Taking on TB:
David Russell brings his germ warriors to Cornell

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A Legacy for a New Century

Germ theory, the idea that infectious diseases were caused by unseen microbial organisms, was still unproven when James Law established the veterinary curriculum at Cornell in 1868. Professor Law was a firm believer in the theory and in its importance to a science-based veterinary education. He saw clearly that, "it is in the prevention of disease that the greatest triumphs are to be won," and he dedicated himself to educating not just students but farmers, bureaucrats, and fellow academicians about the measures that must be taken to prevent the spread of disease among animals and from animals to humans.

In the classroom Dr. Law produced veterinary scientists of the first rank. Two of the greatest, Theobald Smith and Cooper Curtice, received their undergraduate degrees in 1881, one year after Toussaint produced the first anthrax vaccine and one year before Koch’s discovery of the tubercle bacillus. Smith and Curtice went on to make classic contributions to the nascent field of microbiology as employees of Law’s second student, Daniel Salmon, at the Bureau of Animal Industry. Professor Simon Henry Gage, another of Law’s brilliant former students, credited Curtice’s demonstration that ticks carried Texas cattle fever with the ultimate completion of the Panama Canal: “The Texas fever work opened the road to others for the discovery of the way in which insect carriers transmit the germs of malaria, sleeping sickness, yellow fever, typhus fever, spotted fever, and bubonic plague.” Yellow fever had forced the French to abandon their work on the canal; Curtice’s research provided the model for the discovery and eradication of the mosquito vector of disease, efforts that allowed the United States to complete the project.

Equipped only with a microscope, Dr. Law and his students worked at the cutting edge of pathogenic bacteriology. Their legacy thrived as technology advanced and the college expanded. In just the past 50 years researchers, most notably those of the Baker Institute and the Diagnostic Laboratory, have discovered the causal organisms of bovine viral diarrhea, leptospirosis, canine herpesvirus, and canine parvovirus; tests for equine infectious anemia and canine brucellosis; and vaccines for hog cholera, infectious canine hepatitis, canine distemper, Marek’s disease in chickens, bovine mastitis, and canine parvovirus.

Before the end of the 1970s, the wonders of antimicrobial therapy had some people convinced that bacterial diseases had been conquered for good. Indeed, while this college continued to maintain a broad platform for excellence in virology, parasitology, and immunology, much of our work relating to bacterial infections in animals was restricted to studies originating in the Diagnostic Laboratory. In 1998, recognizing the need to rebuild strength in this area, we targeted pathogenic bacteriology for focused faculty recruitment and program development. Our search for a scientist to lead this initiative brought us tuberculosis expert David Russell, whom you will meet in the following pages. As a scientist, Dr. Russell pursues questions with very important implications for world health. As chairman of Microbiology and Immunology, he has a key role in shaping the college’s new and continuing legacy as a world leader in animal and human disease control.
Studies Aim to Hit TB Where it Lives

The key to success for a pathogen—whether bacterium, virus, or parasite—is to reproduce exponentially and see as many of its offspring as possible move on to new hosts. Getting killed off in the invasion will obviously interfere with an organism’s plans for world dominance, but so, too, will killing the host too quickly. With territory staked out in one third of the world’s human population, Mycobacterium tuberculosis clearly knows how to establish a favorable interplay with its host. It is, says microbiology professor David Russell, “the very model of a modern major pathogen.”

Russell, an expert in pathogen-macrophage interaction who recently joined the faculty of the College of Veterinary Medicine as professor and chairman of the Department of Microbiology and Immunology, is working to determine precisely how M. tuberculosis manages to set up permanent residence in a cell—the macrophage—that is designed to destroy invading microbes. Russell and the other members of his group are also investigating how the TB bacillus sustains itself while ensconced in the macrophage—“what it eats, basically,” he explains—with an eye toward discovering a new target for drug action. In addition, Russell is also interested in the tissue response of the host that leads to formation of a granuloma—a highly organized, multi-tiered structure of macrophages, giant cells (very large macrophages with more than one nucleus), and T cells that form a mantle at the periphery of the clump of cells that is the focus of the chronic infection.

When a mycobacterium first enters the lung or other tissue, it is picked up by a patrolling macrophage and swallowed up into a vacuole that, under normal circumstances, delivers its cargo to a lysosome, the cell’s waste disposal center. The lysosome of a macrophage is equipped with a fearsome array of hydrolases, enzymes that literally liquidate germs and other cellular refuse. Most of these enzymes are only effective within a narrow range of acid pH. M. tuberculosis has evolved the ability to arrest maturation of its transport vesicle and maintain its pH at a comfortable level at which the lysosomal enzymes are unable to operate. With the macrophage thus neutralized, it is left to the body’s immune system to tell it to wake up and fight. How well it does that depends on several factors, including heredity, nutrition, and the health of the immune system.

Immune cells called TH1 helper cells can release cytokines including gamma interferon and tumor necrosis factor alpha, both of which activate macrophages and trigger the acidification of the vacuoles where the mycobacteria are holed up. Activated macrophages and TH1 cells then converge on the infected macrophage and form a granuloma around it, thus preventing the further spread of those bacteria.

The cell walls of mycobacteria contain many lipids that are unique to this group of bacteria. These lipids are known modulators of immune function and have been used for years as the active ingredient in adjuvants. Mycobacteria over-produce and release these lipids into the host cell,
which expels them. They are then internalized by neighboring cells. “This apparently self-destructive behavior on the part of the bacterium appears key to the formation of the granuloma at the infection site,” says Russell. “So the granuloma may well fulfill functions beneficial to both organisms; in the host it prevents spread of infection, while to the bacterium it represents a means of maintaining the developing immune response at a distance from the infected cells.” This balance, which represents latent tuberculosis, breaks down whenever a granuloma is disrupted and releases its bacterial contents into the surrounding tissues or the bloodstream. When this happens, the infection spreads and the disease is reactivated.

Patients with active tuberculosis are likely to harbor bacteria in varying phases of activity. Some may be actively dividing while most others are not. The drugs that are used to treat tuberculosis target active cells and have little effect on bacteria that are in a phase of slow growth. This is probably one of the main reasons why it takes so long for antibiotics to rid the body of an infection. A major portion of the effort in Russell’s laboratory is devoted to finding a way to get at slow- or non-growing bacteria and kill them. He and his colleagues recently discovered that persisting bacteria depend upon an enzyme called isocitrate lyase (ICL) in order to metabolize essential fatty acids. Russell’s team, in collaboration with John McKinney at the Rockefeller University, tested the importance of ICL in chronic versus active infections by engineering a mutant strain of M. tuberculosis that lacks the ICL gene and using it to infect a group of mice. A

Frédéric Chopin. The Brontë sisters. John Keats. The youthful, gifted, doomed consumptive is perhaps the most enduring symbol of nineteenth-century Romanticism. But there is nothing romantic or past-tense about tuberculosis. Welcome to the twenty-first century, a time when tuberculosis reigns worldwide as the number-one killer among infectious diseases, ahead of influenza, ahead of malaria, ahead of AIDS.

Each year two-to-three million people succumb to TB, and more than seven million new cases of disease are reported. Although TB is not considered to be a highly contagious disease, one third of the people on this planet are infected with Mycobacterium tuberculosis. Most of them live in sub-Saharan Africa, India, Southeast Asia, or Russia, but infected immigrants arrive daily in the United States.

M. tuberculosis is usually transmitted through the air, localizing in the lungs, but the organism can also enter the body by ingestion or through broken skin, causing lesions to develop in the cells it enters. Contagion becomes a particular threat in crowded quarters where the concentration of airborne bacteria is high. In an underdeveloped country with substandard living conditions, one person with active tuberculosis is likely to infect 20 others, while in this country the average is two or three.

The tuberculosis hospitals that had become so much a part of the American landscape all but disappeared in one year, 1954, after a study showed that visiting a sanatorium was more dangerous than keeping a TB patient at home.

Once infected, a person still has only about a five percent chance of developing active disease within five years. Those who do not are not necessarily out of the woods, however. Another five percent will develop active disease more than five years — perhaps, like Eleanor Roosevelt, even 50 years — after initial infection, although experts believe that many of these cases are due to reinfection rather than to reactivation of an old infection.

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second group of mice was infected with the fully virulent wild type of *M. tuberculosis*.

The investigators found that the lack of the ICL gene did little to hamper bacterial growth during the first two weeks of infection, when the bacteria were actively growing and dividing. During the course of the chronic period that followed, however, the mutant strain of bacteria was eliminated progressively from the lungs while the wild-type strain maintained its peak load for the duration of the 16-week study. In addition to being unable to sustain an infection, the mutant strain was also less virulent than the wild type.

Russell and colleagues then examined this finding from another angle by using the ICL mutant strain to infect mice in which the gene for gamma interferon had been "knocked out", or removed, during early embryonic development. Because these knockout mice lacked the ability to produce gamma interferon, their immune systems were unable to activate macrophages and therefore to send the tuberculosis infection into remission. As expected, the lack of ICL no longer influenced the virulence of the altered bacteria in these mice, confirming that the effect of the mutant bacteria was dependent on the state of the host immune response.

The majority of tuberculosis organisms in the world exist within latent infections that, by virtue of the vegetative state of the bacteria, are poor targets for the antibiotics used routinely to treat this disease. The demonstration that ICL promotes this state of affairs makes it a prominent target for drug design. Russell's group, in collaboration with Jim Sacchettini at Texas A&M University, has already solved the three-dimensional structure of the ICL enzyme of *M. tuberculosis* and is now focused on developing ICL inhibitors with the potential to eradicate persistent bacteria. Success in this work could have major impact on a disease that has molded human evolution over the past 30,000 years.

**A disease for the ages**

Tuberculosis is an ancient scourge. Tubercle bacilli have been isolated from 3,000-year-old mummies of Egypt and Peru, and the hunchback deformity characteristic of tuberculosis of the spine appears frequently in Egyptian art beginning from predynastic times. David Russell speculates that tuberculosis has been infecting human beings for 30,000 years.

Russell and other experts believe that the cause of early human tuberculosis was *Mycobacterium bovis*, the bacterial species that infects cattle and wild ruminants such as deer and elk, and that the human organism *M. tuberculosis* evolved as an off-shoot of *M. bovis*. Spinal deformity is not typical of the disease caused by *M. tuberculosis*, but it is a common feature of human disease caused by *M. bovis*. The hunchback of Victor Hugo's imaginary Notre Dame would likely have acquired his deformity in early childhood by drinking infected raw milk. The advent in the twentieth century of pasteurization and aggressive TB eradication practices in dairy herds substantially reduced the incidence of
David Russell has a PhD in biology from the Imperial College of London University, and comes to Cornell from Washington University School of Medicine, where he held the post of professor of molecular microbiology. Prior to that appointment he was an assistant professor of pathology at New York University Medical Center. In 1994 Russell received the Burroughs Wellcome Scholar Award for Molecular Parasitology.

bovine tuberculosis in both humans and cattle, but reinfection from wildlife remains a serious agricultural problem.

Robert Koch, the German scientist who isolated *M. tuberculosis* in 1882, maintained that the diseases of cattle and humans were caused by the same organism. It was Theobald Smith, a microbiologist who had studied under James Law and other original members of the veterinary faculty at Cornell, who established in 1895 that *M. bovis* is a separate species distinct from *M. tuberculosis*.

How an individual responds to tuberculosis infection depends on age, living conditions, heredity, and general health. Populations with long exposure to tuberculosis are much more resistant to disease than naive populations, such as the native Americans who first encountered the germ after being forced into crowded conditions on reservations. Within any given population heredity also accounts for individual differences in immune response. Some people die within months of being infected with TB; most who develop disease recover, even without antibiotic therapy. Some live long lives punctuated by a chronic, intermittent course of disease; the vast majority successfully contain the infection, never developing clinical symptoms at all. Only those with an active infection are contagious.

As the phenomenon of reinfection suggests, there is no resistance to tuberculosis infection. Resistance comes into play only after infection, in the body's ability to contain the organisms. This is accomplished through the formation of tubercles, or granulomas, clumps of macrophages and other immune cells that encase the bacteria at the site of initial infection. By sealing off the bacteria from their air supply, these granulomas inhibit replication of the organism. Over time the granulomas may calcify, leaving the characteristic lesions, readily visible on X-ray, that inspired the term "white plague".

A highly specialized sub-class of white blood cells called CD4+ T-lymphocytes directs the complex immune response that keeps *M. tuberculosis* under wraps. The great majority of tuberculosis infections remain latent for the lifetime of the infected individual, but this balance can be upset by subsequent challenges to the immune system, including reinfection with *M. tuberculosis*. If the immune system is compromised by drugs or diseases that act to suppress the immune system, the granulomas can burst and spill their contents into the surrounding tissues or, worse yet, into the blood stream. The odds of surviving systemic tuberculosis without antibiotic treatment are only about 50-50.

After peaking in the developed world in the nineteenth century, the incidence of disease caused by *M. tuberculosis* began a gradual decline consistent with the slow rise and fall of disease that has been noted over many centuries. By the 1970s the disease was widely assumed to be waning into insignificance. Then came AIDS.
Safe by Design

Research on a pathogen such as *Mycobacterium tuberculosis* requires the use of specialized facilities that remove the risk of infection to both the investigators and all people in the vicinity. The bacterium will be handled in a Biosafety Level-3 laboratory specially designed and constructed by Paul Jennette, the college's biosafety engineer. Jennette, who has a BS in civil and environmental engineering from Cornell and an MS in environmental engineering from the University of Massachusetts, is applying specialized training that he received from the Centers for Disease Control and the American Biological Safety Association to ensure that the Russell laboratory meets and exceeds the current standards for this type of facility.

The six postdoctoral associates and one technician who accompanied Russell in his move from Washington University to Cornell are all experi-

"Before opening the facility we will test the performance of the suite, its equipment, and the control system not only for normal conditions but for every conceivable failure mode."

Paul Jennette models the protective clothing required for work in a BL-3 laboratory. The container he is holding guards against accidental spills of bacteria in the centrifuge.
enced in working with the tuberculosis organism in a BL-3 facility. The laboratory suite created for their use within the Veterinary Medical Center is the first BL-3 facility on the main campus of Cornell University and has been constructed to ensure containment of the organism. “Through a combination of practices, protocols, and facilities, we are putting multiple layers of protection between the people who work in (and outside of) the lab and the agents that they are working on,” says Jennette.

In addition to primary containment measures, the laboratory suite itself will provide secondary containment, and is designed to be fail-safe. The BL-3 facility is maintained under negative pressure and all vented air passes through several tiers of specialized filters prior to release. Investigators wear disposable outer garments and conduct all manipulation within an airflow cabinet. All material leaving the facility is autoclaved in a through-the-wall autoclave that opens to both the BL-3 lab and its anteroom.

All of the design features of the laboratory will be tested during a rigorous commissioning program, both at the completion of the renovation project and annually thereafter. “Before opening the facility we will test the performance of the suite, its equipment, and the control system not only for normal conditions but for every conceivable failure mode,” says Jennette. “We are going well above and beyond the minimum requirements for a BL-3 facility to make sure that any organisms stay put.”

Four years after AIDS was first described in the United States in 1982, some doctors began to note an association between tuberculosis and AIDS in their patients. It soon became apparent that TB was a major complicating factor for AIDS patients, and it has since been learned that the first immune cells to come under attack from the human immunodeficiency virus – HIV – are the CD4+ lymphocytes that direct the immune response against TB.

Physicians treating drug addicts in New York City observed in the late 1980s that infection with HIV increased tenfold the risk that active tuberculosis would develop from a latent infection. Both the real and relative numbers of active tuberculosis cases are expected to change drastically as AIDS continues to ravage sub-Saharan Africa and spread across Asia.

In another five years new cases of tuberculosis are projected to number nearly 12 million, and deaths to rise nearly 40 percent. The toll is expected to be particularly devastating in Central Africa.

So, what about treatment? There are several antibiotics that are effective against most active cases of tuberculosis. The first and best of these is Isoniazid (also known as INH), which has been in use since the early 1950s. Isoniazid gets very high marks in terms of efficacy, safety, and cost, but INH-resistant TB strains first developed within just a few years of its introduction. Indeed, in any infected person, one in 10,000 TB germs will be resistant to any given treatment, and the problem of drug resistance is rapidly growing more serious.

To address the problem of drug resistance, Isoniazid is used in combination with two or three other drugs for the first month or two of treatment, rapidly killing most bacteria. Then follow several more months of treatment, usually with Isoniazid and one other drug. Cure is normally achieved within six months, but failure to complete all treatment leads to relapse.

Such a regimen is tedious enough for an informed and cooperative patient with access to high-quality medical care, but affording the drugs and ensuring compliance with treatment is all but impossible in impoverished countries that lack a basic infrastructure. Unfortunately, these are the same countries where the incidence of disease is highest.
Veterinarians Linda and Jim Peddie have been partners in life since shortly after graduating with Cornell's DVM class of 1965. In 35 years of practice in Thousand Oaks, California, they have had their share of special patients, ranging from movie animals and television celebrities to Jim Peddie's diverse charges at America's Teaching Zoo, a facility connected to Moorpark College's Exotic Animal Training and Management Program. Although one might be impressed to learn that Jim treats Hollywood types like Moose (a.k.a. Eddie, the Jack Russell terrier of Frasier fame), the award for most dramatic contribution to veterinary medicine easily goes to the Peddies' efforts to stem an outbreak of tuberculosis within a small group of trained elephants.

The trouble started in 1996 when an ailing Asian elephant from another herd was allowed on the premises of Have Trunk Will Travel, a business that provides trained elephants for movies and commercials. The visiting elephant died and was discovered upon necropsy to be riddled with tuberculous lesions. Within the same month another Asian elephant from the visitor's home herd also died of TB.

The challenge then became to determine whether any of the elephants from Have Trunk Will Travel had been infected, and if so, how to treat them. The Peddies were fortunate in that the owners of the business, Gary and Kari Johnson, were willing to do absolutely anything necessary to ensure the safety of their elephants. Unfortunately for the Peddies and the Johnsons, however, the only guidelines for diagnosing and treating TB in wild animals were aimed at controlling Mycobacterium bovis, a separate species of tuberculosis that infects bison, deer, and elk in addition to domestic cattle. Tuberculosis control in those animals consists of slaughtering any that are infected. Clearly this was not an approach to consider using in an endangered species – not to mention in individuals as adored and superbly trained as the Johnsons' elephants.

It has been known for at least 2000 years that elephants – and Asian elephants in particular – are susceptible to tuberculosis. Elephants get the same kind of tuberculosis as humans, and Linda Peddie regards humans with active TB as a much greater threat to elephants than diseased elephants are to humans. Whereas humans transmit the TB bacillus through coughing and sneezing, elephants do not sneeze, avers Dr. Peddie, and almost never cough. “There is not going to be an aerosol transmission from an elephant,” she says, “but elephants are constantly sniffing with their trunks – that's what they do. They're going to pick up any germs that are around them.” An ele-

**Elephants get the same kind of tuberculosis as humans, and Linda Peddie regards humans with active TB as a much greater threat to elephants than diseased elephants are to humans.**
phant that is actively infected and shedding organism can, of course, transmit the infection to another elephant.

Linda Peddie suspects that most of the elephants that turn up with the disease in this country are infected before being exported from Southeast Asia, a region rife with tuberculosis. Ironically, she considers it most likely that the devoted handler who remains in intimate proximity to the animal both day and night — might end up infecting his sacred charge.

Following the diagnosis of tuberculosis in the two Asian elephants who died in 1996, an Elephant Tuberculosis Advisory Panel was formed. This panel worked with the USDA, APHIS Veterinary Services, and the National Tuberculosis Working Group for Zoo and Wildlife Species to establish a protocol for testing elephants for TB. Veterinarians and managers associated with six captive herds in the United States cooperated in the study. The elephants of Have Trunk Will Travel were one of the six herds studied.

The Peddies found that the tuberculin skin test routinely used in humans, cattle, and wild ruminants was "absolutely useless" in elephants. After experimenting with this method and with the blood test used in deer, they hit upon a method that has become the new standard for diagnosis of TB in elephants — trunk washing. This is a method of collecting cells from the mucosal surface lining the trunk from which the tuberculosis organism can be isolated.

"You can only do this with a trained elephant," Linda warns helpfully. The technique entails shooting a saline solution into one nostril of a well-washed trunk. "Then you hold up the end of the trunk and slosh the liquid around, and have the elephant blow it into a gallon Ziploc® bag."

Having cleared the diagnostic hurdle and learned in the process that two of the Johnsons' Asian elephants were infected, though not apparently ill, the Peddies turned to the matter of treatment. Before it was even possible to test the efficacy of an antibiotic regimen, the study participants had to be able to deliver a controlled dose. The simplest way to ensure proper absorption was found to be by giving the dose orally. This doesn't sound like a problem, but elephants don't like the medicine, which can make them colicky, and getting an 8000-pound animal to eat something she doesn't like is a trial of another magnitude.

"It was a learn-as-you-go kind of thing," Linda Peddie recalls, "and I continued on page 21
Evolution has created some strange coincidences. Gregory Acland, BVSc, a senior research associate in the Inherited Eye Disease Studies Unit of the James A. Baker Institute for Animal Health, has been investigating one of the most unlikely and fascinating genetic parallels of man and dog—an inherited day-blindness that strikes Alaskan malamutes and, of all people, certain Irishmen and a group of Pacific Islanders called the Pingelape.

In malamutes, the disease goes by the appropriately colorless name of cone degeneration, or cd. In humans the clinical term is achromatopsia, a reference to the total absence of color vision that accompanies the condition. In Micronesia, the locals call it maskun ("no-see"); Westerners call their condition Pingelape day-blindness. In any language, the lack of retinal cones, the color-vision cells that make it possible to see in bright light, makes sunlight overwhelmingly bright to the unaffected rod cells, which are intended for vision in dim light.

Interestingly, though, day-blind people have a highly enhanced ability to appreciate the nuances of the night. Their lack of cones clears the way for their rods to take in the full beauty of the stars in a way that the rest of us cannot experience.

As luck would have it, the achromatopsia mutation survived, too. In the very limited gene pool from which the subsequent population could draw, the number of carriers, and then affected people, proliferated rapidly. Over 30 percent of modern-day Pingelape are carriers of the achromatopsia mutation, and somewhere between four and ten percent of the population are affected. What nature did with random indifference to the Pingelape gene pool, humans have done with great care and good intentions in artificially selecting pairs of dogs for breeding. Many dog breeds were established from similarly restricted gene pools, and particularly desirable stud dogs are often used in a highly disproportionate number of matings. Hence the very high number of autosomal-recessive diseases that segregate with individual dog breeds—much to the chagrin of dog breeders and owners, but much to the benefit of science.

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Courtesy of American Kennel Club
With people greeting their pets before their spouses and spending $800 on dog beds, animals aren’t what they used to be.

Neither are veterinarians.

Melanie King’s patient has big green eyes, two worried parents, and a history of intestinal troubles. It’s a Wednesday morning in February, and the Tompkins County couple have brought their baby to Cornell for a check-up before they migrate south for the rest of the winter. “She definitely looks happier and healthier,” King says, lifting the shy ten-pounder onto the exam table to take her temperature, check her lymph nodes, and palpate her belly. When she’s done, she asks Dr. Bill Hornbuckle to come in for a second look. “All right, let’s feel your tummy again,” he tells the skittish patient. When he’s finished, he and King go outside for a conference. “Maintain your gentle, sympathetic self,” Hornbuckle tells his student. “But I think you have to promote the idea that you’re concerned.”

The final recommendation: consider postponing the trip, come in for another exam in a day or two – and watch to see if she uses the litterbox.

It’s a typical day at the Cornell University Hospital for Animals, a state-of-the-art facility off Tower Road that treats more than 13,000 pets each year. These aren’t just check-ups and rabies shots; the hospital performs hip replacements and kidney transplants, chemotherapy and CAT scans, generating $5 million in annual revenue. Procedures that were once the province of human medicine have become veterinary standards. Dr. Rob Gilbert started practicing in 1977. Back then, he says, “there was still a very clear limit. A pet was a pet. There was a very clear boundary of what you’d do.” Jump ahead to the year 2000, when the vet college’s associate dean for clinical programs and professional service is having his ten-year-old golden retriever, Buster, treated for lymphoma. “Not too many years ago,” says Gilbert, “I would have scoffed at the idea that I’d have a dog of my own in very sophisticated, expensive chemotherapy.”

It used to be that a badly injured horse got either a bullet or a lethal injection. Now, Gilbert says, “we fix broken legs in here every week.” Dogs get braces and orthopedic surgery. Cats with tooth tartar are anesthetized for a thorough cleaning. Animals with separation anxiety get behavioral counseling or a daily dose of Clomicalm, the veterinary answer to Prozac.

Standing beneath a TV monitor, Dr. Todd Deppe is watching a student examine a Shih Tzu whose extreme musculature may indicate Cushing’s disease. “That Shih Tzu feels like a Great Dane,” he says. A few minutes later, he’s called in to consult with third-year student Sarah Cazabon on another case: an eight-year-old Siamese with an injured tail. “He’s got a small lesion on the tip of his tail,” Cazabon tells Deppe. “He’s got good mobility. It doesn’t feel like there’s a fracture.”

“Just tell her to rest the tail,” Deppe says once he’s examined the cat. Then he stops and smiles. “But how do you rest a tail, really?”

Cornell awarded the nation’s first DVM degree in 1876, to Daniel Salmon 1872, who would eventually discover the Salmonella pathogen; the
veterinary college itself was founded 18 years later. In 1957 it moved from its original location, at the corner of East Avenue and Tower Road, to its present 15-acre campus, the nation’s largest. Facilities include the new Veterinary Medical Center, which tripled the school’s clinical capacity when it opened in 1996. In addition to the patients seen in the Companion Animal Hospital, Cornell treats more than 2,500 horses and agricultural animals each year. Another 40,000 are seen on nearby farms through the vet college’s ambulatory service.

With only 31 veterinary schools in the U.S. and Canada, it’s as hard to get into a vet program as a med school. Cornell’s is one of the most competitive, with 15 to 20 applicants for each spot; according to admissions director Joe Piekunka, its applicants have the highest GPAs and GRE scores of any school. Of the 80 spaces in each class, 60 are reserved for New Yorkers. The odds of an in-state applicant getting in are one in five; for others, it’s one in 60. About 90 percent of those offered admission decide to enroll.

Once enrolled, Cornell students follow a curriculum that turns the old pedagogical system on its head. “We went from a very teacher-centered style to one that was very student-centered,” says dean Donald Smith. Lectures have been replaced by small groups of students working with a professor, studying real-life cases. “This is a very different approach to medical education,” assistant dean for learning and instruction Katherine Edmondson, PhD ’89, says of the curriculum, which Cornell pioneered in 1993. In the spring of their third year, vet students begin clinical rotations that continue until graduation, three semesters later. “We play doctor here, like in the real world,” says third-year vet student Dennis Leon ’97. “But the support we have here isn’t the real world, because we won’t have these experienced doctors to run to.”

Leon is catching up on paperwork from the previous day’s patients. On a shelf above his head are five TV monitors, each showing an exam room. Students are videotaped as they interact with patients, and the tapes reviewed as a teaching tool. “It prepares you to think like you’re going to have to in practice,” Leon says. “You have to solve problems, instead of just rote memorization. They make you apply your knowledge right from the beginning.”

Doctors Treat More Than One Species.” That broad perspective is hammered into vet students from day one; even those convinced they want to practice large-animal medicine are required to study ferrets and parakeets. “It’s a generalist curriculum,” says Edmonson. “They can’t specialize in one thing at the expense of something else.” Douglas Aspros, DVM ’75, who is president of the Westchester County board of health, notes that the focus on comparative medicine makes vets “terribly well grounded in a variety of health issues.”

Case in point: on a Friday afternoon, veterinary lecturer Noha Abou-Madi returns to campus after delivering a baby elephant at the Syracuse zoo and is promptly called in to X-ray an anorexic rabbit. What might have been a tumor turns out to be an infection. Two days of antibiotics later, the rabbit is ready to go home – and Abou-Madi is working on a Quaker parakeet who’s having trouble breathing. After using tape to secure the bird to the table, she and her aides rush out of the room and snap the X-rays. Then she turns her attention to helping intern Audrey Yu-Speight examine a sugar glider, a tiny marsupial kept as an exotic pet. The animal is lethargic and breathing rapidly. “They have a very fast metabolism,”
Yu-Speight explains as she wraps it in a cloth and nests it into a dogfood bowl as an ersatz bed. "By the time we see them they're pretty ill, like this one." Sure enough, the animal dies before the X-rays are finished, and the body is sent to the autopsy lab. It's up to Yu-Speight to return the empty cage to the owner, who stares at the ground and thanks her for trying.

A few minutes later, she consults with third-year Anthony Fischetti '97 about a call from the owners of a seven-year-old sheltie. The dog had chemotherapy four days before and hasn't eaten since. "Oh, boy. Poor baby," Yu-Speight says as she examines the chart. "This dog has extremely severe lymphoma." They decide that there's no point in having the owners drive the dog from Syracuse. "I'm going to tell them to baby her as much as possible," Fischetti says.

Half an hour later, in the midst of an ice storm, the spaniel arrives with the elderly owner and her three daughters. "Guys, our dog's here," Yu-Speight says, and they rush out to the icy parking lot. Badalamenti forgoes the gurney and carries the 40-pound dog inside, wrapped in a blanket. Fischetti stays with the family to take a medical history, while Badalamenti and Yu-Speight rush the dog back to ICU.

"Her mucous membranes are very pale," he says. The dog's temperature is high, 104, and a tech brings in a fan to cool her off. "It's all right, puppy," Badalamenti says as he holds an oxygen mask over her face to help her breathe. "It's all right, sweetie." Yu-Speight gives her a shot of vitamin K, in case she has liver disease or has ingested rat poison. A tech inserts a catheter in the dog's hind leg and takes a blood sample. Yu-Speight is shaking a vial of blood. It's not clotting properly. "We need fresh, whole blood," she says, and goes out to talk to the owners.

The four women are sitting in a consultation room, tears in their eyes. Yu-Speight shakes hands with each of them, then sits on the only available piece of furniture, a small coffee table. "She's pretty critical. She could arrest at any moment," she tells them, then asks if the dog might have eaten rat poison. The owner says it's impossible. "That's too bad," Yu-Speight says, "because it's the best thing I could hope for." She explains the dog's probable condition, known as IMHA. "Honestly, it's not going to be easy. There's nothing simple I can do to stabilize her. She looks quite bad. She could die tonight, despite everything I do. What we're doing is racing, trying to get the blood into her before she destroys so many red blood cells that she can't live anymore."

continued on page 14
With only 31 vet schools in the U.S. and Canada, it’s as hard to get into a vet program as a med school. Cornell’s is one of the most competitive, with 15 to 20 applicants for each spot; according to admissions director Joe Piekunka, its applicants have the highest GPAs and GRE scores of any school.

“Will she ever be well?” the white-haired woman asks. “If she lives, will she have a good life?”

“If we can catch this disease, she might,” Yu-Speight says. “I think we need to be aggressive. But if she starts to suffer, we have to stop.”

Yu-Speight offers the family a chance to spend some time alone with the dog, to decide whether or not to treat her aggressively. “This dog worries me,” she tells Badalamenti back in ICU. “She could die tonight. I want them to think about euthanasia as an option.”

They wheel the cocker spaniel down the hall and into the consultation room. “She looks so much better,” the owner says. Yu-Speight nods. “She’s really liking the oxygen.”

One of the daughters starts to cry and rushes out of the room, followed by...
her sister. "You’re a good dog," the elderly woman says, petting her and leaning down to kiss her head. "Yes, you are. You’re my baby. She’s my ears, you know," she says as Yu-Speight and Badalamenti leave the room. "I can’t hear so well, and she barks whenever there’s a noise, whenever someone comes to the door."

In the lab, the doctor and her two students look at the dog’s blood under a five-headed microscope — and get some good news when they see a number of nascent red blood cells. “There are lots of platelets. This is looking a lot like IMHA,” she says, ruling out another disease that would have been a death sentence. “This dog’s fighting. She’s trying like hell to regenerate.” She goes back in to tell the family.

“Now, I at least feel like there’s some hope,” the owner says with a little smile. The new estimate for treatment, including a transfusion from a volunteer blood-donor dog: $1,800. The woman kisses the dog again, and hands over her Visa.

Aspros likens the relationship between vet and client to that of pediatrician and infant. Both doctors see patients who can’t communicate verbally; to treat them well, they have to establish a relationship with the caregiver — be it a child’s father, or a woman wearing a $45 sweatshirt that says DOG GRANDMA. “If you’re a vet or a pediatrician” says Aspros, “you’re taking care of somebody’s baby.”

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**Vets and the Human Animal**

In the twenty-first century, vets are as involved in human health as they are in animal welfare. They monitor food safety, such as the quality of eggs and milk. They serve as expert witnesses in criminal trials. (Cornell veterinary toxicologist Jack Henion was scheduled to testify in the O.J. Simpson trial, but his appearance was cancelled when Judge Lance Ito decided he’d heard enough science.) Cornell researchers are looking at the effect of wild and domestic animals on the New York City watershed. They’re studying pets on Native American reservations as “disease sentinels” for cancer and immunological disorders that may be caused by environmental factors. "Their dogs don’t smoke. They don’t drink. They don’t do other risky behaviors," says Cornell vet Rob Gilbert. "That makes them better sentinels than humans are."

For the Bronx Zoo’s Tracey McNamara, DVM ’82, large numbers of dead crows were a warning sign that a disease could be threatening the exotic bird collection. "It was unusual to have a single species die off like that," McNamara told Newsweek.

"Something was obviously going on." Sure enough, a bald eagle, a cormorant, a snowy owl, and some flamingoes died. Her tissue dissections indicated an unknown kind of encephalitis. Meanwhile, several elderly people in the New York metropolitan area had been diagnosed with what was assumed to be St. Louis encephalitis. Within weeks, McNamara’s work led to the discovery that the West Nile strain of the virus, never before detected in the Americas, was the real culprit. Extensive pesticide spraying temporarily halted the outbreak.

Research now being conducted at the vet school has applications to a host of human diseases, including hepatitis, liver cancer, muscular dystrophy, Lou Gehrig’s disease, diabetes, and AIDS. Across campus at the Baker Institute, located atop a knoll near East Hill Plaza, research into canine osteoarthritis could help alleviate human suffering. Work on an animal eye disease may lead to treatments for retinitis pigmentosa in humans. Research into equine fetal health is supported both by horse breeders and the NIH, since it may offer insight into human pregnancy. “Virtually every project we have has some relevance to human medicine,” says Doug Antczak ’69, the institute’s director, “even though it’s rooted in an important veterinary problem.”
Rodney Dietert Named Director of BCERF Program
By Roger Segelken, Cornell University News Service

Rodney R. Dietert, professor of immunotoxicology in the College of Veterinary Medicine, has been named director of the Program on Breast Cancer and Environmental Risk Factors (BCERF) at Cornell.

He replaces June Fessenden-MacDonald, founding director of the program that addresses the relationship between environmental risk factors and breast cancer through a variety of research and education strategies. Fessenden-MacDonald is retiring from the university as an associate professor of molecular biology and genetics.

Dietert was director of the Institute for Comparative and Environmental Toxicology in the Cornell Center for the Environment when BCERF was founded in 1995 and became affiliated with the toxicology unit. He is a specialist in the effects of toxic substances on the immune systems of humans and other animals.

BCERF has a program staff of eight, and draws on the expertise of faculty and staff members of Cornell’s colleges of Agriculture and Life Sciences, Arts and Sciences, Human Ecology, and Veterinary Medicine, as well as New York Weill Cornell Medical Center and Cornell Cooperative Extension.

The program works to translate research into everyday life by performing critical evaluations of new studies on the relationship of breast cancer to diet and to pesticides and other chemicals. BCERF also seeks to enhance communication among science and health professions while facilitating statewide discussion among citizens, health professionals, lawmakers and others concerned with reducing the risks of breast cancer. Research and outreach information can be found at the BCERF website: http://cfe.cornell.edu/bcerf/.

Dietert, who assumed the BCERF directorship on July 17, praised Fessenden-MacDonald’s leadership in developing a program “that reflects the very best attributes of Cornell University. BCERF, he said, “is committed to promoting gap-filling research on breast cancer and has pursued an aggressive outreach effort consistent with the land-grant mission of Cornell. The novel multi-media program to deliver research results to those who need them most has empowered individuals and families to make informed decisions in efforts to reduce health risks.”

The new director said the next phase of the program will see BCERF becoming even more proactive in facilitating new research geared to understanding common environmentally linked mechanisms for breast cancer and related diseases. Dietert said BCERF will help bring new research faculty to the university through the formation of department and college partnerships.

“Because many of the environmental risk factors and physiological issues surrounding breast cancer are also important in other diseases, such as prostate cancer, BCERF will gradually expand its research and outreach efforts to include breast cancer-related diseases,” Dietert said.
The Diagnostic Laboratory of the College of Veterinary Medicine at Cornell has been designated as a surveillance site for West Nile virus (WNV) in animals by the New York State Department of Agriculture and Markets and the state Department of Health and has agreed to provide surveillance and diagnostic testing services.

Blood serum, whole blood, and tissue samples from domestic animals and wild animals will be submitted by public-health officials and veterinarians across New York state for screening at the Cornell laboratory. (Testing for the virus in human samples is conducted at a separate laboratory near Albany run by the state Department of Health. In the course of its normal activities, the Cornell University Hospital for Animals will provide services to owners of domestic animals with possible or suspected West Nile virus disease.) The WNV testing program at the Diagnostic Laboratory, which is the official state diagnostic center for animal disease control for the state of New York, is supported, in part, with funding from the state Department of Agriculture and Markets.

“The West Nile virus program is one way the College of Veterinary Medicine can contribute to public health missions within the state,” explained Robert O. Gilbert, associate dean for clinical programs and professional service. Noting that the new program will help public health authorities track the movements of WNV within the state, Gilbert added: “Of course, we are very much concerned for the health and welfare of animals that may be exposed to this virus. But this testing service illustrates the key role of veterinary medicine in comprehensive public-health programs.”

Beginning in the summer of 1999, a disease previously undiagnosed in the United States was first noted in the New York metropolitan area in wild birds, particularly crows, and in zoo animals. More than 60 people in the New York area were sickened and seven died before cold weather ended the “mosquito season.” The virus responsible for the disease was isolated at the National Veterinary Services Laboratory in Ames, Iowa, from avian tissues submitted by Tracey McNamara, D.V.M., a 1982 graduate of Cornell who is now a staff veterinarian at the Wildlife Conservation Society’s Bronx Zoo. Following virus isolation, the organism was positively identified as West Nile virus by the Centers for Disease Control in Atlanta and Fort Collins, Colorado.

Results of WNV tests at the Cornell laboratory will be reported back to authorities who referred samples and not directly to the general public or the news media, according to Diagnostic Laboratory director Donald H. Lein. “That has always continued on page 21.
New Cat-Book Author's Muse is Dr. Mew

By Roger Segelken, Cornell University News Service

If the new book from the director of Cornell's Feline Health Center reads like "What Your Cat Wants You to Know about Kitty Care," that's not surprising. Author and veterinarian James R. Richards had lots of inspirational help with the ASPCA Complete Guide to Cats from one of the best-cared-for cats in the country: his purring office mate, Dr. Mew.

"You'd be surprised what a cat in the lap, yearning to be scratched, does for writer's block," said Richards. "I couldn't have done it without him," the author reveals about the book, which is subtitled "Everything You Need to Know About Choosing and Caring for Your Pet."

Lacking the DVM degree of the author-of-record, the muse-like Mew keeps a low but wide-tracked profile in Cornell's College of Veterinary Medicine. The black-and-white "domestic shorthair" (a fancy name for non-purebred cats, which make up more than 90 percent of America's feline population, according to the book) seldom ventures from the Feline Health Center offices.

To stray from the center — the college's research and education unit for cat owners and veterinarians who care for feline patients — would be to risk capture and rebuke, Dr. Mew seems to know. Pet animals of any kind are strictly forbidden in college buildings, but the wily Dr. Mew has slipped through a regulatory loophole.

"We managed to get him classified as an 'educational exhibit'," Richards said as Dr. Mew rubbed a display rack of center-published educational brochures with titles like "Gastrointestinal Parasites of Cats" and "Inflammatory Bowel Disease."

Such medical topics are addressed in the new book, although without quite as much technical detail as in another publication from the veterinary college, The Cornell Book of Cats. "I've tried to make this book accessible and user-friendly for the majority of cat owners and would-be cat people," Richards said, noting that the guide begins with a frank discussion, "Are You Ready for a Cat?"

Readers who decide they are cat-ready — but can't decide which breed to choose — learn the advantages of domestic shorthairs, such as healthfulness ("a broad genetic background that makes hereditary problems relatively unlikely") and price ("usually inexpensive, or even free") as well as the attributes and disadvantages of the other five percent of cats, the purebreds. In fully illustrated coverage of 50 breeds, ranging alphabetically from Abyssinian to York Chocolate, the author notes which are good with children, talkative, or high-energy lap cats, or have special grooming needs. The leopard-like Bengals, for example, are high-energy animals that will "find their own toys if none are provided," but also are prone to a breed-related eye condition called entropion, which may require corrective surgery, according to the author.

Other sections cover "What Makes a Cat a Cat?" with reviews of feline anatomy, heart and lungs, digestive and urinary systems, reproduction, skin and coat, and the senses, including an explanation for a bizarre cat expression that puzzles many owners,
the so-called flehmen response. When a cat lifts its head, wrinkles its nose, and partially opens its mouth while curling its lips, the authors observe, the animal is trying to smell another cat through the vomeronasal organ, the pouchlike structure in the roof of the mouth.

Also covered are everyday care of the cat, including feeding, grooming, playing, solving behavior problems and traveling; as well as cat health concerns such as viral diseases, urinary tract disorders, and cancer; and feline first aid. Yes, it is possible to give mouth-to-nostril resuscitation to a cat that isn't breathing, Richards says, and he gives step-by-step, not-to-panic directions for the lifesaving maneuver.

As a cat's life approaches a natural end, advice is given on the special needs of the geriatric feline. Human psychological needs are not ignored, either, with a list of quality-of-life considerations when euthanasia is the humane resolution for a cat's terminal illness. Helped to cope with the loss of a beloved cat, readers are advised on the next question: When – if at all – to adopt again? “Do whatever feels right to you and your family,” Richards counsels. “A new cat will bring laughter and companionship into your home. When you are ready, there is a cat waiting to share his life with you.”

“I like these critters, I truly do,” veterinarian Richards said. “I hope my high regard for kitties comes through in the book. It's really a celebration of cats.”

Meanwhile, Dr. Mew is celebrating lunchtime. Like too many American cats, the rotund feline is battling a weight problem. The reasons to avoid obesity, such as an increased likelihood of feline diabetes, and the solutions are right there in the ASPCA Complete Guide to Cats (pages 234-239), almost as if muse Mew had inspired them.

Book Celebrates the Art and Science of Veterinary Medicine at Cornell

Cornell's College of Veterinary Medicine has published a limited-edition portfolio-book documenting the state of the art and science of veterinary medicine at Cornell at the threshold of the new millennium. Covering the college's activities in veterinary and graduate education, clinical medicine, veterinary and biomedical research, and public health, Beyond Traditional Boundaries: Veterinary Medicine at Cornell in the Twenty-first Century explores issues and trends in the field from the perspective of the number-one veterinary college in the country. In keeping with the spirit of its subject matter, it is designed not as a traditional, bound book but as a diverse collection of essays, photographs, illustrations, and feature stories gathered up in a beautiful, red-cloth-bound box.

The book incorporates the contributions of the college's millennium committee, executive staff, faculty, alumni, students, and staff. Writing is by Jeri Wall and Jeanne Griffith, associate and assistant directors of college communications. Art direction and design are by Phil Wilson, principal commissioned photography by Dede Hatch, and principal commissioned illustration by Bill Benson. The book also includes photographs by members of Cornell University Photography and by Alexis Wenski-Roberts of the college's Image Lab. Additional illustration was provided by Michael Simmons, medical illustrator in the college's office of educational development. Communications assistant Amanda Mott provided invaluable production assistance.

Beyond Traditional Boundaries is available for purchase through the Office of Public Affairs, the Cornell Campus Store, and the Statler Hotel gift shop at a price of $65. The Office of Public Affairs can ship the book to any address in the continental United States for an additional charge of $5.50. Payment can be made by Visa, MasterCard, cash, or a check made payable to Cornell University College of Veterinary Medicine.

To order at your convenience, contact the college's Office of Public Affairs, Box 39, Schurman Hall 3-005, College of Veterinary Medicine, Cornell University, Ithaca, NY 14853-6401; phone: (607) 253-3744; fax: (607) 253-3740; email: cvmopa@cornell.edu.
Baker reaches milestone

The college's James A. Baker Institute for Animal Health celebrated the fiftieth anniversary of its founding with an early-October reunion of former graduate students, research scientists, and staff. The event culminated in a half-day scientific symposium given by three leading representatives of the fields of genetics and immunology, two areas of focus in Institute research.

The symposium featured scientific luminaries Dr. Claire Fraser, president and director of The Institute for Genomic Research; Dr. Peter Doherty, chairman of the Department of Immunology of St. Jude Children's Research Hospital and the only veterinarian to be awarded the Nobel Prize, in medicine; and Dr. Jorge Galán, professor and chairman of the Section of Microbial Pathogenesis of the Boyer Center for Molecular Medicine at Yale University.

The Baker Institute, which began life as the Veterinary Virus Research Institute and was renamed in 1975 to honor its founding director, has made many notable contributions to the understanding and control of infectious diseases of livestock and companion animals. The research staff of the Institute's Cornell Research Laboratory for Diseases of Dogs, which opened its doors in January, 1951, was responsible for discoveries including the isolation and / or pathogenesis of canine infectious hepatitis, distemper, parvovirus, brucellosis, and others and the development and standardization of several canine vaccines and diagnostic tests. Beginning in the late 1970s, the Institute's entrée into molecular studies of immunology and infectious diseases and of genetics and developmental biology has yielded significant findings relating to canine and related parvoviruses, inherited eye diseases, osteoarthritis, equine reproduction, and more.
Sharing Life’s Little Challenges

have to give Gary and Kari Johnson a lot of credit for hanging in there. They tried absolutely everything they could think of to hide the drug in food the elephants love – bread, chocolate sauce, melon... Everything they tried worked once, and the next time the elephant wouldn’t look at it. When they tried the melon the second time, the elephant took it, dropped it on the ground, and stomped on it. Using a bite block, Gary Johnson trained his elephants to accept oral medication by direct-dose syringe. The method works well, but only because his elephants are so well trained.

Linda and Jim Peddie appear as second and third authors on the scientific paper describing the study. That article, Epidemiology and Diagnosis of Mycobacterium Tuberculosis in Six Groups of Elephants, will appear in an upcoming issue of the Journal of Zoo and Wildlife Medicine. First author is Susan Mikota, DVM; another contributor to the study was Cornell alumnus Richard J. Montali, DVM ‘64, director of the Smithsonian National Zoological Park.

The Tie that Blinds

“Mapping disease traits is simpler in canine pedigrees than in human families because of the large litter size, short generation time, and the potential to control matings,” Acland explains. According to Acland, cone degeneration is one of more than 350 naturally occurring canine genetic diseases with human equivalents, many of which have no counterpart in any other species.

Acland and his longtime colleague Gustavo Aguirre, VMD, PhD, who is Caspary Professor of Ophthalmology and director of the Center for Canine Genetics and Reproduction at the college’s Baker Institute, collaborate with a group of gene mappers at Fred Hutchinson Cancer Research Center in Seattle that is headed by Elaine Ostrander, PhD. This prolific partnership jump-started the work to map the canine genome, which is proceeding at a very gratifying pace with participation from a number of laboratories.

In their latest coup, Acland, Aguirre, Ostrander, and their colleagues have discovered that the genetic defect that causes cone degeneration in Alaskan malamutes maps to a chromosomal region in dogs that corresponds to the human chromosomal region associated with Pingelapese day-blindness. “In dogs, day-blindness occurs only in the Alaskan malamute, and all dogs have the same mutation,” Acland says. “Because of the rarity of this form of achromatopsia, which, rather than being broadly dispersed in different human families, is only present in a couple of small populations, finding the canine gene in the same region makes it a virtual certainty that the same gene is responsible for the disease in both dogs and humans. The identification of the homology between these two traits underscores the emerging power of canine genomics to aid in the pursuit of the causes of human genetic disease.”

Vet Diagnostic Laboratory

been our policy for tests of any kind and it will be the procedure for West Nile virus tests,” said the chief of the laboratory that performs more than 600,000 tests each year. “Our findings are reported only to the referring veterinarians, to the state veterinarian at the Department of Agriculture and Markets and to public-health officials. Then it’s up to them to release the information, if it is appropriate to do so,” Lein said. He observed that the testing for WNV is a logical extension of the routine efforts of the laboratory, since the virus can cause clinical disease in animals, especially horses.

The Cornell program is prepared to perform one of five kinds of tests, depending on the circumstances: an antibody-capture enzyme-linked immunosorbent assay, an indirect immunofluorescence assay, and a plaque reduction neutralization assay, which detect antibodies in serum, as well as a virus isolation or a polymerase chain reaction test for whole blood and body tissues to detect the presence of virus. All of the tests are used to provide evidence that the virus is present in the geographical area from which the samples were collected. After compiling the data, public-health officials can identify areas where mosquitoes infected with WNV are active, and they can track the geographic movement of the virus.
People, Honors, and Awards

JACK HENION, professor of toxicology and director of the Analytical Toxicology Laboratory, was awarded an honorary doctorate May 26 from the Faculty of Pharmacy at Sweden’s University of Uppsala. Henion was honored at the university’s 400-year-old commencement ceremony for his pioneering work in liquid chromatography / mass spectrometry and related techniques. A member of the Cornell faculty for 24 years, Henion also is the co-founder, president, and CEO of Advanced BioAnalytical Services, Inc. of Ithaca. Henion previously received an honorary doctorate from the University of Ghent in Belgium in 1992.

DONALD LEIN, chairman of the Department of Population Medicine and Diagnostic Sciences and director of the Diagnostic Laboratory, has been elected to a three-year term on the board of directors of the National Institute for Animal Agriculture (NIAA). Formerly known as the Livestock Conservation Institute, the NIAA began its existence on January 1, 2000 with a mission of building consensus and advancing solutions for animal agriculture while providing continuing education and communication linkages for animal-agriculture professionals. Lein also will serve as secretary of the NIAA board of directors.

EDWARD J. PEARCE, associate professor in the Department of Microbiology and Immunology, has received a Scholar Award in Molecular Parasitology from the Burroughs Wellcome Fund. The five-year award, in the amount of $425,000, will help support Pearce’s studies of Schistosoma mansoni, a water-borne parasite that causes severe, life-threatening consequences in ten-to-20 million of the more than 200 million people it infects.

FRED W. QUIMBY, professor in the Department of Biomedical Sciences, and co-editor Walter F. Loeb have published a second edition of The Clinical Chemistry of Laboratory Animals. Also contributing to the book, which is an extensively revised and newly written update of the original, 1989 edition, were Cornell faculty members Thomas Reimers, professor emeritus, recently retired from the Department of Population Medicine and Diagnostic Science, and Bud Tennant, the James Law Professor of Comparative Medicine.

Professors HOLLIS ERB, YRJO GRÖHN, and YNTE SCHUKKEN of the Department of Population Medicine and Diagnostic Sciences were three of the Cornell faculty members who took part in the ninth symposium of the International Society for Veterinary Epidemiology and Economics (ISVEE) held in Breckenridge, Colorado in August. Health issues relevant to livestock, companion animals, fish and wildlife, and public health were presented and discussed during the five-day symposium, with Cornell faculty members co-authoring over 30 presentations. Dr. Erb served on the international management committee and co-chaired the scientific committee. Drs. Gröhn and Schukken also gave a four-day pre-conference course, “Mixed Models for Continuous and Discrete Data in Veterinary Epidemiology.”
ISVEE is a nonprofit organization created to promote the study of veterinary epidemiology and veterinary economics globally. The group meets every three years in a different region of the world to exchange the latest information on such topics as risk management, animal agriculture, food safety, public health, and education. The 2000 conference was attended by over 600 people.

JANET M. SCARLETT, associate professor of epidemiology, was invited to speak at the conference "Cats, Dogs, and Public Policy" sponsored in September by the Association of the Bar of the City of New York. The conference focused on the many difficult public policy issues relating to our relationship with, and responsibilities toward, the two non-human species that are most a part of family life in our society. Among the questions the conference addressed were: society's responsibility to dogs and cats with no owners or guardians; who should regulate our relationship with these animals; whether ownership is the appropriate legal model to define that relationship; and whether it is possible to end the killing of healthy dogs and cats as a means of population control.

THE FELINE HEALTH CENTER recently received the Humanitarian Award of the American Cat Fanciers Association in recognition of the center's efforts in research and in the dissemination of feline health information to cat breeders and owners. In presenting the award to Feline Health Center director James Richards at the association's annual meeting, ACFA president Carol Barbee stated the view of the organization's members that “the Cornell Feline Health Center is of major importance in helping us to learn how to better deal with our cats' health problems.”

MARGARET C. McENTEE, DVM '86, recently became the first second-generation faculty member of the College of Veterinary Medicine. McEntee, a radiation oncologist, came to Cornell from the University of California, Davis, where she was an assistant clinical professor in radiation. McEntee completed an internship and residency at North Carolina State University, then stayed on for four years as a clinical instructor in oncology. She also spent four years in private practice before accepting the post at Davis. She graduated Phi Beta Kappa from the University of Vermont with a BA in mathematics and zoology and is board-certified in veterinary internal medicine and in veterinary radiology.

McEntee's father, Kenneth McEntee, DVM '44, retired as a professor emeritus of veterinary pathology in 1980. He has since authored a textbook, Reproductive Pathology of Domestic Mammals, which was published in 1990 by Academic Press.

Hymans sponsor art show

The College of Veterinary Medicine is hosting a showing this fall of the acrylic-on-canvas paintings of Cuban artist Fabian Martinez. "Caliente y Frío: An Exhibit of Wildlife Art – Animals from the Equator to the Poles" will be on view in the newly refurbished Hagan Room Gallery from September 21 to November 2.

The show is made possible by the Society for the Advancement of Latin American Arts and by Jay (DVM '57) and Anita Hyman, collectors of Cuban art. Exhibit partners are Cornell University's Latin American Studies Program and Herbert F. Johnson Museum of Art.
COMING EVENTS

2000

OCTOBER
12-14  50th Anniversary Kickoff  
James A. Baker Institute, Cornell University
26-28  Cornell University Trustee Council Weekend

NOVEMBER
9-10   Equine Practitioners Seminar, Cornell University
11-12  17th Farriers Conference, Cornell University

2001

JANUARY
13-17  North American Veterinary Conference  
Orlando, Florida

FEBRUARY
11-15  Western States Veterinary Conference  
Las Vegas, Nevada

MARCH
23-25  93rd Annual Conference for Veterinarians  
Cornell University

APRIL
7      Cornell College of Veterinary Medicine  
35th Annual Open House

MAY
26     College of Veterinary Medicine Hooding Ceremony
27     Cornell University Commencement

JUNE
7-10   Reunion Weekend (1’s and 6’s)