In the 1850s, half of all Americans lived on farms, hay was the state’s leading crop, and “book farming” was no compliment. In the next decade, the passage of the Morrill Act in 1862 and the subsequent establishment of Cornell as New York’s land grant college in 1865 elevated agriculture to the same academic rank as language, history, and philosophy. The act firmly aligned higher education with the public good, establishing a land grant ethic that still thrives in the College of Agriculture and Life Sciences today and drives the land grant mission into new frontiers.

EARLY DAYS
The Morrill Act granted each state a parcel of federal land to sell to establish at least one college “to teach the branches of learning related to agriculture and the mechanic arts … in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life.” At Cornell, the early years were marked by vigorous debates about the agricultural mission within New York’s land grant. Was it to teach would-be farmers to think like scientists or to educate the sons of farmers how to farm? To engage in research that would improve farm productivity or assess the miraculous claims of commercial feed additives and fertilizers? By the early 1900s, the land grant mission would firmly encompass three areas: education, extension, and research.

By 1869, only four years after the university was founded, professors had already begun an informal extension program through lectures and farm visits. By 1882, undergraduate students could study in five agricultural disciplines: applied agriculture, agricultural chemistry, economic entomology, horticulture, and veterinary science. The earliest research bulletins, dating to 1888, show researchers engaged with topics from growing greenhouse tomatoes to expediting the separation of cream from milk.

Starting in 1892, a special winter session—with no admission requirements—offered young farmers instruction in subjects like poultry husbandry and vegetable gardening. By 1902, Cornell had extended the reach of its extension program with a three-year home study program for farmers, and its counterpart, The Farmers’ Wives’ Reading Course, was a landmark in outreach to women. By the turn of the century the land grant mission had sturdy roots and statewide influence.

Times have changed: Today’s society is predominantly urban and technologically advanced, and we rely on globally interconnected food and fuel systems. Agriculture research remains at the core of CALS, but the initial five courses of study have matured into 20 academic departments and the Dyson School of Applied Economics and Management. Departments such as Communication, Biological Statistics and Computational Biology, and Neurobiology and Behavior have expanded the boundaries of the land grant mission, and the next generation of scholars is taking CALS research not only to fields and forest but also to streets and schools.

URBAN EXPANSION
The expansion to urban areas is one of the most significant extensions to the land grant mission in the last 150 years. From the persistent plague of cockroaches to the current epidemic of bedbugs, entomologists have long found their...
The sleep-deprived adolescent.

By Amanda Garris Ph.D. ’04
College of Agriculture and Life Sciences at Cornell University

Coffee in high school, many are telling and development. Many get far less.

Land Grant Fellow Rebecca Robbins, a

ing countries struggling with new pests. Climate change is bringing urban natural resources sharply into focus. Many cities have begun large scale tree planting initiatives like New York City’s Million Tree Project, but growing the urban forest requires an army of volunteers and residents to provide water—15 to 20 gallons per week—to young trees.

Christine Moskell, a graduate student in Natural Resources and a 2012 EPA Science to Achieve Results (STAR) Graduate Fellow, has noted that city planners and residents don’t always see eye to eye about tree plantings. Planners anticipate the improvements in air quality and temperature from shade trees, but some residents may be angered by street tree plantings because of future financial and legal costs, including cracked sidewalks from roots and property damage from falling branches.

“If residents are not involved in the tree planting process, tree survival suffers,” Moskell said. “My research will look at the relationship between property owner involvement in tree planting, their willingness to steward the trees, their satisfaction with the trees afterwards, and tree survival rates in communities across the state.”

Her project is just one example of how the land grant mission has spread well beyond its rural beginnings and blends social science with biological science. In 2017, the land grant mission will begin to set down concrete roots in the city, with the opening of CornellNYC Tech, on Roosevelt Island in New York City.

REACHING NEW AUDIENCES
While farm families were the first land grant clientele, the modern land grant mission serves the public at large. Today, scientists and scholars at Cornell collaborate with and offer programs useful to diverse audiences, including entrepreneurs with new products, policymakers wrestling with the municipal impact of climate change, and farmers in developing countries struggling with new pests. Land Grant Fellow Rebecca Robbins, a graduate student in Communication, is taking aim at a very drowsy demographic: the sleep-deprived adolescent.

According to Robbins, teens need on average 9½ hours of sleep per night for proper endocrine function, weight management, and development. Many get far less.

“If you listen to the people in line for coffee in high school, many are telling battle stories about how they pulled all-nighters,” she added. “The perception is often that if you’re sleeping enough, you’re lazy, and this can result in negative health behaviors proliferating across friend networks.”

Robbins suspects the social impact of communication is an important piece of the puzzle. Using models from psychology to understand how people process messages, she is studying how high school students communicate about sleep to identify promising strategies for promoting good sleep behaviors among teens. Her sleep education program will be tested in several high schools in Tompkins County as part of the larger land grant mission to promote health and wellbeing of families and young people in the community

INNOVATION IN EXTENSION
Translating research results into prac-

tice has always been central to the land grant mission. Early efforts attempted to spread research results beyond a day’s carriage journey, sometimes with a missionary zeal.

“The results of the experiment station work must be carried to every farmer’s door; and if he shuts the door, they must be thrown in the window,” wrote Liberty Hyde Bailey, the first dean of Cornell’s College of Agriculture, in his 1896 annual report on the Agricultural Experiment Station.

Innovative extension efforts included a train that functioned as a mobile classroom and traveling expo as it plopped the tracks from Brockport to Watertown to Poughkeepsie. Today, extension experts are harnessing new technologies, from handy apps to webinars that bring the classroom to the convenience of home, no broken windows required.

Recent examples include Rust-Tracker,
which is monitoring 42 million hectares of wheat in 27 developing countries for the virulent wheat rust disease, and a Whale Alert app that alerts ships to the presence of endangered right whales in their shipping lane. However, the challenge of using new media well has spawned a new field—understanding how these communication technologies can best be used to reach new audiences—and it drives the research of Land Grant Fellow Liz Newbury, also a graduate student in Communication.

“It’s a big task to understand the norms of interaction for particular social media,” Newbury said. “For example, Facebook fosters person-to-person contact, while Twitter is where people go for up-to-the-minute news. To capitalize on the strengths of each, you have to understand the expectations, perceptions, and motivations of the users of social media.”

Newbury is harnessing this information to develop a new media training program tailored to the needs of Cornell Cooperative Extension educators for collaboration, reaching new audiences, and answering questions. In the age of new media, technological literacy is a critical part of effective land grant extension, teaching and research.

SMART TECHNOLOGY, SMARTER DECISIONS

Only a few years after the Morrill Act, the first steam-powered tractors were tested, which would eventually revolutionize U.S. farming. Technology development was embraced as part of the CALS land grant mission, and today, CALS-produced technologies run the gamut from new plant varieties and biocontrol strategies for insects to a nanoscale biosensor to detect toxins and pathogens. They are joined by a new breed of technologies that are not for control or detection, but for making decisions.

Recent efforts include Review Skeptic software, developed by Jeff Hancock, associate professor of communication, with Claire Cardie, professor of computer science. Review Skeptic uses language models to detect phony online hotel reviews with nearly 90 percent accuracy. The CALS New York State Center for Rural Schools recently released three data analysis tools—Budget Playground, School Benchmarker, and Reorganizer—that allow school officials to instantly create scenarios and projections based on real education data with the click of a mouse or touch of a screen.

Another example is the work of Land Grant Fellow Shadi Atallah, a graduate student in the Dyson School of Applied Economics and Management, whose work draws on biology and economics to provide a hand-held, customized advisor on managing a global vineyard disease. Grapevine leafroll virus spreads from vine to vine via an insect vector, decreasing vine yields and reducing fruit quality over time.

His goal is to generate an online bioeconomic tool that will be as straightforward as the disease is stealthy. Vineyard managers will be able to include parameters specific to a vineyard block, such as the number of infected vines, their ages and locations, how fast the disease is spreading, and the price for the grapes, and then “play it forward” in time to see how the disease will spread and the hit they’d take on their bottom line if they do nothing to manage it.

“It’s quite a departure from situations where we are limited to leaflets or PowerPoint presentations that outline general recommendations,” Atallah said. “The growers are savvy and they have access to technology. This will empower them to make decisions based on their specific vineyard situation.”

Christine Moskell, a graduate student in Natural Resources and a 2012 EPA Science to Achieve Results (STAR) Graduate Fellow, is working to green New York’s cities.
THE NEW SMALL FARM

With seven million farmed acres producing more than $4 billion worth of food, feed, fiber, and fuel, New York is still an agricultural state. Elements of the original core mission to improve farm productivity are going strong today, including plant breeding, managing diseases and pests, animal husbandry, and food chemistry, but with a new emphasis on sustainability and global food systems. A major difference today is in the training of farmers themselves, many of whom are not the presumed “farmer’s sons” of the early land grant years: They are new to farming.

The teaching of skills to new farmers—from growing salad microgreens to guerrilla marketing—is a mantle the Cornell Small Farms Program assumed in 2005 with the Northeast Beginning Farmers Project. “Because of the aging demographics among U.S. farmers, Secretary of Agriculture Tom Vilsack has set a goal of recruiting 100,000 new farmers to replace those that are retiring,” said Anu Rangarajan, director of the Cornell Small Farms Program. “We are seeing people from all walks of life, from high school students to retirees exploring a second career, interested in getting into farming.”

Small farms—defined as those that bring in less than $250,000 in annual income—make up over 90 percent of the farms in New York state, according to the 2011 census. New York small farms yield a diverse range of products: vegetables, maple syrup, dairy and livestock, grains, fruits, and flowers, to name a few. The resources available through the Small Farms Program are comparably diverse, including workshops, farmer-to-farmer mentoring programs, and online courses.

“Our Northeast Beginning Farmers Project offers interactive, online courses on topics for those just beginning to think about farming—such as ‘Square One’ and ‘Markets and Profits’—to more advanced courses on marketing and financial planning that benefit even more experienced farmers,” Rangarajan said. “I’ve been impressed by the inspiration and enthusiasm for agriculture in the small-farms community.”

The land grant mission in CALS has managed to move forward, without leaving its roots behind, and the broad mandate of “Knowledge with a Public Purpose” ensures that the next 150 years will see an engaged—and still evolving—land grant mission.

Erica Frenay ’98 is the coordinator of the Northeast Beginning Farmers Project and operates Shelter Belt Farm in Brookletdale, N.Y. She is seen here displaying a brood of bees.

THE LAND GRANT MISSION AND DEMOCRACY

Throughout Cornell’s history, the phrase “the land grant mission” has represented an obligation to pursue public purposes that advance the common good, and it has carried an enduring meaning and significance that’s tied to our deepest ideals. The Morrill Act didn’t just advance our liberties by expanding access to higher education for the common, working people, referred to at the time as the “industrial classes.” It also promised to do so by promoting a particular kind of education for these classes.

The act said land grant colleges were supposed to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life. Land grant colleges weren’t charged with a narrow task of providing only a “practical” scientific and technical education that would prepare the industrial classes for jobs. They were charged with a broader and more difficult task of providing an education that would also cultivate the ethical and civic virtues, dispositions, capacities, and intelligence the common people needed to take up their roles as parents, homemakers, neighbors, community members, and citizens.

The provision of a liberal and practical education for the common people in the land grant system represents and contributes to the cultural and political ideal of democracy, understood not only as a system of government, but a way of life. It’s both a challenge and a responsibility to carry the land grant mission forward into this century, not as an antique museum piece, but a living, evolving and dynamic force in our public life and work.

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