



COLLEGE OF  
VETERINARY MEDICINE  
CORNELL UNIVERSITY

*CORNELL UNIVERSITY ANNOUNCEMENTS*

*Cover: During an ophthalmological examination Dr. Thomas Kern found this hand-reared screech owl had cataracts.*

*Opposite: Dr. Thomas Little is a theriogenologist at the college, specializing in equine reproductive problems.*

## **Cornell University Announcements (ISSN 0744-4605)**

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COLLEGE OF  
VETERINARY MEDICINE  
CORNELL UNIVERSITY

*A Statutory College of the State of New York*

**1987–88**

## Cornell Academic Calendar 1987-88

### Fall Semester

Registration begins	Thursday, August 27
Registration ends	Friday, August 28
Instruction begins	Monday, August 31
Fall recess begins	Sunday, October 18
Instruction resumes	Wednesday, October 21
Thanksgiving recess begins	Wednesday, November 25, 1:10 p.m.
Instruction resumes	Monday, November 30
Last day of instruction	Wednesday, December 9
Study period begins	Thursday, December 10
Study period ends	Sunday, December 13
Final examinations begin	Monday, December 14
Final examinations end	Wednesday, December 23

### Spring Semester

Registration begins	Thursday, January 21
Registration ends	Friday, January 22
Instruction begins	Monday, January 25
Spring recess begins	Sunday, March 20
Instruction resumes	Monday, March 28
Last day of instruction	Saturday, May 7
Study period begins	Sunday, May 8
Study period ends	Wednesday, May 11
Final examinations begin	Thursday, May 12
Final examinations end	Saturday, May 21
Commencement	Sunday, May 29

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.



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*Dr. William H. Miller, Jr., with students on the dermatology rotation, treats a patient.*

# THE COLLEGE OF VETERINARY MEDICINE

**F**rom 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 were

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 of the college 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 support 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.

The faculty of the college has an international reputation for research in animal and human health. Current research includes leukemia, atherosclerosis, diabetes, genetic disorders, immunology of aging, hepatitis, cancer, and inheritance of disease resistance. The faculty currently attract more than \$14 million annually in grants and contracts to the college.





*Hand-feeding a baby goat 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.

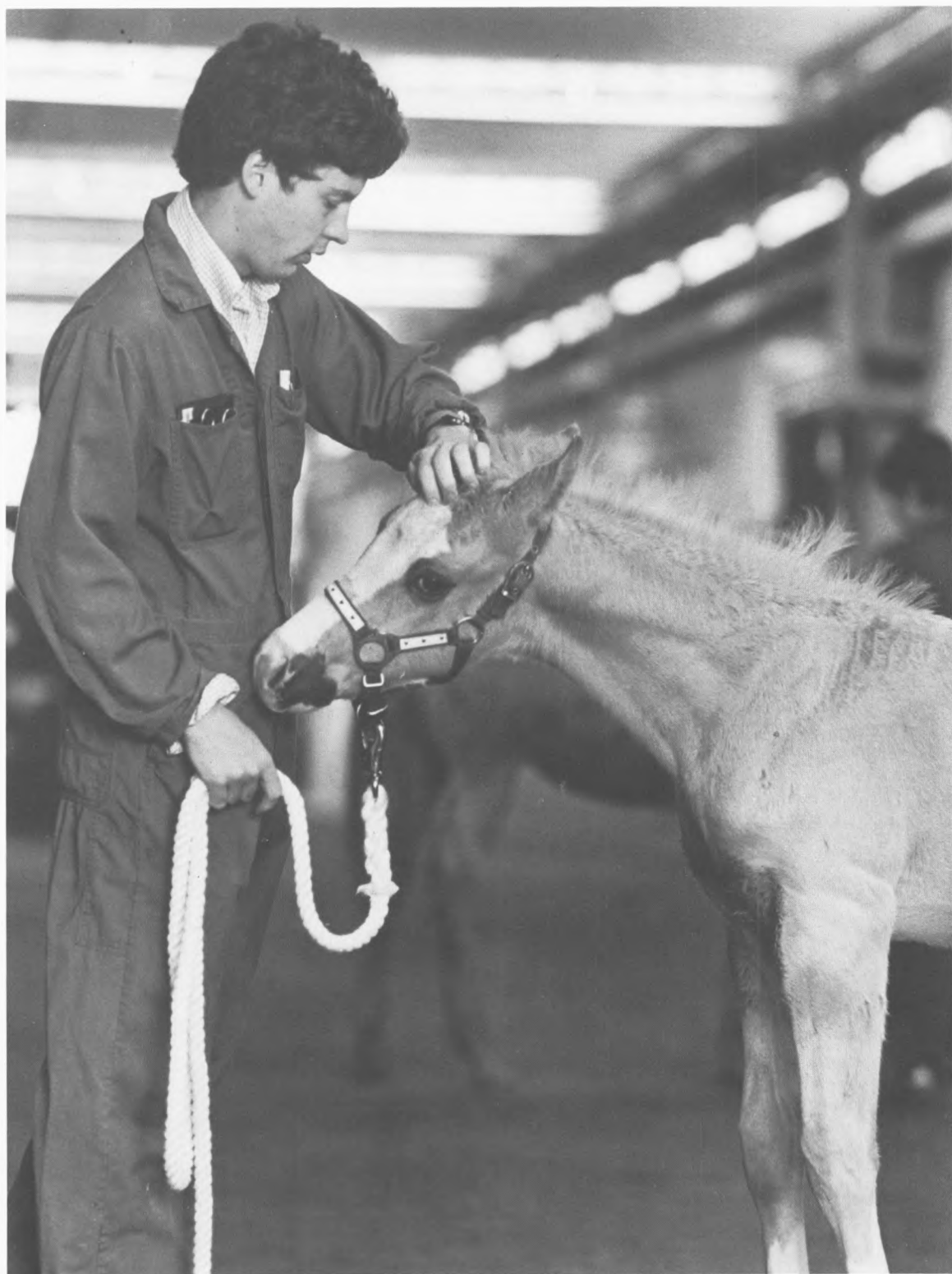
## Minority High School Student Research Apprentice Program

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, 101A James Law Auditorium, Schurman Hall, New York State College of Veterinary Medicine, Cornell University, Ithaca, New York 14853-6401.



*Animal experience with a wide variety of species is an invaluable asset—it is also a requirement for admission to the D.V.M. program.*



# 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. Class size is limited to eighty students, and each year there are many more qualified applicants than the college is able to accommodate.

Approximately 70 percent of the 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, Puerto Rico, and Vermont) 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 of many qualified applicants. No single criterion dominates, since the faculty members look at the whole person.

### 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 Examinations scores.



*A fourth-year student listens to the heart and lungs of a patient in the Small Animal Clinic.*

### **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 carry a heavy academic course load at a demanding institution are taken into account. Ideally, the applicant should have achieved excellence in a broad range of physical and biological sciences, social sciences, and the humanities. As no preference is given to applicants majoring in any particular field, the choice of a major is left to the individual and should be determined by the applicant's alternative career goals. 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 can demonstrate 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, therefore, may 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. Because of the limitations in class size and the competition for admission, every applicant should make plans for an alternative career. The best preparation for the study of veterinary medicine is to fulfill all entrance requirements while attaining a well-rounded college education that includes preparation for an alternative career and completion of prerequisite courses.

The minimum course requirements for admission are shown in the following table:

	<i>Semester Credits</i>	<i>Quarter Credits</i>
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

\*One-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.

Applicants must present evidence of sound training in biology, physics, and chemistry, including an upper-level biochemistry course that requires organic chemistry as a prerequisite. This should be a complete course in general biochemistry. Half of a two-semester sequence does not provide a balanced background. A total of sixteen semester credits (twenty-four quarter credits) of chemistry is required. Some latitude is acceptable with respect to the distribution of credits within this total. If a course substitution is requested, the applicant should submit to the Office of Student Affairs and Admissions a current, detailed course description

that discusses the text used, course objectives, materials covered, and credits offered.

The microbiology prerequisite must include an introduction to the major groups and natural distribution of microorganisms, taxonomy, and terminology. Lecture materials should cover size, morphology, and structure of bacteria and fungi; bacterial motility, sporulation, physiology, growth curve, genetics, and multiplication; and bacteriophage. The applicant should have knowledge of sterilization and disinfectants and of environmental mycology and bacteriology with regard to water, soil, foods, milk, sewage, and animal wastes. The microbiology laboratory should develop skills in the use of the microscope in microbiology; in the preparation of smears and in staining procedures for bacteria; in the interpretation of motility; in the use of liquid- and solid-culture media, sterilization, inoculation and streaking techniques, interpretation of mixed growth, and colonial morphology; and in the recognition of staining and morphological characteristics of representative bacteria, counting techniques, dilutions and pipetting of bacterial suspensions, and bacterial counts of water and milk. Recognition and identification of common environmental and saprophytic bacteria and microbiology of skin, milk, water, sewage, and animal wastes must be included in preparatory course work.

Applicants should be proficient in written and spoken English. Deficiencies in fundamental communication skills hamper professional development in a rigorous scientific discipline. Although not required, courses in mathematics and statistics may provide a useful background.

Official transcripts documenting all courses taken must be submitted to the admissions office as part of the application. Prerequisite courses with grades of less than C– will not fulfill the prerequisite requirement for that course but will be included in the computation of the cumulative prerequisite grade-point average along with those courses that have been repeated. The Office of Student Affairs and Admissions, in its evaluation of academic work, will determine which courses may be used to fulfill the prerequisite requirements.

Grades, although not the sole criterion for admission, are considered to be reliable indicators of academic motivation and aptitude. We expect applicants to have a minimum of a 3.0 (on a 4.0 scale) cumulative grade-point average and a minimum of a 3.0 prerequisite grade-point average. Accepted applicants generally have excellent academic records and grade-point averages well above 3.0. Since it is impossible to evaluate honors, pass-fail, or S-U grading systems, it is necessary for the applicant to obtain a letter grade for all the prerequisite courses and to have these grades certified by the registrar at the applicant's undergraduate institution. A limited number of advanced placement credits may be

accepted at the discretion of the Faculty Admissions Committee and the Office of Student Affairs and Admissions if they appear on the official transcript. In such cases, applicants should provide detailed information from the undergraduate college describing the advanced placement policy of that college.

## 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 15*.

### Essay

Each applicant is required to submit an essay that discusses the applicant's motivation for a career in veterinary medicine and how his or her experience with animals and the veterinary profession relates to this motivation. This essay must be typewritten, double-spaced, and no more than three pages long.

### Letters of Evaluation and Recommendation

Forms for these letters are provided in the application packet.

### Employer Evaluations

An employer evaluation form is to be completed by each employer with whom the applicant worked to fulfill the animal experience requirement.

### Adviser Evaluation

A recommendation from the applicant's faculty adviser is required. Evaluations compiled by advisory committees are also acceptable. If the adviser does not know the applicant well enough to write an in-depth evaluation, a supplemental academic evaluation may be submitted *in addition to* the adviser's evaluation. This supplemental academic evaluation should be filled out by a faculty member who is well informed about the applicant's qualifications.

### Personal Letters of Recommendation

Applicants are required to have two letters of recommendation submitted from persons they know well who can cite their specific qualifications. No more than two letters of this type will be considered for either reapplicants or first-time applicants.

## Graduate Record Examinations

The Graduate Record Examination (GRE) general test is required of all applicants. The GRE 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 1200. 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 GREs.

### 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 wishing 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.

### Counseling

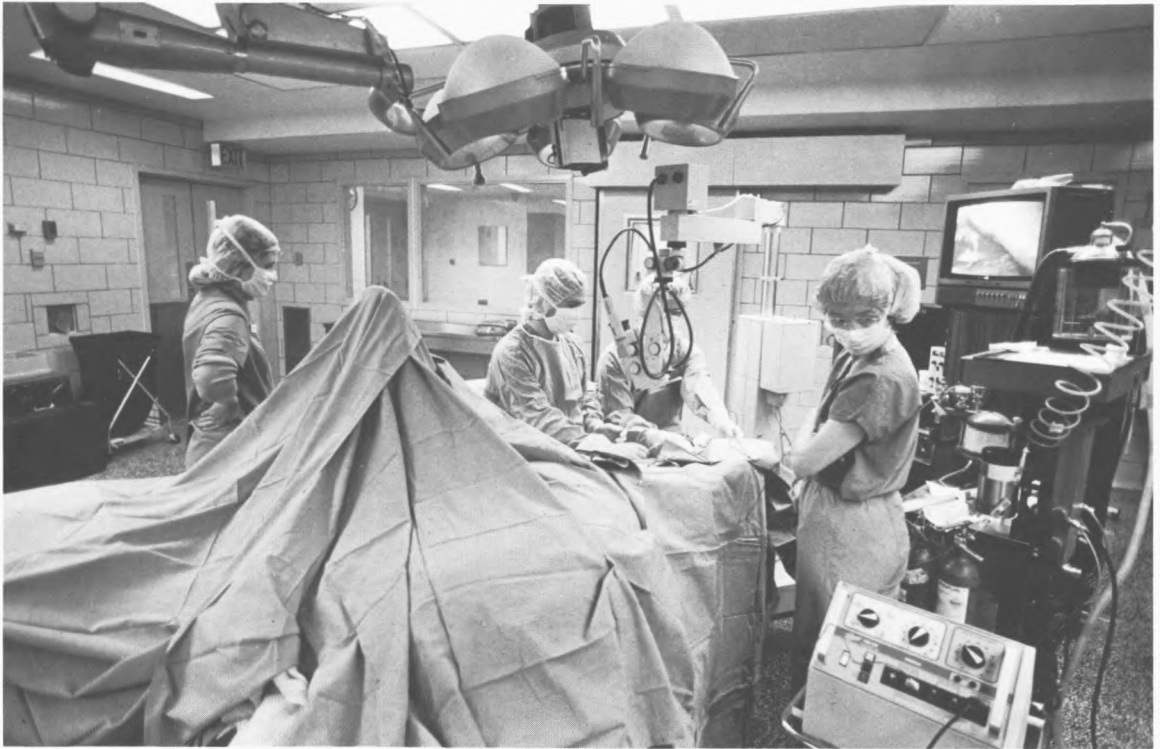
Because of the large number of aspiring students, formal individual preapplication counseling sessions normally cannot be granted. The applicant should, however, consult his or her campus health careers adviser, who may be able to offer special counsel.

### Reapplication

If a previously denied applicant desires to reapply, he or she should follow the same process described above with only slight modification. Previous applications are retained for three years after the date of the last application. Reapplication will require new forms, the application fee, and a completely new personal essay as described earlier. This essay must include developments the reapplicant believes have strengthened his or her application. Previous essays will not be reviewed. All personal reports and other documents should be dated and signed.

It is the responsibility of the applicant to ensure that the college is provided with current information to supplement that submitted with any previous application. Reapplicants are not required to retake the GREs, but if that is done, the Faculty Admissions Committee will use whatever combination of scores is higher.





*Fourth-year students in the D.V.M. program may assist in surgery in the Teaching Hospital.*

### 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

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.



*As part of a microbiology laboratory course, a student plates into 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 \$8,000 a year for New York State residents and \$9,680 a year for nonresidents. Most students in the college do not live in university housing. The cost of room and board in Ithaca for 1987-88 is estimated at \$4,560. Books, instruments, and supplies cost approximately \$600 a year. An additional allowance of \$2,640 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. Applicants interviewed for admission to the first-year class will receive GAPSFAS forms when interviewed. 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, 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: the Auxiliary Loan to Assist Students (ALAS) and the Health Education Assistance Loan (HEAL).

## 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. Application procedures are outlined in announcements that are posted and distributed to each student. Committee evaluations and recommendations are completed at the end of spring semester. Scholarship stipends are handled by the university treasurer and credited to the student's academic charges during the following 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.

**Albany Kennel Club Scholarship.** This scholarship is awarded to a New York State resident who by character, achievement, and financial need is a worthy recipient. It is given as an expression of respect for the New York State College of Veterinary Medicine, which has contributed so substantially to the well-being of our four-footed friends.

**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, Inc., 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.

**The Dr. Cecil F. Brownie Scholarship for Minority Students.** With proceeds realized from the sale of property in 1986 Cecil F. Brownie established a scholarship in the College of Veterinary Medicine at Cornell. Monies from this scholarship are offered to racial 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.

**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.

**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.

**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.

**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.

**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.



Anesthesiologist resident Dr. Grant Seaman helps students prepare a patient for surgery.

**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.

**Syntex Animal Health Scholarship.** A scholarship sponsored by Syntex Animal Health for a third-year veterinary student.

**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.





*Joseph Mankowski '87 received an award from Lloyd's of London to specialize in Thoroughbred work.*

**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.

**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 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 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 dean and 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 Mrs. 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 and the director of student affairs and admissions, 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 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 Philotherian 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 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.



*Florence Kimball was the first woman in the United States to receive a D.V.M. degree from Cornell.*

**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.



*The nuclear imaging capabilities of the gamma camera enable Dr. Francis Kallfelz to pinpoint lesions in various organ systems.*



# THE CURRICULUM

## Use of Animals in Teaching

The faculty adopted the following statement regarding the use of animals in teaching in April 1983:

1. The faculty considers the use of experimental animals important in the training of veterinary students and recognizes that experimental animals must be euthanized at the termination of certain experiments and exercises.

2. Where animals are used in teaching, the work will be under direct supervision of an experienced teacher and the rules for care of such animals will be 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 no. (NIH) 80-23, revised 1978.

3. The faculty members in charge of each course will be responsible for decisions on the course content and animal experimentation to be carried out and for the care and disposal of all animals during and after each exercise. In making such decisions, the faculty will carefully consider the methodologies used in order to obtain the maximum teaching value from each animal and, where possible, will coordinate the use of animals among courses and departments. Alternatives, such as demonstrations and videotapes, will be used where deemed appropriate. The faculty will continuously examine and evaluate each experiment or exercise to

ascertain that the most-appropriate techniques are used for animal handling and surgery compatible with the scientific principles to be taught.

4. Students admitted to the College of Veterinary Medicine are expected to participate in all aspects of the curriculum, including those that require the use of animals. Students and faculty alike are expected to be sensitive to the ethical and humane issues of animal use.

5. The propriety of the procedures and the scientific justification for the use of animals in teaching will be reviewed annually by the College Committee on Animal Welfare.

## 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.



*Dr. John Randolph (second from left) received the 1987 Norden Distinguished Teacher Award.*

**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 Nutrition	2
	<hr/>
	18

<i>Spring Term</i>	
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
519 Introductory Veterinary Microbiology	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†

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

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



*Dr. Donald Schlafer instructs pathology students.*



*First-year students team up in anatomy class.*

## Second Year

### Fall Term

	Credits
510 Veterinary Parasitology	4
515 Veterinary Immunology	2
516 Infectious Diseases I	2
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

### Fall Term

	Credits
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

### Required

	Credits
540 Pathology Service	2
572 Senior Seminar	1
574 Large Animal Surgery Service	4
575 Ambulatory Medicine Service	4
578 Anesthesiology 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



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

**Teaching Hospital Rounds**

**Fall term:** August 31–December 9, 1987

<i>Hour</i>	<i>Monday</i>	<i>Tuesday</i>	<i>Wednesday</i>	<i>Thursday</i>	<i>Friday</i>
7:30–8:00	SAC Patient Rounds Surgery G131	SAC Patient Rounds Medicine G131	LAC Patient Rounds Medicine Large Animal Clinic	LAC Patient Rounds Surgery Large Animal Clinic	
8:00–9:00	Special Topics in Pathology E215	Surgical Pathology Seminar E215	Surgery Rounds 530 VRT	Necropsy Pathology Seminar E215	Anesthesia Resident Rounds Medical Records Conference Room
	SAC Medicine Rounds 530 VRT  Anesthesia Resident Rounds Medical Records Conference Room	Sit-down Rounds Large Animal Medical/Surgical 530 VRT		Medical Staff Conference 530 VRT	8:30–9:00 Cardiopulmonary Rounds G131
12:30–1:00		Radiology Rounds G131	12:15 Pathology Bottom Line C207		Neurology/Ophthalmology Rounds Large Animal Clinic
3:30					Show and Tell Necropsy Laboratory
4:30		Show and Tell Necropsy Laboratory	Senior Seminar Auditorium		Show and Tell Necropsy Laboratory



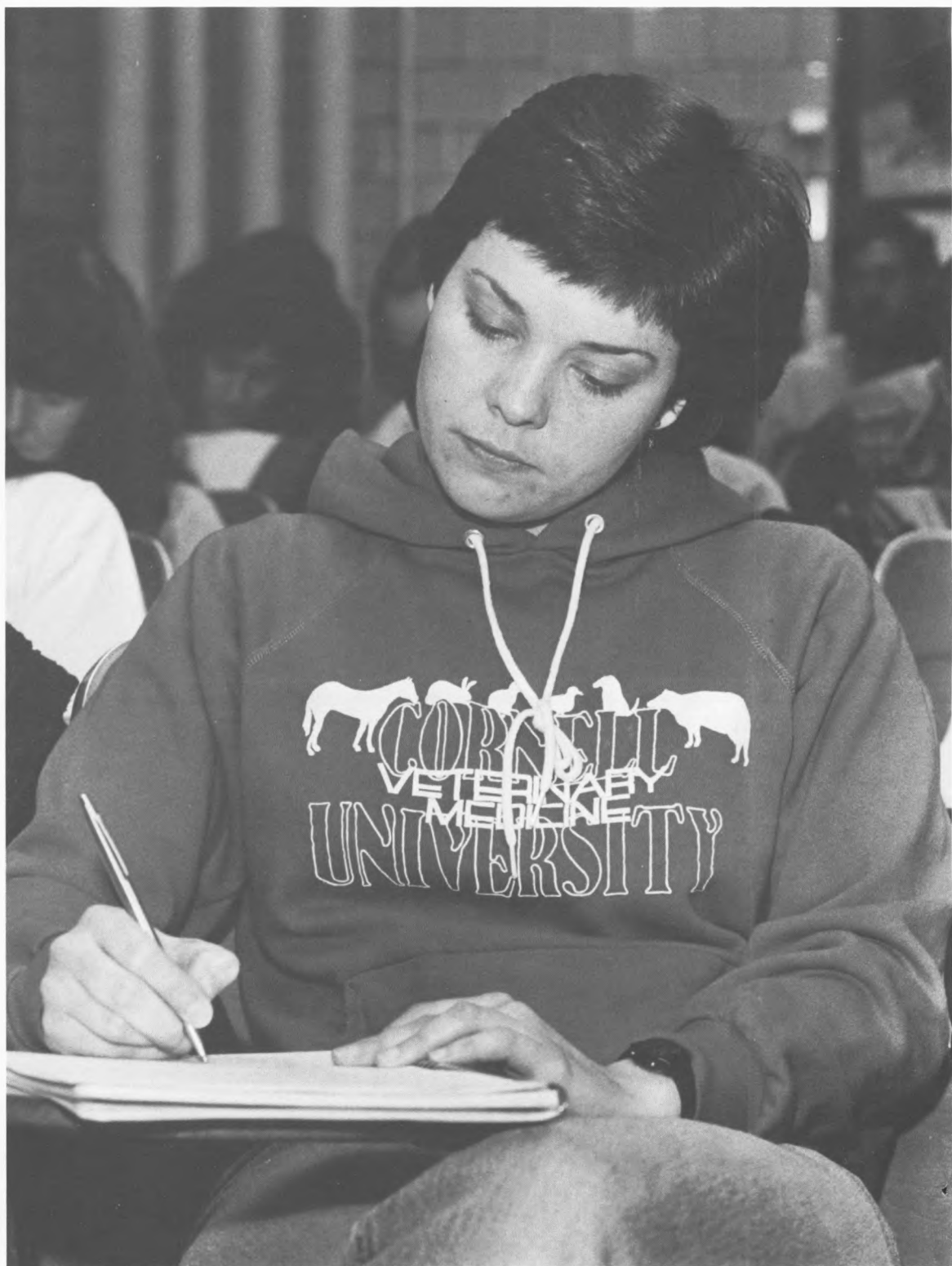
*Dr. Jay Gould performs a physical examination on a boa constrictor.*

## Teaching Hospital Rounds

**Spring term:** January 25–May 7, 1988

Hour	Monday	Tuesday	Wednesday	Thursday	Friday
7:30–8:00	SAC Patient Rounds Surgery G131	SAC Patient Rounds Medicine G131	LAC Patient Rounds Medicine Large Animal Clinic	LAC Patient Rounds Surgery Large Animal Clinic	
8:00–9:00	Pathology State of the Art E215  SAC Medicine Rounds 530 VRT  Anesthesia Resident Rounds Medical Records Conference Room	Surgical Pathology Seminar E215  Sit-down Rounds Large Animal Medical/Surgical 530 VRT	Surgery Rounds 530 VRT	Necropsy Pathology Seminar E215  Medical Staff Conference 530 VRT	Anesthesia Resident Rounds Medical Records Conference Room  8:30–9:00 Cardiopulmonary Rounds G131
9:00–10:00				Infectious Disease Rounds Large Animal Clinic	
12:30–1:00		Radiology Rounds G131	12:15 Pathology Bottom Line C207		Neurology/ Ophthalmology Rounds Large Animal Clinic
3:30					Show and Tell Necropsy Laboratory
4:30		Show and Tell Necropsy Laboratory	Senior Seminar Auditorium		Show and Tell Necropsy Laboratory





*Curriculum changes may shorten the number of hours students spend in lectures during the first three years of the D.V.M. program.*

# 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

University housing in residence halls is available to single graduate and D.V.M. students upon application to the Housing Assignment Office, Cornell University, 1142 Balch Hall, Ithaca, New York 14853.

Sage Hall provides housing for a limited number of men and women. Situated in the center of campus, it is convenient to all colleges. There is a cafeteria in the building. Schuyler House accommodates approximately 150 graduate men and women. It is located in a community residential area within walking distance of campus and downtown shopping areas. A third residence is a small

apartment building, Thurston Court, housing 21 graduate students. It is located just north of Fall Creek Gorge on Thurston Avenue.

### Family Housing

The university maintains apartment accommodations for approximately 420 students and their families. These are Cornell Quarters, Pleasant Grove Apartments, and Hasbrouck Apartments. 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.



*The annual Open House is a popular spring event.*

## 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, 1987–88*

President: Eric Parente, Class of 1989

Vice president: Cynthia Waldron, Class of 1989

Secretary: Mary Battista, Class of 1989

Treasurer: Laurence Cangro, Class of 1990

Advisers: Professor F. A. Kallfelz; 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

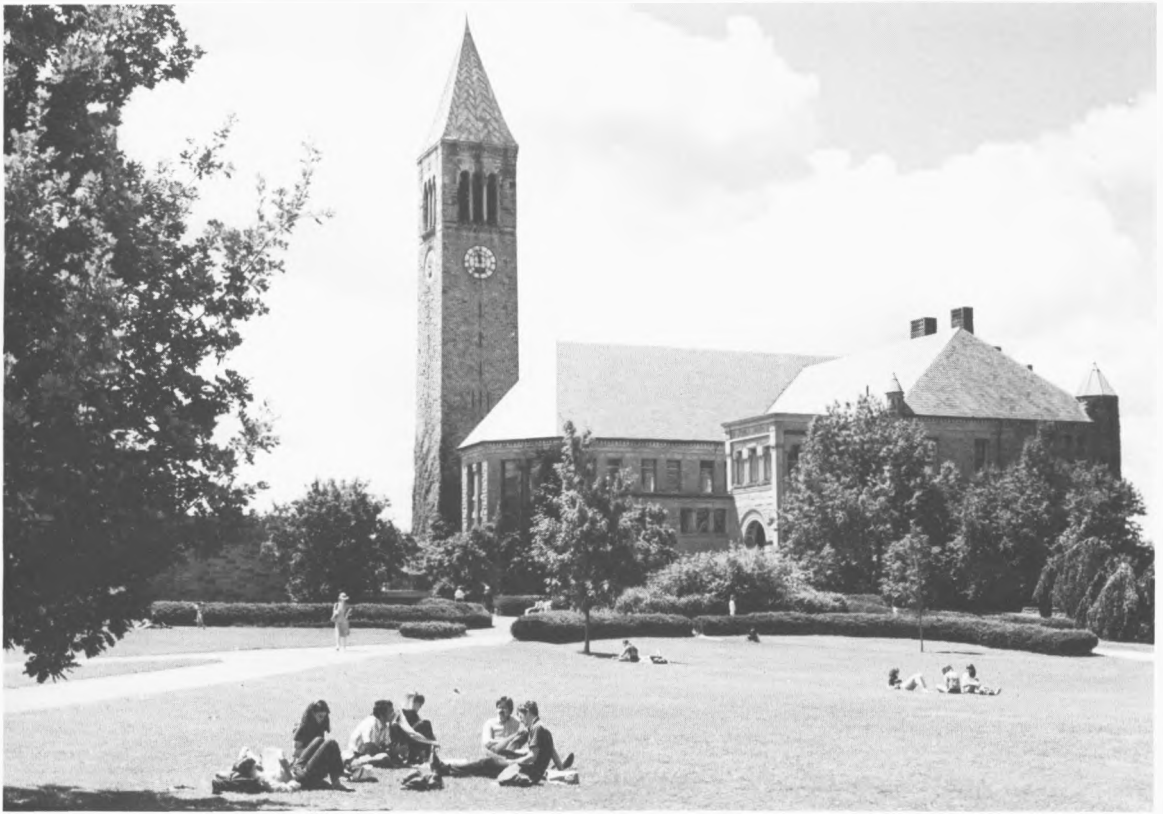
AAZV, American Association of Zoo Veterinarians

AAHA, American Animal Hospital Association

AASGP, American Association of Sheep and Goat Practitioners

VIDA, Veterinarians Interested in Developing Areas

AAWV, American Association of Women Veterinarians



*The many activities and organizations of the Cornell community enrich student life.*

### 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.

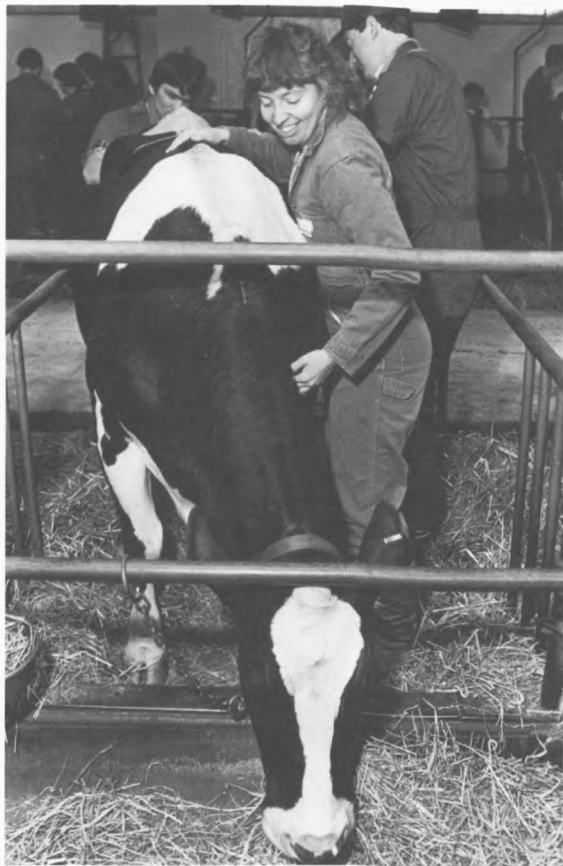
**Phi Kappa Phi.** The society of Phi Kappa Phi was founded in 1897 and soon became a national organization. Its primary objective is to recognize and encourage superior scholarship in all fields of study. Good character is essential for those elected to membership.

### 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.



*Students learn the basics of physical examination and diagnostics.*

## 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.

### Services for the Handicapped

Cornell University is committed to assisting those handicapped students who have special needs. A brochure describing services for the handicapped student may be obtained by writing to the Office of Equal Opportunity, Cornell University, 233 Day Hall, Ithaca, New York 14853-2801. Questions or requests for special assistance may also be directed to that office.

### 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 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.

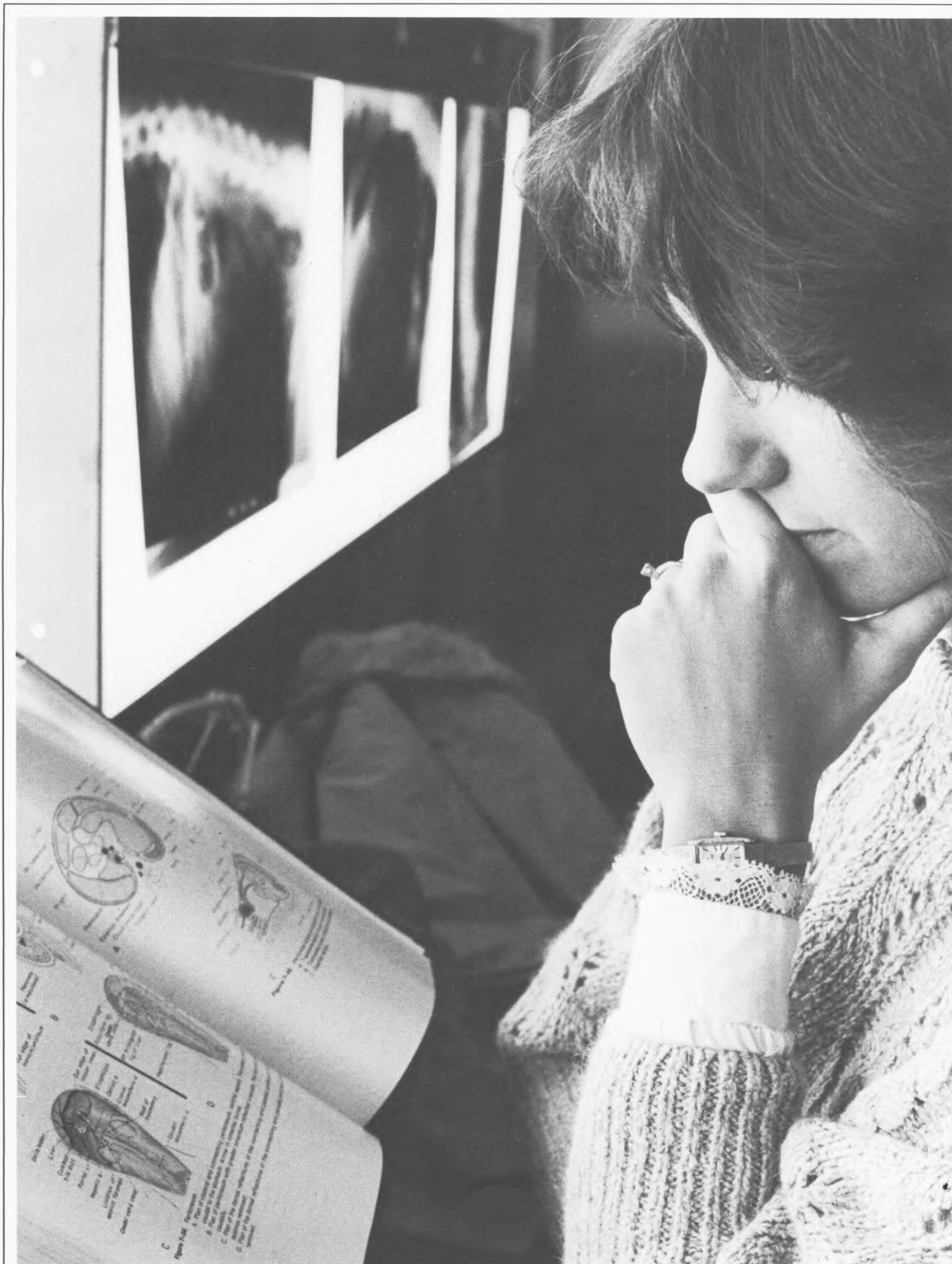


*Many veterinary students take their love of animals home. This Rhodesian ridgeback has won ribbons for Tim Bostley '87.*

### 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 1988

Ahearn, Michele  
Anderson, Karen  
Anderson, Kim  
Aquadro, Philip  
Beane, Douglas  
Bellezza, Christine  
Birmingham, Eden  
Bierman, Naomi  
Bigelow, Judith  
Blumbergs, Albert  
Bobnick, Suzanne  
Bodner, Elizabeth  
Bonda, Michael  
Borowiec, Michael  
Caradonna, Peter  
Carini, Carolyn  
Cline, Carolyn  
Coblentz, Scott  
Denham, Melodee  
Donato, Lisa  
Dunfee, Barbara  
Falcheck, William  
Fatcheric, Eileen  
Flint, Terry  
Franz, Marc  
Friend, Judith

Garell, Della  
Giordano, Joseph  
Grambow, Bonnie  
Griffitts, Caroline  
Harff, J. Blair  
Hartmann, Elizabeth  
Heilberg, Elizabette  
Heit, Mark  
Hotchkiss, Charlotte  
Isaza, Ramiro  
John, Gregory  
Katz, Russell  
Kemp, Jonathan  
Klossner, Michael  
Koga, Jennifer  
Kosik, Elaine  
Laden, Sandra  
Lawrence, Howard  
Lee, Gwen  
Leo, Karin  
Lopez, Noel  
Loree, Ruth  
Lyon, Kathryn  
MacGibbon, David  
Maritato, Melina  
Maus, Paul  
Meyer, Cindy  
Munro, Anne  
Niederer, Nancy  
Nogrady, Jill  
Panzer, Richard  
Payton, Keith  
Percey, Siobhan

Potkewitz, Lisa  
Reiter, Sue  
Robbins, Regina  
Rubin, Jeffrey  
Ruslander, David  
Sandler, Jody  
Scrafford, Robert  
Slade, Kim  
Spatz, Jessica  
Stalis, Ilse  
Toomey, Jane  
Troy, David  
Uhl, Elizabeth  
Walsh, Carla  
Westfall, Laura  
Wiedenkiller, Dayna  
Wooding, Sherri  
Wydner, Catherine  
Wylegala, Susan  
Youket, Richard  
Zakrzewski, Kristina

## Third 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, Douglas  
Gruber, Ronald  
Hecht, Nancy  
Herr, Wayne  
Hirsch, Karen  
Hlaing, Teresa  
Hoskins, Bruce  
Isaman, Linda  
Jones, Laura  
Justin, Robert  
Keller, Angela  
Kokulis, Kimberley  
Kondek, Francesca  
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

## Second Year Class of 1990

Amioka, Mari  
Bacmeister, Cynthia  
Barry, Bridget  
Blinn, Beverly  
Boatwright, Celeste  
Cangro, Laurence  
Carmichael, Daniel  
Carmichael, James  
Carnevale, Joyce  
Chavkin, Matthew  
Chrest, Renee  
Cousineau, Glen  
Cronin, Kim  
Crum, Alberta  
Dallessandro, Marianne  
Diana, Stephen  
Doyle, Kimberly  
Ehram, Beatrice  
Eschner, Andrew  
Feely, Elaine  
Fitchett, Miriam  
Fitzpatrick, Doreen  
Fullam, Lisa  
Gilbraith, Gayanna  
Giles, Stefan  
Goldstein, Richard  
Gordon, Keith  
Grossi, Catherine  
Harter, Susan  
Hoover, Mary  
Hutchinson, Pamela  
Jagne, Jarra  
Johnston, Karen  
Kearney, John  
Kellerman, Dana  
Koster, Sophia  
Lamothe, Michele  
Leahy, David  
Licciardi, Janiene  
Loeven, Koen  
Lowenthal, Anne  
McFee, Cheryl  
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  
Sevalla, 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

## First Year Class of 1991

This list represents those expected to comprise the class of 1991 at the time of publication of this announcement but could change before the class matriculates.

Abdella, Michael  
Angelos, Stephen  
Baum, Frederick  
Baxendell, Kathryn  
Block, Gary  
Brown, Sharon  
Cammarata, Ronald  
Caputo, Richard  
Carpenter, Jean  
Cesaratto, Dorie  
Chang, Laura  
Coger, Laurie  
Cutting, Eileen  
DeFrancesco, Teresa  
Diaz, Hector  
Duddy, Pamela



*Dr. Julia Blue reviews hematology slides with second-year students.*

Dugan, James  
 Durham, Tracy  
 Essick, Linda  
 Falsarella, Mary Louise  
 Fennell, Allison  
 Fischer, Karen  
 Floetenmeyer, Rosemarie  
 Fogelson, Melissa  
 Gamez, Carol  
 Gemperle, Heidi  
 Giovengo Liew, 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  
 Larsen, Mette

Lee, Robert  
 Leroux, Annette  
 Lisciandro, Gregory  
 Luddy, Paul  
 Luke, Carol  
 Lulkin, Erik  
 McCann, Margaret  
 McLaughlin, Steven  
 McNeill, Robert  
 Malloy, Kelly  
 Marx, James  
 Meddleton, Mark  
 Meyer, Gregory  
 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  
 Stanz, Kimberly  
 Tanneberger, Anthony

Thorndyke, Julie  
 Vitulli, Michelle  
 Voell, Andrew  
 Volel, Laurence  
 Walker, David  
 Welsch, Susan  
 Yousey, Steven  
 Zimits, Elizabeth





*Dr. John Timoney is the graduate faculty representative for the field of veterinary medicine.*

# 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. Some of the major areas within the Field of Veterinary Medicine also require graduate students to have completed the D.V.M. degree. 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. 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*.

\* 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 Announcement or communicating with the graduate faculty representative of the selected field. Personal interviews with faculty members are especially encouraged before application.

All applicants to the Field of Veterinary Medicine should provide Graduate Record Examination scores and evidence of high academic achievement, including class standing. In addition, those applying 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.



*Dr. Robert Hillman holds a stallion at the Equine Research Park for some basic grooming.*

### **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 Field of Veterinary Medicine 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. Decisions on the awards are made in December 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 usually 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 1987-88

### 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.

Anttila, Marjukka (Finland), D.V.M.

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

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

Ball, Barry A., A.S., D.V.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.

Buscaglia, Celina (Argentina),  
D.V.M., M.S.

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

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

Christiansen, Janet, B.S.

Chunekamrai, Siraya (Thailand),  
D.V.M.

Clifford, Charles, B.S., D.V.M.

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.

Crosetti, Carlos F. (Argentina),  
D.V.M.

Donaldson, William, B.V.Sc.

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

Dzanis, David, D.V.M.

El Tom, Sakina (Sudan), B.V.Sc.,  
M.S.

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

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

Gallagher, Eleene, B.S.

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

Hoffman, Lisa, B.A.

Horne, William, D.V.M.

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

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

Kenny, Kevin (Ireland), M.V.D.

King, Alan, B.S., D.V.M.

Kintzer, Peter, D.V.M.

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

Linder, Catherine (France), D.V.M.

McAllister, Raymond A. (Canada),  
D.V.M.

McColl, Kenneth (Australia), B.Sc.,  
B.V.Sc.

McGroddy, Kathleen, B.S.

Meschter, Carol, D.V.M., M.S.

Mishra, Prabin (India), B.S., B.V.Sc.,  
M.S.

Monosson, Emily, B.S., M.S.

Mukhtar, Maowia (Sudan), B.V.Sc.,  
M.S.

Munson, Linda, B.A., D.V.M.

Myers, Thomas J., B.S., V.M.D.

Oriol, Julio (Argentina), D.V.M.

Pearce-Kelling, Susan, B.S.

Perdrizet, John, B.A., D.V.M.

Picut, Catherine A., B.A., V.M.D.

Schultz, Bruce, B.S., M.S.

Sirois, Jean (Canada), D.V.M., M.Sc.

Suter, Maja (Switzerland), D.V.M.

Tavares, Luis M. (Portugal), D.V.M.

Thompson, Donald (Australia),  
B.V.Sc.

Todhunter, Rory (Australia), B.V.Sc.,  
M.S.

Treat, Robert, B.A., B.S.

Valentine, Beth A., B.S., D.V.M.

Weinstock, Daniel, D.V.M.

Wilkinson, John E., B.S., M.S.,  
D.V.M.

Winand, Nena, B.S., M.S., D.V.M.

Zhang, Chonghui (People's Republic  
of China), B.S., M.S.

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.

Calnek, David, B.A.

Carney, Edward, B.S., M.S.

Cliff, William, B.S.

Dobrov, Tamara, B.A.

Figueroa, Jorge (Chile), M.D.

Kelling, Steven, B.A.

Kogan, Philip, B.S.

Leipold, Harry, B.S.

McDonald, Thomas, B.S., M.S.

Mahlangu, Andries (South Africa),  
B.Sc.

Massman-Figueroa, Angela (Chile),  
M.D.

Mathis, Ute (Germany), Dipl.

Pimentel, Gabriela (Portugal),  
D.V.M., M.S.

Rhodes, Linda, B.A., V.M.D.

Sadowsky, Drew, B.A.

Tian, Xiuchun (People's Republic of  
China), B.S.

Tomasi, Ana (Argentina), M.D.

Turzillo, Adele, B.A.

Wilcox, Brian, B.S.

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

Carlisle, Melissa S. (Australia)  
B.V.Sc.

Davies, Christopher, B.S., D.V.M.

Elzer, Philip, B.S.

McCallus, Daniel, B.S., M.S.

Olmsted, Stephen, B.S.

Platko, Joseph, B.S.

Rankin, Bruce, B.A.

Zhu, Duzhang (People's Republic of  
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Chung, Jungwon Woo (Korea), B.S.

Kao, Sue-Mei (Taiwan), 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

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Lee, Edgar, B.A.

Pawlowski, Tina, B.S.

### Field of Animal Science

Field representative: Professor

Richard L. Quaas

114 Morrison Hall

607/255-2853

Dunn, Lynn, B.S., M.S.

### Field of Zoology

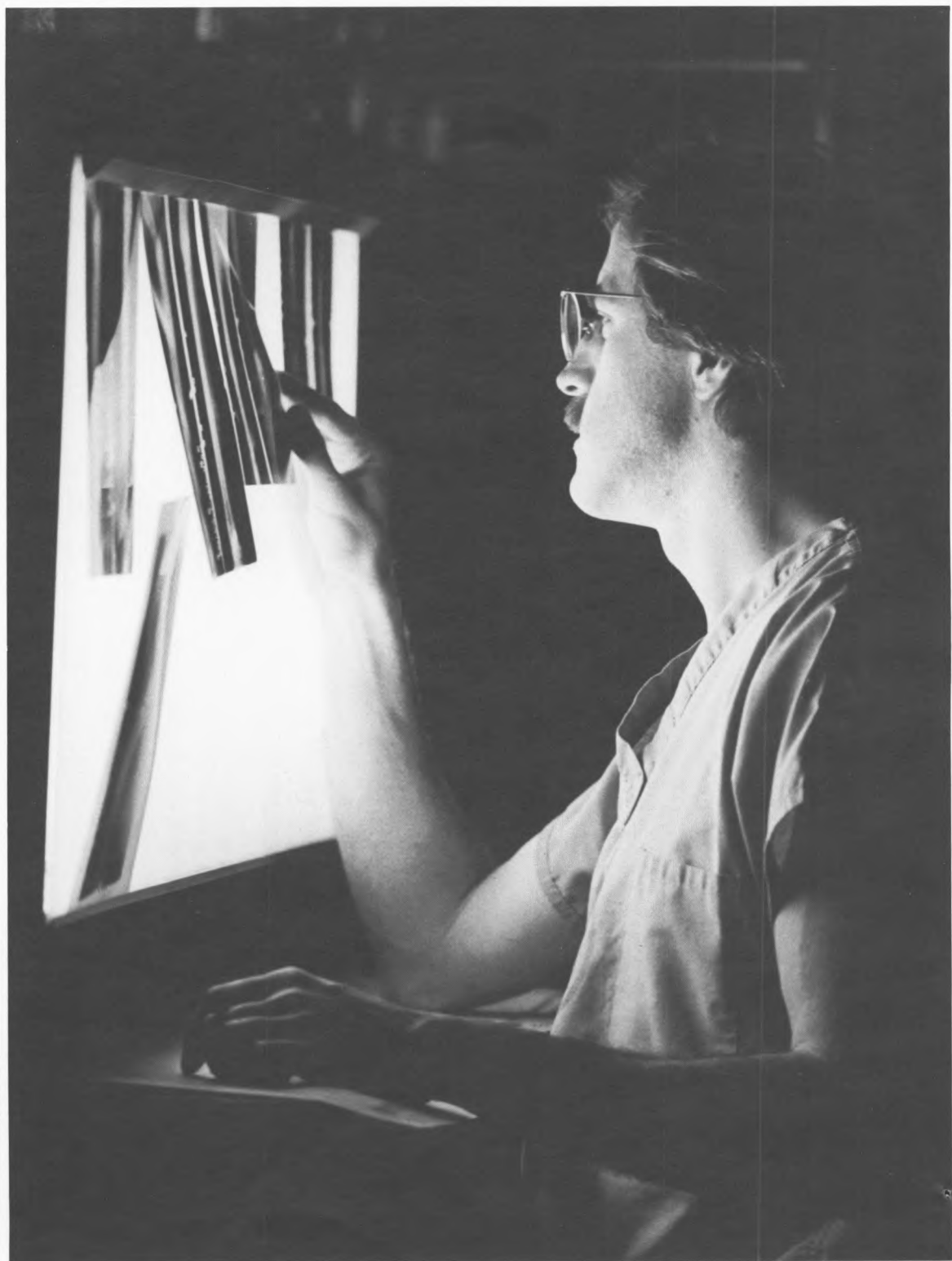
Field representative: Professor

F. Harvey Pough

E211 Corson Hall

607/255-6582

Zich, Karen, B.A.



*Dr. Joseph Glennon, a surgery resident, reviews radiographs in the Small Animal Clinic.*



# *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, Large Animal Clinic (surgery) 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 towards 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.



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

## 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.

### 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, radiology, and small animal surgery).

## Postdoctoral Training in Veterinary Pathology

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

### General Information

The Department of Pathology maintains an active training program for veterinarians interested in pursuing a career in veterinary pathology. Based on the premise that pathologists must be functional in their discipline, a biphasic program has been developed in which the initial period of training emphasizes competency in applied (diagnostic) pathology and meeting the eligibility requirements for specialty board certification by the American College of Veterinary Pathologists. Interns and residents who express good research potential during the initial phase of training are encouraged to pursue as graduate students advanced research training leading to a Ph.D. in experimental pathology (three years). Thus postdoctoral trainees completing the program may enter the job market with board certification and an advanced degree.



*Dr. N. Sydney Moise (seated) monitors a patient's echocardiogram.*

## Eligibility

Applicants must have a degree in veterinary medicine and a strong interest in pathology. Previous experience in the field is desirable but not mandatory. Applications are accepted through December of each year. Candidates are selected by February 1 for appointments that begin July 1 through September 1 of each year.

## Training

Interns and residents acquire disciplinary skills by participating in the departmental diagnostic service programs, a daily seminar series, and selected courses in the veterinary and graduate school curriculum. Necropsy pathology (eighteen hundred accessions per year), surgical pathology (nine thousand accessions per year), and the pathology of laboratory animals and exotic species (two hundred accessions per year) form the basis for training in anatomic pathology. Advanced research training is carried out according to the policies of the Graduate School, Cornell University.

## Special Programs

### San Diego Zoo Residency Program

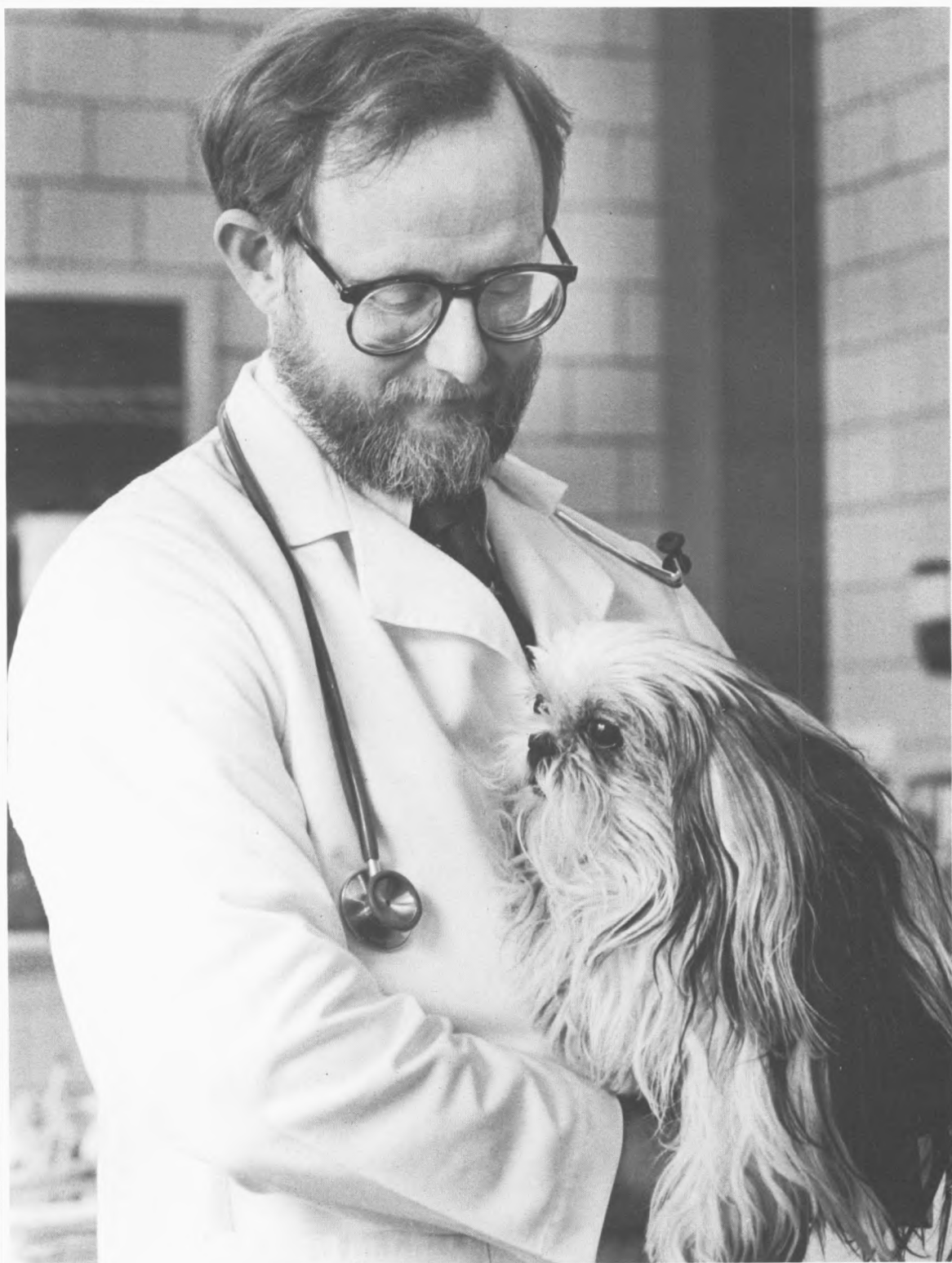
Veterinarians who have completed a minimum of one year of pathology residency at Cornell University are eligible for a special one-year period of residency training in the pathology of exotic animal species. Trainees may return to complete their training at Cornell University following the zoo residency.

### 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, following the NIH postdoctoral fellowship stipend 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.



*In addition to teaching courses in small animal medicine, Dr. William Hornbuckle treats patients and instructs students in the Small Animal Clinic.*

# 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, 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.



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 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; and for the New York State Thoroughbred Breeding Industries' control program for equine viral arteritis.

### **Quality Milk Promotion Services**

The New York State Quality Milk Promotion Services and Mastitis Control Program is a special program developed in 1940 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 \$41,000,000 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, at Canton, Earlville, Kingston, Springville, and Ithaca, 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-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



*Ambulatory resident Dr. Susan Stehman examines a patient on a client's farm.*

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.



*Clinical Pathology provides diagnostic tests for the Teaching Hospital.*

### **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 respiratory diseases, feline leukemia, and feline infectious peritonitis 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 generous contributions from cat fanciers, bequests, the memorial program, memberships, and grants from industries and foundations. Some of the noteworthy funds that have been established are the Camuti Fund in support of the diagnostic consultant service, the Buzz-Fuzz Harder Fund for cardiomyopathy studies, and the Birmingham Feline Fanciers Summer Fellowship Program, which supplies funding for one veterinary student's study of an aspect of feline health.

## **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 twelve 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 photo-duplicated 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 six hundred titles in slide, audiotape, and videotape format. These audiovisual materials enhance academic programs as well as provide opportunities for self study.

A microcomputer facility was established in the library in early 1985 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 Equine Research Park is home to the college's brood-mare herd and stallions.*

### **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.

The CRAR staff is also available to counsel and advise investigators, technicians, and others on

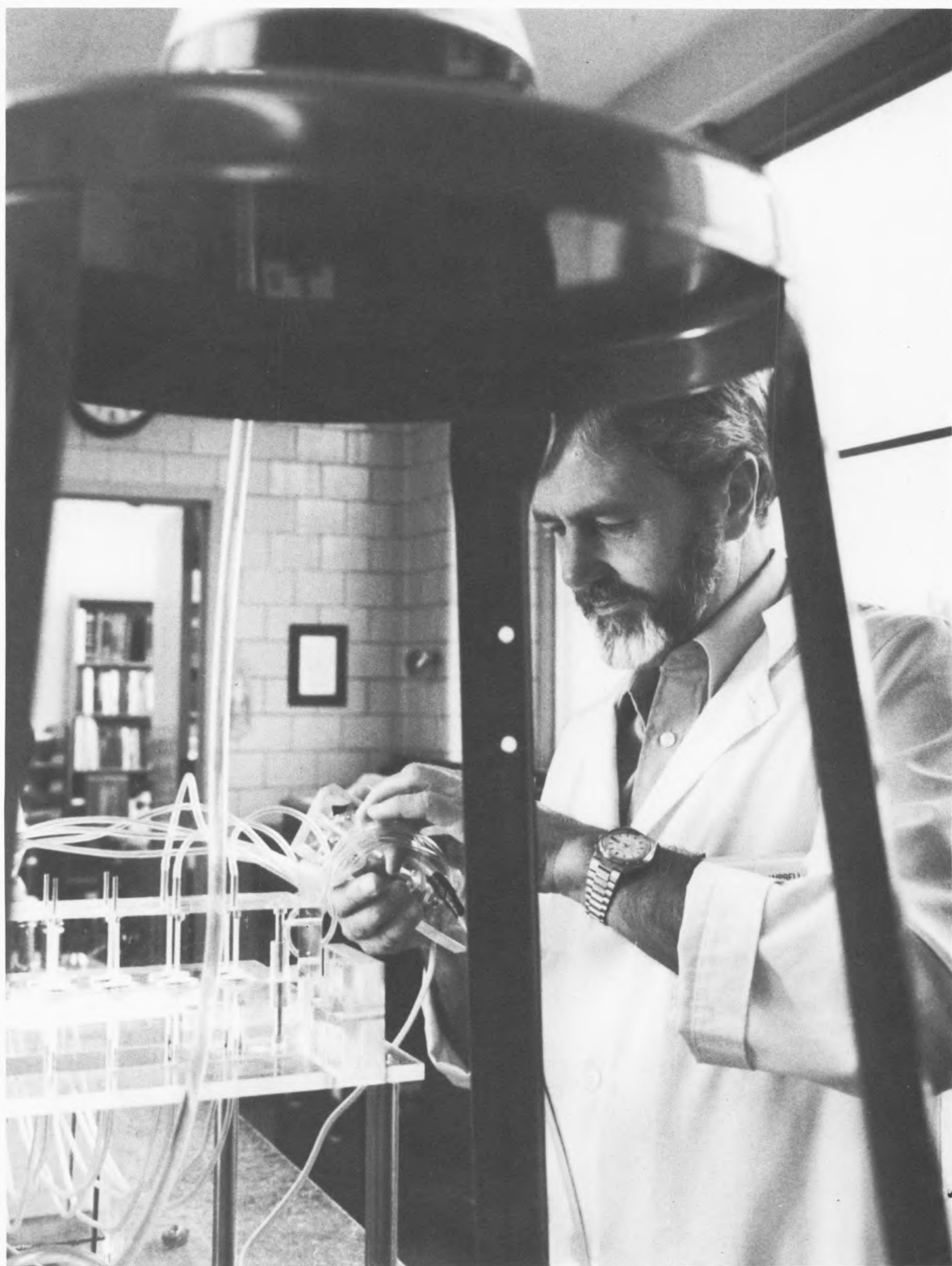
procedures for proper housing, maintenance, care, and sanitation and disease control of animals and animal facilities. The center maintains information on the suitability of various animal models for research purposes and available alternatives to the use of living animals and regularly updates a listing 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.

### **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.





*Associate dean S. Gordon Campbell combines administrative duties with research work.*



# FACULTY AND ADMINISTRATION

## University Administration

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Thomas H. Meikle, Jr., *provost for  
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James A. Sanderson, *chief investment  
officer*

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Larry I. Palmer, *vice provost for  
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Malden C. Nesheim, *vice president for  
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Walter J. Relihan, Jr., *university  
counsel and secretary of the corporation*

Joseph B. Bugliari, *dean of the  
University Faculty*

## College Administration

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college*

S. Gordon Campbell, *associate dean*

John A. Lambert, *assistant dean for  
administration*

John C. Semmler, *assistant dean for  
facilities and research administration*

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*

Ralph A. Jones, *director of public affairs*

Susanne K. Whitaker, *librarian*

Gloria Crissey, *registrar*

Ann Prince Rivkin, *coordinator, grants  
and contracts*

John Lewkowicz, *director, computing  
facility*

Donald Hinman, *director, biomedical  
electronics*

Sandra Berry, *director, biomedical  
communications*

## New York State College of Veterinary Medicine Advisory Council 1987-88

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Director, New Jersey Agricultural  
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Vice President, Agricultural  
Research  
The Upjohn Company  
Kalamazoo, Michigan 49001

Harold M. Zweighaft, D.V.M.  
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New York, New York 10024

## Standing Committees of the College Faculty

### General Committee

*Elected by the faculty*

H. N. Erb (1985-88)  
R. P. Hackett, Jr. (1985-88)  
W. S. Schwark (1986-89)

### Graduate Field of Veterinary Medicine Executive Committee

*Elected by the graduate field faculty*

J. F. Timoney (1988),  
graduate faculty representative  
F. A. Kallfelz (1987)  
R. E. Oswald (1989)  
D. O. Slauson (1989)  
A. Torres (1988)

### University Appeals Panel

*Elected by the faculty*

L. E. Carmichael (1983-88)  
A. Dobson (1982-87)  
J. M. King (1985-90)  
N. L. Norcross (1984-89)  
W. O. Sack (1987-92)

### Faculty Council of Representatives

*Elected by the faculty*

A. E. Dietze (1986-89)  
A. Dobson (1984-87)  
H. N. Erb (1985-88)  
C. M. Fewtrell (1986-89)  
R. D. Gleed (1986-89)  
W. O. Sack (1984-87)  
B. C. Tennant (1985-88)

## Committee on Curriculum

*Elected by the faculty*

C. Guard (1986-89), chairman  
J. T. Blue (1986-87)  
S. A. Center (1986-89)  
R. R. Minor (1986-89)  
D. M. Noden (1984-87)  
S. G. Campbell, ex officio

## SUNY Senate

*Elected by the faculty*

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

## Class Advisory Committees

### Class of 1988

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R. D. Gleed  
H. J. Harvey  
K. A. Houpt  
D. F. Holmes  
R. H. Jacobson  
D. H. Lein  
V. T. Rendano, Jr.  
J. M. Scarlett Kranz

### Class of 1989

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R. B. Hillman  
W. E. Hornbuckle  
F. A. Kallfelz  
J. M. King  
R. M. Lewis  
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S. G. Dill  
T. W. French  
J. R. Georgi  
C. E. Hall  
T. J. Kern  
E. M. Wertz

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

## Admissions Committee

J. F. Cummings, chairman  
C. E. Farnum  
H. J. Harvey  
F. A. Kallfelz  
G. Lust  
H. F. Schryver  
J. F. Timoney  
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. J. 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. H. Schlafer  
A. Torres

## 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 1987-88

### Eightieth Annual Conference for Veterinarians January 12, 13, 14, 1988

B. C. Tennant, chairman  
B. J. Cooper  
S. L. Fubini  
C. Guard  
T. J. Kern  
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

R. V. Pollock, chairman  
B. J. Cooper  
A. Dobson  
E. Loew  
N. S. Moise  
M. E. White  
J. A. Lambert, ex officio  
J. M. Lewkowicz, 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  
H. R. Pallesen  
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  
Dukes, H. Hugh, B.S., D.V.M., M.S., D.H.C., D.Sc. (honorary); veterinary physiology  
Evans, Howard E., Ph.D.; veterinary and comparative anatomy  
Fabricant, Julius, V.M.D., M.S., Ph.D.; avian medicine  
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  
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

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

Buriro, Shah N., Ph.D.; visiting,  
parasitology

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

Cypess, Raymond H., D.V.M.,  
Ph.D.; microbiology

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

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

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



*After flushing a donor cow, Dr. Pamela Powers searches for embryos to transfer to recipient cows.*

Gasteiger, E. L., Jr., M.S., Ph.D.;  
physical biology

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

Lee, Kyu M., M.D., Ph.D.; virology

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

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

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

Litwin, Stephen D., M.D.; adjunct,  
veterinary microbiology

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.; courtesy, 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

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

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

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, 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, director of the  
Division of Biological Sciences

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

Spitalny, George L., Ph.D.; adjunct,  
immunology

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; chairman of the  
Department of Physiology; chairman  
of the Section of Physiology, Division  
of Biological Sciences

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

Wolf, Kenneth E., M.S., Ph.D.;  
courtesy, avian and aquatic animal  
medicine

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

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

Byun, Myung D., Ph.D.; physiology

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

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

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

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

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

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

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

Haider, Sajjad A., M.S., Ph.D.; avian  
and aquatic animal medicine

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

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

Lein, Donald H., D.V.M., Ph.D.;  
theriogenology, acting 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

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

Morgan, Donald O., M.S., D.V.M.,  
Ph.D.; courtesy, microbiology

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

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

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

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

Thoren-Tolling, Kerstin, Ph.D.;  
visiting, pathology

Torres, Alfonso, D.V.M., M.S.,  
Ph.D.; 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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Powers, Pamela A., D.V.M.; medicine

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

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

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

Seeger, Christoph, Ph.D.; microbiology

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

Sunderji, Shirazall G., M.B., Ch.B.; adjunct, obstetrics-gynecology

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

Wolfe, Marilyn J., D.V.M., Ph.D.; avian and aquatic animal medicine

**Senior Research Associates**

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

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

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

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

Holmes, Dorothy E., 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

Poore, Edward R., D.Phil.; physiology

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**

Dinsmore, Roger P., D.V.M.; clinical sciences

Gould, Willard J. III, D.V.M.; clinical sciences

Hackett, Mary S., D.V.M.; anatomy

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

Mitchell, William J., Jr., D.V.M., Ph.D.; microbiology, immunology, and parasitology

Olm, Dale D., D.V.M.; physiology

**Directors, Laboratory Operations**

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

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)

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)

Schulte, Hal F. III, D.V.M., M.S.; mastitis control

## Veterinary Medical Teaching Hospital

Director: R. F. Playter

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

Chief of surgery: H. J. Harvey (soft-tissue surgery)

## Large Animal Clinic

Head: W. C. Rebhun

*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), W. C. Rebhun (internal medicine, ophthalmology), D. F. Smith (general surgery), B. C. Tennant (internal medicine, gastroenterology)

*Residents:* E. M. Gaughan (surgery), L. F. Karcher (medicine), M. A. Prichard (surgery), P. C. Rakestraw (surgery), T. R. Simmons (medicine)

*Intern:* M. G. Boy (surgery)

## Small Animal Clinic

Head: W. E. Hornbuckle

*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), D. G. Brummer (medicine), J. C. Glennon (surgery), K. M. Kalaher (dermatology), S. A. Morrison (medicine), M. H. Neaderland (ophthalmology), M. B. Parchman (surgery)

*Interns:* S. A. Dougherty (medicine, surgery), B. C. Maloney (medicine, surgery), V. L. Moskaluk (medicine, surgery), H. R. Sukhiani (medicine, surgery), S. L. Toll (medicine, surgery)

## Ambulatory

Head: M. E. White

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

*Residents:* D. J. Matsas (medicine), S. M. Stehman (medicine)

*Interns:* H. J. Hamlen (medicine), M. E. Weber (medicine)

## Anesthesiology

Chief: C. E. Short

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

*Residents:* R. D. Keegan, G. C. Seaman

## Theriogenology

Acting chief: R. B. Hillman

*Faculty:* 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, S. M. Shelly

*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 (electrodiagnostic), F. A. Kallfelz (nuclear medicine), V. T. Rendano, Jr. (diagnostic radiology, radiation therapy), J. R. Stouffer (ultrasound)

*Senior lecturer:* G. D. Ryan

## Diagnostic Laboratory

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

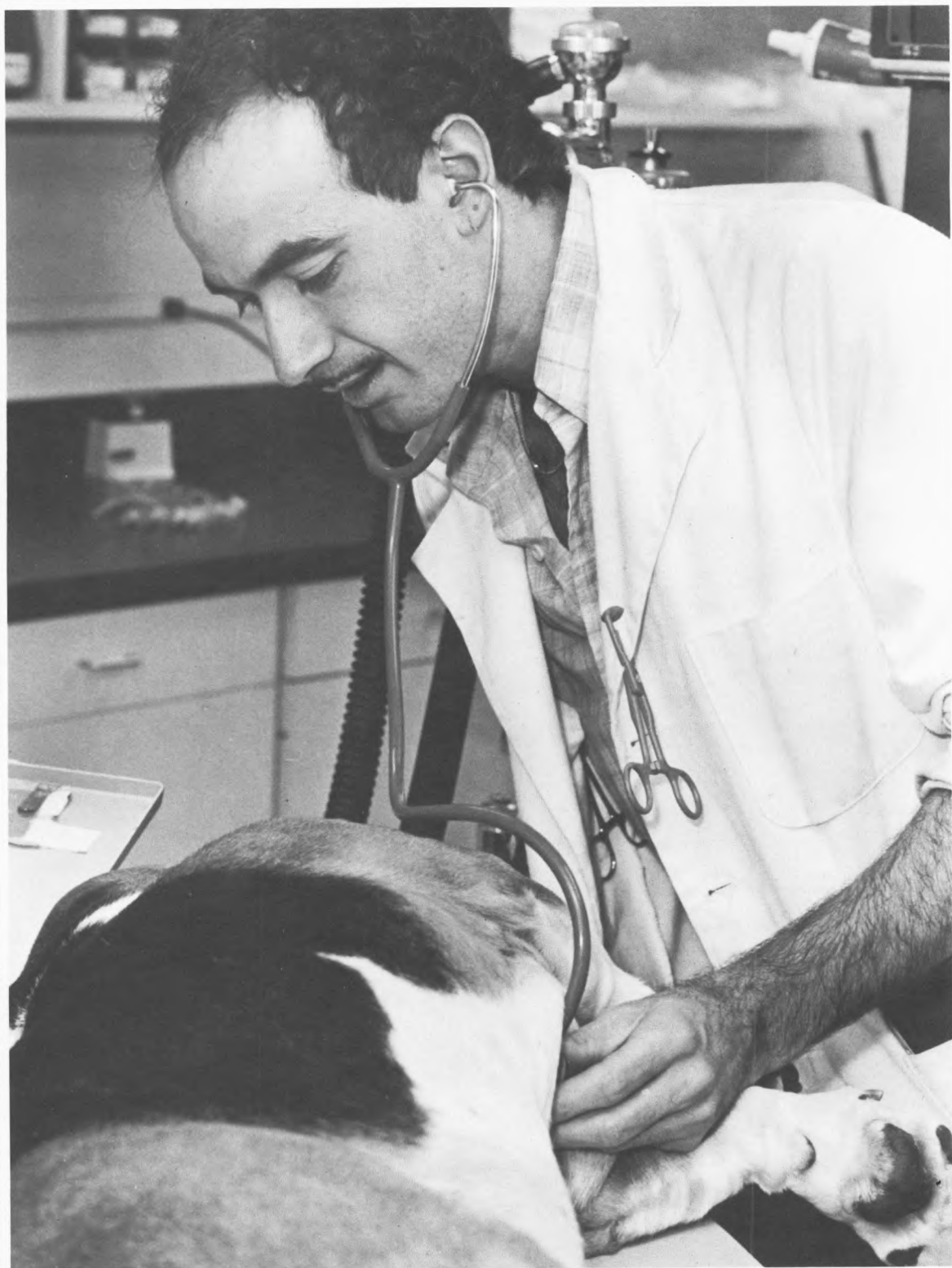
Associate professors: J. D. Henion, R. H. Jacobson, G. A. Maylin, T. J. Reimers, P. M. Sears, B. E. Straw, A. Torres

Assistant professors: E. J. Dubovi

Directors of laboratory operations: D. R. Callihan (anaerobic bacteriology), 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), M. O'Connor (equine extension specialist), B. E. Straw (swine extension specialist)

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



*Three years of course work and a final year of clinical rotations prepare students for their future as veterinarians.*

# DESCRIPTION OF COURSES

**U**nder 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; research associates: D. McClearn, teaching assistants: S. Hackett, R. McAllister; 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.

**[624 Biomechanics and Energetics of Locomotion** Spring. 1 credit. Primarily an elective for veterinary students; others by permission of the instructor. S-U grades only. D. McClearn. Not offered 1987–88.

The course is designed to provide information on recent research in the area of vertebrate locomotion, with an emphasis on biomechanics, energetics, and the functional significance of locomotor behavior in a wide range of animals. Lecture topics covered include bone remodeling in response to stress; why animals change gaits; the fallacy of increasing “energetic efficiency” of locomotion during evolution; allometric relations between body mass and other anatomical and physiological properties; and how respiration and locomotion are coupled in running animals. Domestic mammals and birds, kangaroos, kinkajous, insectivores, gibbons, man, and Cretaceous mammallike reptiles are all subjects of discussion. Two short projects are required, one of which is an outline for a research proposal on a topic of interest to the student.]

## Avian and Aquatic Animal Medicine

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

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

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, and immunology. 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 and aquatic animals.

**255 Poultry Hygiene and Disease** Spring, even-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. H. L. Shivaprasad.

Biology of the chicken: salient features of anatomy and physiology of the chicken, common terms used in pathology; degeneration and necrosis of cells, disturbances of growth; aplasia to neoplasia, inflammation; and definition and types of inflammation, healing, and repair. Principles of disease diagnosis, management, and control; and diagnostic procedures, euthanasia, necropsy technique, and laboratory procedures. Nutritional deficiency and infectious diseases: host-parasite relationships; viral, bacterial, fungal, and parasitic diseases; avian immunology and immunologic impairment; and diseases affecting various systems of the body. The course will include many laboratories in which review of anatomy, bleeding and dissection techniques, and recognition of lesions and their interpretation will be covered.

**555 Avian Diseases** Fall. 2 credits. Limited to veterinary students. Required of third-year veterinary students. Letter grades only. H. L. Shivaprasad and staff.

Avicultural Medicine Section (1 credit. Staff): unique features of the biology and management of pet, exotic, and wild birds are presented. The major malnutritional, infectious, and parasitic diseases of these species are discussed with emphasis on clinical, differential diagnostic, medical, and control aspects. Case material of clinical or pathological interest is presented in laboratory periods.

Poultry Disease Section (1 credit. H. L. Shivaprasad): basic principles of poultry production and management and important diseases of domestic poultry in terms of etiology, clinical signs, pathology, differential diagnosis, and diagnostic techniques will be covered. In addition, avian immunology and immunologic impairment, useful concepts of epidemiology, disease control, and pathogenesis of poultry diseases will also be stressed. Laboratory sessions dealing with dissection, a review of anatomy, euthanasia techniques, and specimens depicting various diseases will be presented.

**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. Avian and Aquatic Animal Medicine faculty. 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. Elective primarily for veterinary students; others by permission of the instructor. 1 lecture-laboratory per week. P. R. Bowser.

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. Elective course for veterinary students; others by permission of the instructor. 1 lecture-laboratory per week. P. R. Bowser. Not offered 1987–88.

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** Spring. 2 credits. Primarily for veterinary students; others by permission of the instructor. General knowledge of microbiology and parasitology helpful but not required. Lecture and laboratory hours to be arranged. P. R. Bowser. The basic study of this course relates to the etiology, pathology, diagnosis, prevention, and control of diseases of finfish and to the relationship of the aquatic environment to diseases of aquatic animals.

**[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. Not offered 1987–88.

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. B. W. Calnek.

**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. Schat.

## Clinical Sciences

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

**Section of Medicine.** Professors: B. C. Tennant (chief); A. deLahunta, F. H. Fox; associate professors: W. E. Hornbuckle, W. C. Rebhun, R. C. Riis, D. W. Scott (sabbatic leave 1987–88), M. C. Smith, M. E. White; assistant professors: S. A. Center, S. G. Dill, C. L. Guard, T. J. Kern, W. H. Miller, N. S. Moise, P. A. Powers, J. F. Randolph; instructors: R. G. Buerger, W. J. Gould

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

**Section of Theriogenology.** Professor: C. E. Hall; senior clinician: R. B. Hillman (acting chief); instructor: T. V. Little

**Section of Anesthesiology.** Professor: C. E. Short (chief); assistant professors: R. D. Gleed, E. M. Wertz

**Section of Epidemiology.** Associate professors: H. N. Erb (chief), J. C. Thompson; assistant professors: R. V. Pollock, J. M. Scarlett Kranz

**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 and guest lecturers.

Topics will include introductory lectures on cost-benefit analysis, ventilation, and other aspects of "safe" animal housing. 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. 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 Kranz, H. N. Erb.

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, T. V. Little.

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, T. V. Little.

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. Ducharme, F. H. Fox, R. P. Hackett, S. Fubini, C. L. Guard, R. B. Hillman, W. C. Rebhun, D. F. Smith, M. C. Smith, B. C. Tennant, M. E. White. 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. Ducharme, F. H. Fox, R. P. Hackett, S. Fubini, C. L. Guard, R. B. Hillman, W. C. Rebhun, D. F. Smith, M. C. Smith, B. C. Tennant, M. E. White.

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 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 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, T. V. Little.

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. Hackett.  
A clinical service rotation.

**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 and Ambulatory Clinic faculty.  
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 Anesthesiology Service** 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 CO<sub>2</sub>, 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, and faculty of Sections of Medicine and Surgery.  
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 technique, and surgical technique 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. D. Scott, A. Dietze, V. Rendano, and 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. S. Center, J. Randolph, and 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. 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. H. Jay Harvey. 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 off-campus experience for fourth-year veterinary students, usually at other universities or research laboratories. Proposals are formulated by the student and submitted to the coordinator of opportunities blocks for approval. Opportunities must add to the education of the student and should consist of experience that cannot be obtained on the veterinary school campus. Off-campus supervisors of the experience 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, even-numbered years. 3 credits. Limited to second-, third-, and fourth-year veterinary students. Letter grades only. 6–8 hours a day for three weeks. P. 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 Service 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, J. M. Scarlett Kranz. 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 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. Concepts introduced in Veterinary Medicine 664, Introduction to Epidemiology, are further developed. Topics will include design and analysis of case-control and cohort studies, adjustment for confounding variables, sample-size determinations, clinical trials, and medical geography. Recent articles in environmental health, cancer, nutrition, and infectious diseases will be used as illustrations. Students will be expected to prepare term papers for delivery in class.

**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. Not offered 1987–88.]

**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, T. V. Little.

**678 Fundamental Techniques in Embryo Transfer**

Spring. 1 credit. Limited to third- and fourth-year veterinary students. S-U grades only. P. A. Powers. The major emphasis of this course is on bovine embryo transfer, but information is provided on equine, ovine, and caprine as well. Freezing and micromanipulation are also considered. Some of the class work is laboratory work.

**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. Not offered 1987–88.

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.]

**682 Large Animal Internal Medicine**

Fall, even-numbered years. 1 credit. Intended for third- and fourth-year veterinary students. W 8. B. C. Tennant. Not offered 1987–88.

Selected topics of large animal internal medicine using lectures and case presentations. Emphasis will be given to the major diseases of the cardiovascular, urinary, respiratory, and gastrointestinal systems.]

**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. J. E. Lowe.

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 1988. 2 credits. Enrollment limited to 6 third-year veterinary students. S-U grades only. M–F 9–5. D. Gallagher.

This minisemester selective course is intended to introduce students to veterinary practice management. Special emphasis will be given to what to look for in a first job, how to evaluate a practice, computers in practice management, and marketing. 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.

**687 Diseases of Swine** Spring. 1 credit. Limited to veterinary students; others by permission of the instructor. Not offered 1987–88.

This course explains the rationale behind, and the clinical approach to, problem solving in swine herds and provides a basic competency in swine practice.]

**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 1987–88.]

**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. 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. Pollock, D. L. Davidson. 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 Common Exotic Pets** Spring. 1 credit. Intended for second-, third-, and fourth-year veterinary students. Others by permission of the instructor. J. Gould. The course will give a brief review of diseases and therapy of common exotic pets, including psittacines, reptiles, and small mammals that are commonly seen in small animal practice. Lecture material will be illustrated by slide presentations when possible. The main objective is to give students a working knowledge of the more-common conditions that they will see in practice and an idea of how to proceed with a diagnostic workup.

**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 and Diagnostic Laboratory. 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 and Diagnostic Laboratory. This course will enable students in the Section of Epidemiology to receive graduate research credits for doctoral-level thesis research.

**[778 Gastroenterology Conference** Spring. 1 credit. R 1:05. B. C. Tennant. Not offered 1987-88.]

**[779 Veterinary Gastroenterology** Spring. 2 credits. W 8-9, F 2-3. B. C. Tennant and others. Not offered 1987-88.

Pathogenesis, diagnosis, and treatment of the major medical diseases of the gastrointestinal tract of domestic animals.]

**782 Special Topics in Comparative Ophthalmology** Fall, alternate years. 1 credit. Intended for veterinary students and graduates. S-U grades only. W 8. R. C. Riis, T. Kern, W. C. Rebhun, M. H. Neaderland. Not offered 1988-89. 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, treatment, and 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, retinopathies, and 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, J. M. Scarlett Kranz. The purpose of this course is to investigate an epidemiologic topic to research a problem 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, R. H. Cypess, J. R. Georgi, K. M. Lee, 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, 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, J. R. Williams; senior extension associate: L. Wuori; lecturers: J. Barlough, L. Winter; instructor: W. J. Mitchell; research support specialist: Gail Rowe; teaching support specialist: M. F. Frongillo; postdoctoral associates: C. Gamazo, M. Korenaga, C. H. Wang;



joint appointees: (professors) N. L. Norcross, G. C. Poppensiek, (associate professors) E. Cupp, W. Rebhun, V. Utermohlen; adjunct professors: (professors) D. Axelrod, A. Burny, J. J. Callis, R. Gallo, S. Litwin, G. Spitalny, (associate professors) C. Grant, D. Morgan; courtesy professor: M. Horzinek; visiting professor: S. Buriro; visiting scientist: G. Santisteban

**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 description of what pathogens are and how they produce harmful effects (disease) in the host. This leads into a discussion of what antigens are and the molecular basis for antigenic specificity. A detailed 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 or 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 cancer.

**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. J. Barlough, 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 R. H. Cypess.

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. J. R. Georgi, D. D. Bowman.

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** Fall. 2 credits. Limited to second-year veterinary students. Prerequisite: Microbiology 519. Letter grades only. J. Appleton, J. Barlough, D. Thompson.

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 whenever possible.

**516 Infectious Diseases I: Bacteriology and Mycology** Fall. 2 credits. Limited to second-year veterinary students. Prerequisites: Vet Med 519. 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 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 bacterial diseases in domestic animals. Laboratory exercises will involve isolation, culture, and identification of the major groups of veterinary bacterial pathogens as they occur in clinical material. These exercises will be supplemented with discussion-demonstration sessions in which recognition of these organisms in clinical specimens will be emphasized.

**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 half of the term will cover general virology, and the second half 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.

**519 Introductory Microbiology**

Spring. 2 credits.  
Limited to first-year veterinary students. Letter grades only. D. Antczak, J. F. Timoney, J. Barlough, L. Winter.  
The course will acquaint the student with the major biological features of microorganisms and mechanisms of pathogenicity. The student will also become familiar with the pathogenic fungi, the pathogenesis of the resulting mycoses, and the methods of identification of the agent involved. The important features of the immunological response will also be covered.

**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 W 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, and prevention, including maternal immunity, vaccination, and hospital design as it relates to the spread of diseases. 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. 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.  
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; to present such an organized plan; and to ensure that the participants can prepare one for themselves or their clients.

**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 Animal Virology**

Spring, odd-numbered years.  
3 credits. Prerequisite: Vet Med 317 or 517 or equivalent. General knowledge of biochemistry and animal pathology helpful. Priority given to graduate students. S-U grades unless otherwise requested. Lectures, M W F 11:15–12:05. M. J. Appel, L. E. Carmichael, K. A. Schat, and staff. Not offered 1987–88.  
Principles of animal virus biology, with focus on mechanisms in viral pathogenesis.]

**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: Monoclonal Antibodies**

Spring, odd-numbered years. 1 credit. Prerequisite: introductory immunology. Lectures, M W F 9. Not offered 1987–88.

This course will involve intensive student participation, and enrollment will be limited.]

**[714 Special Topics in Immunology: Immunodeficiency**

Spring, odd-numbered years. 1 credit. Prerequisite: introductory immunology. Lectures, M W F 9. Not offered 1987–88.

This course will involve intensive student participation, and enrollment will be limited.]

**[715 Special Topics in Immunology: Macrophage Function**

Spring, odd-numbered years. 1 credit. Enrollment limited. Prerequisite: introductory immunology. Lectures, M W F 9. Not offered 1987–88.]

**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. D. Holowka.

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. R. Bell.

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 1987–88. 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 immunopotentialization 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. R. Cypess. Not offered 1987–88. 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  
E-205 Schurman Hall  
607/253-3300

Professors: J. King, L. Krook, R. Lewis, R. Phemister, D. Slauson; professors emeriti: J. Bentinck-Smith, C. I. Boyer, Jr., K. McEntee, C. G. Rickard; adjunct professors: W. J. Dodds, C. A. Mebus, J. Nosanchuk, M. Posso; associate professors: B. Cooper, D. H. Lein, R. R. Minor, D. D. Myers, F. Quimby, B. A. Summers, K. Thoren-Tolling; assistant professors: J. T. Blue, T. French, D. H. Schlafer; adjunct assistant professor: H. T. Nguyen; visiting fellow: W. Holden-Stauffer; interns and residents: W. Anderson, G. Bottomley, J. M. Cline, F. Cramer, B. Dunham, R. Johnson, B. Leblanc, J. LeNet, C. Loudon, R. Pearson, M. Petersen, H. Steinberg; postdoctoral fellow: C. Brayton (New York City); veterinary graduate research assistants: M. Anttila, P. Boschler, B. Car, W. Corapi, G. Foley, L. Munson, C. Picut, M. Suter, B. Valentine, D. Weinstock, C. Ziegler; graduate students: C. Clifford, M. Dore, D. Gregg

The Department of Pathology has academic responsibility for teaching, research, and service in three major areas: anatomic pathology, clinical pathology, and the pathology of laboratory animal species. Since pathology is the bridging discipline between the basic and clinical sciences, these responsibilities encompass a broad range of activities within the college and the Veterinary Medical Teaching Hospital.

Postdoctoral training programs for veterinarians provide residency training in anatomic and clinical pathology, as well as advanced research training in experimental pathology at the doctoral level. Successful completion of these training programs leads to specialty board certification by the American College of Veterinary Pathology.

Well-equipped contemporary departmental research facilities support active programs in the neural sciences, developmental and cell biology, immunobiology, immunopathology, the pathophysiology of inflammation and reproductive disorders, and metabolic bone diseases.

Provision of high-quality diagnostic service to the practicing veterinary public has long been a hallmark of the Department of Pathology. Information and material derived from the Necropsy Service (2,000 accessions per year), the Surgical Pathology Service (9,000 accessions per year) and the clinical pathology service (30,000 tests per year) provide a continuing valuable substrate for the teaching and research activities of the faculty.

The following courses are given particularly for veterinary students. Courses in the 500 series are required. When there is room for them, properly prepared students of other colleges will be admitted, but permission to register must be obtained.

**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. T R 10–12:20, W 10. B. Pauli and staff.

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 and staff.

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. T. Blue, J. M. King, T. French, H. Shivaprasad.

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, T. French.

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 and staff.

**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 Autotutorial Course in Laboratory Animal Medicine and Science** Fall and spring. 1 credit. This course is for individual review. F. W. Quimby.

The objectives of the course are to discuss, identify, describe, define, or list in regard to laboratory animals (1) the justification for their use, (2) legislation and guidelines pertaining to their use, (3) their role as animal models, (4) the significance of diseases as complications of biomedical teaching and research, (5) the primary uses of each species, (6) their significant biologic characteristics, (7) the principles of sound husbandry procedures, and (8) their principal diseases, their significance, and satisfactory procedures for their diagnosis, treatment, control, and prevention, including the application of gnotobiotic and pathogen-free procedures. The course is intended to prepare the undergraduate veterinary student to handle

problems concerning the common laboratory animals, for example, rodents, lagomorphs, and nonhuman primates, as they are encountered in veterinary practice. Examinations and a subjective evaluation form are required for each minicourse.

**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.

**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 and staff.

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.

**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 and staff.  
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. Pathology faculty.

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-118 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, 527; Pathology 535; or permission of the instructors. Letter grades only. R. E. Oswald.

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 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.

**620 Advanced Clinical Pharmacology (Selective)** Spring. 1 credit. Limited to third- and fourth-year veterinary students. Others by permission of the instructor. 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. Not offered 1987–88.

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.

**660 Safety Evaluations in Public Health (also Toxicology 660)** Spring. 2 credits. Limited to second-, third-, or fourth-year veterinary students and graduate students. Others by permission of the instructor. Prerequisites: an introductory-to-intermediate-level course in biology, biochemistry, or physiology. A concurrent or prior course in toxicology would be helpful. Lecture, F 2:05–4:25. J. G. Babish.

Applying toxicologic methods for assessing chemical hazards to populations has become a major role of toxicologists in industry and government today. In this course current methodologies in risk assessment will be presented with emphasis on the interpretation of data in terms of public health effects. Topics covered will include (1) the concept of a safe level, (2) standards for acceptable testing, (3) good laboratory practices and government regulations, (4) testing procedures used in safety evaluation, and (5) monitoring human populations. Students will be evaluated on their ability to interpret data from animal studies and to estimate risks of human exposure.

**700 Calcium and Other Second Messengers in Cell Activation** Spring. 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, odd-numbered years. 2 credits. By permission of the instructor. Lecture and discussion. G. A. Weiland, R. E. Oswald. Not offered 1987–88.

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.

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 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.

**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 Basophils** 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.

**715 Clinical Pharmacokinetics** Fall, spring, and summer. 1–3 credits. By permission of the instructor. W. S. Schwark.

**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, R. E. Oswald.

**745 Neuropharmacology** G. A. Weiland, R. E. Oswald.

**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** 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** Fall, spring, and summer. G. A. Weiland, R. E. Oswald.

**760 Advanced Topics in Pharmacology** Fall, spring, and summer. 1–3 credits. Pharmacology faculty.

## Physiology

Professor R. H. Wasserman, chairman  
717 Veterinary Research Tower  
607/253-3430

Professors: E. N. Bergman, A. Dobson, E. L. Gasteiger, W. Hansel, T. R. Houpt, F. A. Kallfelz, F. W. Lengemann, P. W. Nathanielsz, D. N. Tapper, J. F. Wootton; professor emeritus: A. F. Sellers; associate professors: K. W. Beyenbach, R. A. Corradino, J. E. Fortune, K. A. Houpt, E. R. Loew; assistant professor: A. Quaroni; lecturers: J. S. Chandler, C. H. McFadden; senior research associates: H. W. Alila, P. W. Concannon, C. S. Fullmer, E. R. Poore, R. A. Wentworth; postdoctoral associates: P. A. Figueroa, J. P. McCann, D. H. Petzel, P. C. Tsang, C. R. Wallace, J. M. Wright

Instruction in physiology in the core veterinary curriculum is concentrated in the first year and includes three courses, one devoted to cellular physiology and two to continuing courses on systems physiology. Laboratories exemplifying physiological principles with various animal species are an integral part of the systems physiology courses. These courses are directed towards an understanding of the function, integration, and control of physiological processes. The laboratory is considered a significant aspect of the educational process in physiology, providing the student with hands-on experience as well as the opportunity to observe physiological events from selected demonstrations.

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, and (i) vision.

**[Bio S 214 Biological Basis of Sex Differences (also Women's Studies 214)]** Spring. 3 credits. Prerequisite: one year of introductory biology. Lectures, T R 8:30–9:55. Not offered 1987–88. Occasional discussions to be arranged. J. E. Fortune.

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 stressed.

**[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. Not offered 1987–88. Next offered 1988–89. 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. Not offered 1987–88; next offered 1988–89.

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, Lectures (also Biological Sciences 311)** Fall. 3 credits. Prerequisites: one year of college biology, chemistry, and mathematics. Lectures, M W F 11:15. Evening preliminary examinations to be arranged. E. R. Loew.

A general course in vertebrate physiology emphasizing the basic characteristics of the circulatory, nervous, pulmonary, renal, and gastrointestinal systems; energy metabolism; endocrinology; and reproductive physiology. Neural and hormonal control of function is emphasized.

**348 Introductory Animal Physiology, Laboratory (also Biological Sciences 319)** Fall. 2 credits. Limited to 80 students, with preference given to students concentrating in animal physiology and anatomy. Each lab section limited to 20 students. Prerequisite: concurrent or previous enrollment in Veterinary Medicine 346 (also Biological Sciences 311) or permission of instructor based on meritorious performance in another introductory physiology course. Letter grades only. Laboratories, M T W or R 1:25–5. P. W. Concannon, R. A. Corradino. A series of exercises designed to illustrate basic physiologic processes in animals, including mammals. Students learn scientific methodology and analyses of results by actual performance of the exercises. Reports of laboratory activities are required. Grading is based on evaluation of the reports and laboratory performance.

**[Bio S 351 Biological Rhythms with a Period of One Day to One Year]** Fall. 1 credit. Prerequisites: one year of introductory biology and either Mathematics 106, 111, or 113. Lecture, R 12:20. A. van Tienhoven. Not offered 1987–88.

Theoretical and practical aspects of circadian and circennial rhythms will be considered. Selected topics, such as the biological clock of plants, insects, and vertebrates, will be presented. Light will be considered as a stimulus and as an entraining agent. The role of rhythms of migration and reproduction will be emphasized.]

**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: R. H. Wasserman).

Topics: fall 1987, effects of endogenous and exogenous excitants and depressants on reproduction; spring 1988, current readings in physiological optics, H. H. Howland.

**Bio S 411 Comparative Neuroendocrinology** Fall. 3 credits. Prerequisite: Biological Sciences 311 or Entomology 483. Lectures, M W F 11:15. H. H. Hagedorn, A. van Tienhoven.

A comparison of the interactions of the nervous and endocrine systems in invertebrates and vertebrates, from *Hydra* to humans. Areas covered will include morphology, development, evolution, physiology, and molecular biology of neuroendocrine glands and their hormones.

**[Bio S 452 Comparative Physiology of Reproduction of Vertebrates, Lectures (also Animal Sciences 452)]** Spring. 3 credits. Prerequisite: Animal Sciences 427 or permission of instructor. Lectures, M W F 1:25. A. van Tienhoven. Not offered 1987–88.

Sex and its manifestations. Neuroendocrinology, endocrinology of reproduction, sexual behavior, gametogenesis, fertilization, embryonic development, care of the zygote, environment and reproduction, and immunological aspects of reproduction.]

**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, respiratory physiology, and acid-base balance.

**[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. Not offered 1987–88.

Practice in planning, conducting, and reporting independent laboratory and library research programs. 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.



*Dr. Lennart Krook has studied the origin of racetrack fractures in Thoroughbreds.*

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** 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 (also Biological Sciences 719)** 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.

**Bio S 710-718 Special Topics in Physiology** Fall and spring. 1 or 2 credits each topic. Enrollment may be limited. Lectures, laboratories, discussions, or seminars on specialized topics as indicated. Contact the professor in charge for information concerning format, organizational meeting, meeting times, and place.



**Fall 1987: three topics are offered.**

**711 Pathophysiology of Calcium Metabolism: Hypertension, Osteoporosis, Arteriosclerosis** 1 credit. Seminar, 1 hour each week. R. H. Wasserman.

**713 Epithelial Transport of Salt and Water** 1 credit. Seminar, 1 hour each week. K. W. Beyenbach.

**717 Structure and Function of Joints with Emphasis on Arthritis** 1 credit. Lecture, 1 hour each week. G. Lust.

**Spring 1988: four topics are offered.**

**712 Regulation of Cell Processes** 1 credit. Seminar, hours to be arranged. J. Wootton.

**714 Physiology of Pregnancy** 2 credits. Laboratory. Hours to be arranged. P. W. Nathanielsz.

**716 Seminar on Insect Physiology (also Entomology 685)** 1 credit. Prerequisite: permission of the instructor. Seminar, 1 hour each week to be arranged. H. H. Hagedorn.

**718 Evolution of Color Vision** 1 credit. Seminar, 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** 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 Systems 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. F. W. Lengemann. 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  $^{14}\text{C}$  and  $^3\text{H}$  as metabolic tracers. Experiments are designed to present basic principles using plants and 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. Not offered 1987–88.

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 Mammalian Neurophysiology (also Biological Sciences 450)** Spring. 3 credits. Prerequisites: two years of college biology. Recommended: courses in biochemistry and physics. Lecture-discussion, T 10:10. Laboratories, R 1:25–4:25. Additional hours to be arranged. E. L. Gasteiger. Not offered 1987–88.

The anatomy and physiology of the mammalian nervous system are examined through classical and modern laboratory studies. Sensory, central integrative, and motor functions are explored primarily by electrophysiologically recording spontaneous and evoked unit and field potentials. Behavioral, pharmacological, and histological methods are used where appropriate.]

**758 Molecular Mechanisms of Hormone Action (also Biological Sciences 658)** Spring, even-numbered years. 2 credits. By permission of the instructor. 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. Not offered 1987–88. 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.

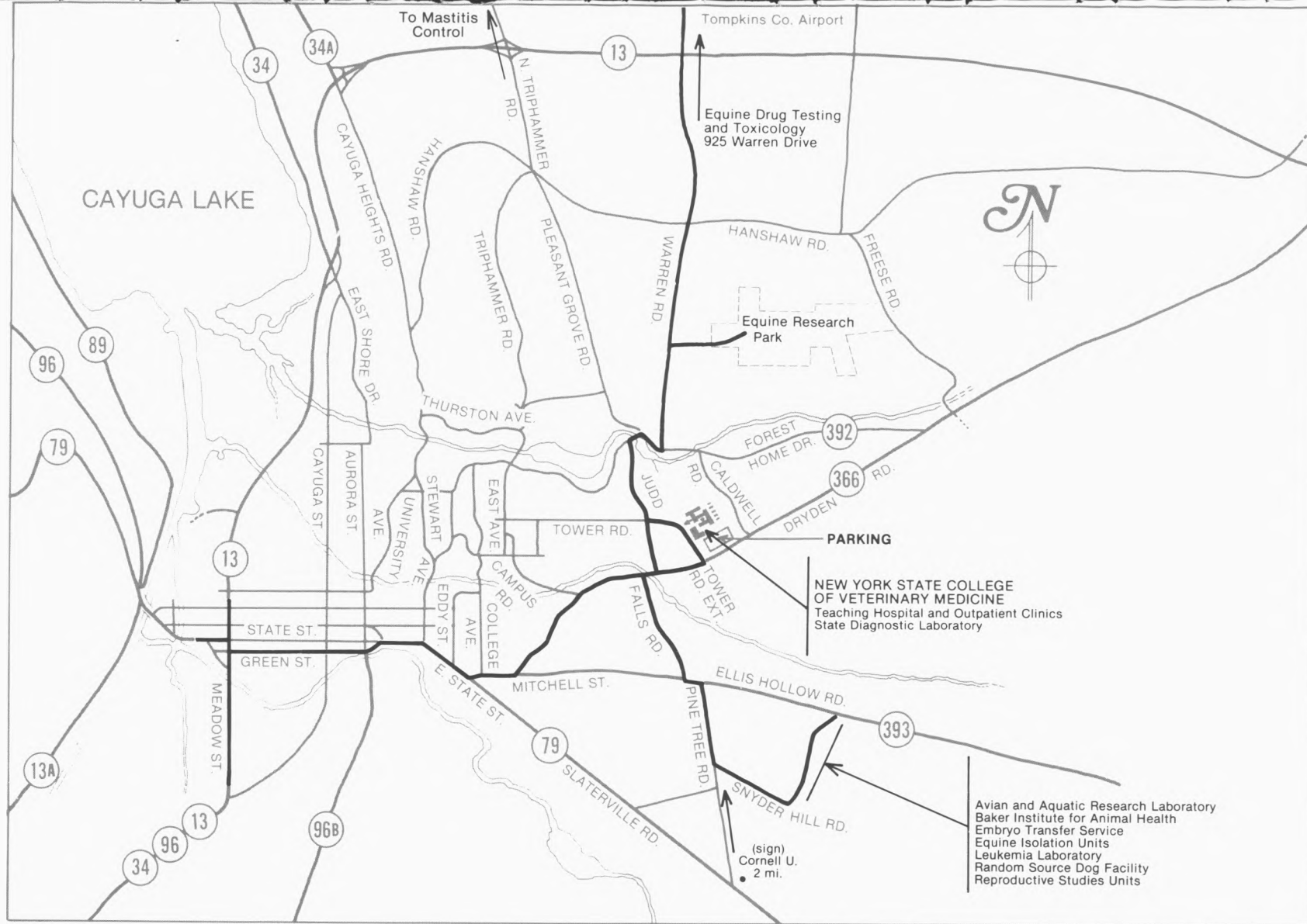
The physiology of the endocrine glands and the roles played by each hormone in the regulation of normal body processes. Endocrine regulation of growth, metabolism, and reproduction is emphasized. Examples are selected from domestic species and humans.

**[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. Not offered 1987–88. 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.]

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## Tentative Cornell Academic Calendar 1988-89

### Fall Semester

Registration begins	Thursday, August 25
Registration ends	Friday, August 26
Instruction begins	Monday, August 29
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	Wednesday, December 7
Study period begins	Thursday, December 8
Study period ends	Monday, December 12
Final examinations begin	Tuesday, December 13
Final examinations end	Thursday, December 22

### 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.

COLLEGE OF  
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CORNELL UNIVERSITY

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Research Apprenticeship Program
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Please specify areas of interest: \_\_\_\_\_

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