio
F. W. Quimby, ex officio

Committee on College Library

W. O. Sack, chairman
D. R. Callihan
A. Dobson
H. F. Schryver
G. A. Weiland

Pharmacy and Therapeutics Committee

W. E. Hornbuckle, chairman
S. L. Fubini
C. Guard
W. S. Schwark
E. M. Wertz
R. C. Johnson, ex officio

Special Committees 1988-89

Eighty-first Annual Conference for Veterinarians January 10, 11, 12, 1989

R. F. Playter, chairman
F. H. Fox
S. L. Fubini
W. J. Gould
C. Guard
T. J. Kern
T. J. Reimers
C. E. Short, ex officio

Senior Seminar Committee

F. H. Fox, chairman
A. deLahunta
A. E. Dietze
J. A. Flanders
T. W. French
T. R. Houpt
E. J. Trotter

Biohazard Safety Committee

E. J. Dubovi, chairman
L. E. Carmichael
F. W. Lengemann
T. J. Reimers
J. C. Semmler, ex officio

Computer Advisory Committee

E. Loew, chairman
B. J. Cooper
A. Dobson
N. S. Moise
M. E. White
J. A. Lambert, ex officio
J. M. Lewkowicz, ex officio
R. V. Pollock, ex officio

Snyder Hill Advisory Committee

B. W. Calnek, chairman
W. C. Anderson
J. E. Gilmartin
R. B. Hillman
D. F. Holmes
J. E. Lowe
D. D. McGregor
P. W. Nathanielsz
D. H. Schlafer
J. C. Semmler

Research Council

D. D. McGregor, chairman
B. J. Cooper
H. N. Erb
F. A. Kallfelz
B. C. Tennant
G. A. Weiland

James Law Lecture Series Committee

D. N. Tapper, chairman
R. G. Bell
P. R. Bowser
B. J. Cooper
R. H. Cypess
R. H. Wasserman

Student-Faculty Liaison Committee

Student representatives and faculty members are elected by the student body in the fall. One student serves as chairperson.

Honor Code Committee

Student and faculty representatives are elected by the student body.

Graduate-Faculty Liaison Committee

Graduate students select the committee.

Environmental Health Committee (Faculty-Staff)

Rita Harris, chairwoman

Faculty

Emeritus Professors

Bentinck-Smith, John, A.B., D.V.M.; clinical pathology
Boyer, Clyde I., Jr., V.M.D., M.S.; laboratory animal medicine
Bruner, Dorsey W., B.S., Ph.D., D.V.M.; veterinary microbiology
Danks, A. Gordon, B.S., D.V.M.; veterinary surgery
Evans, Howard E., Ph.D.; veterinary and comparative anatomy
Fabricant, Julius, V.M.D., M.S., Ph.D.; avian medicine
Gasteiger, E. L., Jr., M.S., Ph.D.; physical biology
Geary, Jack C., D.V.M.; radiology
Gillespie, James H., V.M.D.; veterinary microbiology
Habel, Robert E., D.V.M., M.Sc., M.V.D.; veterinary anatomy
Hitchner, Stephen B., B.S., V.M.D.; avian medicine

Kirk, Robert W., D.V.M.;
medicine

Lengemann, Fred W., M.N.S.,
Ph.D.; radiology biology

Leonard, Ellis P., B.S., D.V.M.; small
animal surgery

McEntee, Kenneth, D.V.M., Ph.D.
(honorary); veterinary pathology

Melby, Edward C., Jr., D.V.M.;
medicine

Poppensiek, George C., V.M.D.,
M.S.; James Law Professor of
Comparative Medicine

Rickard, Charles G., D.V.M., M.S.,
Ph.D.; veterinary pathology

Roberts, Stephen J., D.V.M., M.S.;
veterinary medicine, obstetrics

Sellers, Alvin F., V.M.D., M.Sc.,
Ph.D.; veterinary physiology

Sheffy, Ben E., M.S., Ph.D.;
nutrition

Whitlock, John H., D.V.M., M.S.;
parasitology

Professors

Appel, Max J., D.V.M., Ph.D.;
veterinary virology

Avery, Roger J., Ph.D.; virology,
chairman of the Department of
Veterinary Microbiology,
Immunology, and Parasitology

Axelrod, David, M.D.; adjunct,
veterinary microbiology

Bergman, Emmett N., D.V.M.,
M.S., Ph.D.; veterinary physiology

Burny, Arsene, Ph.D.; adjunct,
microbiology

Callis, Jerry J., D.V.M., M.S.;
adjunct, animal diseases exotic to the
United States

Calnek, Bruce W., D.V.M., M.S.;
avian and aquatic animal medicine;
chairman of the Department of
Avian and Aquatic Animal Medicine

Campbell, S. Gordon, M.V.Sc.,
Ph.D.; immunology, associate dean
for academic affairs

Carmichael, Leland E., D.V.M.,
Ph.D.; John M. Olin Professor of
Virology

Cummings, John F., D.V.M., M.S.,
Ph.D.; veterinary anatomy

deLahunta, Alexander, D.V.M.,
Ph.D.; veterinary anatomy, chairman
of the Department of Veterinary
Anatomy

Dobson, Alan, Ph.D., M.A., Sc.D.;
veterinary physiology

Dodds, W. Jean, D.V.M.; adjunct,
pathology



Dr. Jay Harvey (center) was the 1988 recipient of the Norden Distinguished Teacher Award.

Fox, Francis H., D.V.M.; veterinary
medicine and obstetrics

Gallo, Robert C., M.D., D.Sc.;
adjunct, veterinary microbiology

Georgi, Jay R., D.V.M., Ph.D.;
parasitology

Hansel, William, M.S., Ph.D.;
veterinary physiology, Liberty Hyde
Bailey Professor of Animal
Physiology

Hintz, Harold F., Ph.D.; animal
nutrition

Horzinek, Marian C., Ph.D.;
courtesy, veterinary virology

Haupt, T. Richard, V.M.D., M.S.,
Ph.D.; veterinary physiology

Kallfelz, Francis A., D.V.M., Ph.D.;
veterinary medicine

King, John M., D.V.M., Ph.D.;
veterinary pathology

Krook, Lennart P., D.V.M., Ph.D.;
veterinary pathology

Leibovitz, Louis, V.M.D.; avian and
aquatic animal medicine

Lewis, Robert M., D.V.M.;
veterinary pathology

Lust, George, Ph.D.; physiological
chemistry

McGregor, Douglas D., M.D.,
D.Phil.; veterinary immunology,
director of the James A. Baker
Institute for Animal Health

Mebus, Charles A., D.V.M.,
M.S., Ph.D.; adjunct, pathology

Minor, Ronald R., V.M.D., Ph.D.;
veterinary pathology

Naqi, Syed A., Ph.D.; avian and
aquatic animal medicine

Nathanielsz, Peter W., M.B., Ph.D.,
M.D.; reproductive biology

Noden, Drew M., M.S., Ph.D.;
anatomy

Norcross, Neil L., M.S., Ph.D.;
immunochemistry, secretary of the
college

Noronha, Fernando M., D.V.M.;
veterinary virology

Nosanchuk, Jerome S., M.D.;
adjunct, clinical pathology

Pauli, Bendicht U., D.V.M., Ph.D.;
veterinary pathology, chairman of
the Department of Veterinary
Pathology

Phemister, Robert D., D.V.M.,
Ph.D., veterinary pathology, dean of
the college

Playter, Robert F., D.V.M., M.S.;
ophthalmology, director of the
Veterinary Medicine Teaching
Hospital

Posso, Manuel, M.D.; adjunct,
comparative pathology

Robertshaw, David, B.V.Sc., Ph.D.;
physiology; chairman of the
Department of Physiology/Section of
Physiology

Sack, Wolfgang O., D.V.M., Ph.D.,
Dr. Med. Vet.; veterinary anatomy

Schwark, Wayne S., D.V.M., M.Sc.,
Ph.D.; veterinary pharmacology

Scott, Danny W., D.V.M.; medicine

Scott, Fredric W., D.V.M., Ph.D.;
veterinary virology, director of the
Cornell Feline Health Center

Sharp, Geoffrey W. G., B.Pharm.,
Ph.D., D.Sc.; pharmacology,
chairman of the Department of
Pharmacology

Short, Charles E., D.V.M., M.S.;
anesthesiology

Slauson, David O., D.V.M., Ph.D.;
veterinary pathology

Smith, Donald F., D.V.M.; surgery,
chairman of the Department of
Clinical Sciences

Tapper, Daniel N., V.M.D., Ph.D.;
physical biology

Tennant, Bud C., D.V.M.;
comparative gastroenterology

Timoney, John F., M.V.M., M.S.,
Ph.D., D.Sc.; veterinary bacteriology

VanPoznak, Alan, M.D.; adjunct,
anesthesiology

Wasserman, Robert H., M.S., Ph.D.;
physiology

Winter, Alexander J., D.V.M., M.S.,
Ph.D.; veterinary microbiology

Wootton, John F., M.S., Ph.D.;
biochemistry

Associate Professors

Antczak, Douglas F., V.M.D., Ph.D.;
immunology

Arnoczky, Steven P., D.V.M.;
adjunct, clinical sciences

Babish, John G., M.S., Ph.D.;
toxicology and epidemiology

Bell, Robin G., Ph.D.; immunology

Blue, Julia T., D.V.M., Ph.D.; clinical
pathology

Bowser, Paul R., M.S., Ph.D.; avian
and aquatic animal medicine

Center, Sharon A., D.V.M.;
medicine

Cooper, Barry J., Ph.D.; veterinary
pathology

Corradino, Robert A., M.S., Ph.D.;
physiology

Dubovi, Edward J., M.A., Ph.D.;
virology

Dunny, Gary M., Ph.D.; bacteriology

Edwards, N. Joel, D.V.M.; adjunct,
medicine

Erb, Hollis N., D.V.M., M.S., Ph.D.;
epidemiology

Fewtrell, Clare, M.S., D.Phil.;
pharmacology

Fortune, Joanne E., M.S., Ph.D.;
physiology

Gilmour, Robert F., Jr., Ph.D.;
physiology

Gleed, Robin D., B.V.Sc., D.V.A.;
anesthesiology

Grant, Christopher K., M.I. Biology,
Ph.D.; adjunct, immunology

Guard, Charles L., Ph.D., D.V.M.;
medicine

Hackett, Richard P., D.V.M., M.S.;
surgery

Hall, Charles E., D.V.M.;
reproductive studies

Harvey, H. Jay, D.V.M.; surgery

Henion, John D., M.S., Ph.D.;
toxicology

Hornbuckle, William E., D.V.M.;
small animal medicine

Haupt, Katherine A., V.M.D.,
Ph.D.; veterinary physiology

Jacobson, Richard H., M.S., Ph.D.;
immunoparasitology

Kaderly, Robert E., D.V.M., M.Sc.,
Ph.D.; surgery

Kessler, Matt J., D.V.M.; adjunct,
medicine

Lein, Donald H., D.V.M., Ph.D.;
theriogenology, director of the
Diagnostic Laboratory

Lowe, John E., D.V.M., M.S.;
veterinary surgery, director of
Equine Research Park

Maylin, George A., D.V.M., Ph.D.;
toxicology and environmental health,
director of the Equine Drug Testing
Program

Morris, Mark L., Jr., D.V.M., M.S.,
Ph.D.; adjunct, medicine

Myers, David D., D.V.M., M.S.,
Ph.D.; courtesy, pathology

Oswald, Robert E., Ph.D.;
pharmacology

Postle, Donald S., D.V.M., M.S.;
veterinary science

Poston, Hugh A., M.S., Ph.D.;
courtesy, avian and aquatic animal
medicine

Quimby, Fred W., V.M.D., Ph.D.;
pathology, director of the Center for
Research Animal Resources

Rebhun, William C., D.V.M.;
medicine

Reimers, Thomas, M.S., Ph.D.;
endocrinology

Rendano, Victor, V.M.D., M.S.;
radiology

Riis, Ronald C., M.T., D.V.M., M.S.;
clinical ophthalmology

Schat, Karel A., D.V.M., Ph.D.;
avian and aquatic animal medicine

Schlafer, Donald H., D.V.M., M.S.,
Ph.D.; pathology

Schryver, Herbert F., D.V.M., Ph.D.;
pathology

Sears, Philip M., D.V.M., Ph.D.;
Diagnostic Laboratory, director of
the New York State Mastitis Control
Program and Quality Milk
Promotion Services

Smith, Mary C., D.V.M.; medicine

Straw, Barbara E., D.V.M., Ph.D.;
Diagnostic Laboratory

Summers, Brian A., M.Sc., Ph.D.;
pathology

Thompson, John C., Jr., M.S., Ph.D.;
environmental radiation biology

Torres, Alfonso, D.V.M., M.S.,
Ph.D.; adjunct, veterinary virology

Trotter, Eric J., D.V.M., M.S.;
surgery

Weiland, Gregory A., Ph.D.;
pharmacology

White, Maurice E., D.V.M.;
medicine

Assistant Professors

Appleton, Judith A., Ph.D.; immunology

Ball, Barry A., D.V.M., Ph.D.; theriogenology

Beck, Kathy A., D.V.M.; radiology

Bowman, Dwight D., Ph.D.; parasitology

Cerione, Richard A., Ph.D.; pharmacology

Dietze, Amy E., D.V.M.; radiology

Dill, Stephen G., D.V.M.; medicine

Ding, Xiu-Ying, M.D.; visiting, reproductive studies

Ducharme, Normand G., D.V.M., M.Sc.; surgery

Farnum, Cornelia, D.V.M., Ph.D.; anatomy

Flanders, James A., D.V.M.; surgery

Freeman, Kathleen, D.V.M., M.S.; clinical pathology

French, Tracy W., D.V.M.; clinical pathology

Fubini, Susan L., D.V.M.; surgery

Gould, Willard J. III, D.V.M.; medicine

Grohn, Yrjo T., D.V.M., M.S., Ph.D.; epidemiology

Hermanson, John W., Ph.D.; anatomy

Kern, Thomas J., D.V.M.; ophthalmology

Mechor, Gerald D., D.V.M., M.V.Sc.; medicine

Miller, William H., Jr., V.M.D.; dermatology

Mohammed, Hussni O., M.V.Sc., M.P.V.M., Ph.D.; epidemiology

Moise, N. Sydney, D.V.M., M.S.; medicine

Nguyen, Hai T., V.M.D., M.D.; adjunct, pathology

Nixon, Alan J., B.V.Sc., M.S.; surgery

Nowak, Linda M., Ph.D.; pharmacology

Peterson, Mark E., D.V.M.; courtesy, medicine

Pollock, Roy V., D.V.M., Ph.D.; medical informatics, director of the Center for Medical Informatics

Randolph, John F., D.V.M.; medicine

Scarlett, Janet M., D.V.M., M.P.H., Ph.D.; epidemiology

Seeger, Christoph, Ph.D.; microbiology

Shivaprasad, H. L., Ph.D., M.S.; avian and aquatic animal medicine

Spitsbergen, Jan M., D.V.M., Ph.D.; aquatic animal medicine

Suter, Maja M., Ph.D.; pathology

Wertz, Etta M., D.V.M., M.S.; anesthesiology

Wood, Philip A., D.V.M., Ph.D.; adjunct, pathology

Senior Research Associates

Alila, Hector W., Ph.D.; physiology

Bullis, Robert A., D.V.M., M.S.; avian and aquatic animal medicine

Callihan, Donald R., M.S., Ph.D.; Diagnostic Laboratory

Cheng, Chao-Fu, M.S., Ph.D.; pathology

Concannon, Patrick W., Ph.D., M.S.; physiology

Figuroa, Jorge P., M.D., Ph.D.; physiology

Fullmer, Curtis S., M.S., Ph.D.; physiology

Holmes, Dorothy F., D.V.M., Ph.D.; microbiology, immunology, and parasitology

Horne, William A., D.V.M.; pharmacology

Lucio, Benjamin, Ph.D.; avian and aquatic animal medicine

Shin, Sang J., D.V.M.; Diagnostic Laboratory

Wentworth, Richard A., M.S., Ph.D.; physiology

Woolcock, Peter R., Ph.D.; avian and aquatic animal medicine

Wurster, Nancy I., Ph.D.; microbiology, immunology, and parasitology

Senior Clinician

Hillman, Robert B., D.V.M., M.S.; clinical sciences

Lecturers

Barlough, Jeffrey E., microbiology, immunology, and parasitology

Gallagher, David P., clinical sciences

Ryan, Gerald D., clinical sciences

Winter, Lola E., microbiology, immunology, and parasitology

Instructors

Little, Thomas V., D.V.M.; clinical sciences

Stebbins, Kenneth E., D.V.M.; pathology

Tamke, Patricia G., D.V.M.; clinical sciences

Directors, Laboratory Operations

Carbone, Lawrence G., D.V.M.; Center for Research Animal Resources

Dean, William F., M.S., Ph.D.; avian and aquatic animal medicine (Eastport)

Dillingham, Lloyd A., D.V.M.; Center for Research Animal Resources

Ebel, Joseph G., Jr.; equine drug testing

Eckerlin, Richard H., D.V.M.; equine drug testing

Fronckowiak, Andrew F., M.S.; equine drug testing (Buffalo/Batavia)

Georgi, Marion, D.V.M.; Diagnostic Laboratory

Hopkins, Stephen E., M.A.; equine drug testing

Howard, Daniel A.; equine drug testing (Finger Lakes)

Kilkenny, Betty A., B.S.; equine drug testing (Belmont/Aqueduct)

Lomangino, Thomas F., B.S.; equine drug testing

Myers, John A.; equine drug testing (Vernon Downs)

Schlau, Richard A.; equine drug testing (Monticello)

Sondak, David G., A.A.S.; equine drug testing (Yonkers/Roosevelt)

Wilson, Frederick, M.S.; equine drug testing (Saratoga)

Field Veterinarians

Bennett, Gary J., D.V.M.; mastitis control (Canton)

Hayes, Gerald L., D.V.M.; mastitis control (Earlville)

Julius, Frederic S., D.V.M.; mastitis control (Kingston)

Mitchell, Grayson B., D.V.M.; avian and aquatic animal medicine (Kingston)

Sandhu, Tirath S., M.S., Ph.D.; avian and aquatic animal medicine (Eastport)

Veterinary Medical Teaching Hospital

Director: R. F. Playter

Chief of medicine: B. C. Tennant (internal medicine, gastroenterology)

Chief of surgery: R. E. Kaderly (orthopedic surgery)

Large Animal Clinic

Head: R. P. Hackett

Faculty: S. G. Dill (internal medicine), N. G. Ducharme (general surgery, orthopedics), S. L. Fubini (general surgery), R. P. Hackett (equine, general surgery), J. E. Lowe (orthopedics, neurology), A. J. Nixon (general surgery, orthopedics), W. C. Rebhun (internal medicine, ophthalmology), D. F. Smith (general surgery), B. C. Tennant (internal medicine, gastroenterology)

Residents: E. M. Gaughan (surgery), M. A. Prichard (surgery), P. C. Rakestraw (surgery), T. R. Simmons (medicine), D. L. Step (medicine), J. L. Ward (surgery)

Small Animal Clinic

Head: D. W. Scott

Faculty: R. G. Buerger (dermatology), S. A. Center (internal medicine), J. A. Flanders (soft-tissue surgery), W. J. Gould (internal medicine, avian medicine), H. J. Harvey (soft-tissue surgery), W. E. Hornbuckle (internal medicine), T. J. Kern (ophthalmology), W. H. Miller (dermatology), N. S. Moise (cardiology), J. F. Randolph (internal medicine), R. C. Riis (ophthalmology), D. W. Scott (dermatology), E. J. Trotter (orthopedic surgery, neurology)

Residents: R. S. Bagley (medicine), P. F. Bookbinder (surgery), S. A. Dougherty (medicine), K. M. Kalaher (dermatology), M. B. Parchman (surgery), P. H. Scherlie (ophthalmology), D. J. Severson (surgery), S. L. Smedes (medicine)

Interns: J. K. Bender (medicine, surgery), D. A. Brass (medicine, surgery), H. C. Mier (medicine, surgery), L. E. Rice (medicine, surgery), S. E. Rothstein (medicine, surgery), A. L. Swabey (medicine, surgery)

Ambulatory

Head: M. C. Smith

Faculty: F. H. Fox (internal medicine, obstetrics), C. L. Guard (internal medicine), M. C. Smith (internal medicine, clinical toxicology), M. E. White (internal medicine)

Senior resident: S. M. Stehman (medicine)

Resident: D. J. Matsas (medicine)

Interns: J. J. Descanio (medicine), L. D. Warnick (medicine)

Anesthesiology

Chief: C. E. Short

Faculty: R. D. Gleed, C. E. Short, E. M. Wertz

Residents: K. E. Kuersten, K. K. Otto, E. A. Saunders

Theriogenology

Acting chief: R. B. Hillman

Faculty: B. A. Ball, C. E. Hall, R. B. Hillman, T. V. Little

Clinical Pathology

Chief of pathology: B. Pauli

Head of clinical pathology: J. T. Blue

Faculty: J. T. Blue, T. W. French

Senior resident: R. C. Pearson

Radiological and Physical Diagnostics

Chief: F. A. Kallfelz

Faculty: K. A. Beck (diagnostic radiology), A. E. Dietze (radiology, diagnostic ultrasound), E. L. Gasteiger (electrodiagnostics), F. A. Kallfelz (nuclear medicine), V. T. Rendano, Jr. (diagnostic radiology, radiation therapy)

Senior lecturer: G. D. Ryan

Diagnostic Laboratory

Director: associate professor
D. H. Lein
206 Diagnostic Laboratory
607/253-3900

Associate professors: E. J. Dubovi, J. D. Henion, R. H. Jacobson, G. A. Maylin, T. J. Reimers, P. M. Sears, B. E. Straw

Senior research support specialists: D. R. Callihan (bacteriology), S. J. Shin (bacteriology)

Directors of laboratory operations: E. J. Dubovi (virology), R. Eckerlin (diagnostic toxicology), M. E. Georgi (parasitology), D. H. Lein (extension and field services: quarantine station), G. A. Maylin (equine drug testing), T. J. Reimers (endocrinology), P. M. Sears (mastitis), S. J. Shin (bacteriology)

Extension field services: M. A. Brunner (bovine extension specialist), J. E. Lowe (equine extension specialist), B. E. Straw (swine extension specialist)



Dr. Susan Fubini, a surgeon in the Large Animal Clinic (left), shows a student how to administer a nerve block during a lameness examination.

DESCRIPTION OF COURSES

Under each department heading there are brief descriptions of the courses offered. Most of these courses are a part of the veterinary core curriculum; some are elective to veterinary students or are given primarily for graduate students or students of other colleges of the university.

Courses in other colleges available to all Cornell students are listed in *Courses of Study*.

Course Numbering System

500 series: D.V.M. core curriculum courses

600 series: elective courses for D.V.M. and other students

700 series: graduate-level courses

Anatomy

Professor A. deLahunta, chairman
D-204 Schurman Hall
607/253-3547

Professors: J. F. Cummings, D. N. Noden, W. O. Sack; assistant professors: C. E. Farnum, J. Hermanson; emeritus professors: H. E. Evans, R. E. Habel; teaching assistants: S. Hackett, G. Burns; medical illustrator: M. Simmons

The major objectives of the Department of Anatomy are the education of the veterinary students and the performance of investigations that contribute new information to the scientific literature. Graduate

education is a component of this research activity. Textbook preparation is a major activity that supports the teaching program and contributes to the professional literature.

The educational program in the anatomical sciences provides a solid foundation for other basic sciences and for the courses in the clinical sciences. Significant efforts are made to integrate the anatomical teaching with those courses and to relate the anatomical studies to clinical medical and surgical situations. First-year students are introduced to the professional vocabulary in the anatomical sciences that will serve them throughout their professional career.

Research activities span a large range of basic and applied subjects in the fields of gross anatomy, developmental biology, cytology, neuromuscular mechanisms, neuroanatomy, neuropathology, and clinical neurology. Faculty are frequently consulted in their various areas of expertise.

500 Gross Anatomy: Small Animal Fall. 4 credits. Limited to first-year veterinary students. Letter grades only. C. E. Farnum, A. deLahunta, and assistants. The structure of the typical mammal is studied by detailed systematic and regional dissection of the dog. The lectures, which are supplemented by demonstrations and films, consider the comparative and regional gross aspects of vertebrate organ systems, anatomical terminology, anatomic literature and techniques, and radiographic anatomy.

501 Gross Anatomy: Large Animal Spring. 5 credits. Limited to first-year veterinary students. Letter grades only. Prerequisite: Anatomy 500. W. O. Sack and assistants.

Regional anatomy of the horse, cow, goat, and pig is studied by dissection. Special attention is given to the anatomic basis for physiological processes and clinical procedures and to the veterinary public health inspection of food animals.

502 Microscopic Anatomy Fall and spring. 3½ credits. Primarily for first-year veterinary students; others by permission of the instructor. Prerequisites: completion of, or concurrent registration in, Anatomy 500 or 700. Letter grades only. J. F. Cummings and assistants.

The microscopic structure of the cell, tissue, and organs of domestic animals is studied. Illustrated lectures are presented to relate structure to function, correlate microscopic and gross anatomy, and establish a foundation for subsequent studies in physiology and pathology. Routine histologic slides, electron photomicrographs, and immunocytochemical and histochemical preparations are used in laboratory study.

504 Neuroanatomy and Clinical Neurology Fall and spring. 2½ credits. Limited to first-year veterinary students. Letter grades only. A. deLahunta.

The nervous system of domestic animals is studied by functional systems. This is a vertically integrated course that includes dissection of the central nervous system of the dog, the anatomical basis for the diagnosis of diseases of the nervous system, and the differential diagnosis of these diseases. Clinical cases with pertinent lesions are demonstrated with each system.

505–506 Applied Anatomy 505, fall; 506, spring. 1 credit each term. Limited to third-year veterinary students. Letter grades only. A. deLahunta.

This course provides an opportunity for practice in the recognition of the anatomical features that are essential to diagnostic, surgical, obstetrical, and postmortem procedures. The approach is topographical, comparative, and clinical. The emphasis is on the study of living animals, supplemented by dissections, serial transections, models, and radiographs.

507 Animal Development Fall. 3 credits. Primarily for first-year veterinary students; a limited number of others by permission of the instructor. Prerequisites: Biological Sciences 274 or equivalent, and permission of the instructor. Letter grades only. D. M. Noden.

This course focuses on the pre-implantation, embryonic, and fetal stages of development in amniotic vertebrates, particularly domesticated species. While primary emphasis is on the morphological development of the young embryo, of fetal organ systems, and of the placentas in these species, considerable attention is given to understanding the mechanisms controlling developmental processes and the genetic or environmental factors responsible for many congenital birth defects.

508 Anatomy of the Fish and Bird Spring. ½ credit. Limited to first-year veterinary students. Letter grades only. H. Evans.

An introduction to the anatomy of fishes and birds.

600 Special Projects in Anatomy Fall and spring. By permission of the instructor. (1 credit per 2½-hour period.)

601 Research Opportunities in Veterinary Medicine May be taken during the school term, during January, or in the summer. 1–4 credits. By permission of the instructor. S-U grades only.

An independent study course. Students will work closely with individual faculty members in their research laboratories.

602 Advanced Clinical Neurology Fall. 1 credit.

Prerequisite: first two semesters of veterinary curriculum. S-U grades only. A. deLahunta.

Correlation of anatomy, physiology, and pathology in the diagnosis and treatment of diseases of the nervous system and an understanding of their pathogenesis. Case demonstrations will be emphasized.

Avian and Aquatic Animal Medicine

Professor B. W. Calnek, chairman
E-113 Schurman Hall
607/253-3365

Professors: S. A. Naqi, L. Leibovitz; associate professors: K. A. Schat, P. R. Bowser; courtesy associate professor: H. A. Poston; assistant professors: H. L. Shivaprasad, J. Spitsbergen; senior research associates: R. Bullis, B. Lucio, P. Woolcock; director of laboratory: W. F. Dean; field veterinarians: G. B. Mitchell, T. S. Sandhu

The department is strongly research oriented, following the general approach of disease control through preventive medicine. Diagnostic laboratories for domestic poultry, various pet and wild bird species, and both freshwater and marine aquatic animals are located at the college, at two regional laboratories in New York State, and at the Marine Biology Laboratory at Woods Hole, Massachusetts. These laboratories provide fresh material for teaching and research purposes. Research facilities are found at several of these locations but are mostly located at the P. Philip Levine Laboratory near the campus. Departmental laboratories are well equipped for studies in the disciplines of pathology, microbiology, immunology, and molecular biology. Special emphasis has been placed on studies of infectious diseases. Well-defined genetic strains of specific-pathogen-free chickens are maintained as a source of experimental animals. Isolation units are available for studies of infectious diseases of domestic poultry, pets and wild birds, and aquatic animals.

255 Poultry Hygiene and Disease Spring, odd-numbered years. 2 credits. Minimum enrollment, 5 students; maximum enrollment, 15 students. Prerequisites: Microbiology 290 and permission of the instructor. Letter grades only. Lecture and laboratory, W 2:05–4:25. B. Lucio-Martinez.

Biology of the chicken, salient features of anatomy and physiology of the chicken. Health and disease. Hygiene and sanitation. The poultry industry: its structure, common management practices, and their effect on poultry health. Disease prevention. The course includes a review of the most-common diseases grouped by affected system:

hemopoietic, respiratory, digestive, musculoskeletal, and nervous. The review includes descriptions of the disease, epidemiology, and control. The course includes a laboratory in which students will get acquainted with the anatomy of the chicken and with bleeding, euthanasia, and necropsy techniques.

555 Avian Diseases Fall. 2 credits. Limited to veterinary students. Required of third-year veterinary students. Letter grades only. S. A. Naqi, W. J. Gould.

Avicultural Medicine Section (1 credit. W. J. Gould). A clinically oriented course that will start with restraint and dietary requirements of pet birds but will focus primarily on presentation, diagnosis, and treatment of common avian diseases. A laboratory session will use budgerigars to illustrate the fundamentals of restraint and physical examination of pet birds.

Poultry Disease Section (1 credit. S. A. Naqi). Presentations will focus on the etiology, pathogenesis, diagnosis, prevention, and control of some of the common diseases of domestic and commercial poultry. Consequences of stress and immunologic impairment for the disease process will be discussed. Basic concepts of epidemiology and preventive medicine in relation to the current disease control practices in the poultry industry will be emphasized. Laboratory sessions will address handling and restraint of birds, bleeding techniques, euthanasia, and necropsy procedures.

614 Research Opportunities in Veterinary Medicine May be taken during the school term, during January, or in the summer. 1–4 credits. Primarily for veterinary students; others by permission of the instructor. S-U grades only. K. A. Schat.

An independent study course. Students will work closely with individual faculty members in their research laboratories.

[630 Diseases of Aquarium Fishes Spring, even-numbered years. 2 credits. Minimum enrollment, 8 students; maximum enrollment, 16 students. Elective primarily for veterinary students; others by permission of the instructor. 1 lecture-laboratory per week. P. R. Bowser. Not offered 1988–89.

A discussion of health management of aquarium fishes including aquarium system design; water quality; and pathogenesis, diagnosis, and management of commonly encountered diseases of aquarium fishes.]

631 Fish Health Management Spring, odd-numbered years. 2 credits. Minimum enrollment, 8 students; maximum enrollment, 16 students. Elective course primarily for veterinary students; others by permission of the instructor. 1 lecture-laboratory per week. P. R. Bowser. A discussion of principles and practices designed to minimize diseases in fishes maintained in aquaria, aquaculture facilities, and research laboratories. The course will emphasize the interactions between the fish, the environment, and pathogenic organisms that are found in the fish culture environment.

663 Veterinary Medicine in Developing Nations Spring, even-numbered years. 2 credits. Limited to 20 students, with preference given to veterinary students; others by permission of the instructor. S-U grades only. Lecture-discussion, F 2–4. K. A. Schat.

The aim of this course is to give students a broader insight into the many problems important for lesser-developed nations. Special emphasis will be placed on nonveterinary

aspects related to the development of those countries, such as sociological and economic interactions, the transfer of technology, and the role of women. Final selection of the topics will depend on the availability and expertise of participating faculty. Active participation of the students during the lecture and discussion periods is encouraged and essential for the success of the course.

671 Diseases of Aquatic Animals Wintersession, odd-numbered years. 2 credits. Minimum enrollment, 8 students; maximum enrollment, 16 students, by written permission of the instructor. Primarily for veterinary students and graduate students. Permission must be obtained by the December 1 immediately preceding the January in which the course will be taught. Prerequisites: Microbiology 290 and 291 or equivalent. S-U grades only. Laboratory and lecture hours to be arranged. P. R. Bowser. This is a five-day short course conducted during the wintersession. The basic study of this course relates to the etiology, pathology, diagnosis, prevention, and control of diseases of intensively cultured finfishes.

672 Aquavet I: Introduction to Aquatic Veterinary Medicine Four weeks of full-time instruction at Woods Hole, Massachusetts, immediately after the spring term. 4 credits. Limited to 32 students from Cornell, the University of Pennsylvania, and other colleges of veterinary medicine. S-U grades only. P. R. Bowser.

The course is sponsored by this college, the School of Veterinary Medicine at the University of Pennsylvania, and three marine science institutions at Woods Hole—the Marine Biological Laboratory, the Woods Hole Oceanographic Institution, and the Northeast Center of the National Marine Fisheries Service. It is designed to introduce veterinary medical students to medicine as it applies to aquatic animals. The marine environment is described and visited on field trips in the Woods Hole area. Certain aspects of the comparative anatomy, physiology, nutrition, microbiology, pathology, and medicine of a variety of marine and freshwater species are discussed. Some emphasis is placed on systems of aquaculture. The specific diseases of a few selected species are presented as examples, including the diseases of a crustacean, a shellfish, a finfish, and marine mammals. Students present seminars on appropriate topics.

673 Aquavet II: Health Management in Confined Populations of Invertebrates and Fish Summer. 4 credits. Limited to 14 veterinary students. Prerequisites: formal course work in diseases of aquatic animals or appropriate aquatic animal experience, and permission of the instructor. S-U grades only. P. R. Bowser.

An advanced course in diseases of aquatic animals. Four weeks of full-time instruction at Woods Hole, Massachusetts, immediately after the spring term. The course is sponsored by the New York State College of Veterinary Medicine, the School of Veterinary Medicine at the University of Pennsylvania, and three marine science institutes at Woods Hole—the Marine Biological Laboratory, the Woods Hole Oceanographic Institution, and the Northeast Center of the National Marine Fisheries Service. It is oriented toward the health maintenance of marine invertebrates commonly used as laboratory animals and of finfish encountered in display aquaria and aquaculture facilities. The material presented will consist of an in-depth discussion of aquatic systems design, water-quality management, culture methods, nutrition, immunology, physiology, infectious diseases, noninfectious diseases, and regulatory concerns. This

gives the student an extensive hands-on learning experience under the guidance of invited faculty members considered to be among the leaders in their respective fields of aquatic animal medicine.

770 Advanced Work in Avian Diseases Fall and spring. Credit to be arranged. By special arrangement with the instructor. Letter grades only. S. A. Naqi.

772 Advanced Work in Aquatic Animal Diseases Fall and spring. By special arrangement with the instructor. P. R. Bowser.

773 Advanced Work in Avian Immunology Fall and spring. Credit to be arranged. By permission of the instructor. K. A. Schat.

Clinical Sciences

Professor D. F. Smith, chairman
427 Veterinary Research Tower
607/253-3570

Section of Medicine. Professors: B. C. Tennant (chief); A. deLahunta, F. H. Fox, D. W. Scott; associate professors: W. E. Hornbuckle, W. C. Rebhun, R. C. Riis, M. C. Smith, M. E. White; assistant professors: S. A. Center, S. G. Dill, W. J. Gould, C. L. Guard, T. J. Kern, G. D. Mechor, W. H. Miller, N. S. Moise, J. F. Randolph; instructor: P. G. Tamke

Section of Surgery. Professor: D. F. Smith; associate professors: Robert E. Kaderly (chief); R. P. Hackett, H. J. Harvey, E. J. Trotter; assistant professors: N. G. Ducharme, J. A. Flanders, S. L. Fubini, A. J. Nixon

Section of Theriogenology. Associate professor: C. E. Hall; assistant professor: B. A. Ball; senior clinician: R. B. Hillman (acting chief); instructor: T. V. Little

Section of Anesthesiology. Professor: C. E. Short (chief); associate professor: R. D. Gleed; assistant professor: E. M. Wertz

Section of Epidemiology. Associate professors: H. N. Erb (chief), J. C. Thompson; assistant professors: Y. T. Grohn, H. O. Mohammed, R. V. Pollock, J. M. Scarlett

Radiological and Physical Diagnostics. Professor: F. A. Kallfelz (chief); associate professor: V. T. Rendano, Jr.; assistant professors: K. A. Beck, A. E. Dietze; senior lecturer: G. D. Ryan

Equine Research. Professor: H. F. Hintz; associate professor: H. F. Schryver (director); J. E. Lowe

Mastitis Research. Professor: N. L. Norcross (director); associate professor: D. S. Postle

The majority of the lectures and laboratory courses provided by the Department of Clinical Sciences are taught during the third year of the veterinary curriculum. The practical application of the

students' basic knowledge in veterinary medicine to clinical diagnosis and therapy of diseases is emphasized at this time.

The fourth year is devoted to intensive training in clinical medicine, surgery, and the specialty disciplines. Students are assigned responsibility for patient care under close faculty supervision. The curriculum consists mostly of an assignment to clinical services throughout the teaching hospital and ambulatory clinic.

During this thirty-six-week period the students participate for twenty-eight weeks on assigned clinical services, and for any eight-week period they may elect the clinical service of their choice.

The teaching hospital is equipped with modern surgical and diagnostic services, including sophisticated radiologic facilities and diagnostic capabilities involving ultrasound and nuclear medicine. The clinical pathology laboratory is equipped with an automated analyzer for blood and other body fluids.

The teaching hospital consists of three clinics. The Small and Large Animal Clinics are both hospitals with complete facilities for intensive patient care. These clinics receive both outpatients and patients that are hospitalized. Patients come directly from local clientele or are referred to the teaching hospital from veterinary practitioners in New York State and the surrounding states of New England, New Jersey, and Pennsylvania. Students are assigned to the patients in the hospital, where their activities are closely supervised by the faculty. Students participate in the selection and evaluation of diagnostic and therapeutic procedures and assist in surgery. Although the final decision on all diagnostic and therapeutic procedures is made by the faculty assigned to each service, active student participation is encouraged and is essential for optimum patient care and student education.

Proximity to an urban community and an agricultural college and well-stocked farming community offer the necessary variety of patients for study.

The Ambulatory Clinic provides veterinary service on the premises of the patient under conditions similar to those encountered in private large animal practice. Students perform physical examinations and give treatment under the supervision of a faculty member. The farming community adjacent to the veterinary college is largely devoted to dairy farming, providing ample material related to obstetrics and diseases of dairy cows. In addition, the New York State Mastitis Control Program maintains a central field laboratory at the college. Fourth-year students accompany and assist veterinarians on field trips that deal with all phases of bovine mastitis and related dairy management procedures.

475 Health and Diseases of Animals Spring. 3 credits. For students in undergraduate colleges. Not open to first-year students or to those who have had no course in animal husbandry. Letter grades only. Lectures, M W F 11:15. C. E. Hall and guest lecturers from veterinary college faculty.

Diseases of domestic animals, chiefly those related to food and fiber production, are discussed with specific examples and models. Causes, prevention and control, and importance to human health are emphasized. Early lectures cover the concepts and categories by which health and disease processes are identified and studied. One object is to get the student to grasp the language and another is to provoke reading in suggested books and texts. Subject matter shifts to more specific diseases in the latter half of the course.

520 Preventive Medicine in Animal Health Management Spring. 1 credit. Required of all third-year veterinary students. Graduate and animal science students by permission of the instructor. Letter grades only. H. N. Erb, Y. T. Grohn, and guest lecturers.

Topics will include introductory lectures on cost-benefit analysis, ventilation and other aspects of "safe" animal housing, and genetics. Then, several lectures will deal with species-specific herd health programs (dairy, sheep, swine, horse, dog, and cat). The emphasis in these lectures will be on methods and problems in setting up programs, record keeping, decisions on what to include, and the difference between preventive *programs* and sporadic diagnostic and therapeutic practice.

531 Regulatory Medicine Spring, first seven weeks. No credit. Required of all third-year veterinary students. S-U grades only. Lectures, M 8. F. J. Drazek. A review of animal and poultry diseases that are reportable to the New York State Department of Agriculture and Markets in preparation for taking the USDA accreditation examination.

545 Clinical Epidemiology Fall. 2 credits. Required of all second-year veterinary students. Others by permission of the instructor. Letter grades only. J. M. Scarlett, H. N. Erb, H. O. Mohammed.

This course reviews the basic concepts of infectious and chronic disease epidemiology. Descriptive, analytic, and experimental study designs are covered, as well as evaluation of diagnostic and screening tests, data quality, and ethical considerations in biomedical research. In addition, the application of epidemiologic methods to the investigation of disease outbreaks is discussed.

547 Practice Management Fall and spring. 2 credits. Intended for fourth-year veterinary students. Open to spouses of currently matriculated veterinary students, graduates of the college, and students of other schools of veterinary medicine by permission of the instructor. S-U grades only. D. P. Gallagher.

An elective rotation designed for the individual who anticipates a career in private practice, this course bridges the gap between the traditional scientific and clinical training that a student receives and the nonclinical aspects of the setting in which he or she will ultimately work. The subject matter focuses on the tasks and techniques of fiscal, administrative, and marketing management, with emphasis on the issues and problems typically encountered in a veterinary practice. Employing a combination of lecture, discussion, case studies, and readings, the topics covered include bookkeeping, accounting, financial and economic analysis, basic

principles of pricing and fee determination, credit and collection techniques, inventory maintenance and control, site feasibility, marketing and public relations, personnel management, and the use of computers. Also included are a review of issues related to opportunities for practice ownership (acquisitions) and an introduction to basic concepts of personal financial planning.

548 Anesthesiology Fall. 1 credit. Required of all third-year veterinary students. Not open to students of other colleges. Letter grades only. C. E. Short, R. D. Gleed, E. M. Wertz.

The basic principles of anesthesiology are presented, including the responses to injectable and inhalant anesthetics, premedications, and medications to control pain. The clinical use of anesthetics and the responses during administration of these agents in both large and small animals is included. There is an emphasis on the cardiopulmonary responses of the animal during anesthesia, including the methods and medications to improve function. The discussions include the use of equipment for administration of anesthetics, patient monitoring, and mechanical ventilation. Related study includes lectures on shock and fluid administration, postoperative care, and cardiopulmonary resuscitation.

561 Theriogenology I Spring. 3 credits. Required of all second-year veterinary students. Not open to others. Letter grades only. Fee, \$15. R. B. Hillman, C. E. Hall, B. A. Ball.

A presentation of applied physiology and endocrinology of the male and female reproductive tract. Normal cyclic changes are discussed in relation to management practices to ensure maximum reproductive efficiency. Pregnancy diagnosis and heat detection techniques are detailed. Diagnosis, treatment, and prevention of congenital, infectious, and endocrine diseases affecting the genital organs are discussed. Breeding-soundness evaluation of the male and female are covered. A programmed reproductive herd health approach is emphasized for all species of domestic animals. The techniques, advantages, and risks involved in artificial insemination are also detailed. Hands-on laboratory experience is provided for learning rectal examination of the genital organs in cattle and horses, collection and evaluation of equine semen, and determination of the stage of the estrus cycle in bitches by vaginal cytology. Reproductive tracts recovered from the slaughterhouse are used to illustrate and correlate the stage of the estrus cycle with ovarian and uterine changes as well as provide demonstrations of many of the pathologic conditions of the genital organs.

562 Theriogenology II Fall. 3 credits. Required of all third-year veterinary students. Not open to others. Letter grades only. Fee, \$15. R. B. Hillman, C. E. Hall, B. A. Ball.

Normal gestation in domestic species is discussed, including normal parturition and care of the mother and newborn immediately following delivery. Diseases of the gestation period, including teratology and abortion, as well as postpartum diseases are covered emphasizing diagnosis, treatment, and prevention. Dystocia is covered in detail, including causes, diagnosis, preventative measures, obstetrical manipulations, and operations. Laboratory exercises include continuation of training in rectal examinations and breeding-soundness evaluations. Hands-on experience is provided for obstetrical manipulation and fetotomy techniques.

563 Large Animal Medicine and Surgery Fall. 5 credits. Limited to third-year veterinary students. Letter grades only. S. G. Dill, N. G. Ducharme, F. H. Fox, R. P. Hackett, S. L. Fubini, C. L. Guard, R. B. Hillman, W. C. Rebhun, D. F. Smith, M. C. Smith, B. C. Tennant, M. E. White, and others.

This is a team-taught lecture course that is designed to impart a general knowledge of the principles of diagnosis and treatment of medical and surgical diseases of large domestic animals. Major emphasis is on cattle and horses, but some lectures are devoted to swine and small ruminants. Important medical and surgical diseases of all major body systems are discussed as well as metabolic disorders and those associated with various toxicities and poisonous plants. Several lectures address the diagnosis and treatment of various lamenesses in large animals.

564 Large Animal Medicine and Surgery Spring. 6 credits. Limited to third-year veterinary students. Letter grades only. S. G. Dill, N. G. Ducharme, F. H. Fox, R. P. Hackett, S. L. Fubini, C. L. Guard, R. B. Hillman, W. C. Rebhun, D. F. Smith, M. C. Smith, B. C. Tennant, M. E. White, and others.

A continuation of lectures designed to impart a general knowledge of the principles of diagnosis and treatment of medical and surgical diseases of large domestic animals.

566 Radiographic Techniques Fall, first five weeks.

1 credit. Required of all third-year veterinary students.

Others with appropriate background by permission of the instructor. K. A. Beck, A. E. Dietze, F. A. Kallfelz, V. T. Rendano, G. D. Ryan.

Fundamentals of radiographic imaging and diagnosis, radiation safety, radiation therapy, ultrasound, and nuclear medicine.

567 Clinical Nutrition Fall. 2 credits. Required of all third-year veterinary students. Others by permission of the instructor. Letter grades only. F. A. Kallfelz.

The first third of this course is devoted to a review of basic principles of nutrition and specific nutritional requirements of both companion and farm animals. Students are given an introduction to ration evaluation and formulation of rations for normal animals. Computerized approaches to ration evaluation and formulation are demonstrated. In addition, the special nutritional needs of newborn and growing animals; special nutrient requirements for work, production, and reproduction; and nutritional considerations for older animals are considered. The second two-thirds of this course covers clinical nutrition. Nutritionally induced diseases due to both nutrient deficiencies and excesses as well as metabolic diseases are considered. Dietary management of nutritionally induced, degenerative, and other diseases is stressed. Case material from the Teaching Hospital is used as appropriate to demonstrate these principles.

568 Foundations of Clinical Science I Fall. 2 credits.

Limited to first-year veterinary students.

W. E. Hornbuckle, C. L. Guard, R. H. Pollock, W. C. Rebhun, and other faculty.

The purpose of this course is to begin to build the fundamental clinical skills of physical examination and diagnostic reasoning and to relate these to concurrent studies in anatomy and physiology. Practical laboratories will give students the opportunity to practice these skills, and the participation of both clinical and basic science faculty members will emphasize the interdependence of the basic and clinical sciences.

569 Foundations of Clinical Science II Spring. 2 credits. Limited to first-year veterinary students. Prerequisite: Vet Med 568. W. E. Hornbuckle, C. L. Guard, R. H. Pollock, W. C. Rebhun, and other faculty.

A continuation of Vet Med 568.

570 Theriogenology Service Spring. 4 credits. Limited to fourth-year veterinary students. Letter grades only.

R. B. Hillman, C. E. Hall, B. A. Ball.

An elective clinical service rotation, this course is offered to provide additional hands-on experience in all phases of theriogenology. Equine reproductive experience is gained in teasing, rectal palpations, ultrasound scanning, semen collection and evaluation, natural breeding, and artificial insemination. Additional techniques emphasized include taking and evaluation of endometrial biopsies, endometrial culturing, and collection and evaluation of endometrial cytology smears. Bovine experience includes weekly trips to the slaughterhouse, where rectal palpation findings can be compared to actual structures present in recovered tracts. Additional experience in rectal palpation is gained by following cyclic changes in assigned cows in the veterinary college dairy herd as well as by participating in herd health palpations. Hands-on experience is provided in superovulation and embryo-recovery techniques, as well as in surgical deviation of the penis to provide teaser bulls. Trips to the Department of Animal Science sheep and swine barns allow observation of breeding programs and provide experience in castration, docking, clipping milk teeth, notching ears, etc. Weekly seminars are presented on current topics in theriogenology.

572 Senior Seminar Fall and spring. 1 credit. Required of all fourth-year veterinary students. First-, second-, and third-year students and all staff members are also invited and encouraged to attend. S-U grades only. F. H. Fox, chairman.

The aim of this course is to give the student the responsibility and opportunity of selecting and studying a disease entity on the basis of a case or series of cases or to give the student the responsibility and opportunity of conducting a short-term, clinically oriented research project under the direction of a faculty member. In either case, an oral report will be presented at a weekly seminar. A written report will also be submitted at the time of the seminar. All participants are encouraged to foster an atmosphere in which discussion, exchange of ideas, and the airing of controversial opinions might flourish.

574 Large Animal Surgery Service Fall and spring. 4 credits. Limited to fourth-year veterinary students.

Letter grades only. R. P. Hackett.

The rotation through Large Animal Surgery Service is structured to provide supervised clinical experience in the practice of large animal surgery. Under the direction of faculty and house staff, students participate in the diagnosis, surgical treatment, and care of patients presented to the Large Animal Clinic. Training through patient care is supplemented by formal rounds and by didactic instruction.

575 Ambulatory Service Fall and spring. 4 credits.

Required of all fourth-year veterinary students. Not open to students from other colleges. Letter grades only.

M. C. Smith, F. H. Fox, C. L. Guard, G. D. Mechor, M. E. White.

A clinical service rotation. Students accompany ambulatory clinicians on farm calls. Routine herd health visits are conducted for cattle, horses, sheep, goats, and swine. Reproductive evaluations (including pregnancy and

fertility examinations), nutritional evaluation, and disease prevention are stressed. Herd health programs also include vaccinations, parasite control, mastitis prevention, and routine procedures such as castration and dehorning. With appropriate herds, analysis of computerized performance data is conducted and discussed with the owner. In addition to assisting with routine scheduled work, students participate in diagnosis and medical or surgical treatment of ill or injured animals. This includes rotating assignments for night and weekend emergency duty. In summary, while assigned to the ambulatory clinic, fourth-year students learn the skills and procedures necessary for operation of a modern veterinary practice offering primary care to private large animal clients.

578 Clinical Anesthesia Fall and spring. 2 credits.

Limited to fourth-year veterinary students. Letter grades only. C. E. Short, R. D. Gleed, E. M. Wertz.

This course is designed to provide clinical experience in the use of anesthetics in both large and small animals.

Experience includes both elective and high-risk procedures. Extensive monitoring of the patient, including ECGs, blood pressure, end tidal CO₂, and blood gases are included in the program. In addition to the technical experience of anesthetic administration, case discussions, literature reviews, and anesthetic fundamentals are provided by the residents and faculty.

579 General Medicine and Surgery Spring. 4 credits.

Required of all second-year veterinary students.

Prerequisite: Pathology 536. Letter grades only.

W. E. Hornbuckle, H. J. Harvey, C. L. Guard, and other faculty.

An introduction to veterinary internal medicine and surgery. Emphasis is placed on the comparative and pathophysiologic aspects of disease, the clinical manifestations of organ system dysfunction, the principles of aseptic surgical technique, the healing of incised and traumatic wounds, and the prevention and treatment of surgical complications.

580 Radiology Service Fall and spring. 2 credits.

Required of all fourth-year veterinary students. Not open to others. Letter grades only. K. A. Beck, A. E. Dietze,

F. A. Kallfelz, V. T. Rendano, G. D. Ryan.

A clinical rotation, this is a two-week course in diagnostic veterinary radiology that provides the student with technical and interpretive aspects of radiology in clinical, laboratory, and autotutorial settings. Radiographic examples of common large and small animal disease conditions are available for study in an autotutorial teaching film file. Under the guidance of the radiology staff the student participates in radiographing and interpreting radiographs of patients in the Veterinary Medical Teaching Hospital. Eight, three-hour laboratory sessions are given in which the student gains hands-on experience in diagnostic ultrasound, nuclear medicine, patient positioning for radiography, formulation of a radiographic technique chart, performance of a nonselective angiogram, and performance of an intravenous urogram-cystogram. The laboratories familiarize the student with darkroom techniques and radiographic film artifacts. Aspects of radiation safety are discussed.

581 Animal Nutrition Fall. 2 credits. Limited to first-year veterinary students. Letter grades only. H. F. Hintz.

Functions of nutrients, signs of deficiencies and excesses of nutrients, sources of nutrients, and situations that are likely to cause deficiencies or excesses are discussed during the first part of the course. The identification and

evaluation of feedstuffs and supplements are stressed. During the last part of the course, feeding programs for beef cattle, dairy cattle, horses, swine, cats, and dogs will be discussed. Practice in ration formulation will be provided.

582 Large Animal Surgical Exercises Spring. 2 credits.

Required of all third-year veterinary students. Not open to others. S-U grades only. S. L. Fubini and faculty of surgery and anesthesiology sections.

This course is designed to impart fundamental skills in preoperative and postoperative care, anesthesia, aseptic techniques, instrument and tissue handling, and surgical techniques by closely supervised operations on the large domestic animals.

583 Small Animal Medicine and Surgery Fall. 5 credits.

Required of all third-year veterinary students. Not open to others. Prerequisites: Pathology 536, Clinical Pathology 571, and Pharmacology 528. Letter grades only. Faculty of medicine and surgery sections.

The major medical and surgical diseases of dogs and cats are presented on an organ-system basis. Emphasis is on diagnosis (clinical signs, laboratory aids) and therapy. This course is continuous with Clinical Sciences 584 in the spring.

584 Small Animal Medicine and Surgery Spring.

7 credits. Limited to third-year veterinary students. Letter grades only. Faculty of the Department of Clinical Sciences. A continuation of Clinical Sciences 583.

586 Small Animal Surgical Exercises Spring. 2 credits.

Limited to third-year veterinary students. S-U grades only. H. J. Harvey and faculty of the surgery and anesthesiology sections.

This course provides the opportunity for the student to practice basic surgical skills. Three procedures (laparotomy, thoracotomy, orthopedic approach) were chosen as the core exercises of the course. These procedures encompass maneuvers with widespread application to many types of surgery. The schedule is constructed so that each student will be the primary surgeon for each core exercise.

589 Small Animal Medicine Service Fall and spring.

4 credits. Required of all fourth-year veterinary students. Not open to others. Letter grades only. W. E. Hornbuckle,

S. A. Center, W. J. Gould, N. S. Moise, J. A. Randolph.

Two medical services. The Small Animal Medicine Service is structured to provide supervised clinical experience in the practice of companion-animal medicine. The course is conducted in the Small Animal Clinic of the Veterinary Medical Teaching Hospital. Students interact directly with clients presenting their pets for primary or referral medical care. Under the supervision of the clinical faculty and staff, the students are expected to formulate and carry out plans for the diagnostic evaluation and medical management of these patients. After review by the faculty and staff, the students then explain their plans to the clients and provide follow-up care and management of these patients. The net effect of this course is that the students gain experience under close supervision and the pets presented receive appropriate care.

591 Small Animal Surgery Service Fall and spring.

4 credits. Required of all fourth-year veterinary students. Not open to others. Letter grades only. R. E. Kaderly.

A clinical service rotation, this course exposes the student to the practice of surgery under actual hospital conditions. Students participate in the diagnostic techniques, the

planning of therapy, and the daily care of dogs, cats, and exotic species under the direction of a faculty veterinarian. Students assist experienced surgeons in the operating room and, with house-officer supervision, are responsible for patients undergoing elective ovariohysterectomy or castration. Client communications and the basics of efficient practice are also emphasized.

593 Ophthalmology Service Fall and spring. Two-week (2 credits) minimum requirement for fourth-year veterinary students. Limited to veterinary students. Letter grades only. R. C. Riis, T. J. Kern.

This course combines clinical experience with beginning skills in diagnostic ophthalmology. Students learn how to apply the diagnostic tests. The feeling of performing a good ocular examination is the goal of this rotation. Confidence in using direct and indirect ophthalmoscopes, slit lamps, tonometers, gonioscopes, conjunctival cytology, and surgery comes with practice introduced in this rotation. The first week requires an introductory orientation tape in the Autotutorial Center. Every morning of this rotation includes a surgical procedure, and every afternoon is scheduled with consultations. A high percentage of the consultations are referral cases that usually challenge the service, although adequate routine case material is presented to prepare most senior students for practice.

594 Large Animal Medicine Service Fall and spring. 2 credits. Required of all fourth-year veterinary students. Not open to students of other colleges. Letter grades only. W. C. Rebhun.

596 Opportunities in Veterinary Medicine Fall and spring. 2–4 credits. S-U grades only. Curriculum Committee.

This course provides opportunities for students after the end of the third year to explore professional areas not available through the core-selective curriculum. Blocks of two to four weeks are usually spent at other teaching hospitals, research laboratories, or zoological facilities. Proposals are formulated by the student and submitted to the college registrar. The coordinator of opportunities blocks reviews and approves the proposals. On-site supervisors of the block act as ex-officio faculty members and are expected to formally evaluate each student.

598 Dermatology Service Fall and spring. 2 credits. Required of all fourth-year veterinary students. Not open to others. Letter grades only. D. W. Scott, W. H. Miller, Jr. A clinical rotation. Students participate in the diagnosis and management of skin disorders in small and large animals. Patients are examined by appointment and through consultation with other hospital services.

611 Mastitis January minisemester. 3 credits. Limited to second-, third-, and fourth-year veterinary students. Letter grades only. 6–8 hours a day for three weeks. P. M. Sears and staff.

An elective course for veterinary students. Covers the causes, diagnosis, treatment, and prevention of bovine mastitis. The role of management practices is stressed. The course includes lectures, readings, discussions, laboratory exercises, and farm visits as part of the New York State Quality Milk Services Program—Mastitis Control Program.

616 Research Opportunities in Veterinary Medicine May be taken during the school term, during January, or in the summer. 1–4 credits. By permission of the instructor. S-U grades only. Clinical Sciences faculty. An independent study course. Students will work closely

with individual faculty members in their research laboratories.

664 Introduction to Epidemiology Spring. 4 credits. Recommended for seniors and graduate students. Prerequisite: a previous or concurrent course in statistics. S-U grades optional. H. N. Erb, H. O. Mohammed, J. M. Scarlett.

Lectures and discussion will deal with the fundamentals of epidemiology, including study-design methodologies, analysis, and interpretation of results. Current topics in epidemiology from the fields of nutrition, infectious and chronic diseases, occupational medicine, and veterinary medicine will be reviewed to illustrate the principles and practice of epidemiology. The course is oriented toward research as opposed to clinical practice.

665 Advanced Methods in Epidemiology Fall. 4 credits. A graduate course. Prerequisites: Veterinary Medicine 664 and Statistics and Biometry 601(College of Agriculture and Life Sciences). Lecture, hours to be arranged. S-U grades optional. H. N. Erb, Y. T. Grohn, H. O. Mohammed, J. M. Scarlett.

Concepts introduced in Veterinary Medicine 664, Introduction to Epidemiology, are further developed, with emphasis on statistical methods. Topics will include design and analysis of case-control and cohort studies, adjustment for confounding variables, sample-size determinations, clinical trials, and surveys.

675 Special Problems in Large Animal Medicine Fall or spring. Limited to veterinary students. By permission of the instructor.

676 Special Problems in Large Animal Surgery Fall and spring. By permission of the instructor.

677 Special Problems in Large Animal Obstetrics Fall and spring. Limited to veterinary students. By permission of the instructor. R. B. Hillman, C. E. Hall, B. A. Ball.

679 Dairy Herd Management and Health Fall, even-numbered years. 2 credits. Intended for third- and fourth-year veterinary students. Enrollment limited to 20 students. S-U grades only. Lectures, TR 7:30–9 p.m.; some Saturday p.m. labs. C. Guard.

This course will cover areas of dairy herd management in the context of production efficiency and the role of the veterinarian as management consultant. Major subject areas will include nutrition, mastitis, reproduction, and herd-replacement raising. Means of evaluating performance in these key areas will be stressed. Other related topics include relevant data acquisition and analysis, a survey of housing and feeding facilities, and milking equipment designs and troubleshooting.

680 Poisonous Plants Fall. 1 credit. Students from other colleges by permission of the instructor. S-U grades only. R. B. Hillman, M. C. Smith.

Field trips demonstrate toxic plants growing in natural or cultivated settings. Lectures address economically important poisonous plants native to the United States. Information presented includes plant identification, natural habitat, toxic principles, clinical signs of toxicity, and treatment and prevention of poisoning in animals. Some of the major toxic principles found in plants and considered in detail in the course are nitrates, cyanide, oxalates, photodynamic agents, alkaloids, and mycotoxins.

681 Horse Health Management Spring, odd-numbered years. 1 credit. Intended for third- and fourth-year veterinary students. W 8. R. B. Hillman.

Prevention of equine diseases from foaling through adulthood by management practices, nutrition, and vaccination procedures is emphasized. The reproductive aspects of a breeding farm are detailed starting with the need for complete health records and including the normal reproductive cycle, detection of estrus, breeding techniques, use of lighting programs and hormones, stallion fertility, and artificial insemination. Diagnosis, treatment, and management of problem mares are included. Pregnancy determination and care of the pregnant mare are covered, as are natural and induced parturitions. Care of the newborn foal and diagnosis, treatment, and prevention of foal diseases are also included.

683 Elementary Biostatistics Spring. 1 credit. Intended for veterinary students; others with permission of the instructor. Minimum enrollment of 10 students is required. H. Erb.

The course will take a practical approach to elementary statistics for people who will read statistics and maybe do some statistics on their own. Topics will include descriptive statistics and some of the simpler, two-variable tests of association.

684 Horse Lameness Spring. 1 credit. Limited to second- and third-year veterinary students. S-U grades only. This course is designed to acquaint second- and third-year students with the principles of lameness diagnosis. Physical examination for soundness of the musculoskeletal system is stressed through lecture-demonstration and assigned case material from the Large Animal Hospital and Equine Research Park. Motion pictures and television tapes are used each week to illustrate principles of diagnosis and specific types of lameness.

685 Introduction to Practice Management January 1989. 2 credits. Enrollment limited to 6 veterinary students. S-U grades only. M-F 9-5. D. P. Gallagher.

This minimester selective course is intended to introduce students to veterinary practice management. The format will be lectures and discussions. The course meets at the instructor's office in Trumansburg.

686 Goats: Management and Diseases Spring. 1 credit. Intended for second-, third-, and fourth-year veterinary students. S-U grades only. W 7. M. C. Smith. Infectious, parasitic, nutritional, and toxic diseases of goats are considered. Appropriate herd health programs to prevent or control these conditions are outlined. Medical and surgical procedures demonstrated or discussed include anesthesia, dehorning, castration, tattooing, foot care, and various obstetrical manipulations. Physiology, nutrition, and management are considered as they pertain to maintaining health and productivity of the goats.

688 Special Problems in Small Animal Medicine Fall and spring. Limited to veterinary students. By permission of the instructor.

[689 Special Problems in Small Animal Surgery Fall or spring. Limited to fourth-year veterinary students. By permission of the instructor. Not offered 1988-89.]

690 Veterinary Dermatology Spring. 1 credit. Limited to veterinary students. S-U grades only. W 8. D. W. Scott, W. H. Miller, Jr. This course will emphasize dermatologic conditions of small and large animals *not* covered in the core curriculum. Course grade will be based on a final examination.

691 Advanced Large Animal Internal Medicine Problems Spring. 2 credits. Limited to fourth-year veterinary students. W. C. Rebhun and faculty of Medicine Section. This course offers the fourth-year veterinary students interested in large animal medicine advanced training in internal medicine. The course will go into more detail on the workup of problematic large animal medicine cases than time allows in the core curriculum. The laboratory will allow students to perform a full spectrum of diagnostic procedures.

692 Computers in Veterinary Medicine Spring. 2 credits. Veterinary students only. Enrollment limited to 40 students. R. V. Pollock, C. Rumsey.

The course will be a practical hands-on laboratory course. Each session will begin with a brief overview and demonstration. Students will then be given specific assignments using the computer. The course will be divided into approximately equal parts, the first dealing with microcomputer basics: using MS-DOS, word processing, spreadsheets, and commercial data base management programs; the second addressing applications specific to veterinary medicine: herd health software, ration balancing, practice management, and computer-assisted diagnosis. The precise balance will depend on the expertise of the students in the course (to be surveyed before the first class meeting). If students are already computer literate, less time will be spent on basics and more on specific medical applications.

693 Professional Development Seminar Fall. 2 credits. Veterinary students only. Enrollment limited to 30 students. S-U grades only. R. V. Pollock.

The course will include discussions of the fundamentals of interpersonal communications and relationships; approaches to creativity, goal setting, accomplishments, and problem solving; managing stress to avoid burnout and professional impairment; balancing caring and detachment; maintaining personal well-being in a high-pressure environment; attitudes about success and handling money; leadership and management skills; balancing practice and family; and building self-esteem and self-confidence.

694 Diseases of Exotic Pets Spring. 1 credit. Intended for second-, third-, and fourth-year veterinary students; others by permission of the instructor. W. J. Gould.

A potpourri of topics relating to exotic animal pets and sick or injured wildlife will be covered. Speakers from the college and surrounding area will touch on many subjects of practical clinical interest.

695 Advanced Equine Surgical Techniques Spring. 1 credit. Limited to third-year veterinary students. Letter grades only. S. Fubini.

This course will consist of four laboratories performing advanced surgical procedures on ponies. Procedures in this laboratory are performed primarily at referral surgical centers, and it is the intent of this course not to make the students proficient in these techniques, but to make them more enlightened referring practitioners. The course therefore is intended for those students anticipating equine practice after graduation. This course will be offered the last four weeks of spring semester, following the core course Large Animal Surgical Exercises.

766 Graduate Research Fall, spring, and summer. Credit and hours to be arranged. By permission of the graduate faculty member concerned. S-U grades only. Graduate faculty of the Section of Epidemiology.

768 Master's-Level Thesis Research Fall or spring. 1–6 credits. Graduate faculty, Section of Epidemiology. This course will enable graduate students in the Section of Epidemiology to receive graduate research credits for master's-level thesis research.

769 Doctoral-Level Thesis Research Fall or spring. 1–6 credits. Graduate faculty, Section of Epidemiology. This course will enable students in the Section of Epidemiology to receive graduate research credits for doctoral-level thesis research.

782 Special Topics in Comparative Ophthalmology Fall, alternate years. 1 credit. Intended for veterinary students and graduates. Minimum enrollment, 10 students. S-U grades only. W 8. R. C. Riis, T. Kern, W. C. Rebhun. This is a selective course for students and graduates who want more depth and core material. The topics are expanded considerably, hoping to be complete, ranging from presenting signs, diagnosis, and treatment to follow-up evaluations. All species are covered independently. The titles of the topics will be general, but specific detail will be given. These topics may range from keratopathies (in other words, dystrophies, degenerations, and inflammations), lid abnormalities with corrective surgical options, glaucoma options, and retinopathies through optic neuropathies. When appropriate, case material will be brought to class for discussion of interesting ocular manifestations of systemic disease. Lectures on special diagnostics and their interpretations.

799 Independent Studies in Epidemiology Fall and spring. 1 to 3 credits. H. N. Erb, Y. T. Grohn, H. O. Mohammed, J. M. Scarlett. The purpose of this course is to investigate an epidemiologic topic with one of the instructors. It will provide experience in problem definition, research design, and the analysis of epidemiologic data.

Microbiology, Immunology, and Parasitology

Professor R. J. Avery, chairman
616A Veterinary Research Tower
607/253-3400

Professors: M. Appel, S. G. Campbell, L. E. Carmichael, J. R. Georgi, G. Lust, D. D. McGregor, F. M. Noronha, F. W. Scott, J. F. Timoney, A. J. Winter; professors emeriti: C. Boyer, D. W. Bruner, J. H. Gillespie, G. C. Poppensiek, B. E. Sheffy, J. H. Whitlock; associate professors: D. F. Antczak, R. G. Bell, G. M. Dunny; assistant professors: J. A. Appleton, D. D. Bowman, C. Seeger; senior research associates: D. F. Holmes, N. B. Wurster; research associates: S. E. Wade, C. H. Wang, J. R. Williams; senior extension associate: L. Wuori; lecturer: L. Winter; teaching support specialist: M. F. Frongillo; postdoctoral fellow: J. Steinmyer; joint appointees: (professor emeritus) G. C. Poppensiek; (professor) N. L. Norcross; (associate professors) W. Rebhun, V. Utermohlen; adjunct professors: (professors) D. Axelrod,

A. Burny, J. J. Callis, R. Gallo, S. Litwin; (associate professor) C. Grant; courtesy professor: M. Horzinek

315 Basic Immunology Lectures (also Biological Sciences 305) Fall. 3 credits. Strongly recommended: basic courses in microbiology, genetics, and biochemistry. Letter grades only. T R 8:30–9:55. A. J. Winter.

The course begins with a consideration of antigens and the molecular basis for antigenic specificity. A discussion follows of the molecular structure, biological functions, and genetic basis of diversity of antibodies, and in vitro interactions of antigens and antibodies. The student is then introduced to the lymphoid system and the cellular interactions responsible for production of antibodies and immune lymphocytes. This requires a substantial coverage of the genetic control mechanisms imposed by the major histocompatibility complex. The general question of regulation of the immune response, including the unresolved problem of unresponsiveness to one's own body antigens (self-tolerance) is taken up, followed by the final section concerning the manifestations of immunity. These include reactions that are harmful to the body (allergies) as well as beneficial reactions that defend the body against harmful microorganisms and cancers.

316 Basic Immunology Laboratory (also Biological Sciences 307) Fall. 2 credits. Prerequisite: a course in basic microbiology or permission of the instructor. Recommended: concurrent enrollment in Microbiology 315. Letter grades only. Laboratories, T R 10:10–12:15. N. L. Norcross.

A series of laboratory exercises illustrate the immunological concepts presented in Microbiology 315. Exercises are designed to give students experience with the stimulation and measurement of an immune response in the rabbit. Techniques to familiarize students with both humoral and cellular immune phenomena are included with the goal of offering tangible, hands-on experience in immunology. Among the methods and techniques offered are agglutination and precipitation methods, virus neutralization and phagocytosis, measurement of the biological activity of complement components, antibody-dependent cell-mediated cytotoxicity, T and B cell identification, monoclonal antibodies and the ELISA, antibody production by single cells, lymphocyte blastogenesis, and delayed hypersensitivity.

317 Pathogenic Microbiology Spring. 4 credits. Intended primarily for graduate and undergraduate microbiology majors. Limited to 20 students. Prerequisites: Microbiology 290 and 291 (College of Agriculture and Life Sciences). Strongly recommended: Microbiology 315 and 316. Letter grades only. Lectures, T R 1:25–2:15. Laboratory, 2:25–5. G. M. Dunny, L. Winter. This is a two-part course in medical microbiology, covering pathogenic bacteriology, mycology, and virology. Lectures in bacteriology and mycology cover the major groups of bacterial pathogens and some of the important virulence mechanisms, as well as highlight certain aspects of the normal flora, antibiotic therapy, and drug resistance that are relevant to the pathogenesis of bacterial disease. Virology lectures provide the student with an introduction to animal viruses and discuss viral diseases, biochemistry, genetics, and replication. Laboratories emphasize techniques for isolation and culture of bacterial, fungal, and viral pathogens as well as demonstrate tissue culture and animal models for studying the pathogenesis of, and the immune response to, infectious agents. One important

principle emphasized in both portions of the course is that disease is the product of the interaction of the host, pathogen, and environment.

331 Medical Parasitology Fall, alternate years. 2 credits. Prerequisite: zoology or biology. Letter grades only. Lectures, M F. D. D. Bowman.

A systematic study of arthropod protozoan and helminth parasites of public health importance, with emphasis on epidemiological, clinical, and zoonotic aspects of these parasitisms.

510 Veterinary Parasitology Fall. 4 credits. Limited to second-year veterinary students. Prerequisites: zoology and biology. Letter grades only. D. D. Bowman, J. R. Georgi.

A systematic study of arthropod, protozoan, and helminth parasites of vertebrate animals, with particular emphasis on the bionomics, epidemiology, and control of parasitisms of veterinary and public health importance. Laboratories consist of practical exercises in the antemortem and postmortem diagnosis of arthropod, protozoan, and helminth parasitisms of domestic animals and the interpretation of their pathogenetic significance.

515 Veterinary Immunology Spring. 2 credits. Limited to first-year veterinary students. Letter grades only. J. Appleton.

The objective of the lectures is to give the veterinary student a general outline of the mammalian and avian immune response. Emphasis will be on basic principles, using examples from domestic animals, thereby stressing the applications of immunology to veterinary medicine. The laboratories illustrate and enlarge upon the concepts presented in the lectures and give the student firsthand experience of the simple immunological tests commonly used in veterinary practice. The more complex tests are presented as demonstrations. Discussion of the clinical aspects of immunology is incorporated throughout the course.

516 Infectious Diseases I: Bacteriology and Mycology Fall. 4 credits. Limited to second-year veterinary students. Letter grades only. J. F. Timoney, L. Winter.

The lectures in veterinary bacteriology are intended to give the veterinary student an understanding of the circumstances and processes by which pathogenic bacteria and fungi enter and cause disease in the different organ systems of animals. Thus the student will be given the basis for an intelligent approach to the symptomatology, diagnosis, control, treatment, and prevention of the more important bacterial and fungal diseases in domestic animals. Laboratory exercises will be concerned with the isolation, culture, and identification of the major groups of veterinary bacterial and fungal pathogens as they occur in clinical material. Students will have the opportunity to collect and culture specimens and make presumptive bacteriologic or fungal diagnoses based on their own investigations in the laboratory. The laboratory exercises will also be supplemented with small group discussion-demonstration sessions on interesting cases and diagnostic material.

517 Infectious Diseases II: Virology and Viral Diseases Fall. 2 credits. Required of all second-year veterinary students. Letter grades only. F. W. Scott.

This course will cover viruses that produce important diseases in animals. The first third of the term will cover general virology, and the second two-thirds will cover viral diseases, including the basic properties of the virus, how the virus produces disease, and how the host responds to

the virus infection. Virological and serological procedures important for the diagnosis of various virus diseases will be discussed.

518 Infectious Diseases III: Infectious and Zoonotic Diseases Spring. 2 credits. Required of all second-year veterinary students. Others by permission of the instructor. Letter grades only. Lecture-demonstration-discussion. D. F. Holmes (zoonotic diseases),

G. C. Poppensiek (foreign-animal diseases). Clinical signs, etiology, methods of differential diagnosis, pathogenesis, methods of spread, reservoir hosts, methods of prevention and control of diseases transmissible to man, and foreign-animal diseases that resemble indigenous infectious diseases or present serious economic or public health threats to the United States. Sections on food- and water-borne and occupational diseases are included.

605 Special Projects in Microbiology Fall and spring. Credit to be arranged. By permission of the instructor.

Prerequisite: a good background in microbiology or immunology. S-U grades only. Microbiology staff. The course is designed for undergraduates and as a veterinary elective. Preferably, students should have some background in pathogenic microbiology and immunology. It normally provides an opportunity for the student to work in a research laboratory or carry out a special project under supervision.

606 Small Animal Infectious Diseases Spring. 2 credits. Prerequisite: three semesters of the veterinary college curriculum or permission of the instructor. S-U grades only. T R 8. F. W. Scott and guest lecturers.

An elective course designed to give the future small-animal practitioner a greater understanding of the infectious diseases of the dog and cat. Emphasis will be on etiology, pathogenesis, diagnosis, treatment, and prevention. The diseases covered will include the diseases of dogs and cats that are caused by viruses, bacteria, fungi, and protozoa.

607 Virus Diseases of Cattle Fall, even-numbered years. 1 credit. Limited to junior and senior veterinary students. Open to graduate students in the veterinary college by permission of the instructor. S-U grades only. W 8. F. Fox, J. Gillespie, J. King, and guest lecturers.

Designed to give the future bovine practitioner an understanding of the viral diseases of cattle raised in the United States. Emphasis will be placed on clinical signs and diagnosis, etiology, pathogenesis, pathology, control and prevention (including maternal immunity), vaccination, and other therapy. A clinician, a pathologist, and a microbiologist will be in attendance at every lecture to cover each aspect of the disease as it relates to their disciplines. This assures complete coverage of each topic through appropriate interaction and integration of the subject matter.

[609 A Health Program for Sheep Spring, every three or four years. Lecture, 1 credit; lecture and laboratory, 2 credits. Limited to veterinary students; others by permission of the instructor. S-U grades only. 1 lecture and 1 laboratory each week. S. G. Campbell. Not offered 1988-89.

The objectives of the course are to provide the student with sufficient information about the nutrition, husbandry, and diseases of sheep to set up a health program for sheep in the northeastern United States and to ensure that the participants can prepare one for themselves or their clients. During the laboratory the student carries out certain practical exercises with sheep (handling, necropsy,

pregnancy diagnosis) and actually formulates a health maintenance program for a flock of sheep in Tompkins County.]

615 Research Opportunities in Veterinary Medicine

May be taken during the school term, during January, or in the summer. 1–4 credits. By permission of the instructor. Microbiology faculty.

An independent study course. Students will work closely with individual faculty members in their research laboratories.

706 Immunology Seminar Series Fall and spring. No credit. Required of all graduate students in the Field of Immunology. S-U grades only. 12:15, first and third Friday of each month. R. Bell.

Presentations of research investigations by Cornell faculty members, postdoctoral fellows, and graduate students in the Field of Immunology and by invited speakers from other institutions.

707 Advanced Work in Bacteriology, Virology, and Immunology Fall and spring. Credit to be arranged. By permission of the instructor. Hours to be arranged. Microbiology staff.

This course is designed primarily for graduate students with a good background in pathogenic microbiology and immunology. It may be elected by veterinary students who are properly prepared.

708 Selected Topics in Animal Virology Spring. 2 credits. Hours to be arranged. C. Seeger.

Lectures will focus on the molecular biology of a few selected animal viruses. Important publications will provide the basis for a discussion of current models for virus replication and for host-viral interactions.

709 Laboratory Methods of Diagnosis Fall and spring. 1–3 credits by arrangement. By permission of instructor. Microbiology staff.

Instructions and practice in the application of microbiological and serological methods for the diagnosis of disease.

710 Microbiology Seminar Fall and spring. No credit. Required of all graduate students in the Department of Veterinary Microbiology, Immunology, and Parasitology. S-U grades only. M 12:15. C. Seeger.

713 Special Topics in Immunology: Antiviral and Tumor Immunity Spring, odd-numbered years. 1 credit. Prerequisite: introductory immunology. Lectures, M W F 9.

This course will involve intensive student participation, and enrollment will be limited.

714 Special Topics in Immunology: Mucosal Immunity Spring, odd-numbered years. 1 credit. Prerequisite: introductory immunology. Lectures, M W F 9.

This course will involve intensive student participation, and enrollment will be limited.

715 Special Topics in Immunology: Inflammation Spring, odd-numbered years. 1 credit. Enrollment limited. Prerequisite: introductory immunology. Lectures, M W F 9.

716 Special Topics in Immunology: Topic to Be Determined Spring, even-numbered years. 1 credit. Prerequisite: introductory immunology. Lectures, M W F 9.

This course involves intensive student participation, and enrollment will be limited.

717 Special Topics in Immunology: Topic to Be Determined Spring, even-numbered years. 1 credit. Prerequisite: introductory immunology. Lectures, M W F 9.

This course involves intensive student participation, and enrollment will be limited.

718 Special Topics in Immunology: Topic to Be Determined Spring, even-numbered years. 1 credit. Prerequisite: introductory immunology. Lectures, M W F 9.

This course involves intensive student participation, and enrollment will be limited.

737 Advanced Work in Animal Parasitology Fall and spring. 1–3 credits by arrangement. For advanced undergraduate and graduate students. Prerequisite: Microbiology 335 or 510. Letter grades only. J. R. Georgi and other faculty.

This course is intended for graduate students minoring in parasitology and for highly motivated veterinary students with interests in parasitologic research.

[767 Immunoparasitology Spring. 2 credits. Not offered 1988–89.

This course studies the immune response to representative helminth and protozoan parasites of vertebrate hosts. Emphasis will be placed on the physiological and immunological relationships that play a role in regulation of parasitic infections. In vitro correlates of immunity to parasites, immunodiagnosis, and parasite-induced immunopotential and suppression will be discussed.]

783 Seminars in Parasitology Fall and spring. 1 credit. Open to veterinary students, graduate students minoring in the field of parasitology, and others by permission of the instructor. S-U grades only. Lectures, R 4. D. D. Bowman. Date and hours to be arranged.

A seminar series designed to acquaint students with current research in the field of parasitology. The range of topics will include the ecology of parasitism, parasite systematics, immunoparasitology, and parasitic diseases of plants and animals, including man.

Pathology

Professor B. U. Pauli, chairman
216 Veterinary Research Tower
607/253-3300

Professors: J. King, L. Krook, R. Lewis, R. Minor, R. Phemister, D. Slauson; professors emeriti: J. Bentinck-Smith, C. I. Boyer, Jr., K. McEntee, C. G. Rickard; adjunct professors: W. J. Dodds, T. Donnelly, C. A. Mebus, J. Nosanchuk, M. Posso, P. Wood; associate professors: J. T. Blue, B. Cooper, D. H. Lein, D. D. Myers, F. Quimby, D. H. Schlafer, B. A. Summers; assistant professors: K. Freeman, T. French, M. Suter; adjunct assistant professor: H. T. Nguyen

535 Veterinary Pathology I Fall. 4 credits. Required of all second-year veterinary students. Others by permission of the instructor. Prerequisites: Anatomy 502 and 503 or equivalent histology courses. Letter grades only. T R 9–12:20. D. O. Slauson.

A study of disease processes beginning at the cellular level and progressing to selected body systems. Cellular

pathology, injury and death at the cellular and tissue level, derangements in body fluids and blood flow, inflammation and repair, the nature and causes of tissue injury, abnormalities of cell growth, neoplasia, and the relationship of genetics to disease are discussed as general processes at a mechanistic level. These basic pathogenic processes are subsequently applied to the diseases occurring in complex organ systems such as the skin and endocrine and reproductive systems. This serves as a bridge between Veterinary Pathology I and Veterinary Pathology II.

536 Veterinary Pathology II Spring. 4½ credits. Required of all second-year veterinary students. Not open to others. Prerequisite: Pathology 535. Letter grades only. TR 10–12:20, W 10. B. Pauli.

A systematic study of the diseases in each major organ system with emphasis on differential diagnostic features and the correlation of disturbed function with morphologic change.

539 Introduction to Laboratory Animal Medicine Spring. 1 credit. Required of all third-year veterinary students. Others by permission of the instructor. Prerequisites: Pathology 535 and 536. Letter grades only. F. W. Quimby.

An introduction to the biology and diseases of common laboratory animal species, including mice, rats, hamsters, guinea pigs, rabbits, and nonhuman primates. Exotic species, including amphibia and reptiles, are also discussed. The etiology and pathogenesis of the most prevalent diseases are emphasized. Practical means of diagnosis and treatment are discussed. The course also provides an overview of the many aspects of laboratory animal medicine as practiced in academe, industry, and research.

540 Pathology Service Fall and spring. 2 credits. Required of all fourth-year veterinary students. Not open to others. Letter grades only. J. M. King. This course involves the hands-on diagnostic necropsies of most mammalian species that come to the necropsy room in the pathology department and the hands-on necropsies of feathered species in the avian and aquatic animal medicine department. The sessions are two weeks long for each group of three to five senior veterinary students. They meet at 9:00 a.m. each day for an hour's review of the students' written reports of necropsies done the day before followed by a 2½-hour microscopic review of hematology and cytology slides, performance of urinalysis techniques, and case study discussions. Beginning about 1:30 p.m. each day, the necropsy requests are reviewed and necropsies performed under the guidance of pathology interns, residents, or faculty members until all are complete. One student per day attends and performs avian necropsies in the laboratory. The mammalian necropsy service is a twenty-four-hour service, seven days a week, but prudence is used for late-night and weekend duty.

571 Clinical Pathology Spring. 3 credits. Required of all third-year veterinary students. Others by permission of the instructor. Prerequisites or corequisites: Vet Med 535 and Vet Med 536. Letter grades only. In any week there will be either three lectures or two lectures and one laboratory. J. Blue.

The course teaches the application of hematology, urinalysis, cytology, and other laboratory procedures to the evaluation of clinical disorders.

613 Research Opportunities in Veterinary Medicine May be taken during the school term, during January, or in the summer. 1–4 credits. By permission of the instructor. Pathology faculty.

An independent study course. Students will work closely with individual faculty members in their research laboratories.

635 Special Problems in Pathology Fall or spring. By permission of the instructor. Letter grades only. B. Pauli.

636 Wildlife Pathology Fall. 2 credits. Intended for first-, second-, and third-year veterinary students. Open to others. J. M. King.

A presentation of the nature and causes of diseases of wild rabbits, opossums, squirrels, deer, certain waterfowl, and some other species. Emphasis on epizootiology, etiology, pathogenesis, diagnostic lesions, and effects on populations. Laboratory experience in specimen collection and necropsy techniques. Guest lectures on ecology and population dynamics by members of the Department of Natural Resources.

637 Postmortem Pathology Fall and spring. 1 credit. Intended for first-, second-, or third-year veterinary students. J. M. King.

A presentation of gross and microscopic lesions of diagnostic significance, employing color projection slides as illustrations. Emphasis on pathological and differential diagnosis of a wide spectrum of viral, metabolic, bacterial, parasitic, and other diseases.

638 The Bottom Line Fall and spring. 1 credit. Limited to veterinary students. S-U grades only. Discussion, W 12:20–1. R. M. Lewis.

This course is organized in a modified Clinico-Pathologic Conference format. Selected case material derived from the Teaching Hospital patient population is discussed, emphasizing and illustrating the salient clinical, antemortem, and postmortem features of twenty-eight disease entities each semester. Interactive discussion between participating faculty and students follows each case presentation.

639 Special Topics in Laboratory Animal Medicine and Science (formerly Autotutorial Course) Fall and spring. 1–3 credits. F. Quimby.

This course is offered to individuals interested in pursuing various aspects of laboratory animal medicine and science in depth. A variety of resources are available to assist students in their research on a particular topic: the library of the Division of Laboratory Animal Medicine, including the autotutorial library; the university libraries; and special information collected from other institutions. Grades will be determined on the basis of a paper, an oral presentation, or the creation of an audiovisual teaching aid, any of which may be selected by the student.

640 Principles of Toxicological Pathology Fall, odd-numbered years. 3 credits. Intended for veterinary and graduate students. J. M. King.

The primary objective of this elective graduate-level course is to make the student aware of the problems and their solutions encountered in pathology as it applies to the field of toxicology, with special emphasis on industrial toxicology and governmental regulations.

641 Clinical Immunology Spring. 1 credit. Limited to veterinary students. Others by permission of the instructor. Lecture, W 8. R. M. Lewis.

This course emphasizes the clinical aspects of fifteen

specific diseases that are mediated by immunologic processes. Case material from the teaching hospital will be used to illustrate the presenting clinical signs, laboratory diagnostic methods, clinical course, therapeutic approaches, and eventual outcome of each disease under discussion. Student participation in the informal case discussions will be encouraged as a means of introducing students to the practice of veterinary medicine through case discussion and analysis. Training will also be provided in the use of the college's computerized biomedical information system and the hospital records system to develop a critical case analysis, which serves as the basis for grading.

642 Public Policy and Laboratory Animal Science Spring. 2 credits. Intended for fourth-year veterinary students, residents, and veterinarians enrolled in the Graduate School who have a serious interest in pursuing a career in laboratory animal medicine. Prerequisite: Pathology 539 or equivalent. One evening each week for two hours. F. Quimby and others.

The course will be conducted as a series of small group discussions with individual participation and weekly readings required. It will focus on public policy in laboratory animal science and include the following discussion topics: public perceptions of animal use in teaching, research, and testing; federal and state laws governing animal use; the recognition and alleviation of pain and distress during animal experimentation; euthanasia; biological hazards in animal research; alternatives and adjuncts to animals in research; and factors that complicate animal research.

643 The Use of Animal Models to Explore Physiologic and Pathologic Mechanisms in Animals and Man Fall. 2 credits. Intended for fourth-year veterinary students, residents, and veterinarians enrolled in the Graduate School who have a serious interest in pursuing a career in laboratory animal medicine. Prerequisite: Pathology 539 or equivalent. One evening each week for two hours. F. Quimby and others.

The course will be conducted as a series of small group discussions with individual participation and weekly readings required. It will focus on the use of animal models for exploring physiologic and pathogenetic mechanisms in animals and man. This segment will include the following discussion topics: the value of basic research, the benefits of animal research to human and animal health, the requisite features of an appropriate animal model, the origin of inbred and congenic strains, transgenic animals, and a survey of animal models. Animal models used in investigations of body systems (pulmonary, CNS, hematologic) will be the focus during even-numbered years, while models of disease processes (oncology, virology, autoimmunity), as well as aging and transplantation, will be the focus in odd-numbered years.

736 Pathology of Nutritional Diseases Spring. 3 credits. For graduate students in pathology or nutrition and an elective course for veterinary students at the sophomore level or above. Prerequisite: Pathology 535. Letter grades only. L. P. Krook.

739 Advanced Work in Pathology Fall and spring. 1 to 3 credits by arrangement. Letter grades only. B. Pauli. Properly prepared students may undertake special problems or receive special assignments.

749 Laboratory Animal Clinical Rotation Fall and spring. 4 credits. Limited to veterinary students and graduate students in laboratory animal medicine. F. W. Quimby. To gain clinical experience in the management and care of various laboratory animal species as well as in the professional operation of a large animal facility, students are rotated through various areas, including the experimental surgery laboratory, animal diagnostic laboratory, and the animal facility.

788 Seminar in Surgical Pathology Fall and spring. 1 credit. Intended for third- and fourth-year veterinary students, graduate students, interns, and residents. Letter grades only. Lecture-seminar, T 8. Pathology staff. The major objective of this course is to introduce the students to the gross and microscopic features of surgical pathology. Selected material from the Surgical Pathology Service is prepared in advance for independent review by the students. The material is presented in a slide seminar format by the students under the review of the faculty. Emphasis is placed on pathogenesis, etiology, and pathologic descriptions of the lesions. In addition, appropriate guest lecturers cover specific areas of interest and special topics not encountered in the departmental service programs. B. J. Cooper.

789 Seminar in Necropsy Pathology Fall and spring. 1 credit. Intended for third- and fourth-year veterinary students, graduate students, interns, and residents. Letter grades only. R 8. J. King.

The major objective of this course is to introduce the student to the gross and microscopic features of necropsy pathology. Selected material from the Necropsy Service is prepared in advance for independent review by the students. This material is presented in a slide seminar format by the students under the review of the faculty. Emphasis is placed on pathogenesis, etiology, and pathologic description of the lesions. In addition, appropriate guest lecturers cover specific areas of interest and special topics not encountered in the departmental service programs.

790 Special Topics in Pathology Fall. 1 credit. Intended for third- and fourth-year veterinary students, graduate students, interns, and residents. B. Pauli.

The major objective of this course is to introduce the student to the gross and microscopic features of special topics in pathology, including neuropathology, ocular pathology, reproductive pathology, and the pathology of laboratory animals and avian and marine species. Selected material from the Surgical and Necropsy Services is prepared in advance for independent review by the students. This material is presented in a slide seminar format by the staff. Emphasis is placed on pathogenesis, etiology, and pathologic description of the lesions. In addition, appropriate guest lecturers cover specific areas of interest and special topics not encountered in the departmental service programs.

792 Pathogenetic Mechanisms Spring, even-numbered years. 3 credits. Prerequisites: Pathology 535 or 315 or permission of the instructor. Letter grades only. D. O. Slauson.

A topics course in advanced pathology emphasizing pathogenetic mechanisms as illustrated by naturally occurring and experimentally induced disease processes in humans and animals. Subject areas include cell injury induced by physical, toxic, and viral agents; pathobiology of the central and peripheral nervous system; cellular and humoral mediators of inflammation; hypersensitivity and

autoimmune phenomena; congenital and acquired immunodeficiencies; immunobiology of mononuclear cells; and the pathogenesis of neoplastic processes.

793 Lectures in General Pathology Fall. 2 credits. Limited to graduate students by permission of the instructor. Letter grades only. Lecture, T R 9–10. D. O. Slauson.

This course consists of only the lecture portion of Pathology 535 without the laboratory. It is designed to accommodate certain graduate students who desire exposure to general pathology but lack histology experience. The subject matter covered is described under 535.

794 Lectures in Special Pathology Spring. 3 credits. Limited to graduate students by permission of the instructor. Letter grades only. Lecture, T W R 10–11. B. Pauli.

This course covers only the lecture portion of Pathology 536, consisting of a systematic study of the diseases in each major organ system with emphasis on differential diagnostic features and the correlation of disturbed function with morphologic change.

Pharmacology

Professor G. W. G. Sharp, chairman
D-124 Pierre A. Fish Laboratory
607/253-3650

Professor: W. S. Schwark; associate professors: J. G. Babish, R. E. Oswald, G. A. Weiland; assistant professors: R. A. Cerione, C. M. S. Fewtrell, L. M. Nowak

Specific information about faculty, staff, and courses may be obtained by contacting the department.

528 Pharmacology I Fall. 4 credits. Prerequisites: Anatomy 500, 501, 502, 503, and 504; Physiology 525, 526, and 527; Pathology 535; or permission of the instructors. Letter grades only. R. A. Cerione and other faculty. Topics covered will include physiological disposition of drugs and poisons, drug-receptor interactions, cell and organ pharmacology, and actions of drugs affecting the nervous system. A number of clinical topics will be covered in the laboratory session.

529 Pharmacology II Spring. 2 credits. Prerequisite: Pharmacology 528 or permission of the instructors. Letter grades only. W. S. Schwark and other faculty. Topics covered will include chemotherapy and the action of drugs affecting the heart, gastrointestinal tract, skin, and the respiratory, endocrine, and urinary systems.

610 Introduction to Chemical and Environmental Toxicology (also Toxicology 610) Fall. 3 credits. M W F 11:15. J. Babish.

This course is designed to introduce graduate and upperclass undergraduate students to the principles of toxicology. Specifically the course will cover the concepts underlying the absorption, distribution, and excretion of toxicants; biological systems as targets of toxic agents; commonly encountered toxic agents; and the ecological distribution of toxic materials.

620 Advanced Clinical Pharmacology (Selective) Spring. 1 credit. Limited to third- and fourth-year veterinary students. Others by permission of the instructor. S-U grades only. W. S. Schwark.

An extension of the core veterinary pharmacology courses, Vet Med 528 and 529. Emphasis will be on selected topics in veterinary therapeutics with reference to clinical case material.

621 Toxicology (also Toxicology 621) Spring, alternate years. 1 credit. Nonveterinary students by permission of the instructor. S-U grades only. T 8. W. S. Schwark. Specific information about this course can be obtained from the department. Basic and clinical aspects of the more common poisonings that affect domestic animals will be considered. Emphasis will be given to heavy-metal poisoning; chelation phenomena; selected organic poisonings, including pesticides, herbicides, and rodenticides; and forensic considerations.

622 Special Projects in Pharmacology Fall, spring, and summer. 1–3 credits. By permission of the instructor. Pharmacology faculty.

629 Research Opportunities in Veterinary Medicine May be taken during the school term, during January, or in the summer. 1–4 credits. By permission of the instructor. S-U grades only. Pharmacology faculty. An independent study course. Students will work closely with individual faculty members in their research laboratories.

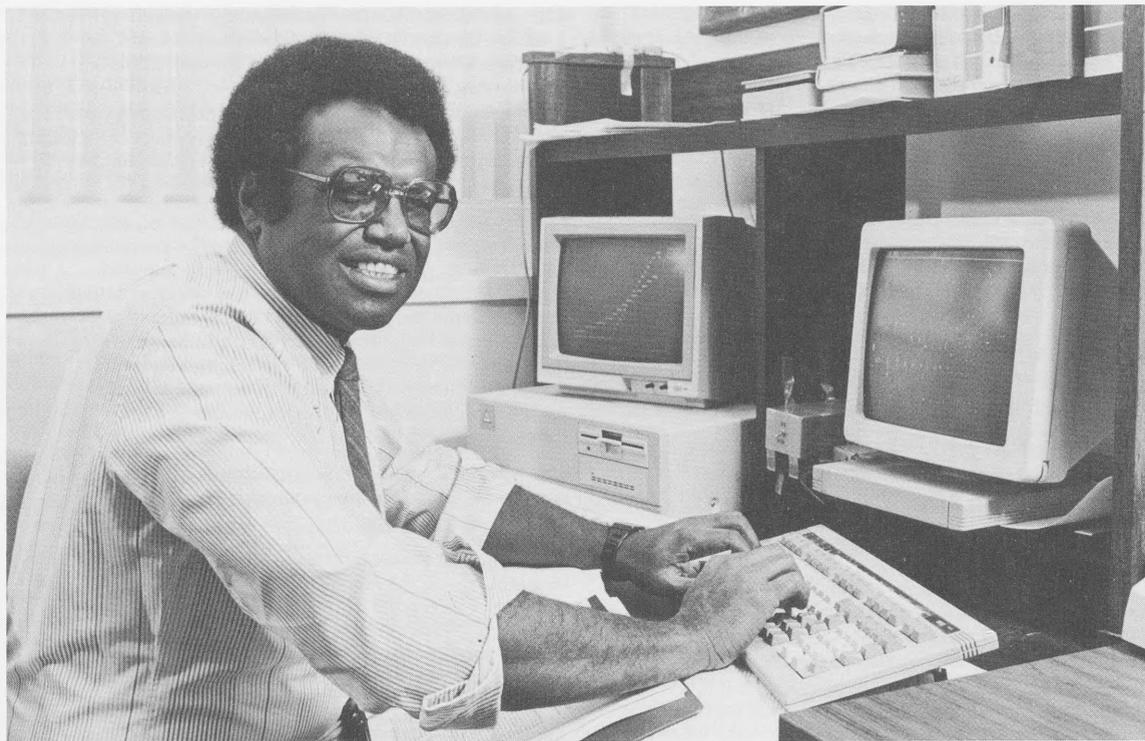
700 Calcium and Other Second Messengers in Cell Activation Fall, alternate years. 2 credits. By permission of the instructor. Lecture-discussion, 2 hours each week. C. M. S. Fewtrell.

Calcium as second messenger; regulation of intracellular calcium and techniques for studying calcium movements and distribution in cells. Phosphatidylinositol turnover; activation of protein kinase C by diacylglycerol and the release of calcium from intracellular stores by inositol trisphosphate. Adenylate cyclase, guanine nucleotide regulatory proteins, and cyclic nucleotides as transducers and second messengers. The role of ion channels in cell activation. Each topic will be introduced with a lecture that will be followed by discussion of recent papers from the literature.

[701 Receptors and Ion Channels Spring. 2 credits. By permission of the instructor. Lecture and discussion. G. A. Weiland, R. E. Oswald. Not offered 1988–89. Biochemical and electrophysiological mechanisms of ligand- and voltage-modulated ion channels and the role of these channels in physiological function; disease states, and drug actions on the level of the membrane, cell, and organ. This is to familiarize students with concepts, methods, and recent progress in understanding the mechanisms of neurotransmitter-drug receptors.]

[703 Receptor Binding: Theory and Techniques (also Biological Sciences 790–02) Spring, even-numbered years. 2 credits. By permission of the instructors. Lecture, T 7–8:50 p.m. R. E. Oswald, G. A. Weiland. Not offered 1988–89.

The course will cover both the practical and theoretical tools needed to set up and use a radioligand binding assay to measure and characterize physiologically and pharmacologically relevant neurotransmitter hormone drug receptors. The emphasis of the course is on the quantitative and physical chemical aspects of receptor binding. Topics discussed in the course are historical



Dr. Hussni Mohammed at his computer in the Section of Epidemiology

background of receptor theory; the basic methods of a radioligand binding assay, including various methods of separating and measuring bound and free ligand; methods of analyzing equilibrium binding; the thermodynamic basis of the binding; equilibrium binding for complex binding mechanisms, including allosteric mechanisms; coupling of binding to response; antagonism of response and inhibition of binding; the kinetics of simple and complex binding mechanisms; and common artifacts encountered in radioligand binding assays.]

704 CNS Neuropharmacology: Mechanisms—Synaptic Transmission Limited to 20 third- and fourth-year undergraduate and graduate students.

This is a basic-level course in vertebrate central nervous system pharmacology, in which mechanisms of synaptic transmitter and drug action at the membrane and cellular level will be emphasized. The relationship between particular neurotransmitters, neuroanatomical structures, normal function, and dysfunction will be discussed.

711 The Role of Calcium in Stimulus-Secretion Coupling Fall, spring, and summer. 1–3 credits. By permission of the instructor. C. M. S. Fewtrell.

712 The Receptor for Immunoglobulin E on Tumor Mast Cells Fall, spring, and summer. 1–3 credits. By permission of the instructor. C. M. S. Fewtrell.

713 Mechanisms of Growth-Factor Action Fall, spring, and summer. 1–3 credits. By permission of the instructor. R. A. Cerione.

714 Central Nervous System Neurotransmitters Fall, spring, and summer. 1–3 credits. By permission of the instructor. L. M. Nowak.

716 Neurobiology of Seizure Disorders Fall, spring, and summer. 1–3 credits. By permission of the instructor. W. S. Schwark.

717 Single-Channel Recording Fall, spring, and summer. 1–3 credits. By permission of the instructor. R. E. Oswald.]

[718 Structure-Function of the Nicotinic Acetylcholine Receptor Fall, spring, and summer. 1–3 credits. By permission of the instructor. R. E. Oswald.]

719 Computer Modeling of Drug-Receptor Interactions Fall, spring, and summer. 1–3 credits. By permission of the instructor. R. E. Oswald.]

720 Modulation of Nicotinic Acetylcholine Receptor Function by Substance P Fall, spring, and summer. 1–3 credits. By permission of the instructor. G. A. Weiland.

721 Molecular Mechanisms of Pharmacological Blockade of Voltage-dependent Calcium Channels Fall, spring, and summer. 1–3 credits. By permission of the instructor. G. A. Weiland.

[723 The Role of Calcium in the Control of Electrolyte Transport Fall and spring. 1–3 credits. By permission of the instructor. G. W. G. Sharp.]

[724 The Control of Hormone Secretion Fall and spring. 1–3 credits. By permission of the instructor. G. W. G. Sharp.]

Special Topics in Pharmacology Fall, spring, and summer. 1 credit each topic. By permission of the instructor. Pharmacology faculty. Reading and discussions.

741 Neuromodulation G. A. Weiland.

- 742 Receptor Mechanisms** G. A. Weiland.
- 743 Neuropeptides** G. A. Weiland.
- 744 Voltage-dependent Calcium Channels**
G. A. Weiland.
- 745 Neuropharmacology** G. A. Weiland.
- [746 Electrophysiological Techniques** R. E. Oswald.]
- 747 Amino Acid Neurotransmitters** L. M. Nowak.
- 748 Stimulus-Secretion Coupling** C. M. S. Fewtrell.
- 749 Second Messengers in Cell Activation**
C. M. S. Fewtrell.
- 750 Cell Calcium** C. M. S. Fewtrell.
- 751 Receptors in the Immune System** C. M. S. Fewtrell.
- 752 Mediators of Inflammation** C. M. S. Fewtrell.
- 753 Clinical Pharmacology** Fall. W. S. Schwark.
Discussion on current issues in applied therapeutics in
veterinary medicine.
- 754 G Proteins in Signal Transduction** R. A. Cerione.
- [755 Calcium in the Control of Hormone Secretion** Fall
and spring. G. W. G. Sharp.]
- [756 Mechanisms of Calcium Handling** Fall and spring.
G. W. G. Sharp.]
- [757 Intestinal Electrolyte Transport** Fall and spring.
G. W. G. Sharp.]
- 759 Receptor Binding Techniques** G. A. Weiland,
R. E. Oswald.
- 760 Advanced Topics in Pharmacology** 1–3 credits.
Pharmacology faculty.

Physiology

Professor D. Robertshaw, chairman
727 Veterinary Research Tower
607/253-3854

Professors: E. N. Bergman, A. Dobson, W. Hansel,
T. R. Houpt, F. A. Kallfelz, F. W. Lengemann,
P. W. Nathanielsz, D. N. Tapper,
R. H. Wasserman, J. F. Wootton; professors
emeritus: E. L. Gasteiger, A. F. Sellers; associate
professors: K. W. Beyenbach, R. A. Corradino,
J. E. Fortune, R. Gilmour, K. A. Houpt,
E. R. Loew, A. Quaroni; senior lecturer:
C. H. McFadden; senior research associates:
H. W. Alila, P. W. Concannon, J. Figueroa,
C. S. Fullmer, R. A. Wentworth; postdoctoral
associates: P. J. Battista, J. Beaulieu, H. S. Cross,
M. M. Hinshelwood, D. A. Myers,
T. L. Pannabecker, A. E. Stock, P. C. Tsang,
D. J. Zimmer; research associates: J. S. Chandler,
T. J. McDonald

Instruction in physiology in the core veterinary
curriculum is concentrated in the first year and
includes two semesters devoted to systems and
cellular physiology. Laboratories, demonstrations,
and small group discussions exemplifying
physiological principles in various animal species are

an integral part of these offerings. The courses are
directed toward an understanding of the function,
integration, and control, as well as the cellular and
biochemical basis, of physiological processes. The
laboratory, demonstrations, and small group
discussions are considered a significant aspect of the
educational process, providing the students with
hands-on experience and enabling them to observe
and work with concepts and mechanisms associated
with important physiological events.

Faculty are also members of the Section of
Physiology, Division of Biological Sciences. The
section has teaching responsibilities in the
undergraduate curriculum, offering basic courses in
introductory biology, introductory animal
physiology, cellular physiology, and mammalian
physiology, in addition to upper-level specialized
courses. Faculty are also members of the Graduate
Field of Physiology, the Graduate Field of Veterinary
Medicine, and other graduate fields.

The facilities of the department and section
include laboratories and offices in the Veterinary
Research Tower, D-wing of Schurman Hall, and the
Physiology Annex. Research projects range from
those dealing with the physiology and metabolism of
the whole animal to the investigation of the
hormonal regulation of gene expression. The
laboratories and animal quarters are well equipped.
The following research areas are emphasized:
(a) reproductive physiology, (b) endocrinology,
(c) cellular physiology, (d) neurophysiology,
(e) gastrointestinal physiology, (f) metabolism,
(g) behavioral physiology, (h) renal physiology,
(i) vision, (j) cardiovascular physiology, and
(k) temperature regulation.

**Bio S 214 Biological Basis of Sex Differences (also
Women's Studies 214)** Fall. 3 credits. Prerequisite: one
year of introductory biology. Lectures, T R 8:30–9:55.
Occasional discussions to be arranged. Staff.

The structural and functional differences between the sexes
are examined. Emphasis is placed on mechanisms of
mammalian reproduction; where possible, special
attention is given to studies of humans. Current evidence
of the effects of gender on nonreproductive aspects of life
(behavior, mental and physical capabilities) is discussed.
The course is intended to provide students with a basic
knowledge of reproductive endocrinology and with a basis
for objective evaluation of sex differences in relation to
contemporary life.

Bio S 274 The Vertebrates Spring. 5 credits. Primarily for
sophomores; this course is a prerequisite for many
advanced courses in vertebrate biology, anatomy, and
physiology. Each lab section limited to 21 students.
Prerequisite: one year of introductory biology for majors.
Fee, \$10. Lectures, T R 10:10. Laboratories, M W 1:25–5,
M W 7–10 p.m., or T R 1:25–5. F. H. Pough and
T. J. Cade. Evening prelim March 15; 3 evening lab
practicals to be arranged.

An introduction to the evolution, classification,
comparative anatomy, life history, and behavior of
vertebrate animals. Laboratory dissection and
demonstration are concerned with structure, classification,
systematics, biology of species, and studies of selected
aspects of vertebrate life.

Bio S 313 Histology: The Biology of the Tissues (also Biological Sciences 313) Fall. 4 credits. Prerequisite: one year of introductory biology; a background in vertebrate anatomy and organic chemistry or biochemistry strongly recommended. Lectures, T R 11:15. Laboratories, T R 2-4:25.

Provides the student with a basis for understanding the microscopic, fine structural, and functional organization of vertebrates, as well as the methods of analytic morphology at the cell and tissue levels. The dynamic interrelations of structure, composition, and function in cells and tissues are emphasized.

Bio S 315 Ecological Animal Physiology, Lectures Fall. 3 credits. Prerequisite: one year of introductory biology for majors. M W F 10:10. W. N. McFarland. Offered alternate years.

A discussion of the properties of major ecosystems initiates the lectures. On the basis of this introduction, major environmental variables are identified and the physiological adaptations that various animals have developed to these variables are compared. The similarities and differences in major physiological structures (e.g., cardiovascular function, respiration, osmotic and ion regulations) are considered for different kinds of animals. Animals discussed range from protozoa through representative invertebrates to vertebrates.

Bio S 316 Cellular Physiology (also Biological Sciences 316) Spring. 4 credits. Limited to 100 students, with preference given to students concentrating in animal physiology and anatomy. Each lab limited to 24 students.

Prerequisite: concurrent or previous enrollment in Biological Sciences 330 or 331. Lectures, M W F 9:05. Laboratories, M T W or R 1:25-5. A. Quaroni and staff. Lectures introduce students to the most-current information on the ways cells function and regulate themselves and neighboring cells and on what molecules are involved in these regulatory processes. Laboratories provide an introduction to cell and organ culture and to immunological techniques used to study cell structure and function in vivo and in vitro. Experiments performed in the laboratory are closely related to, and provide practical experience with, subjects covered in the lecture.

Bio S 317 Ecological Animal Physiology, Laboratory

Fall. 1 credit. Limited to 12 students. Prerequisite: concurrent enrollment in Biological Sciences 315. Offered alternate years. Laboratory, W or R 1:25-4:25. W. N. McFarland.

Exercises involve measurements of important environmental factors in local habitats, laboratory experiments to familiarize students with the use of physiological methods, and an individual student research project dealing with specific adaptations of organisms to environment.

346 Introductory Animal Physiology (also Biological Sciences 311) Fall. 3 credits. Prerequisites: one year of college biology, chemistry, and mathematics. Lectures, M W F 11:15. Evening prelims to be arranged. E. R. Loew.

A general course in animal physiology emphasizing principles of operation, regulation, and integration common to a broad range of living systems from the cellular to the organismal level. Structure-function relationships will be stressed along with underlying physical-chemical mechanisms.

348 Introductory Animal Physiology, Laboratory (also Biological Sciences 319) Fall. 3 credits. Enrollment limited to 80 students, with preference given to students concentrating in animal physiology and anatomy. Each laboratory section limited to 20 students. Prerequisite: concurrent or previous enrollment in Biological Sciences 311 or permission of instructor based on previous meritorious performance in another introductory animal physiology course. Laboratories, M T W or R 1:25-5. R. A. Corradino, P. W. Concannon.

A series of student-conducted in vitro and in vivo experimental exercises designed to illustrate basic physiological processes in animals and to introduce students to animal physiology research techniques, instrumentation, experimental design, and interpretation of results. Protocols include anesthesia, dissection, vivisection, physiographic recording, and computer simulations. Experiments with living tissues and live animals will examine properties of blood; muscle; nerves; cardiovascular, respiratory, and gastrointestinal function and control; and endocrine regulation of mineral metabolism and reproductive tissue activity. Experimental resources include live animals of several vertebrate species, including frogs, birds, rats, and rabbits, which will be euthanized in conjunction with the laboratory exercises. Written reports of laboratory activities are required. Grading is based on evaluation of these reports on laboratory performance.

Bio S 410 Seminar in Anatomy and Physiology Fall and spring. 1 credit. May be repeated for credit only once.

Limited to upperclass students. S-U grades only. Seminar to be arranged. Organizational meeting first W of each semester at 7:30 p.m. in Stimson G 25. Staff (coordinator: D. Robertshaw).

Topics: fall 1988, effects of endogenous and exogenous excitants and depressants on reproduction; spring 1989, current readings in physiological optics, H. H. Howland.

Bio S 458 Mammalian Physiology Spring. 6 credits.

Enrollment limited. Graduate student auditors allowed in lectures. Prerequisite: Biological Sciences 311 (Vet Med 346) or equivalent with permission of instructor. Lectures, M W F 8. Laboratory, M 1:25-4:25; 4 additional hours to be arranged. K. W. Beyenbach and staff.

Selected topics in mammalian physiology are discussed in the lecture and concurrently studied in the laboratory. Topics are selected from the following: physiology of excitable and epithelial cell membranes, the autonomic nervous system, cardiovascular physiology, gastrointestinal physiology, renal physiology, energy metabolism, and acid-base balance. Live animals and isolated living tissues are studied in the laboratory portion of the course.

Bio S 499 Undergraduate Research in Biology Fall and spring. Variable credit. Prerequisite: written permission from the staff member who will supervise the work and assign the grade. Any faculty member in the Division of Biological Sciences may act as a supervisor. Faculty supervisors outside the division are acceptable only if a faculty member of the division agrees to take full responsibility for the quality of the work. *This course is divided into multiple sections as printed in the Course and Time Roster and its supplement.* Students must register under supervisor's assigned section number, or section 1 if supervisor was not assigned a section number. Staff. Practice in planning, conducting, and reporting independent laboratory and library research programs.



Dr. Steven Dill examines a patient on the medicine service.

Research credits may *not* be used in completion of the following concentration areas: animal physiology and anatomy; biochemistry; botany; cell biology; and ecology, systematics, and evolution. No more than 4 credits of research may be used in completion of the following concentration areas: genetics and development, neurobiology and behavior.

525 Molecular and Cellular Physiology Fall. 3 credits. Required of all first-year veterinary students. Prerequisite: Biological Sciences 330 or 331 or an equivalent upper-level course in general biochemistry based on solid background in general and organic chemistry and physics. Letter grades only. Three lectures and one discussion per week. J. F. Wootton, R. H. Wasserman, F. A. Kallfelz, R. R. Minor.

Dynamic, functional, and structural aspects of cellular and extracellular processes in higher animals. Clinically related topics will be included by way of illustration.

526 Systems Physiology I Fall. 4 credits. Required of all first-year veterinary students. Others by permission of the instructor. Prerequisites: Veterinary Medicine 525, Anatomy 500 and 501, or Anatomy 700 and Biological Sciences 330–331. Letter grades only. E. N. Bergman and staff.

This course, together with Vet Med 527, is a study of systemic physiology of the common domestic animals. Lectures and laboratory exercises on living animals emphasize bodily function as a foundation for pathology, surgery, veterinary clinical medicine, and diagnosis of disease. Topics in this course include the nervous system, muscle, blood, and cardiovascular, respiratory, and renal physiology.

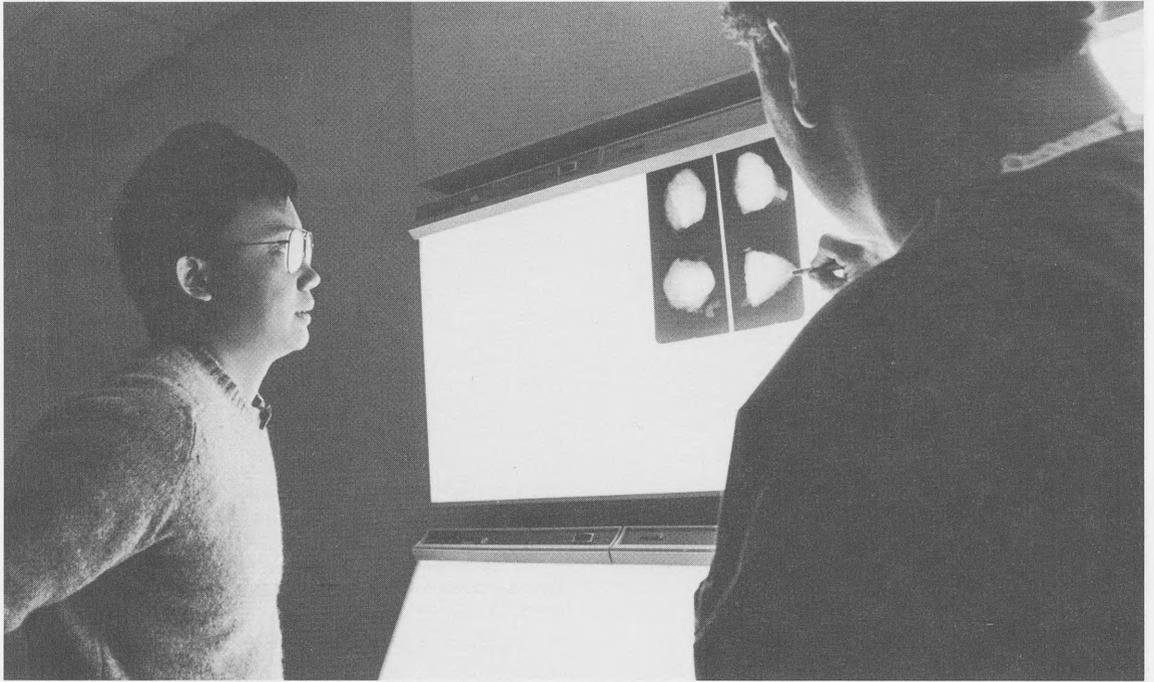
527 Systems Physiology II Spring. 5 credits. Required of all first-year veterinary students. Others by permission of the instructor. Prerequisites: Veterinary Medicine 525 and 526. Letter grades only. T. R. Houpt and others.

A continuation of organ and systems physiology of domestic animals that includes acid-base relations and environmental physiology, simple-stomach and ruminant digestive systems, hepatic function, liver and metabolic physiology, endocrinology, and reproduction, with emphasis on medically relevant aspects.

612 Research Opportunities in Veterinary Medicine May be taken during the school term, during January, or in the summer. 1–4 credits. Limited to veterinary students. By permission of the instructor. Physiology faculty. An independent study course. Students will work closely with individual faculty members in their research laboratories.

Bio S 619 Lipids (also Nutritional Sciences 602) Fall. 2 credits. Lectures, T R 11:15. A. Bensadoun. Advanced course on biochemical, metabolic, and nutritional aspects of lipids. Emphasis is placed on critical analysis of current topics in lipid methodology; lipid absorption; lipoprotein secretion, molecular structure, and catabolism; mechanism of hormonal regulation of lipolysis and fatty acid synthesis; and cholesterol metabolism and atherosclerosis.

625 Problems in Dog and Cat Behavior Spring. 1 credit. Students of other colleges by permission of the instructor. K. A. Houpt. The goal of this course is to give veterinary students the ability to treat the behavior problems of cats and dogs.



In the final year of their D.V.M. training students participate on assigned clinical services throughout the Teaching Hospital.

The most common problems are aggression and destructiveness in dogs and aggression and house soiling in cats. Other, less frequently encountered problems, are insufficient or excessive sexual or maternal behavior, wool chewing, and hypervocalization in cats, and hyperactivity, phobias, and barking in dogs. History-taking, counseling, and follow-up methods will be presented, and each student will have the opportunity to participate in three cases. Cases will be treated in the clinic, during house calls, and via telephone consultations. The behavioral and pharmacological techniques used to treat behavior problems will be presented and the success of each evaluated.

626 Problems in Equine Behavior Spring. 1 credit. Students of other colleges by permission of the instructor. K. A. Houpt.

The goal of this course is to give veterinary students the ability to treat behavior problems of horses. The most common behavior problems are aggression, self-mutilation, stable vices, and foal rejection. History-taking, counseling, diagnostic tests, follow-up, and the importance of cooperation with the referring veterinarian will be presented. Methods of preventing behavior problems, training techniques of value to the practitioner, and socialization of foals will be presented using videotapes and demonstrations. The behavioral and pharmacological techniques used to treat behavior problems will be presented and the success of each evaluated. The students will be encouraged to develop techniques of their own based on an understanding of normal equine behavior.

627 Acid-Base Relations (also Biological Sciences 719) Fall, spring, and summer. 1 credit. Students of other colleges by permission of the instructor. Prerequisite: Physiology 526 or permission of the instructor. A. Dobson. The course uses a self-instruction program to promote an understanding of the basis, interpretation, and technique of measuring acid-base status. The text used, *Acid Base Physiology*, by R. W. Winters, K. Engel, and R. B. Dell, starts with the elementary physical chemistry of acids, bases, and buffers and then discusses the bicarbonate buffer system and whole-blood buffers. The physiological controls for acid base of the respiratory and renal system are introduced followed by a logical development of acid-base terminology. The latter part of the text systematically describes the physiopathology and etiology of the four primary acid-base disturbances. This book is particularly effective in consolidating the basis principle because it continues to reinforce the concepts it introduces throughout the remainder of the text. It requires about thirty hours of study.

628 Graduate Research in Animal Physiology Fall and spring. Variable credit. Prerequisite: written permission of section chairperson and staff member who will supervise the work and assign the grade. S-U grades optional. Similar to Biological Sciences 499 but intended for graduate students who are working with faculty members on an individual basis.

710-718 Special Topics in Physiology Fall or spring. 1 or 2 credits for each topic. May be repeated for credit. Enrollment in each topic may be limited. S-U grades optional, with permission of instructor. Lectures, laboratories, discussions, and seminars on specialized topics.

Fall 1988: two topics are offered.

717 Structure and Function of Joints with Emphasis on Arthritis Offered each fall. 1 credit. Lec, 1 hour each week to be arranged. G. Lust.

719 Acid-Base Relations (also Veterinary Medicine 627) Offered each fall, spring, and summer. 2 credits. Self-instruction program, thirty hours each term. A. Dobson.

Spring 1989: four topics are offered.

712 Plasma Lipoproteins 1 credit. Sem, 1 hour each week to be arranged. A. Bensadoun.

714 Physiology of Pregnancy 2 credits. Offered every other year. Lab to be arranged. P. W. Nathanielsz.

716 Seminar on Insect Physiology (also Entomology 685) 1 credit. Prerequisite: permission of instructor. Sem, 1 hour each week to be arranged. H. H. Hagedorn.

718 Evolution of Color Vision 1 credit. Sem, 1 hour each week to be arranged. E. R. Loew.

720 Special Problems in Physiology Fall and spring. Registration by permission. Laboratory work, conferences, collateral readings, and reports. Adapted to the needs of students.

726 Physiology I Fall. 3 credits. Limited to graduate students. Prerequisites: a course in cell physiology or biochemistry and a course in anatomy. By permission of the instructor. Letter grades only. E. N. Bergman and others.

This course consists of the lectures only of Vet Med 526. The subjects include the nervous system, muscle, blood, and cardiovascular, respiratory, and renal physiology.

727 Physiology II Spring. 3 credits. By permission of the instructor. Prerequisite: Vet Med 726. Letter grades only. T. R. Houpt and others.

A continuation of organ and systems physiology of domestic animals that includes acid-base relations and environmental physiology, simple-stomach and ruminant digestive systems, hepatic function, liver and metabolic physiology, endocrinology, and reproduction, with emphasis on medically relevant aspects. Lectures only.

750 Radioisotopes in Biological Research (also Biological Sciences 616) Fall, even-numbered years. 4 credits.

Prerequisites: courses in animal or plant physiology or permission of the instructor. Letter grades only. Lectures, T R 11:15. Laboratory, T 1:30.

Lectures and laboratories deal with the radioisotope as a tool in biological research. Among the topics considered are the use and detection of beta-emitting isotopes, gamma spectrometry, Cerenkov counting, neutron activation, autoradiography, and isotope dilution. Emphasis is placed on liquid scintillation counting, double-label experiments, and ^{14}C and ^3H as metabolic tracers. Experiments are designed to present basic principles using plants and vertebrate animals as subject material. This course is acceptable by the Office of Environmental Safety for certification as a radioisotope user at Cornell University.

752 Biological Membranes and Nutrient Transfer (also Biological Sciences 618) Spring. 2 credits. Prerequisites: courses in animal or plant physiology, quantitative and organic chemistry, and physics and permission of the instructor. Recommended: a course in cellular physiology. Letter grades only. Lectures, T R 11:15. R. H. Wasserman. Offered alternate years.

An introduction to elementary biophysical properties of

biological membranes; theoretical aspects of permeability and transport; mechanism of transfer of inorganic and organic substances primarily across epithelial membranes; and characteristics and properties of transporting macromolecules and ion channels.

753 Animal Biotechnology Fall. 3 credits. Prerequisites: two courses in physiology, two courses in biochemistry, and one course in endocrinology or nutrition. Lecture and discussion, M 11:15; laboratory, M 1:25–4:20; additional hours to be arranged. W. Hansel and staff.

A course in animal biotechnology designed to prepare students for research in animal genetic engineering. Standard techniques for cloning DNA in bacteria are discussed. Development of expression systems in bacteria, yeast, and mammalian cells; DNA sequencing and analysis; and insertion of DNA into mammalian embryos are carried out in the laboratory. Hypophysectomized rates are used to bioassay growth hormone.

758 Molecular Mechanisms of Hormone Action (also Biological Sciences 658) Spring. 2 credits. Minimum enrollment, 6 students. Prerequisite: permission of instructor. Offered alternate years. Lectures, T R 10:10. R. A. Corradino.

An advanced course developed from the current literature on endocrine mechanisms.

759 Nutrition and Physiology of Mineral Elements (also Biological Sciences 615 and 659) Fall. 2 credits.

Prerequisites: courses in basic physiology, intermediate biochemistry, and general nutrition. Lectures, T R 9:05. R. H. Wasserman, R. Schwartz, D. R. VanCampen. Offered alternate years.

Lectures on nutritional aspects and physiological, biochemical, and hormonal relationships of the prominent macroelements and microelements, with emphasis on recent developments. Information is included on methodologies of mineral research and the essentiality, requirements, transport, function, homeostasis, interrelationships, and toxicity of various mineral elements.

Fundamentals of Endocrinology (Animal Sciences 427)

Fall. 3 credits. Prerequisite: human or veterinary physiology or permission of the instructor. Lectures, M W F 9:05. W. R. Butler.

The physiology of the endocrine glands and the roles played by each hormone in the regulation of normal body processes. Endocrine regulation of growth, metabolism, and reproduction is emphasized. Examples are selected from domestic species and humans.

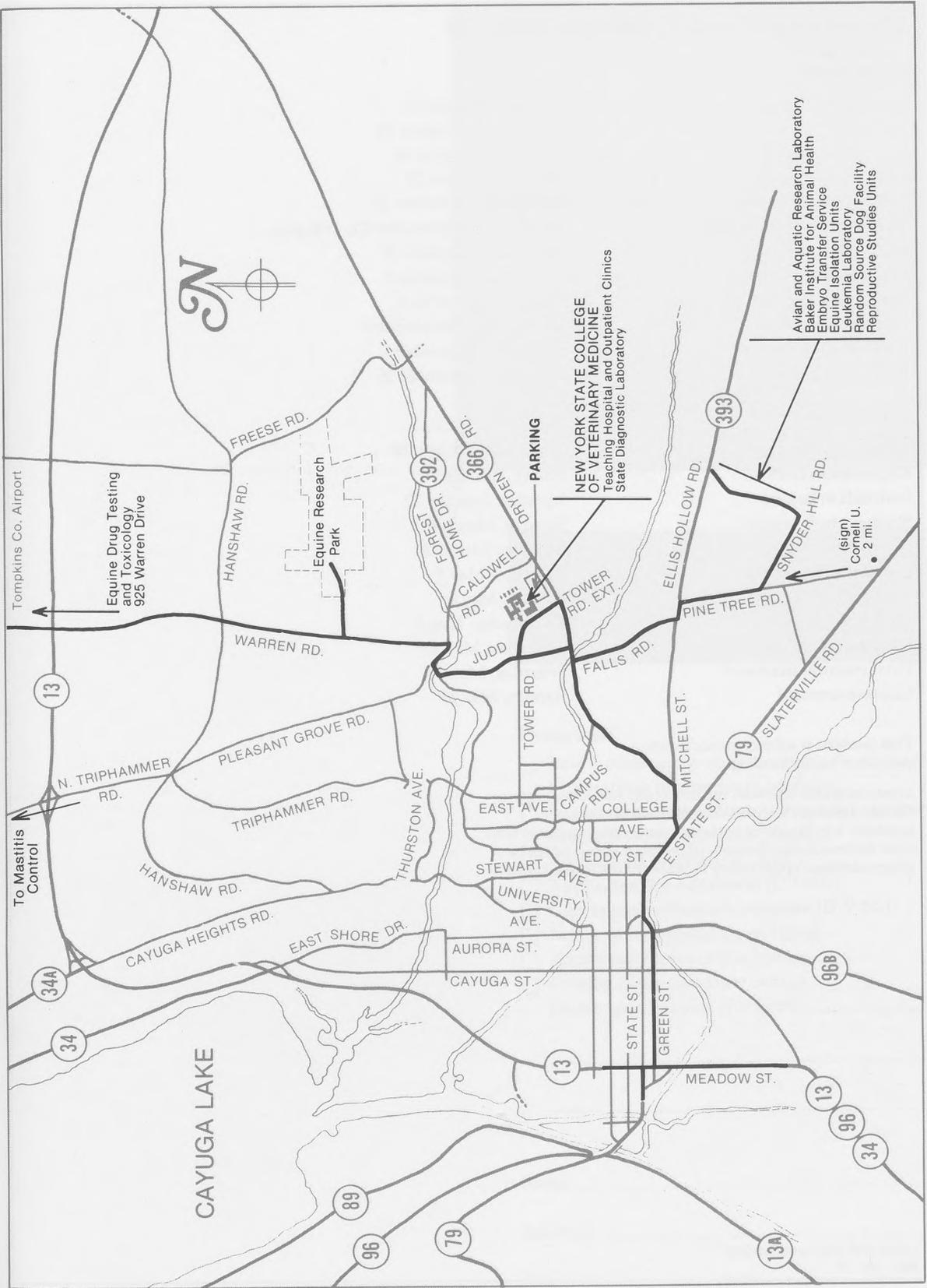
Fundamentals of Endocrinology, Laboratory (Animal Sciences 428)

Fall. 2 credits. Each lab limited to 30 students. Prerequisite: concurrent registration in Animal Sciences 427 or permission of the instructor. Laboratory, T or R 1:25–4:25. W. R. Butler.

Laboratory exercises are designed to demonstrate hormonal mechanisms for each of the major endocrine glands. Laboratory techniques include animal surgery, blood collection, and hormone radioimmunoassay.

Index

- Academic calendar: current, 2; tentative 1989–90, 88
- Academic support services, 54–55
- Activities and organizations, 34–35
- Administration: college, 57; university, 57
- Admission: D.V.M. program, 11–15; Graduate School, 43; guaranteed, 13
- Advisory Council, 58
- Anatomy, 65–66
- Application procedures, 13
- Avian and aquatic animal medicine, 66–68
- Clinical sciences, 68–74
- Combined courses, 15
- Committees of the college, 58–59
- Computing facility, 55
- Conduct of students, 36
- Counseling, 36
- Course descriptions, 65–85
- Curriculum, 27–31
- Diagnostic Laboratory, 51, 63
- Dining services, 33
- Disabled, services for, 37
- Faculty, 59–62
- Fees, 17
- Finances, 17–25
- Financial aid, 18
- Graduate School admission, 43
- Graduate students, 44–45
- Graduation requirements, 27
- Health services, 36
- High school programs, 9
- History of the college, 5–7
- Honor societies, 35
- Housing, 33
- Internships, 47
- Legal requirements to practice, 37
- Library, 54
- Loan funds, 18
- Microbiology, Immunology, and Parasitology, 74–76
- Pathology, 76–79
- Pharmacology, 79–81
- Physiology, 81–85
- Placement of graduates, 36
- Postdoctoral training in veterinary pathology, 48–49
- Prizes, 23–25
- Refund policies, 17–18
- Residencies, 47
- Resources and facilities, 51–55
- SCAVMA, 34
- Scholarships, 18–22
- Special veterinary interests, 29
- Species-oriented programs, 52–54
- Staff, 62
- Student life, 33–37
- Students: D.V.M., 39–41; graduate, 44–45
- Teaching Hospital rounds, 31
- Tuition, 17
- University administration, 57
- University requirements for admission, 15
- Use of animals in teaching, 27
- Veterinary Medical Teaching Hospital, 51, 63



Cornell Academic Calendar 1989–90

Fall Semester

Registration begins	Tuesday, August 22
Registration ends	Wednesday, August 23
Instruction begins	Thursday, August 24
Fall recess begins	Sunday, October 22
Instruction resumes	Wednesday, October 25
Thanksgiving recess begins	Wednesday, November 22, 1:10 p.m.
Instruction resumes	Monday, November 27
Last day of instruction	Saturday, December 2
Study period begins	Sunday, December 3
Study period ends	Wednesday, December 6
Final examinations begin	Thursday, December 7
Final examinations end	Saturday, December 16

Spring Semester

Registration begins	Thursday, January 18
Registration ends	Friday, January 19
Instruction begins	Monday, January 22
Spring recess begins	Sunday, March 18
Instruction resumes	Monday, March 26
Last day of instruction	Saturday, May 5
Study period begins	Sunday, May 6
Study period ends	Wednesday, May 9
Final examinations begin	Thursday, May 10
Final examinations end	Saturday, May 19
Commencement	Sunday, May 27

This calendar is subject to modification and is not legally binding.

In enacting this calendar, the university has scheduled classes, laboratories, and examinations on religious holidays. It is the intent of the university that students who miss those activities because of religious observances be given adequate opportunity to make up the missed work.

COLLEGE OF
VETERINARY MEDICINE
CORNELL UNIVERSITY

Please send:

- Information on the summer high school program
Explorations in Veterinary Medicine
- Information on the Minority High School Student
Research Apprenticeship Program
- Admissions brochure (D.V.M.)
- Application for admission (D.V.M.)
- Guaranteed admission program (D.V.M.)
- Notice of the annual Open House
- Additional copies of this catalog
- Catalog of the Graduate School

Please specify areas of interest: _____

Name _____

Address _____

City _____ state _____ zip _____

Place
Stamp
Here

Office of Student Affairs and Admissions
New York State College of Veterinary Medicine
Cornell University
C-117 Schurman Hall
Ithaca, New York 14853-6401

Cornell University
(USPS 132-860)
New York State College of Veterinary Medicine
Cornell University
C-117 Schurman Hall
Ithaca, New York 14853-6401

Second-class postage
paid at Ithaca, New York